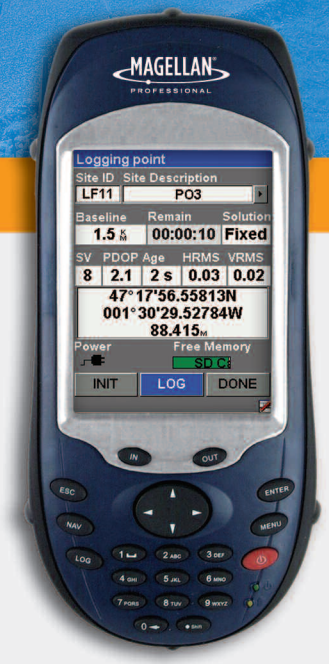
MAGELLAN®
PROFESSIONAL

ProMark™3 / ProMark3 RTK

Getting Started Guide



Copyright Notice
Copyright 2005-2007 Magellan Navigation, Inc. All rights reserved.

Trademarks
All product and brand names mentioned in this publication are trademarks of their respective holders.

FCC Notice
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 or modifications not expressly approved by Magellan Navigation could void the user's authority to operate this equipment.
CAUTION: To comply with FCC RF exposure compliance requirements, a separation distance of at least 20 cm must be maintained between the antenna of this device and all persons.

CE In the presence of RF field, the receiver's satellite signal strength may degrade. When removed from the RF field, the signal strength should return to normal.

RSS-210
This device has been found compliant with the Canadian RSS-210 specification, issue 5, November 2001 which stipulates that 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.

Where to Find Information
This manual is designed to guide you through the basic ProMark3 procedures. You can find additional information in the *ProMark3 RTK / ProMark3 Reference Manual*, also provided on the ProMark3 CD.

Magellan Professional Products - Limited Warranty (North, Central and South America)
Magellan Navigation warrants their GPS receivers and hardware accessories to be free of defects in material and workmanship and will conform to our published specifications for the product for a period of one year from the date of original purchase. THIS WARRANTY APPLIES ONLY TO THE ORIGINAL PURCHASER OF THIS PRODUCT.

In the event of a defect, Magellan Navigation will, at its option, repair or replace the hardware product with no charge to the purchaser for parts or labor. The repaired or replaced product will be warranted for 90 days from the date of return shipment, or for the balance of the original warranty, whichever is longer. Magellan Navigation warrants that software products or software included in hardware products will be free from defects in the media for a period of 30 days from the date of shipment and will substantially conform to the then-current user documentation provided with the software (including updates thereto). Magellan Navigation's sole obligation shall be the correction or replacement of the media or the software so that it will substantially conform to the then-current user documentation. Magellan Navigation does not warrant the software will meet purchaser's requirements or that its operation will be uninterrupted, error-free or virus-free. Purchaser assumes the entire risk of using the software.

PURCHASER'S EXCLUSIVE REMEDY UNDER THIS WRITTEN WARRANTY OR ANY IMPLIED WARRANTY SHALL BE LIMITED TO THE REPAIR OR REPLACEMENT, AT MAGELLAN NAVIGATION'S OPTION, OF ANY DEFECTIVE PART OF THE RECEIVER OR ACCESSORIES WHICH ARE COVERED BY THIS WARRANTY. REPAIRS UNDER THIS WARRANTY SHALL ONLY BE MADE AT AN AUTHORIZED MAGELLAN NAVIGATION SERVICE CENTER. ANY REPAIRS BY A SERVICE CENTER NOT AUTHORIZED BY MAGELLAN NAVIGATION WILL VOID THIS WARRANTY.

To obtain warranty service the purchaser must obtain a Return Materials Authorization (RMA) number prior to shipping by calling 1-800-229-2400 (press option #1) (U.S.) or 1-408-615-3981 (International), or by submitting a repair request on-line at: http://professional.magellangps.com/en/support/rma.asp. The purchaser must return the product postpaid with a copy of the original sales receipt to the address provided by Magellan Navigation with the RMA number. Purchaser's return address and the RMA number must be clearly printed on the outside of the package.

Magellan Navigation reserves the right to refuse to provide service free-of-charge if the sales receipt is not provided or if the information contained in it is incomplete or illegible or if the serial number is altered or removed. Magellan Navigation will not be responsible for any losses or damage to the product incurred while the product is in transit or is being shipped for repair. Insurance is recommended. Magellan Navigation suggests using a trackable shipping method such as UPS or FedEx when returning a product for service.

EXCEPT AS SET FORTH IN THIS LIMITED WARRANTY, ALL OTHER EXPRESSED OR IMPLIED WARRANTIES, INCLUDING THOSE OF FITNESS FOR ANY PARTICULAR PURPOSE, MERCHANTABILITY OR NON-INFRINGEMENT, ARE HEREBY DISCLAIMED AND IF APPLICABLE, IMPLIED WARRANTIES UNDER ARTICLE 35 OF THE UNITED NATIONS CONVENTION ON CONTRACTS FOR THE INTERNATIONAL SALE OF GOODS. Some national, state, or local laws do not allow limitations on implied warranty or how long an implied warranty lasts, so the above limitation may not apply to you.

The following are excluded from the warranty coverage: (1) periodic maintenance and repair or replacement of parts due to normal wear and tear; (2) batteries and finishes; (3) installations or defects re-

sulting from installation; (4) any damage caused by (i) shipping, misuse, abuse, negligence, tampering, or improper use; (ii) disasters such as fire, flood, wind, and lightning; (iii) unauthorized attachments or modification; (5) service performed or attempted by anyone other than an authorized Magellan Navigations Service Center; (6) any product, components or parts not manufactured by Magellan Navigation; (7) that the receiver will be free from any claim for infringement of any patent, trademark, copyright or other proprietary right, including trade secrets; and (8) any damage due to accident, resulting from inaccurate satellite transmissions. Inaccurate transmissions can occur due to changes in the position, health or geometry of a satellite or modifications to the receiver that may be required due to any change in the GPS. (Note: Magellan Navigation GPS receivers use GPS or GPS+GLONASS to obtain position, velocity and time information. GPS is operated by the U.S. Government and GLONASS is the Global Navigation Satellite System of the Russian Federation, which are solely responsible for the accuracy and maintenance of their systems. Certain conditions can cause inaccuracies which could require modifications to the receiver. Examples of such conditions include but are not limited to changes in the GPS or GLONASS transmission.) Opening, dismantling or repairing of this product by anyone other than an authorized Magellan Navigation Service Center will void this warranty.

MAGELLAN NAVIGATION SHALL NOT BE LIABLE TO PURCHASER OR ANY OTHER PERSON FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES WHATSOEVER, INCLUDING BUT NOT LIMITED TO LOST PROFITS, DAMAGES RESULTING FROM DELAY OR LOSS OF USE, LOSS OF OR DAMAGES ARISING OUT OF BREACH OF THIS WARRANTY OR ANY IMPLIED WARRANTY EVEN THOUGH CAUSED BY NEGLIGENCE OR OTHER FAULT OFMAGELLAN NAVIGATION OR NEGLIGENT USAGE OF THE PRODUCT. IN NO EVENT WILL MAGELLAN NAVIGATION BE RESPONSIBLE FOR SUCH DAMAGES, EVEN IF MAGELLAN NAVIGATION HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

This written warranty is the complete, final and exclusive agreement between Magellan Navigation and the purchaser with respect to the quality of performance of the goods and any and all warranties and representations. This warranty sets forth all of Magellan Navigation's responsibilities regarding this product. This limited warranty is governed by the laws of the State of California, without reference to its conflict of law provisions or the U.N. Convention on Contracts for the International Sale of Goods, and shall benefit Magellan Navigation, its successors and assigns.

This warranty gives the purchaser specific rights. The purchaser may have other rights which vary from locality to locality (including Directive 1999/44/EC in the EC Member States) and certain limitations contained in this warranty, including the exclusion or limitation of incidental or consequential damages may not apply.

For further information concerning this limited warranty, please call or write:

Magellan Navigation, Inc., 960 Overland Court, San Dimas, CA 91773, Phone: +1 909-394-5000, Fax: +1 909-394-7050 or

Magellan Navigation SAS - ZAC La Fleuriaye - BP 433 - 44474 Carquefou Cedex - France Phone: +33 (0)2 28 09 38 00, Fax: +33 (0)2 28 09 39 39.

Magellan Professional Products Limited Warranty (Europe, Middle East, Africa)

All Magellan Navigation global positioning system (GPS) receivers are navigation aids, and are not intended to replace other methods of navigation. Purchaser is advised to perform careful position charting and use good judgment. READ THE USER GUIDE CAREFULLY BEFORE USING THE PRODUCT.

1. MAGELLAN NAVIGATION WARRANTY

Magellan Navigation warrants their GPS receivers and hardware accessories to be free of defects in material and workmanship and will conform to our published specifications for the product for a period of one year from the date of original purchase or such longer period as required by law. THIS WARRANTY APPLIES ONLY TO THE ORIGINAL PURCHASER OF THIS PRODUCT.

In the event of a defect, Magellan Navigation will, at its option, repair or replace the hardware product with no charge to the purchaser for parts or labor. The repaired or replaced product will be warranted for 90 days from the date of return shipment, or for the balance of the original warranty, whichever is longer. Magellan Navigation warrants that software products or software included in hardware products will be free from defects in the media for a period of 30 days from the date of shipment and will substantially conform to the then-current user documentation provided with the software (including updates thereto). Magellan Navigation's sole obligation shall be the correction or replacement of the media or the software so that it will substantially conform to the then-current user documentation. Magellan Navigation does not warrant the software will meet purchaser's requirements or that its operation will be uninterrupted, error-free or virus-free. Purchaser assumes the entire risk of using the software.

2. PURCHASER'S REMEDY

PURCHASER'S EXCLUSIVE REMEDY UNDER THIS WRITTEN WARRANTY OR ANY IMPLIED WARRANTY SHALL BE LIMITED TO THE REPAIR OR REPLACEMENT, AT MAGELLAN NAVIGATION'S OPTION, OF ANY DEFECTIVE PART OF THE RECEIVER OR ACCESSORIES WHICH ARE COVERED BY THIS WARRANTY. REPAIRS UNDER THIS WARRANTY SHALL ONLY BE MADE AT AN AUTHORIZED MAGELLAN NAVIGATION SERVICE CENTER. ANY REPAIRS BY A SERVICE CENTER NOT AUTHORIZED BY MAGELLAN NAVIGATION WILL VOID THIS WARRANTY.

3. PURCHASER'S DUTIES

To obtain service, contact and return the product with a copy of the original sales receipt to the dealer from whom you purchased the product.

Magellan Navigation reserves the right to refuse to provide service free-of-charge if the sales receipt is not provided or if the information contained in it is incomplete or illegible or if the serial number is altered or removed. Magellan Navigation will not be responsible for any losses or damage to the product incurred while the product is in transit or is being shipped for repair. Insurance is recommended. Magellan Navigation suggests using a trackable ship-

ping method such as UPS or FedEx when returning a product for service.

4. LIMITATION OF IMPLIED WARRANTIES

EXCEPT AS SET FORTH IN ITEM 1 ABOVE, ALL OTHER EXPRESSED OR IMPLIED WARRANTIES, INCLUDING THOSE OF FITNESS FOR ANY PARTICULAR PURPOSE OR MERCHANTABILITY, ARE HEREBY DISCLAIMED AND IF APPLICABLE, IMPLIED WARRANTIES UNDER ARTICLE 35 OF THE UNITED NATIONS CONVENTION ON CONTRACTS FOR THE INTERNATIONAL SALE OF GOODS.

Some national, state, or local laws do not allow limitations on implied warranty or how long an implied warranty lasts, so the above limitation may not apply to you.

5. EXCLUSIONS

The following are excluded from the warranty coverage:

(1) periodic maintenance and repair or replacement of parts due to normal wear and tear;

(2) batteries;

(3) finishes;

(4) installations or defects resulting from installation;

(5) any damage caused by (i) shipping, misuse, abuse, negligence, tampering, or improper use; (ii) disasters such as fire, flood, wind, and lightning; (iii) unauthorized attachments or modification;

(6) service performed or attempted by anyone other than an authorized Magellan Navigations Service Center;

(7) any product, components or parts not manufactured by Magellan Navigation,

(8) that the receiver will be free from any claim for infringement of any patent, trademark, copyright or other proprietary right, including trade secrets

(9) any damage due to accident, resulting from inaccurate satellite transmissions. Inaccurate transmissions can occur due to changes in the position, health or geometry of a satellite or modifications to the receiver that may be required due to any change in the GPS. (Note: Magellan Navigation GPS receivers use GPS or GPS+GLONASS to obtain position, velocity and time information. GPS is operated by the U.S. Government and GLONASS is the Global Navigation Satellite System of the Russian Federation, which are solely responsible for the accuracy and maintenance of their systems. Certain conditions can cause inaccuracies which could require modifications to the receiver. Examples of such conditions include but are not limited to changes in the GPS or GLONASS transmission.).

Opening, dismantling or repairing of this product by anyone other than an authorized Magellan Navigation Service Center will void this warranty.

6. EXCLUSION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES

MAGELLAN NAVIGATION SHALL NOT BE LIABLE TO PURCHASER OR ANY OTHER PERSON FOR ANY INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES WHATSOEVER, INCLUDING BUT NOT LIMITED TO LOST PROFITS, DAMAGES RESULTING FROM DELAY OR LOSS OF USE, LOSS OF OR DAMAGES ARISING OUT OF BREACH OF THIS WARRANTY OR ANY IMPLIED WARRANTY EVEN THOUGH CAUSED BY NEGLIGENCE OR OTHER FAULT OFMAGELLAN NAVIGATION OR NEGLIGENT USAGE OF THE PRODUCT. IN NO EVENT WILL MAGELLAN NAVIGATION BE RESPONSIBLE FOR SUCH DAMAGES, EVEN IF MAGELLAN NAVIGATION HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

Some national, state, or local laws do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

7. COMPLETE AGREEMENT

This written warranty is the complete, final and exclusive agreement between Magellan Navigation and the purchaser with respect to the quality of performance of the goods and any and all warranties and representations. THIS WARRANTY SETS FORTH ALL OF MAGELLAN NAVIGATION'S RESPONSIBILITIES REGARDING THIS PRODUCT.

THIS WARRANTY GIVES YOU SPECIFIC RIGHTS. YOU MAY HAVE OTHER RIGHTS WHICH VARY FROM LOCALITY TO LOCALITY (including Directive 1999/44/EC in the EC Member States) AND CERTAIN LIMITATIONS CONTAINED IN THIS WARRANTY MAY NOT APPLY TO YOU.

8. CHOICE OF LAW.

This limited warranty is governed by the laws of France, without reference to its conflict of law provisions or the U.N. Convention on Contracts for the International Sale of Goods, and shall benefit Magellan Navigation, its successors and assigns.

THIS WARRANTY DOES NOT AFFECT THE CUSTOMER'S STATUTORY RIGHTS UNDER APPLICABLE LAWS IN FORCE IN THEIR LOCALITY, NOR THE CUSTOMER'S RIGHTS AGAINST THE DEALER ARISING FROM THEIR SALES/PURCHASE CONTRACT (such as the guarantees in France for latent defects in accordance with Article 1641 et seq of the French Civil Code).

For further information concerning this limited warranty, please call or write:

Magellan Navigation SAS - ZAC La Fleuriaye - BP 433 - 44474 Carquefou Cedex - France.

Phone: +33 (0)2 28 09 38 00, Fax: +33 (0)2 28 09 39 39

English

Table of Contents

English

1. Introduction

Thank you for buying a ProMark3 RTK or ProMark3 system from Magellan.

What is ProMark3?

ProMark3 is a data collector allowing you to perform Survey and GIS jobs. It also includes a full set of navigation functions.

ProMark3 includes a large, high-resolution screen and offers enhanced communication with Bluetooth, USB and serial connections.

ProMark3 can be upgraded into a ProMark3 RTK by installing the appropriate firmware available from the Magellan FTP server and then enabling the RTK function through a password. For more information, please refer to *Unlocking RTK and FAST Survey on page 71*.

What is ProMark3 RTK?

ProMark3 RTK offers the same functions as ProMark3 *plus* the capability to perform real-time, centimeter-accurate surveys using BLADE™, Magellan's special RTK L1 algorithm. From the hardware point of view, ProMark3 RTK is strictly similar to ProMark3.

RTK implementation in ProMark3 RTK relies on the use of:

- A base/rover system (*base/rover configuration*) with its dedicated data link (license-free radio),
- A network connection (NTRIP or Direct IP, via GPRS), in which case no user-owned base is required (*rover-only configuration*),
- Or any other solution using an external RTCM source (beacon, etc.).

To perform your surveys with ProMark3 RTK, you can use either the built-in Surveying function or, as an option, the Magellan FAST Survey software.

This Getting Started Guide covers both the ProMark3 and ProMark3 RTK systems.

For the sake of simplicity, and unless otherwise specified, the term "ProMark3" refers to both the ProMark3 RTK and ProMark3 systems.

"RTK Setup", "Standard RTK: "Surveying"" and "Advanced RTK: FAST Survey Option" are chapters specific to ProMark3 RTK.

System Components Overview

The table below provides an overview of the different key items composing the ProMark3.

English

Depending on your purchase, based on the type of survey you wish to perform, you may only have part of the listed items. Please refer to the delivered packing list for an accurate description of the equipment that has been delivered to you.

Basic Supply:

ProMark3 Receiver Unit

Handstrap

Two Styli

Accessories, General Purpose:

I/O Module

AC Adapter/ Charger

USB Cable

(1) Two versions available: US (111360) and EC (111359). Two units are needed: one at the base, the other on the rover.

ProMark3 CD (User documentation)

Survey-specific accessories:

External GNSS Antenna

External Antenna Cable

Vertical Antenna Extension + Washer

Field Bracket

Measurement Tape

Field Bag

Initializer Bar and antenna adaptor

GNSS Solutions CD

RTK specific accessories

License-free radio with its power/data cable. (1)

Fastening Accessory Kit

License-free radio bracket

RTK Vertical Antenna Extension, 0.25 m high (10 inches)

FAST Survey CD Option

GIS

MobileMapper Office CD

ProMark3 Controls

Keyboard

In addition to the 8 specific keys (LOG, NAV, ESC, IN, OUT, ENTER, MENU and Power), ProMark3 is fitted with an alphanumeric keypad. The cursor keys are used to move the cursor left, right, up and down on the screen. Buttons 2-9 contain alphanumeric characters.

Using the Stylus

The stylus is used for menu selection or data input on the touch-screen. The following terminology is used:

Tap: Touch the screen once with the stylus to select or open an item.

Double-tap: Touch the screen twice rapidly to open a selected item.

Drag: Hold the stylus on the screen and drag it across to select text. Drag in a list to select multiple items.

Press vs. Tap - Key vs. Button

"Pressing the LOG key" does not describe the same action as "tapping the Log button".

In this guide, the verb "Press" refers to any action performed on the keyboard and "Tap" refers to any action performed with the stylus on the touch screen, including on the on-screen keypad. Likewise, the name "key" refers to any key on the keyboard and "button" refers to any on-screen pushbutton.

On-Screen Keypad

Tap this icon to show or hide the on-screen keypad.

The ProMark3 screen now continually displays a keypad icon in its lower-right corner. This icon gives you permanent control over the ProMark3's on-screen keypad. The icon operates as a toggle switch. Any time, you can tap it to show or hide the on-screen keypad.

Note that the ProMark3 continues to automatically display the on-screen keypad when context requires data entry. It disappears when you press ENTER.

2. Preparing For First-Time Use

Charging the ProMark3 Battery Pack

Battery Life
Whether used as a rover or a base, ProMark3 will run for 8 hours with its internal battery in typical conditions of use.

The ProMark3 includes a rechargeable, replaceable battery pack. Before using the receiver, you must first charge the battery pack:

1. Locate the removable battery provided.
2. Open the battery door, located in the back of the receiver, using a screwdriver or a coin.
3. Insert the battery –label side upward, contact towards the top of the unit– into the battery compartment:

4. Close the battery door and tighten the screws.
5. Attach the Clip-on I/O module to the receiver as shown below (Insert bottom first, hold down release button, press I/O module against unit and release button):

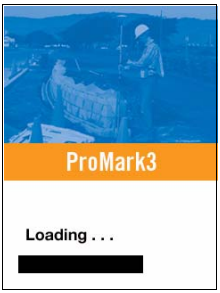
6. Connect the AC adapter (see below) and then let it charge the battery for approximately six hours.

Connect cable from AC adapter to this input

7. To detach the clip-on I/O module, press the release button on the module.

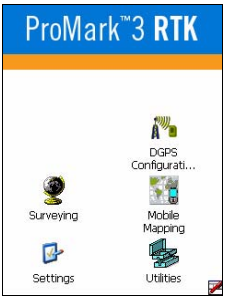
Turning On/Off the Receiver

Once you have charged the battery, press the red key (the power key) on the front of the receiver until the power indicator turns solid green.



ProMark3 Start-up Screen

You will first see the receiver's start-up screen (see opposite left). Wait for the progress bar to complete its sequence. The screen then displays the ProMark3 workspace with its main icons (see opposite right).

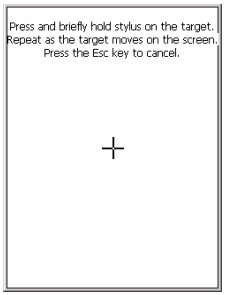


ProMark3 Workspace

There are three categories of programs behind these icons:

- ProMark3 primary functions: Surveying and Mobile Mapping icons.
  For a ProMark3 RTK with the FAST Survey software option installed and unlocked, you will also see the FAST Survey icon.
- DGPS Configuration icon, for a quick access to the DGPS configuration options.
- Settings and Utilities icons giving access to the complete sets of setup and utility programs.

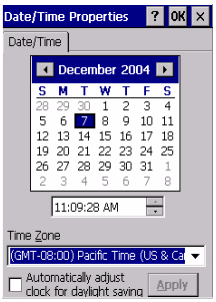
When you need to turn off ProMark3, simply press the ⏻ red key until the screen displays the Shut Down window and then tap OK.



Calibrating the Screen

For the first-time use, you need to align your display screen so the cursor on the touch screen align with the tip of your stylus. Use the stylus pen to tap the center of each target that appears on the Calibration screen with the tip of the stylus. Tap anywhere on the display when finished.

To re-calibrate your screen at anytime, double-tap the **Settings** icon then double-tap **Stylus** from the list, tap the **Calibration** tab and then follow the instructions.

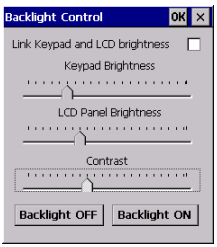


Automatic System Time Update

ProMark3 will automatically update the system date & time using the GPS time determined by the integrated GPS receiver and the time zone that you specify. To set the time zone:

- In the ProMark3 workspace, double-tap the **Settings** icon.
- Double-tap the Date/Time function. This opens the Date/Time Properties screen.
- Set the time zone field (see opposite) and then select **OK** on top of the screen.

  Please note that you should wait for a few seconds, after turning on ProMark3, before system time can effectively be updated.



Adjusting the Backlight

To switch the backlight on/off for both the keypad and display, or to adjust the brightness and screen contrast, double-tap the **Settings** icon on the ProMark3 workspace and then double-tap the **Backlight Control** function.

To conserve battery power, we recommend you to switch the backlight off whenever possible.

For other settings, please refer to the *ProMark3 Reference Manual*.

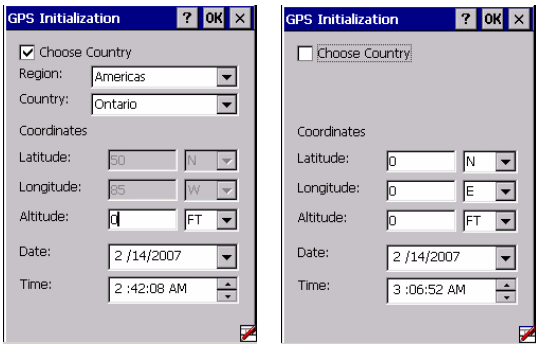
Initializing GPS

Please Go Outside to Perform Initialization!

Initialization is required when 1) the receiver is brand new, 2) you have moved more than 500 miles from the last place you were using it, 3) memory has been completely erased or 4) the receiver has not been used for more than a few months.

Take the receiver to a location where there is a clear view of the sky, then:

- From the ProMark3 workspace, tap successively the **Utilities** icon and then the **GPSInit** icon.
- Initialize the receiver using one of the two methods below:
  1. If you don't have the slightest idea of what the coordinates of your current position are, check the **Choose Country** option (see screen below left), select respectively your region and country in the two fields underneath, enter the date and time (bottom of the screen) and then tap **OK** to start the initialization process. This closes the GPS Initialization window.



  2. If you have a rough idea of what the coordinates of your current position are, directly enter these coordinates in the **Latitude** and **Longitude** fields (see screen above right), enter the date and time (bottom of the screen) and then tap **OK** to start the initialization process. This closes the GPS Initialization window.

Preliminary Settings

From the ProMark3 workspace, do the following:

- Double-tap the Surveying icon if you want to perform a real-time (ProMark3 RTK only) or post-processing survey.
- Or double-tap the Mobile Mapping icon if you want to perform a GIS job.

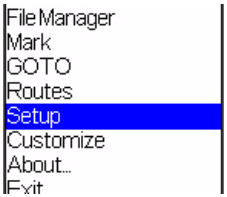
Whatever your choice, ProMark3 will then display a navigation screen.

Just press the NAV or ESC button to scroll through the different available navigation screens.

For more information on Navigation screens, please refer to chapter *Navigation Tools on page 69.*

Access to Preliminary Settings

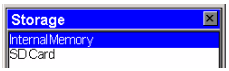
Now that ProMark3 displays a navigation screen, press the MENU key and tap Setup (see screen opposite).



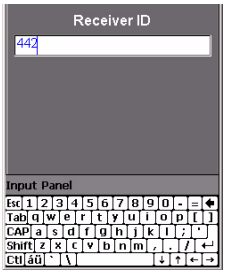
There are many options to select among, and all are explained in full in the *ProMark3 RTK / ProMark3 Reference Manual* available from the documentation CD. For the purposes of getting started, however, we will concentrate on just a few of these options.

As a general rule, tap an option to open the corresponding setting window. Then tap the desired value. This will enable the value and take you back to the Setup menu. You can also return to the Setup menu by pressing the ESC button.

Choosing the Storage Medium



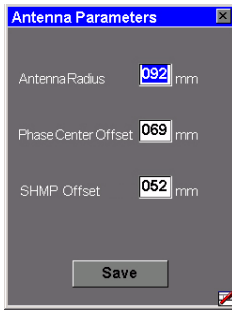
ProMark3 can store your jobs either in its internal memory or on the SD card you have inserted in the unit. Tap the desired option.



Entering the Receiver ID

(From within Surveying function only)

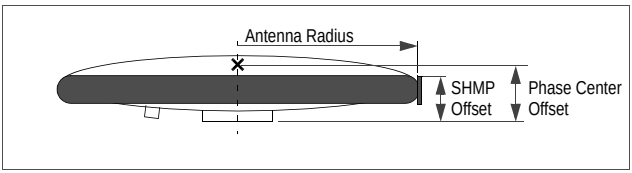
The Receiver ID screen provides you with the ability to enter the 4-character receiver ID which is used in naming the raw data files. Each raw data file from this receiver will include this 4-character receiver ID.



Specifying the Antenna Used

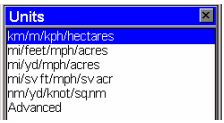
You select this option to define the type of external antenna used, its height and the unit used to express this height.

Three different types of antennas are listed (ProMark Antenna 110454, NAP100 or Other). If you choose “Other”, you will have to define the following parameters for your antenna: antenna radius, phase center offset and SHMP offset (slant height measurement point offset).



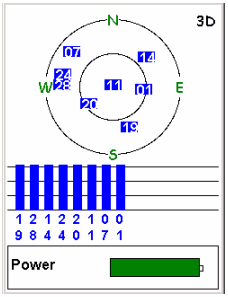
The choices made through the External Antenna option become the default antenna settings for all the ProMark3 surveying and mobile mapping functions.

Choosing the Units



You select this option to set the units of measurement you want to use. Units are presented in this order: long distances, short distances, speed and area. You can set these units to “kilometers, meters, kph and hectares” or “miles, feet, mph, acres” if you like, or to three other standard sets of units. You can also create a custom mix of units by selecting the **Advanced** option that contains a wide variety of units for distance, speed, elevation, bearing and area.

Checking that ProMark3 Receives Satellites



Satellite Status screen

Press NAV repeatedly until the Satellite Status screen is displayed. This screen shows which satellites the receiver is tracking and where they are located in the sky. If you are not tracking 3 or more satellites you may have to move to a more open area.

When used with its internal antenna (Mobile Mapping only), the receiver will have the best view of the sky when you hold it at an angle of 45 degrees from horizontal and not too close to you.

This allows the internal antenna to function optimally for the best accuracy.

In Survey jobs for which the external antenna is mandatory, only the vertical orientation of this antenna is important.

3. RTK Setup

Introduction to RTK

Enabling the RTK algorithm in the ProMark3 RTK is simply done by launching "Surveying", pressing MENU, selecting Receiver Mode and then Real-Time or Real-Time & Raw Data Recording.

From this time on, the ProMark3 RTK will operate to deliver fixed position solutions, provided the operating requirements are met.

Selecting Real-Time & Raw Data Recording is a safe way to perform a real-time survey. With raw data recorded in the background, you will have the capability to post-process the raw data in the office. This however requires that base raw data be also available for the same period of time (see also *page 39*).

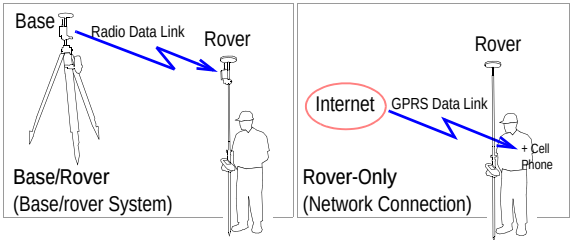
The table below summarizes the keywords and principles used in the RTK technique. **Please carefully read this table before getting started**.

When the base setup is under your responsibility, make sure the base is sited in a clear area giving the best possible view of the sky!

When this is possible, avoid trees, buildings or any high obstacles in the vicinity of the base.

Having a clear view of the sky will allow the base to collect data from a maximum of visible satellites, which is highly recommended to perform a successful, accurate and fast survey.

1.	**Corrections**. Corrections generated by a static receiver ("base") are needed for the rover to be able to deliver centimeter-accurate positions.
2.	**Data Link**. The data link that must be established to transfer corrections from the base to the rover can be implemented in three different ways with ProMark3 RTK: license-free radio, cellular phone (GPRS) or any other external RTCM device.
3.	**Base**. Depending on the chosen data link, the base will be either: • A ProMark3 RTK set as a base and generating RTCM3.1 corrections. • Or an external provider delivering its corrections via the Internet. In this case, corrections may be the following: RTCM3 or RTCM2.3.

4.	**ProMark3 RTK Configurations** 
5.	**Rover Initialization**. Before starting a survey, the rover must be initialized. There are three possible methods: “On The Fly”, “Known Point” and “Bar”. The “Bar” method can only be used if you have your own base. The initialization methods are introduced in the post-processing chapter (see page 42). The description is accurate for real-time processing too. Unlike post-processing though, real-time processing tells you in real time when initialization is complete. Compared with post-processing surveying, RTK surveying proposes **a fourth initialization method called “Static”**. With this method, the antenna should stay still over an unknown point until initialization is achieved. This method gives faster initialization than “On-The-Fly” initialization in the same operating conditions. The time required for initializing the rover ranges from a few seconds to a few minutes, depending on the baseline length, the GPS constellation and the initialization method used. “Known Point” and “Bar” are the fastest initialization methods.
6.	**Baseline Length**. Whatever the base used, its distance to the rover, called “baseline” (up to 1.6 km or 1.0 mile with license-free radios, up to 10 km with a network connection), must roughly be known to make sure RTK positions will achieve the expected level of accuracy.

Base/Rover Configuration

You are using your own ProMark3 RTK base to generate the RTCM corrections needed by the rover. A pair of Magellan license-free, plug-and-play radios is used for the data link.

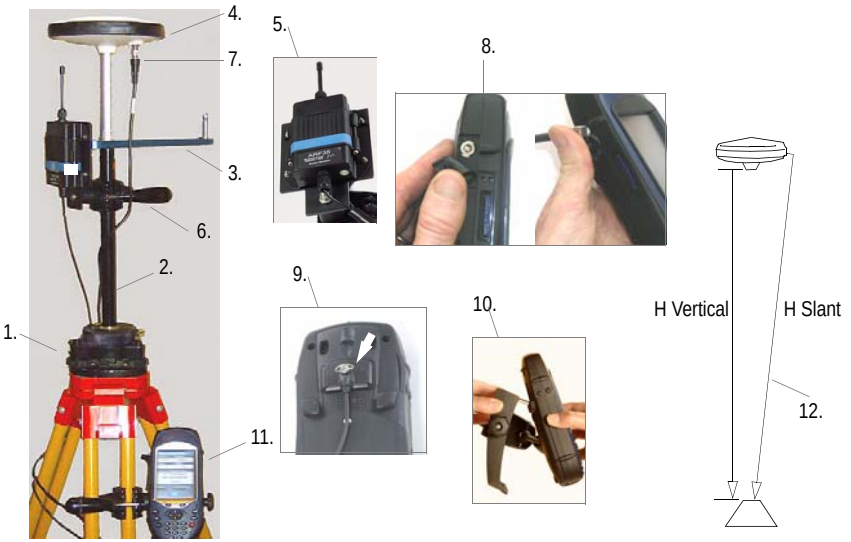
In the Base/Rover Configuration example described in this guide:

- "Surveying" is used as the user interface.
- The base is installed on a known point. The coordinates of this point were uploaded to ProMark3 RTK from a GNSS Solutions project containing this point. This means the point is now selectable from the list of control points stored in the ProMark3 RTK.

  NOTE: Points uploaded to ProMark3 RTK through this method always have their coordinates automatically converted to WGS84.
- The "Bar" method is used to achieve rover initialization. On the rover, a range pole fitted with a quick release adaptor is required to use this method.

Setting Up the Base

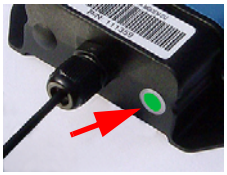
The installation site should offer the best possible GPS reception conditions. The antenna should have a clear view of the sky in all directions. There should be no, or a minimum of satellite obstructions in the vicinity.



1. Set up the tripod / tribrach combination over the point.
2. Screw the RTK vertical antenna extension into the tribrach.
3. Insert the kinematic bar on top of the RTK vertical antenna extension.
4. Attach the GNSS antenna on top of the kinematic bar.
5. Mount the license-free radio onto its bracket using the screws, nuts and washers provided.

The higher the radio, the better the quality and range of the radio link.

Warning!
Unscrewing the radio antenna protection is pointless or even hazardous for the antenna.

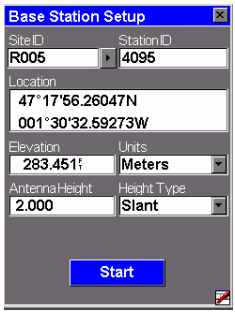


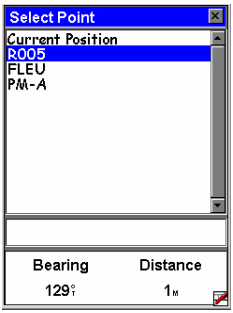
6. Secure the radio bracket onto the RTK vertical antenna extension. Place it as high as possible, just underneath the GNSS antenna, as shown. Placing the radio too low will reduce the radio range.
7. Connect the external antenna cable to the GNSS antenna.
8. Connect the other end of the external antenna cable to the ProMark3 RTK. Lift the flap on the side on the unit to access the antenna input connector.
9. Connect the radio cable to the back of the receiver. The connection is secure after you have fully tightened the thumb screw.
10. Place the ProMark3 RTK receiver into the field bracket.
11. Attach the field bracket / ProMark3 RTK combination onto the tripod.
12. Measure and record the instrument height (HI) of the GNSS antenna.
13. Turn on the ProMark3 RTK and check that the green LED indicator on the radio is on. This means the connection between the radio and the ProMark3 RTK is correct and the radio is normally powered.

Configuring the Base

Remember in this example that the position of the base is stored in the ProMark3 RTK as a control point (see *page 13*). Follow the instructions below:

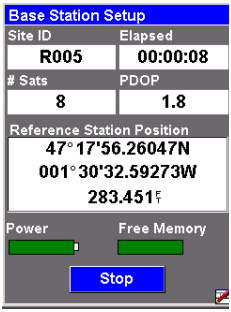
1. Double-tap the **Surveying** icon.
2. Press MENU, tap **Receiver Mode**, then **Real-Time**.
3. Press MENU, tap **Base Station** and enter the base parameters:
   - **Site ID**: Allows you to quickly enter the coordinates of the base: Tap the right-arrow button to the right of the field.





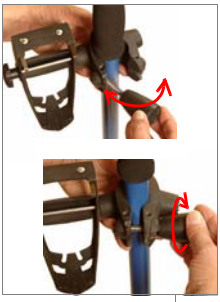
This opens a points list from which you can select the control point name corresponding to where the base is installed. This automatically sets the **Location** field to the right coordinates.

- **Station ID**: A 4-character string (0.. 4095).
- **Location**: Coordinates of base position. See **Site ID** field above.
- **Elevation**: Above ellipsoid.
- **Units**: Antenna height unit (meters, US feet or Int feet).
- **Antenna Height**: From the reference point.
- **Height Type**: **Slant** or **Vertical**.



4. Tap **Start**. The ProMark3 RTK starts operating as a base. RTCM 3.1 corrections are now broadcast via the radio modem. The screen shows the following parameters:
   - **Site ID**: As a reminder
   - **Elapsed**: Time elapsed since you started the base station
   - **# Sats**: Current number of satellites received
   - PDOP
   - Base Station Position
   - Power indicator (all green: fully charged)
   - Free memory indicator (all green: maximum)

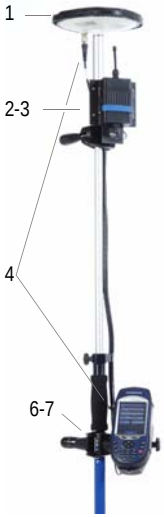
Later, after you have finished your survey and you come back to the base to switch it off, first tap **Stop**. The ProMark3 RTK will instantly stop transmitting RTCM corrections.



Setting Up the Rover

Install the unit on its range pole:

1. Mount the GNSS antenna on top of the pole using a quick release extension.
2. Mount the radio modem onto its bracket using the screws, nuts and washers provided.
3. Secure the radio bracket onto the pole.
4. Connect the GNSS antenna to the ProMark3 RTK using the cable provided.
5. Connect the radio cable to the back of the ProMark3 RTK.
6. Attach the field bracket onto the pole
7. Place the ProMark3 RTK into the field bracket
8. Measure the antenna height.

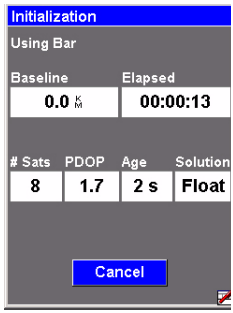


Configuring the Rover

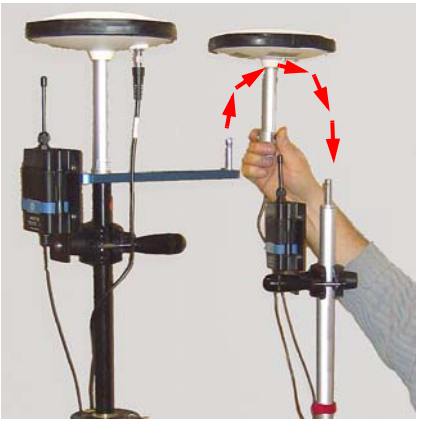
1. Turn on the ProMark3 RTK.
2. Double-tap the **DGPS Configuration** icon. This opens the DGPS Configuration window.
3. Tap **Select Mode**, select **UHF** and tap **OK**. Tap **OK** again to close the DGPS Configuration window.

Initializing the Rover

1. Move the rover antenna from the range pole to the kinematic bar (see picture below left), then:
2. On rover side, double-tap the **Surveying** icon.
3. Press MENU, tap **Receiver Mode**, then **Real-Time**.
4. Press MENU and tap **Initialize RTK**.
5. Select **Bar**. This opens the Initialization window.



6. Keep an eye on the displayed parameters while the receiver initializes:
   - Baseline: Baseline length. Should stay 0.0 km in the case of a bar initialization.
   - Elapsed: Counts the time since you started initialization.
   - # Sats: Should be 6 or more for fast initialization.
   - PDOP: Should be less than 3.
   - Age: Should stay around 2 seconds. If it starts increasing steadily, this probably means RTCM corrections are no longer received. Check your radios.
   - Solution: Position solution status. Should be a blinking "Float" throughout initialization.
     When "Fixed" appears in the Solution field, this means the rover is initialized. A new button (OK) then appears next to the Cancel button.
7. Tap OK to close the Initialization window.
8. Move the rover antenna from the initializer bar to the top of the rover pole (see picture below right). While doing this, take care not to mask the rover antenna or else you would have to resume initialization.



9. Refer to *Standard RTK: "Surveying" on page 24* to start your survey.

Rover-Only Configuration (Network)

Two types of connections are possible: NTRIP and Direct IP. Both rely on the use of a Bluetooth-enabled, GPRS-enabled cell phone within range of the ProMark3 RTK.

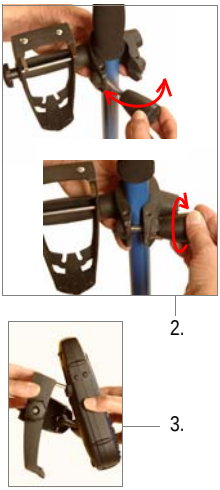
No user-owned base needs to be deployed in this configuration.

In the Rover-Only Configuration example described in this guide:

- "Surveying" is used as the user interface.
- The NTRIP mode is used to acquire RTCM corrections from the Internet.
- The "Known Point" method is used to achieve rover initialization. The coordinates of the known point were uploaded to ProMark3 RTK from a GNSS Solutions project containing this point. This means the point is now selectable from the list of control points stored in the ProMark3 RTK.

  NOTE: Points uploaded to ProMark3 RTK through this method always have their coordinates automatically converted to WGS84.

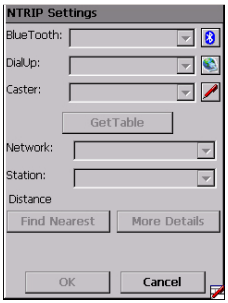
Setting Up the Rover



Install the unit on its range pole:

1. Mount the GNSS antenna on the pole
2. Attach the field bracket onto the pole
3. Place the ProMark3 receiver into the field bracket
4. Connect the GNSS antenna to the unit using the cable provided.
5. Measure the antenna height.

Configuring the Rover



1. Turn on the ProMark3 RTK.
2. Double-tap the DGPS Configuration icon.
3. Tap the Select Mode button.
4. For our example, select NTRIP and then tap OK. This gives access to the NTRIP settings window from which you can now do the following:
   a) Establish a Bluetooth connection with your cell phone.
   b) Establish an Internet connection via the cell phone.
   c) Gain access to the NTRIP provider via the cell phone and download the provider's NTRIP source table.
5. To establish a wireless connection between the cell phone and the ProMark3 RTK:

For step 5, you need to know how to activate Bluetooth on your cell phone and how to make it discoverable.

Please refer to its Instructions Manual.

Your cell phone may also ask you for a paired connection with the ProMark3 RTK. Please accept to be able to proceed.

- Tap  on the NTRIP Settings window.
- Turn on your cell phone. Activate its Bluetooth device. Make its local Bluetooth device discoverable from external Bluetooth devices.
- On ProMark3 RTK, tap  to search for the Bluetooth devices present in the vicinity. At the end of the search sequence, an icon representing your cell phone should be visible in the Bluetooth Manager window.
- Double-tap the cell phone icon. The Bluetooth Manager window now shows the Bluetooth services offered by your cell phone.
- Double-tap the **Dial-Up Networking** icon. As a result, a connection is automatically implemented using the first Bluetooth virtual port available on ProMark3 RTK. The message "**Connection succeeded on communication port COMx:**" is displayed.
- Tap **OK** to close the message window. Note the presence of a plug in a green circle on the Dial-Up Networking icon showing that the connection is effective.

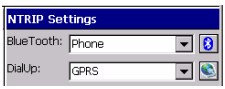
- Tap  to close the Bluetooth Manager window. The NTRIP Settings window now shows the Bluetooth connection to your cell phone.

6. To establish a GPRS connection to the Internet via the cell phone:

For step 6, you need to know the GPRS call number as well as your GPRS connection profile (user name, password, domain).

Please ask your phone operator and/or GPRS provider if you don't know these parameters.

- Tap  on the NTRIP Settings window.
- In the window that opens, double-tap the **Make New Connection** icon.
- Name the new connection (for example "My Cell Phone") using the virtual keyboard, keep **Dial-Up Connection** checked on and then tap **Next>**.
- In the **Select a modem** field, select the port used on ProMark3 RTK (i.e. the port assigned previously) to communicate with the Bluetooth modem of the cell phone (the selected modem should be in the form "BT Modem on <Cell_Phone_Name> COMx")
- In the Modem window, tap **Next>**.
- In the **Phone Number** field, type the GPRS call number corresponding to your cell phone model and GPRS operator.
- Tap **Finish**. A new icon appears in the Connection window.
- Double-tap the icon you have just created in the connection window.
- Enter the following parameters:
  - User Name
  - Password
  - Domain
- Enable the **Save password** option.
- Tap on the **Dial Properties** button and then on the **Edit** button. This opens the Edit Dialing Patterns window.
- Correct the content of this window in order to read "G" in the three fields.
- Tap **OK** twice to return to the Dial-up Connection window.
- Tap on the **Connect** button. The following messages appear successively: "Opening Port", "Dialing...",... "User Authenticated" and "Connected". The GPRS connection is now established.
- Tap **Hide** to close the message window.



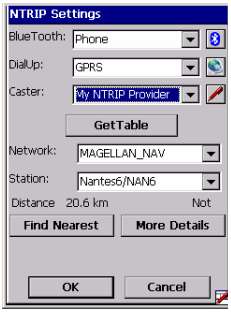
- Tap  to close the Connection window. The NTRIP Settings window now shows the connection to the GPRS operator.

For step 7, you need to know your NTRIP connection profile (host, port, login, password).

Please contact your NTRIP provider if you don't know these parameters.

7. To choose a station from which to receive RTCM corrections:

- Tap  on the NTRIP Settings window. The NtripCaster Connection window opens in which you can store several NTRIP configurations.
- To enter your first NTRIP configuration, with **New** selected in the **NTRIP Configuration** field, tap on the **Add** button and then enter the following parameters:
  - Name: NTRIP Configuration Name (freely choose a name)
  - Host: Host IP address
  - Port: Port number
  - Login: User name
  - Password: User password

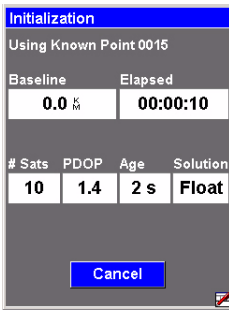


- Tap **OK**. The name of the configuration you have just created is now pre-selected in the **NTRIP Configuration** field. Tap **OK** again. This takes you back to the NTRIP Settings window (see example opposite).
- Set the **Network** and **Station** fields to select the base to work with.
- Tap **OK**. This takes you back to the DGPS Configuration window. On top of the screen, you can read part of the settings you have just made.
- Tap the **Connect** button. The DGPS Configuration screen now indicates the amount of incoming data packets (bottom of the screen) as well as the status of the DGPS mode (top of the screen).
- Tap **OK** to close the DGPS Configuration window. The following two messages are displayed successively: "Please wait..." and "Processing incoming data packets...".
- Tap **OK** to close the message window.

Initializing the Rover

Remember in this example that the position of the point used for initializing the system is stored in the ProMark3 RTK as a control point (see *page 19*). Follow the instructions below:

1. Hold the pole in vertical position over the known point.
2. Double-tap the **Surveying** icon.
3. Press MENU, tap **Receiver Mode**, then **Real-Time**.
4. Press MENU and tap **Initialize RTK**.
5. Tap **Known Point**.
6. Tap the name of the known point from the displayed list. This opens the Initialization window.
7. Keep an eye on the displayed parameters while the receiver initializes:
   - **Baseline**: Baseline length.
   - **Elapsed**: Counts the time since you started initialization.
   - **# Sats**: Should be 6 or more for fast initialization.
   - **PDOP**: Should be less than 3.
   - **Age**: Should stay around 2 seconds. If it starts increasing steadily, this probably means RTCM corrections are no longer received. Check your connection to the corrections provider.
   - **Solution**: Position solution status. Should be a blinking "Float" throughout initialization.
     When "Fixed" appears in the **Solution** field, this means the rover is initialized. A new button (**OK**) then appears next to the **Cancel** button.
8. Tap **OK** to close the Initialization window.
9. Refer to *Standard RTK: "Surveying" on page 24* to start your survey.



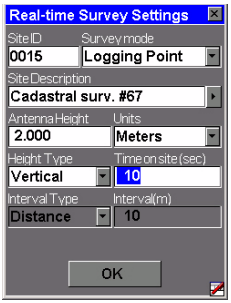
4. Standard RTK: “Surveying”

It is assumed that RTK has been implemented according to the instructions provided in chapter *RTK Setup on page 11*.

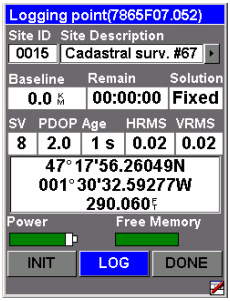
Once the rover has been initialized (see *page 17* or *page 23*, depending on whether you are in base/rover or rover-only configuration), you can move on to the survey as such. Always take care to maintain maximum satellite visibility from the antenna in order to preserve system initialization.

If the rover loses initialization, you will need to resume this step using whichever initialization method is preferable in your context of use (see *page 12*).

Logging Points in Real Time



1. Walk to the first point you want to log and stand still on that point.
2. Press the LOG key and then enter the following parameters:
   - Site ID: A 4-character string.
   - Survey Mode: Logging Point.
   - Site Description: An optional 20-character narrative description of the point. Tap inside the field, enter your text from the on-screen keypad and press ENTER.
   - Antenna Height: From the reference point.
   - Units: Antenna height unit (meters, US feet or Int feet).
   - Height Type: Slant or Vertical.
   - Time on site (sec): Time, in seconds, that must elapse, with the antenna not moving, before the rover stores the position of the point (default: 15 seconds). You decide the duration of the occupation (If it is greater than 1 second, the position solutions will be averaged over this period of time to improve accuracy. If it is 1 second, there is no position averaging but work proceeds more quickly).



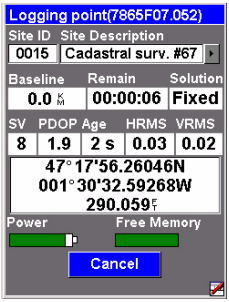
3. Tap the OK button. This opens a new screen on which you can see the following parameters:
   - The name of the opened log file is shown in the title bar between brackets.
   - Baseline: Baseline length in km
   - Solution: Solution status. Check that it is "Fixed" for centimeter accuracy.
   - Receiver status:

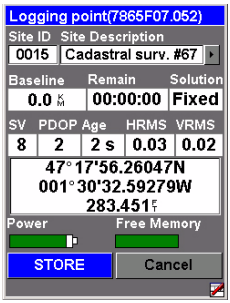
     SV: Number of received SVs. Should be 6 or more.

     PDOP: Should be less than 3.

     Age: Age of corrections (should not be greater than 2 sec).

     HRMS and VRMS: Should be in the order of 0.03 meters (1.2 inches) when the position is fixed. Always displayed in meters whatever the chosen distance unit.
   - Your position's current coordinates, as determined by the system.
4. If you are satisfied with the quality of the displayed data, tap the on-screen LOG button. This opens a new screen on which you can now see the Remain field count down. When Remain=00:00:00, the STORE button appears at the bottom of the screen (see screen below right).





If the point you save has a "Fixed" solution, then it is stored as a control point.

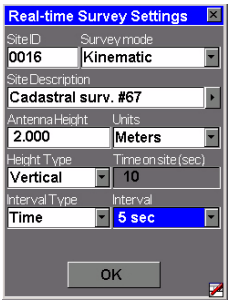
This means it can later be selected from the list of control points to initialize the system with the rover precisely located over this point.

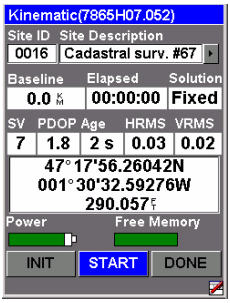
5. Tap the STORE button. This saves the point position and takes you back to the Logging Point screen where you can see that the Site ID has automatically been incremented by one.

6. Move to the next point you want to log.
7. Resume steps 3 through 6 as many times as necessary.
8. When all points have been logged, tap DONE on the screen. This closes the open log file, which now contains the positions of all the logged points, and takes you back to the last displayed navigation screen.

Logging Trajectories in Real Time

1. Walk to the start point of the trajectory and stand still on that point.
2. Press the LOG key and then enter the following parameters:
   - Site ID: A 4-character string.
   - Survey Mode: Kinematic.
   - Site Description: An optional 20-character narrative description of the point. Tap inside the field, enter your text from the on-screen keypad and press ENTER.
   - Antenna Height: From the reference point.
   - Units: Antenna height unit (meters, US feet or Int feet)
   - Height Type: Slant or Vertical.
   - Interval Type: Time or Distance, according to whether you want the points of the trajectory to be created and logged at regular intervals of time or distance.
   - Interval: Time elapsed, in seconds, or distance traveled, in meters, between any two point positions logged along the trajectory followed.





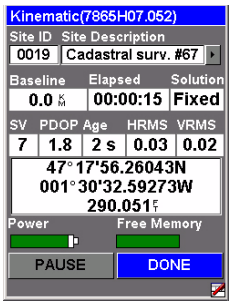
3. Tap the OK button. This opens a new screen on which you can see the following parameters:
   - The name of the opened log file is shown in the title bar between brackets.
   - Baseline: Baseline length
   - Solution: Solution status. Check that is “Fixed” (for centimeter accuracy).
   - Receiver status:

     SV: Number of received SVs. Should be 6 or more.

     PDOP: Should be less than 3.

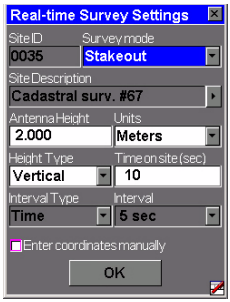
     Age: Age of corrections (should not be greater than 2 sec).

     HRMS and VRMS: Should be in the order of 0.03 meters (1.2 inches) when the position is fixed. Always displayed in meters whatever the chosen distance unit.
   - Your position’s current coordinates, as determined by the system.



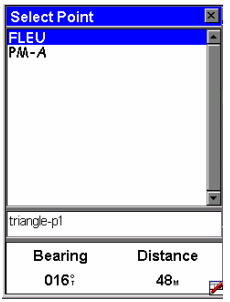
4. Tap the START button to start logging the trajectory.
5. Walk along the trajectory and let the system operate on its own. You can see that the Site ID is automatically incremented as you walk. Note that using the PAUSE button, you can pause the position logging if you need to do so.
6. When you have reached the end of the trajectory, tap the DONE button. This closes the open log file, which now contains the positions of all the logged points along the trajectory, and takes you back to the last displayed navigation screen.

Staking Out

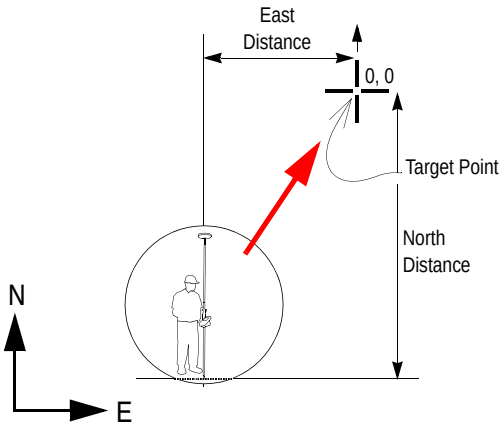


1. Press the LOG key and then enter the following parameters:
   - Survey Mode: Stakeout.
   - Antenna Height: From the reference point.
   - Units: Antenna height unit (meters, US feet or Int feet).
   - Height Type: Slant or Vertical.
   - Time on site (sec): Time, in seconds, that must elapse, with the antenna not moving, before the rover stores the position of the point (default: 15 seconds). You decide the duration of the occupation (If it is greater than 1 second, the position solutions will be averaged over this period of time to improve accuracy. If it is 1 second, there is no position averaging but work proceeds more quickly).
   - Enter coordinates manually check button: Do not check this button if the points you want to stake out are control points already stored in memory. Check it on if you want to enter the coordinates for a point to stake out.

2. Tap the OK button. Depending on how you set the Enter coordinates manually check button, the receiver now displays the list of control points, so you can select one (below left), or asks you to enter the coordinates of the point to stake out (below right). In the latter case, make sure the coordinate system used is the right one (MENU key> Setup> Coord Sys).



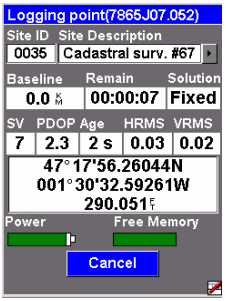
3. After you have selected a point from the list or entered coordinates manually, the ProMark3 RTK switches to the last selected navigation screen.
4. Follow the instructions on the screen to get closer to the stakeout point. When the distance to the point is only about one meter, the screen displays the following:



5. Check the distances displayed at the top of the screen. Move the pole to zero these values (see diagram above left). Carefully plumb the pole for precise staking. The displayed distances should be interpreted as follows:
   - East 0.233 M means you must move east to zero this value.
   - North 0.367 M means you must move north to zero this value.
6. When these values are all zero, stop moving. You are on the point.
7. Set the stake.
8. You may want to take another reading to save the as-staked position. Obviously, this position should be the same as that of the stakeout point but later you can compare your field work with the target coordinates.

To save the as-staked position:

- Tap the OK button. This opens a new screen on which you can now see the Remain field count down. In the window's title bar is the name of the log file where the position is about to be saved. Note that a non-editable Site ID, different from the name of the target point, is automatically assigned to that position. GNSS Solutions will automatically make the correspondence between the target point and the saved position.
  When Remain=00:00:00, the STORE button appears at the bottom of the screen (see screen below right).



- Tap the STORE button. This saves the point position and takes you back to the stakeout screen.

9. Tap Next to display the list of control points from which you can select a new target point.
10. Resume steps 4 through 7 until all the points have been staked out, then tap Done to end the stake out survey. This takes you back to the last displayed navigation screen.
    If you have also logged the positions where you placed your stakes, tapping Done also closes the log file containing the measured positions of all these points.

Quitting The Surveying Function

Press the MENU key and tap Exit. This takes you back to the ProMark3 RTK workspace.

5. Advanced RTK: FAST Survey Option

Introduction

The two requirements for running FAST Survey are: 1) You are using a ProMark3 RTK and 2) FAST Survey has been unlocked.

Launching FAST Survey

From the ProMark3 RTK workspace, double-tap the FAST Survey icon to launch FAST Survey. The software takes full control of the platform and re-assigns new functions to the function keys. See re-allocation table on *page 72*.

Creating a New Job

FAST Survey first asks you to open a job (a crd file). Do the following:

1. Choose Select New/Existing Job. A new screen is now displayed.
2. In the Name field, type in the name of the job you wish to create. For example, type in “tuto1.crd”.
3. Then tap OK to create the job. The screen then displays the Units tab.
4. On the Units tab, set the desired units and parameters for the job.
5. Tap on the GPS tab.
   On the GPS tab, choose the coordinate system to be used in the job as well as the geoid model. A large number of coordinate systems are stored in FAST Survey. To select one of them, click on the Edit Projection List button and then Add Predefined. Some coordinate systems require that a datum grid (or projection grid) be uploaded before you are allowed to use them. Geoids can be uploaded using GNSS Solutions.
6. After selecting all the desired parameters, click OK (located on top of the screen).

Configuring a Base

It is assumed that the ProMark3 RTK base has been set up as explained in *RTK Setup on page 11*. If you want to use the Bar method to initialize the rover, don't forget the kinematic bar between the antenna and the tribrach.

1. Tap on the **Equip** tab.
2. Tap the on the **Instrument** button.
3. Select **ProMark3 Magellan Base** and tap **OK**.
4. Tap on the **Configure Base** button, define the antenna height and type as well as the elevation mask.
   If you intend to log base raw data, check on the **Data Recording** option, set the recording interval in seconds, define the media where to store the data (SD Card or Internal memory) and enter a Unit ID. Reminder: This parameter is used as header in raw data filenames.
5. Tap **OK** to enter all these settings. FAST Survey then asks you to enter the position of the base and then the reference station ID.
6. When base configuration is complete, FAST Survey asks you to save the base settings in a ref file (<job_name.ref). The ProMark3 RTK will then run as a base until you exit FAST Survey.

Configuring a Rover

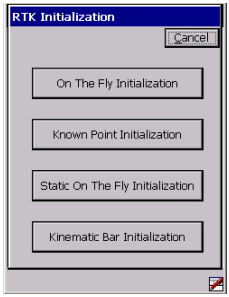
It is assumed that the ProMark3 RTK rover has been set up as explained in *RTK Setup on page 11*.

1. Tap on the **Equip** tab.
2. Tap the on the **Instrument** button.
3. Select **ProMark3 Magellan Rover** and tap **OK**.
4. Tap on the **Rover Settings** button, define the antenna height and type as well as the elevation mask. Indicate the type of position solution that is expected from the rover ("Float" or "Fixed" status).

If you intend to log rover raw data, check on the **Data Recording** option, set the recording interval in seconds, define the media where to store the data (SD Card or Internal memory) and enter a Unit ID. Reminder: This parameter is used as the header in raw data filenames.

5. Tap **OK** to enter all these settings and complete the rover configuration.

Initializing the Rover

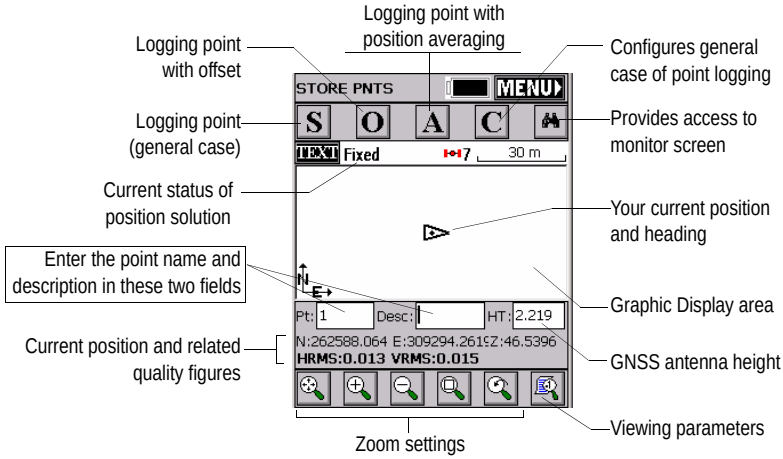


1. Tap on the **RTK Initialization** button (**Equip** tab)
2. Select the type of initialization you wish to use (see opposite) and then follow the instructions on the screen.
   NOTE: Except for "On The Fly Initialization", the message "**Please do not move the antenna until the position is Fixed!**" will appear when you choose an initialization method. Tap **OK** to close this message window.

3. After you have selected an initialization method, FAST Survey will switch to the Monitor/Skyplot screen. This screen shows the progress of the initialization phase (HRMS, VRMS, Status, Latency, etc.).
4. A beep can be heard when the position solution is fixed. You can then tap BACK at the top of the screen and move on to your survey, taking care not to lose system initialization.

Logging RTK Points

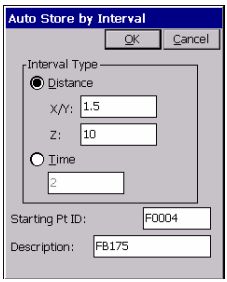
1. Tap on the Surv tab and then on Store Points. The screen now displayed allows you to log all your points.
   The figure below summarizes all the functions available from that screen.



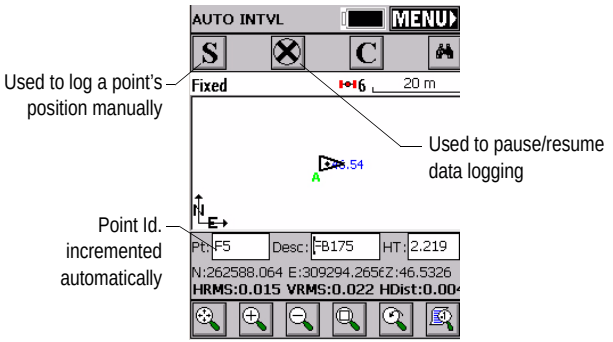
   For example, you are on a point that you want to log. Do the following:
2. Type in the point name and description in the corresponding two fields (see above)
3. Tap on the "**A**" button
4. Enter the number of readings you want before FAST Survey is allowed to compute an average position for this point. For example, type in "5" and tap OK.
   Messages follow successively indicating that the system is taking the 5 requested readings. Then FAST Survey displays the average coordinates it has determined.
5. Tap OK if you agree. The "Point Stored" message appears briefly. The screen then shows the location of the point together with its name and description.

6. After logging all your points, tap **MENU** in the upper-right corner of the screen to return to the menu.

Logging RTK Points in Continuous Mode



1. On the Surv tab, select the Auto by Interval function. Two different modes are possible: Time or Distance.
2. If you choose Distance, enter the horizontal and vertical increment value respectively in the X/Y and Z fields, according to the chosen unit. If you choose Time, enter the increment value, in seconds.
3. Enter a point Id. for the start point in the Starting Pt ID field. This field will be incremented by one after each point logging. You do not need to define a name finishing with a figure. FAST Survey will place one anyway when incrementing this field.
4. Press OK to switch to the graphic screen (see figure below) and start logging the first point.



The S button lets you instantly log the position of a point.

The X button allows you to pause data logging in continuous mode.

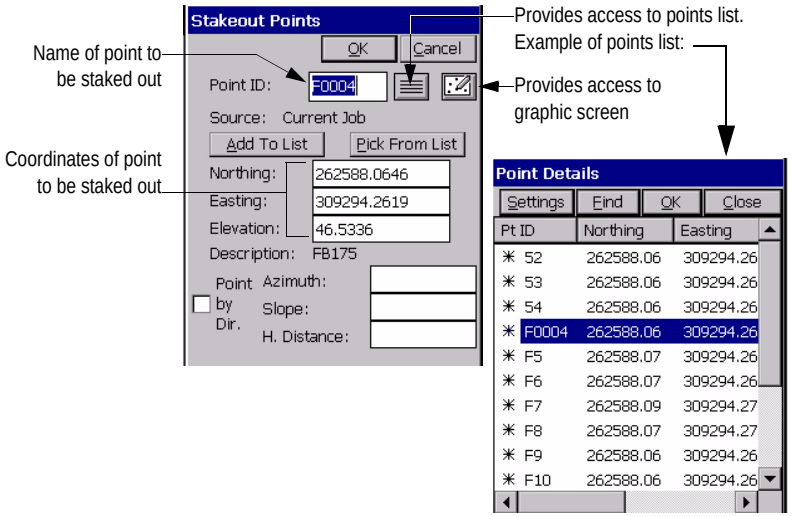
If data logging in continuous mode is paused, you can still continue to log points in manual mode using the S button.

Tap the X button again (changed into a right arrow during pause) to resume data logging in continuous mode.

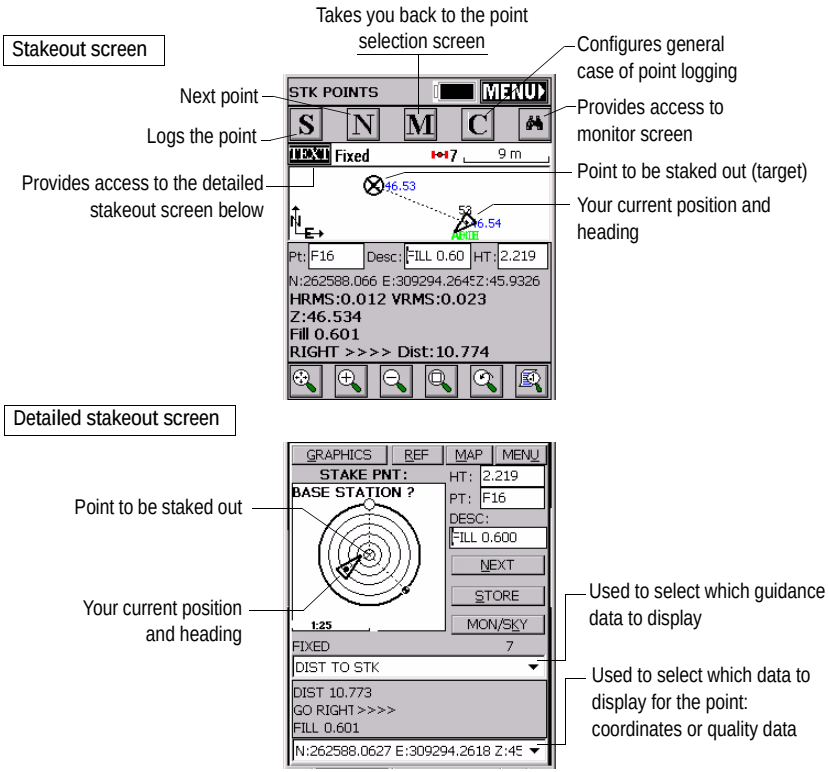
If you come back to the main menu by tapping on MENU, then data logging in continuous mode is automatically stopped.

Staking out RTK Points

1. Tap on the **Surv** tab and then select **Stakeout Points**. The screen now displayed allows you to stake out your points.
2. On this screen, FAST Survey asks you to choose the point you want to stake out. You can either type in its coordinates in the **Northing**, **Easting** and **Elevation** fields, or select a pre-defined point from the points list (see **File>List Points**). You can also, define graphically this point by tapping on the point on the graphic screen, or define that point according to azimuth, slope and horizontal distance.



3. Once you have chosen a point, tapping on the OK button will display a graphic screen from which you can easily stake out your point:



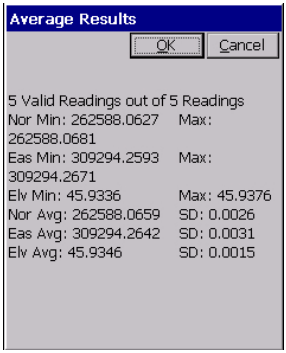
The target radius is automatically changed as the distance from you to the point changes.

When getting closer to the point, markers appear at the four corners of the target (see below left) informing you that you nearly are on the point. You can now set the stake and log the position of this point.

4. Tapping on the STORE button allows you to start performing measurements to determine the position of the point.

The number of measurements will depend on the value entered earlier through the **File** tab>**Configure Readings** function. Once the position has been determined, FAST Survey displays the results of the computation so that you can check them (see below right).

5. Tap **OK** if you are satisfied with the results. FAST Survey will then save these results and will take you back to the stakeout screen for the next point.



6. Post-Processing Surveying

Reminder on Surveying Techniques

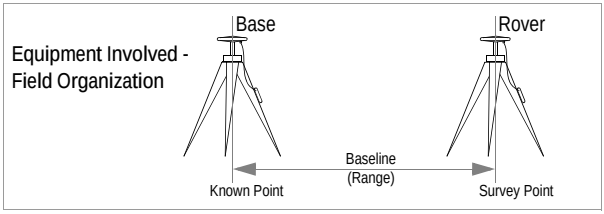
Static

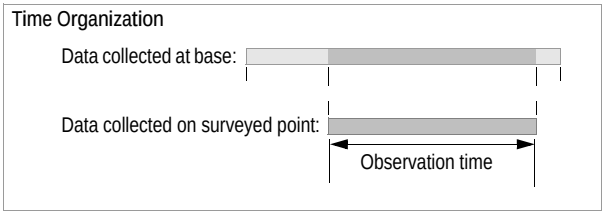
Typical Use: Surveying a New Control Point.

Make sure the base is sited in a clear area giving the best possible view of the sky!

When this is possible, avoid trees, buildings or any high obstacles in the vicinity of the base.

Having a clear view of the sky will allow the base to collect data from a maximum of visible satellites, which is highly recommended to perform a successful, accurate and fast survey.





Key Instructions:

1. Two units needed: one (the base) operated on an accurately known position and the other (the rover) on the point to be surveyed. There can be several rovers logging data at the same time.
2. Approximate distance between the two units (baseline) must be known.
3. Data must be collected simultaneously by the two units. Use the same logging interval on both units.
4. Observation time is determined by last unit set up (start) and first unit turned off (end). We recommend that you start the base first and you turn it off last.
5. Required observation time mainly depends on distance between the two units (+ reception conditions). Rover unit estimates observation time needed.
   When Obs. Range on screen is equal to or greater than the baseline, you can stop collecting data.

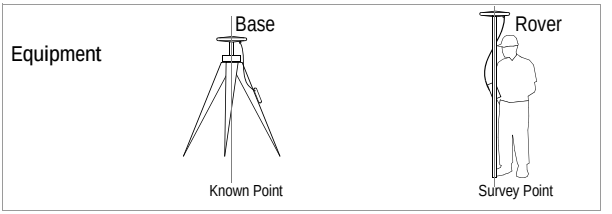
“Stop & Go”

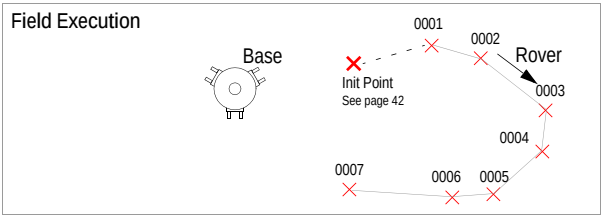
Typical Use: Surveying Several Points within a Relatively Small Area.

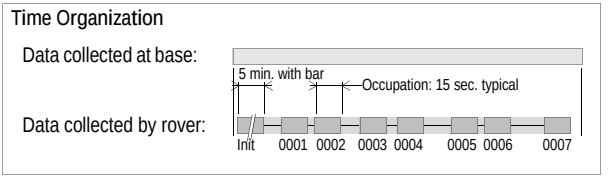
Make sure the base is sited in a clear area giving the best possible view of the sky!

When this is possible, avoid trees, buildings or any high obstacles in the vicinity of the base.

Having a clear view of the sky will allow the base to collect data from a maximum of visible satellites, which is highly recommended to perform a successful and accurate survey.







Key Instructions:

1. Two units needed: one stationary (the base) and the other (the rover) moved successively on the points to be surveyed. There can be several rovers logging data at the same time.
2. Survey must start with an initialization phase (see page 42).
3. Once initialization is achieved, be careful not to mask the rover’s GNSS antenna throughout the survey. In case of satellite signal loss, you will have to resume the initialization phase.
4. Data must be collected simultaneously by the two units. We recommend that you start the base first and you turn it off last. Use the same logging interval on both units. Rover collects data continuously throughout the survey.
5. User-preset occupation (observation time) on each surveyed point. Defaults: 5 min. on init point, 15 sec. on surveyed points. Countdown tells the user when he/she can move to the next point.

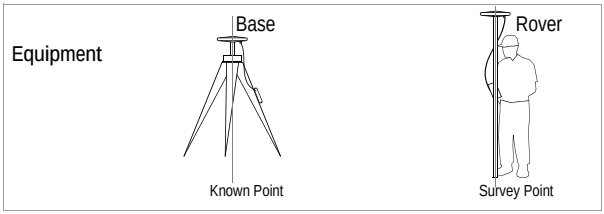
Kinematic

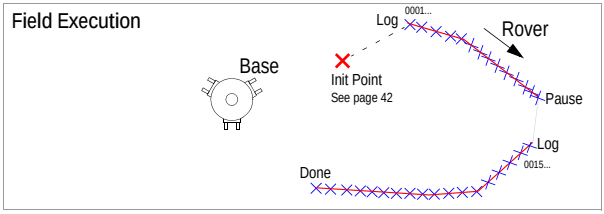
Typical Use: Surveying Trajectories.

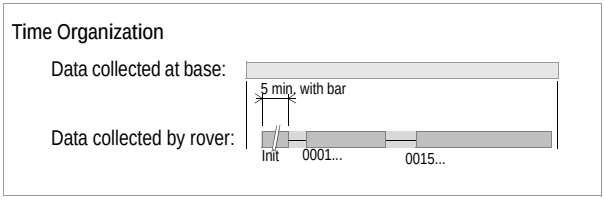
Make sure the base is sited in a clear area giving the best possible view of the sky!

When this is possible, avoid trees, buildings or any high obstacles in the vicinity of the base.

Having a clear view of the sky will allow the base to collect data from a maximum of visible satellites, which is highly recommended to perform a successful and accurate survey.







Key Instructions:

1. Two units needed: one stationary (the base) and the other (the rover) moved along each surveyed trajectory. There can be several rovers logging data at the same time.
2. Survey must be preceded by an initialization phase (see page 42).
3. Once initialization is achieved, be careful not to mask the rover's GNSS antenna throughout the survey. In case of satellite signal loss, you will have to resume the initialization phase.
4. Data must be collected simultaneously by the two units. We recommend that you start the base first and you turn it off last. Use the same logging interval on both units. Rover collects data continuously throughout the survey.
5. Site ID is automatically incremented along the trajectory according to the recording interval used.

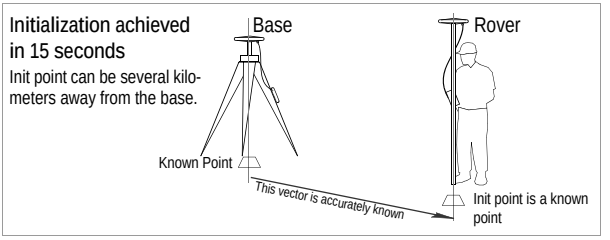
Initialization Methods

The initialization phase is required to ensure that your kinematic surveys, whether continuous or Stop & Go, will reach centimeter-level accuracies through post-processing.

With the "Known" method, you can make a survey at a fairly long distance from the base.

Three possible methods, from fastest to slowest:

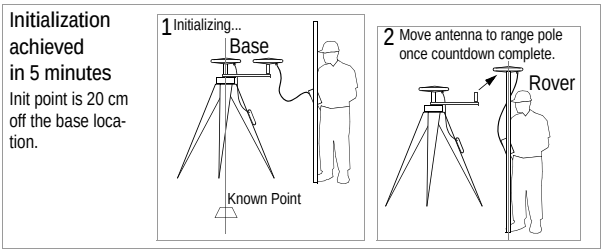
- Known: Initialization on Known point.



1. You need to specify the Site ID of the known point (surveyed in a previous job or downloaded from office software).
2. GNSS antenna held stationary over known point for about 15 seconds
3. Countdown indicates when initialization is achieved.

- Bar: On Initializer Bar Installed at the Base

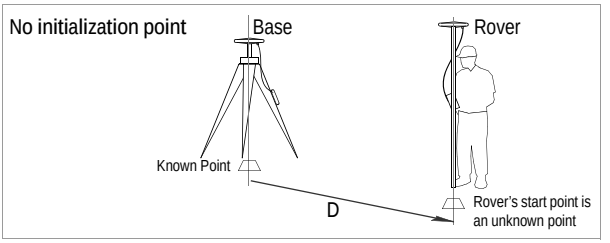
Conversely, with the "Bar" method (the method we recommend), your survey will necessarily start from the base and obviously the points to be surveyed should not be too far away from the base.



1. You freely enter a Site ID for the rover's start point
2. GNSS antenna held stationary on the initializer bar for about 5 minutes.
3. Countdown indicates when initialization is achieved.
4. Move the antenna from the bar to the range pole taking care not to mask the antenna while doing this. Then start your job

- <None>: On The Fly (OTF) Initialization

With the "<None>" method, the survey start point can be any point but you should have a rough idea of the distance from your working area to the base so you can estimate the overall time you should spend collecting data (15 to 30 minutes typical)



1. You freely enter a Site ID for the rover's start point
2. There is no countdown indicating when initialization is achieved.

Running a Static Survey

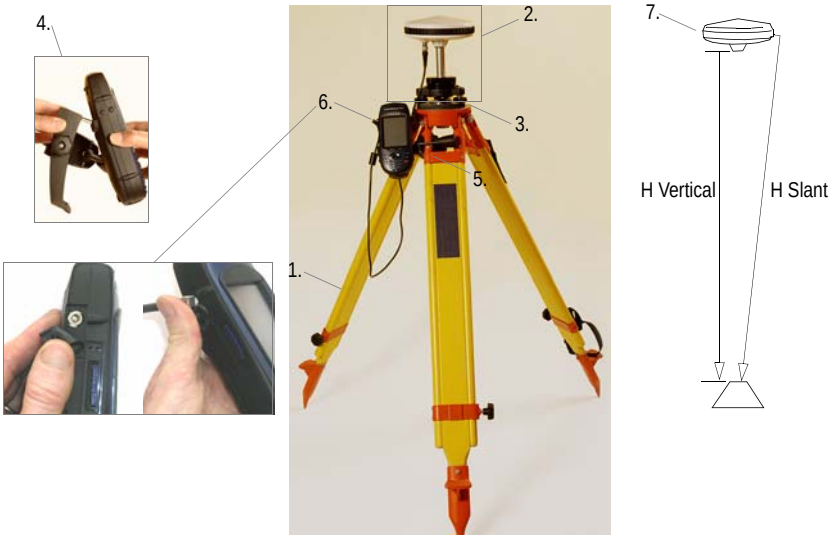
Equipment Setup

The equipment setup instructions are the same for both the base and the rover. Install and run the base first.

In both cases, the installation site should offer the best possible GPS reception conditions. The antenna should have a clear view of the sky in all directions. There should be no, or a minimum of satellite obstructions in the vicinity.

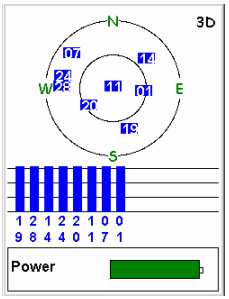
Typical setup with tripod is described here. You can also use a fixed-height tripod.

1. Set up the tripod / tribrach combination over the point.
2. Attach the vertical extension bar and a tribrach adapter to the GNSS antenna.
3. Place the GNSS antenna assembly on the tripod.
4. Place the ProMark3 receiver into the field bracket.
5. Attach the field bracket / ProMark3 combination onto the tripod.
6. Connect the GNSS antenna cable to the unit.
7. Measure and record the instrument height (HI) of the GNSS antenna.



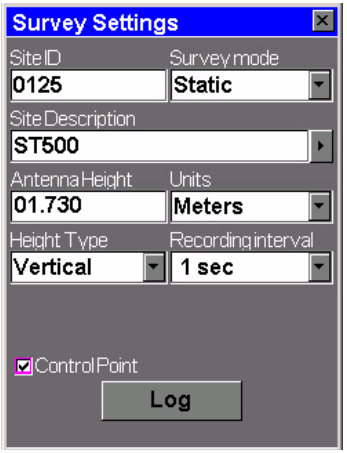
Static Survey Setup

It is assumed that you have already run all the instructions detailed in *Chapter 2. Preparing For First-Time Use on page 4*. Follow the instructions below to run both the base and the rover.

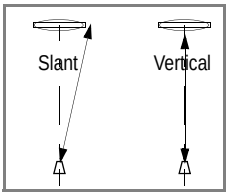


Satellite Status screen

1. Turn on the receiver by pressing the ⏻ red key.
2. Double-tap the **Surveying** icon.
3. If you have a ProMark3 RTK, press MENU, tap **Receiver Mode** and then **Post-processing**.
4. Press the NAV key until you see the Satellite Status screen (see opposite). Wait until at least 4 satellites are received.
5. When there is enough satellites received, press the LOG key. The **Survey Settings** screen opens.



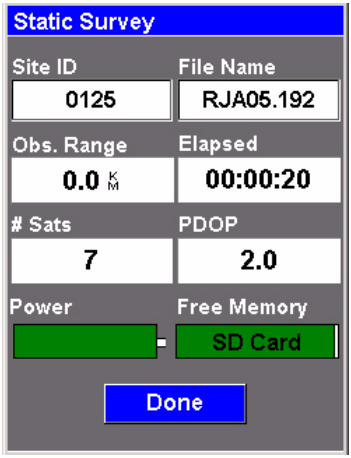
6. Enter the following parameters:
   - **Site ID**: A 4-character string.
   - **Survey Mode**: **Static**.
   - **Site Description**: An optional 20-character narrative description of the point.
   - **Antenna Height**: From the reference point.



- Units: Antenna height unit (meters, US feet or Int feet)
- Height Type: Slant or Vertical.
- Recording Interval: Time in seconds between any two consecutive acquisitions of GPS data. Make sure the same recording interval is used at the base and in the rover.
- Control Point check box: If you check this box, you will be able, later on, to use the point associated with this Site ID as a control point.

Data Collection

7. Tap the Log button at the bottom of the screen.
   The Static Survey screen opens providing information on the status of your survey during the data collection period.



   Information provided here will help you determine when enough data has been collected.

Make sure the rover antenna will have the best possible view of the sky at all times during the survey. This should result in #Sats *continuously greater than 4 and* PDOP *continuously less than 4.*

Obs. Range *is equivalent to* Obs. Timer *in ProMark2.*

8. Watch the following data on the rover unit:
   - Obs. Range (Observation Range): Indicates the maximum length of the baseline that could be accurately determined through post-processing considering the amount of data currently collected. The more you collect data, the longer this baseline.
   - Elapsed: Time elapsed since data collection began.
   - # Sats: Number of received satellites.
   - PDOP: Current PDOP value.
9. When according to the Obs. Range parameter on the rover, enough data has been collected in this observation session, tap the Done button at the bottom of the screen or press the ENTER key.
10. Follow the steps presented above for each observation session required to complete your survey. After data collection is complete, take all ProMark3 receivers used in the survey to the office and download the data to an office computer as described in *Downloading Raw Data on page 62*. The data is now ready for post-processing using GNSS Solutions.

Running a "Stop & Go" Survey

This chapter describes a typical Stop & Go survey in which initialization is performed using the initializer bar. (This is the initialization method recommended by Magellan.)

It is assumed that you have already run all the instructions detailed in *Chapter 2. Preparing For First-Time Use on page 4*.

Allowing for kinematic initialization using Initializer bar at the base

Base Setup and Operation

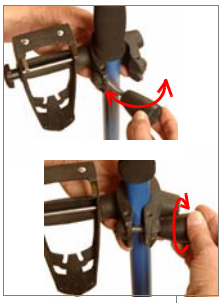
The base is setup and operated in the same way as it is in static surveys (see *page 43*). The only difference is the use of the initializer bar at the base station.

The base antenna should be centered and levelled above the known point. To be able to use the initializer bar for initialization, be sure to incorporate the bar as part of the base setup as shown opposite.

Rover Setup

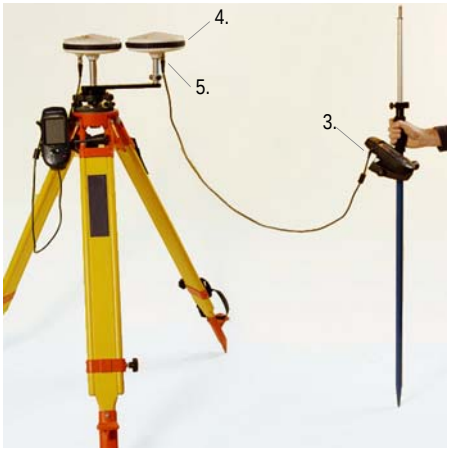
Install the unit on its range pole:

1. Attach the field bracket onto the pole.
2. Place the ProMark3 receiver into the field bracket.
3. Connect the GNSS antenna cable to the unit.
4. Mount the GNSS antenna at the end of the base's initializer bar.
5. Connect the other end of the antenna cable to the rover antenna.



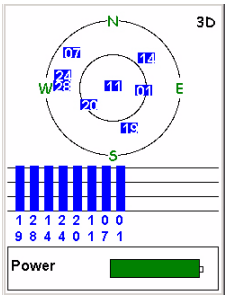
1.

2.

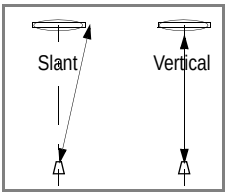


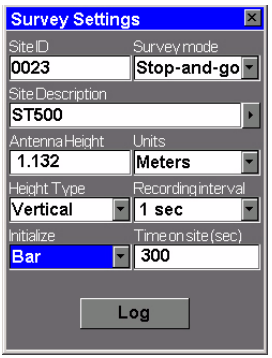
Stop & Go Survey Rover Setup

1. Turn on the receiver by pressing the ⏻ red key.
2. Double-tap the **Surveying** icon.
3. If you have a ProMark3 RTK, press MENU, tap **Receiver Mode** and then **Post-processing**.
4. Press the NAV key until you see the Satellite Status screen (see opposite). Wait until at least 4 satellites are received.
5. When there is enough satellites received, press the LOG key. The **Survey Settings** screen opens.
6. Enter the following parameters:
   - **Site ID**: A 4-character string.
   - **Survey Mode**: **Stop -and-go**.
   - **Site Description**: An optional 20-character narrative description of the point.
   - **Antenna Height**: Distance from the rover antenna mounted on the bar to the ground.
   - **Units**: Antenna height unit (meters, US feet or Int feet)
   - **Height Type**: **Slant** or **Vertical**.
   - **Recording Interval**: Time in seconds between any two consecutive acquisitions of GPS data. Make sure the same recording interval is used at the base and in the rover.
   - **Initialize**: **Bar**.
   - **Time on Site (sec)**: Occupation time on initializer bar for the rover antenna (default: 300 seconds).

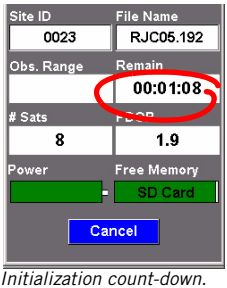


Satellite Status screen





Initialization Phase

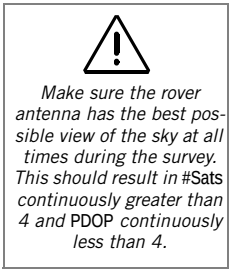


Initialization count-down.

7. Tap the **Log** button at the bottom of the screen.
   A screen is displayed showing the counting-down of the initialization phase (see screen opposite). The **Remain** field will count down beginning from the value of the **Time on site** field set on the **Survey Settings** screen. At the end of the countdown sequence, the **Remain** field reads "00:00:00".
8. Move the rover antenna from the initializer bar to the top of the rover pole (see illustration below). While doing this, take care not to mask the rover antenna or else you would have to resume the initialization.

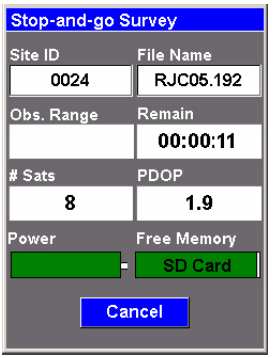
Data Collection

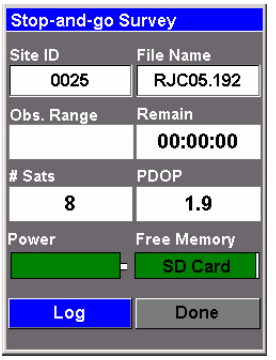
9. Walk to the 1st point you want to survey. Be careful not to mask the antenna as this might cause loss of satellite signals.
10. Press the LOG key (not the on-screen Log button). The Survey Settings screen is displayed allowing you to change the following parameters:
    - Site ID and Site Description: Change these two fields if required.
    - Antenna Height: New height of the rover antenna now located on top of the pole.
    - Initialize: Check that <None> is now selected
    - Time on Site: Enter the occupation time needed on each point that you will survey (typically 15 seconds).
11. While holding the pole stationary above the point, tap Log on the screen. The receiver then displays the screen below left.
12. Wait until Remain=00:00:00. The receiver then displays the screen below right.

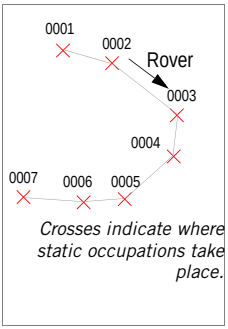


Make sure the rover antenna has the best possible view of the sky at all times during the survey. This should result in #Sats *continuously greater than 4 and* PDOP *continuously less than 4.*

The Obs. Range *field is irrelevant to the Stop & Go mode and for this reason is left blank.*







Crosses indicate where static occupations take place.

Note that the content of the **Site ID** field is incremented by 1 after ending static occupation on a point (increment: 0 to 9, then A to Z, then 0.. again, etc.). You can however change the **Site ID** between any two occupation times by pressing the LOG key (not the on-screen **Log** button) and editing the **Site ID** field.

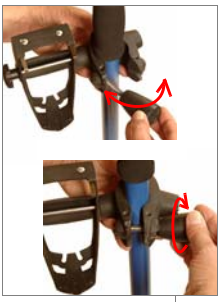
13. Move to the next point and resume the above two steps until all the points have been visited.
14. Tap **Done** after surveying the last point. This completes the data collection phase.

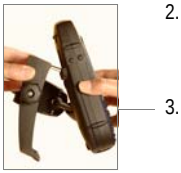
Running a Kinematic Survey

This chapter describes a typical Kinematic survey in which initialization is performed on a known point (The fastest initialization method.)

Base Setup and Operation

The base is setup and operated in the same way as it is in static surveys (see *page 43*).





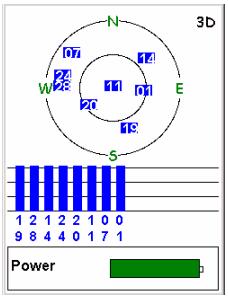
Rover Setup

Install the unit on its range pole:

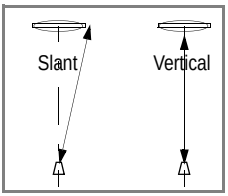
1. Mount the GNSS antenna on the pole
2. Attach the field bracket onto the pole
3. Place the ProMark3 receiver into the field bracket
4. Connect the GNSS antenna to the unit using the cable provided.
5. Measure the antenna height.

Kinematic Survey Rover Setup

It is assumed that you have already run all the instructions detailed in *Chapter 2. Preparing For First-Time Use on page 4*.

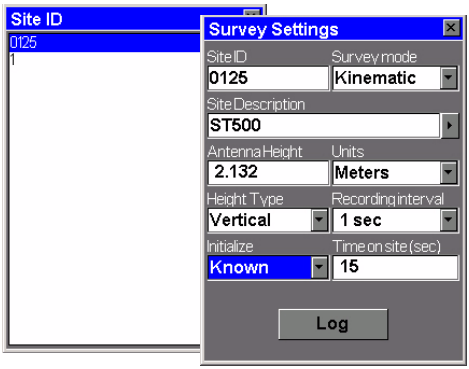


Satellite Status screen



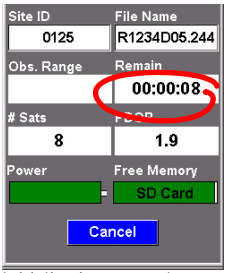
1. Turn on the receiver by pressing the ⏻ red key.
2. Double-tap the **Surveying** icon.
3. If you have a ProMark3 RTK, press MENU, tap **Receiver Mode** and then **Post-processing**.
4. Press the NAV key until you see the Satellite Status screen (see opposite). Wait until at least 4 satellites are received.
5. When there is enough satellites received, press the LOG key. The **Survey Settings** screen opens.
6. Enter the following parameters:
   - **Survey Mode**: **Kinematic**.
   - **Antenna Height**: Distance from the rover antenna mounted on top of the pole to the ground.
   - **Units**: Antenna height unit (meters, US feet or Int feet)
   - **Height Type**: **Slant** or **Vertical**.
   - **Recording Interval**: Time in seconds between any two consecutive acquisitions of GPS data. Make sure the same recording interval is used at the base and in the rover.
   - **Initialize**: **Known**. On selecting this option, the unit asks you to indicate the Site ID of the control point where initialization will take place.

After selecting a point from the prompted list (see figures below), the unit will set the Site ID and Site Description fields accordingly.



- Time on Site (sec): Occupation time on known point (default: 15 seconds).

Initialization Phase



Initialization count-down.

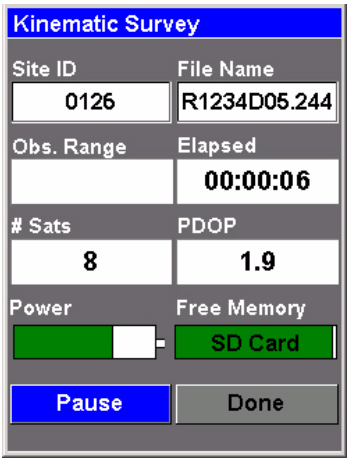
7. Tap the Log button at the bottom of the screen.
   A screen is displayed showing the counting-down of the initialization phase (see screen opposite). The Remain field will count down beginning from the value of the Time on site field set on the Survey Settings screen. At the end of the countdown sequence, the Remain field is replaced with the Elapsed field which reads “00:00:00”.

Data Collection

8. Walk to the start point of the trajectory you want to survey. Be careful not to mask the antenna as this might cause loss of satellite signals.

9. Tap the on-screen Log button and then walk along the trajectory. The screen then looks like this:

Make sure the rover antenna has the best possible view of the sky at all times during the survey. This should result in #Sats continuously greater than 4 and PDOP continuously less than 4.

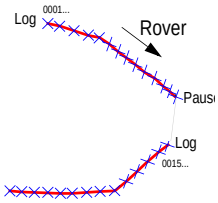


The Obs. Range field is irrelevant to the kinematic mode and for this reason is left blank.

As you are progressing along the trajectory, the content of the Site ID field will be incremented by 1 at the recording interval rate (increment: 0 to 9, then A to Z, then 0.. again, etc.).

Use the buttons at the bottom of the screen to do the following:

- Pause: Tap this button when you arrive at the end of the trajectory. The button is then renamed "Log". Tap the Log button when you are at the start point of a new trajectory you want to survey. Be careful not to mask the antenna between the two trajectories.
- Done: Will end the kinematic survey by closing the data file and taking you back to the last displayed navigation screen. (After selecting Done, the receiver is idle but still in the Surveying function.)



Bold lines indicate the trajectories surveyed.

Quitting the Surveying Function

Press the MENU key and tap Exit. This takes you back to the ProMark3 workspace screen.

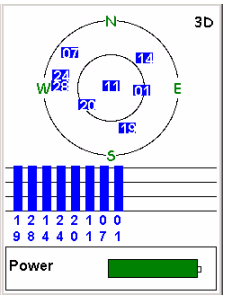
7. Mobile Mapping

This guide presents the Mobile Mapping function in its simplest implementation, i.e. using the ProMark3's internal antenna and with no differential mode enabled.

With a ProMark3 RTK using an external antenna, Mobile Mapping can also be run in RTK mode, thus offering the same accuracy level as in surveying.

Once you know how to perform RTK surveys with ProMark3 RTK (see *RTK Setup on page 11*), it's easy to understand how you can extend the use of RTK to Mobile Mapping. However, the current position status ("Float", "Fixed", etc.) can only be seen on the Position screen (see *page 70*).

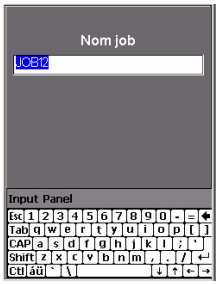
Preliminary Steps



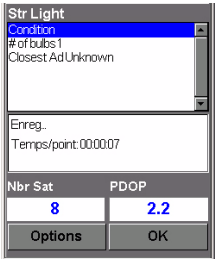
Satellite Status screen

It is assumed that you have already run all the instructions detailed in *Chapter 2. Preparing For First-Time Use on page 4*.

1. Turn on the receiver by pressing the ⏻ red button.
2. Double-tap the **Mobile Mapping** icon.
3. Press the NAV key until you see the Satellite Status screen (see opposite) Wait until at least 4 satellites are received. For the best accuracy it is important to hold the receiver at an angle of 45° from horizontal and not too close to you.



Entering a job name



Logging screen

The Logging screen also displays the time elapsed since you started logging at this point feature, the number of satellites currently received and the current value of PDOP.

Logging New GPS/GIS Data

1. Creating a Job and Selecting a Feature Library

- Press the LOG button.
- Tap Create New Job.
- Enter the job name and press ENTER
- Tap the "TUTORIAL.MMF" feature library (or as required).
- Tap the "Real-Time" job mode (or as required).

2. Logging and Describing a Point Feature

- Highlight the "Str Light" feature (you are supposed to be near one of these features) and tap the on-screen Log button. This starts feature logging. A sound is heard every time ProMark3 logs data.

  The Logging screen is now displayed where you can see the list of attributes pertaining to this feature. You will now enter the "Description" phase of the feature
- Tap the first attribute ("Condition") and then tap the right attribute value describing the feature near you (for example "Good"). This takes you back to the Logging screen.
- Select the next attribute in the list and repeat the previous step. Repeat this step until all the attributes have been properly described.

  "Describing" the feature only takes a few seconds. By the time you are done with the feature description, the feature's GPS position will probably have been saved in the job. You can also stay more time on the feature to let the receiver determine several positions. This will give an even more accurate position for the feature as ProMark3 will average all the GPS positions it has computed on the feature.

- To stop logging the feature, tap Done. This takes you back to the Feature List screen
- Move to the next feature and resume the above instructions to log this feature.

3. Logging and Describing a Line Feature

Basically, you use the same procedure as when you log a point feature (see 2. above). There are however two differences when you log a line feature:

- You need to define a logging interval when you start logging the feature
- And then you are supposed to move from the beginning to the end of the line feature before stopping the logging.

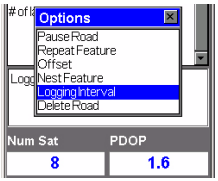
These differences are explained below.

After tapping the "Road" line feature from the Feature List screen and tapping the Log button, ProMark3 starts logging GPS positions from the position where you are. The default logging interval is 5 seconds. To change this interval:

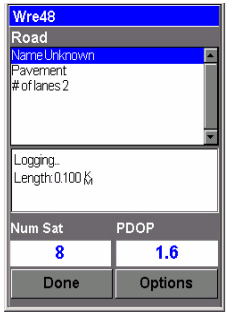
- Tap Options on the screen and highlight Logging Interval. Two options are then prompted:

  By Time: Select this option when you want to log a new GPS position at regular intervals of time regardless of the distance traveled since the last position logged. After tapping this option, tap the desired time interval. This takes you back to the Logging screen where you can see the list of attributes pertaining to the feature.

  By Distance: Select this option when you want to log a new GPS position only after you have moved by a certain distance since the last position logged. After tapping this option, tap the desired distance interval. This takes you back to the Logging screen where you can see the list of attributes pertaining to the feature.



Selecting the logging interval option



Logging screen

The Logging screen also displays the distance traveled since you started logging the line feature.

- As you would for a point feature, describe the feature by describing the different attributes pertaining to the feature.
- When the description is finished, you can start walking along the road.
- When you arrive at the end of the road, with ProMark3 still displaying the Logging screen, tap Done to stop logging the feature.

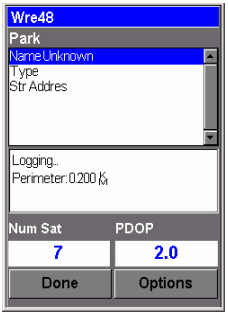
4. Logging and Describing an Area Feature

Basically, you use the same procedure as when you log a line feature, especially regarding the need for defining a logging interval (see 3. above).

The only difference between a line and area feature is that for an area feature, the first and last position calculated by the receiver are connected when you close the feature.

Record the attributes of an area feature as you do for a line feature (see page 57):

- Tap the name of the "Park" area feature from the list of features and tap the Log button. ProMark3 starts logging the area feature.
- Choose a logging interval using the Options button (see explanations given for a line area on page 57). This takes you back to the Logging screen where the list of attributes for the feature is displayed
- Describe each attribute by selecting or entering the appropriate attribute value for each of them.



Logging screen

This screen displays the current values of perimeter and area measured since you started logging the feature (+ number of satellites and PDOP)

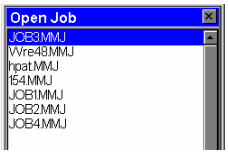
Revisiting and Updating Existing GPS/GIS Jobs

You can use ProMark3 not only to position and describe new GIS features but also to update information gathered previously. This is particularly useful when collecting data on things that change over time: streetlight bulbs burn out, new roads are added to housing developments, new crops are planted, etc.

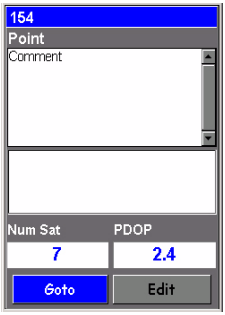
1. General Procedure

Return to the area where the original job was recorded, turn ProMark3 on and double-tap the Mobile Mapping icon. When it has calculated a GPS position, follow the procedure below to update the job or to append more data to it.

- Press the LOG button and tap Open Existing Job.
- Tap the name of the job you want to revisit.
- Unless this screen is already displayed, press NAV repeatedly until the Map screen is displayed. The Map screen provides a geographical view of the different features present in the job. From this screen, you will now indicate the first feature you want to revisit. If necessary, press the IN or OUT button to adjust the scale so you can see this feature.
- On the Map screen, tap on the feature you want to revisit first. (The feature name appears in the lower part of the screen when the cursor is positioned over the feature.)
- When the map cursor is positioned over the feature to be updated, press ENTER. A new screen is displayed showing the attribute values currently assigned to the feature. Note that the Goto field is highlighted at the bottom of the screen.

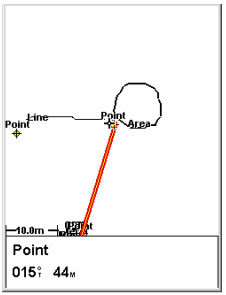


Job List screen



Screen prompting you to go to the selected feature

When you know which attributes must be changed for a point feature, which means you don't really need to visit the point, then tap Edit *rather than* Goto *and change the attributes directly.*



Map screen showing straight line to target

- Tap Goto to ask ProMark3 to guide you to this feature. By doing this, you will make the selected feature your destination and all the navigation screens will be set to help you reach that feature. The Map screen will also be automatically displayed showing a straight line connecting your current position to the selected feature.
- Walk to the feature according to the navigation instructions provided on the Map screen. You can use other navigation screens if you prefer (see also Navigation Screens chapter from page 69). You will know when you are close to the feature when the distance to the feature goes to zero or close to zero, or simply because you can identify it visually. Another nice way of being informed that you have arrived at the feature is to set the Alarms option (see explanations in the *ProMark3 Reference Manual*)
- After arriving at the feature, press the LOG key. This takes you to the Feature Attributes screen.
- Now that you are near the feature and you can see which of its attributes need to be changed, tap successively each of these attributes and change them.
- After reviewing the attributes, tap the Done field at the bottom of the screen. This ends the review of this feature and displays the Map screen again.
- Follow the same steps described above to revisit and update the other features present in the job.

2. Repositioning a Point Feature

If a point feature appears to be mislocated on the Map screen, do the following after you have arrived at the feature:

- Press the LOG key and tap the on-screen Log button. Let the ProMark3 recompute the point position and then tap the Done button to close the feature.

  Note that only point features can be repositioned. If you wish to reposition a line or area feature, you should record a new feature and then delete the old one in MobileMapper Office.

3. Adding More Features and Attributes to the Job

If you want to add more features and descriptions to the existing job, you just have to record them exactly as you record features into a new job.

4. Closing the Job

To close a job, from the screen showing the list of attributes, tap Done then confirm by tapping Yes.

8. Office Work

Download Procedures

The easiest way to download ProMark3 data to your PC is to remove the SD card from the ProMark3 and insert it into your PC card reader. This implies the following:

1. All your field data should have been saved on the SD card (see setting on *page 8*).
2. Your PC should be equipped with an SD card reader.

If you do not have a card reader on your PC, then you should connect the ProMark3 to your PC via the USB cable provided.

Field data collected with the FAST Survey option can only be downloaded via the USB cable.

This chapter more particularly describes the download procedures based on the use of the USB cable provided. It is assumed that both GNSS Solutions and Mobile Mapper Office have already been installed on your PC.

Working on Field Data Collected With "Surveying"

Downloading Raw Data

1. On ProMark3:
   - Turn on the receiver.
   - Double-tap the Surveying icon.
   - Make sure the ProMark3 Storage option setting will allow the Download utility to access the desired files. For example, if the files to be downloaded are on the SD Card, make sure SD Card is selected as the Storage option. To set this information, press the MENU key then select Setup then Storage.
2. Clip the I/O module as shown opposite.

Do not forget to double-tap the Surveying icon or else no communication will be possible between ProMark3 and the PC.

3. Connect the USB cable between the ProMark3 unit and your PC.

   ⚠ The first time you connect ProMark3 to the office PC, you may be asked to install a USB driver on the PC (although this driver should normally have been installed when installing GNSS Solutions). This driver is located on the GNSS Solutions CD in the ".../USB Driver/PROMARK/ " folder. Once you have inserted the CD in your CD drive, ask the PC to search for this driver on the installation CD and then follow the on-screen instructions to complete the driver installation.

⚠

It is very important that you connect the ProMark3 to the PC BEFORE running Download.

4. On the PC:
   - From the Windows task bar, select Start>Programs>GNSS Solutions>Tools>Download.

     (Double-click ⬑.. in the right side of the window if you want to change to the parent directory and open another folder on your PC.)
   - In the Download window, select File>Connect>Receiver>Connect via Cable. This opens the Connect Via Cable dialog.
   - In this dialog, choose the port created on the PC following the installation of the USB driver and then click OK. The following appears successively in the status bar, at the bottom of the window:

     Looking for remote on COMx at xxxx Baud...
     Connected to Data Source
     Setting Baud rate...
     Preparing for listing...
     Directory has been listed

     The left side of the Download window then lists the files present in the ProMark3.
   - Select the files you want to download. If necessary, hold down the Ctrl key to make a multiple selection.

If you have some difficulty identifying which port number should be selected, first run Download WITHOUT the connection to ProMark3 in order to list the available ports. Then quit Download and resume the operation after connecting ProMark3. An additional port will then appear in the list. This additional port is precisely the port you need to select to allow communication with ProMark3.

Files resulting from the downloading of an observation file are named as follows:
X<Downloadedfilename>
where prefix X = "E" for Ephemeris Data, "B" for Position Data, "D" for GPS Raw Data and "W" for SBAS Data.

- Press the **F5** key. A Copying file dialog appears during data transfer.
  After the transfer is complete, notice in the right side of the Download window that each downloaded file has been split into different files named with a prefix as explained opposite.
- Close the Download window.

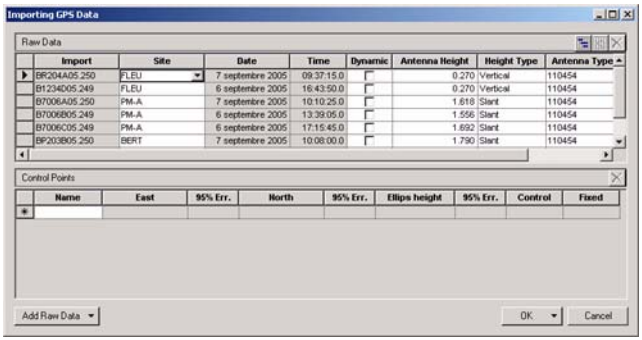
5. On ProMark3, quit the Surveying function, turn off the receiver and remove the cable between the PC and ProMark3.
6. Repeat the previous 5 steps for each of the ProMark3 units involved in the project to download their respective files to the same project folder on your office computer.

Downloading RTK Data

1. Resume steps 1 to 3 described in *Downloading Raw Data on page 62*.
2. On the PC:
   - Run GNSS Solutions and open or create the project in which to download your RTK results.
   - In GNSS Solutions, select Tools>Preferences and make sure Show RTK functions is enabled, otherwise check it and then click OK.
   - Select Project>Download Positions from External Device.
   - Select ProMark3 Surveying and click OK. This launches the Download Utility on the PC. The left side of the Download window then lists the files present in the ProMark3 RTK.
   - Select the O-files you want to download
   - Press the **F5** key to start the file transfer.
   - When the transfer is complete, close the Download window. The RTK results are now visible in the project open in GNSS Solutions.

Post-Processing Raw Data

1. On your office computer, launch GNSS Solutions
2. Click **Create a New Project**, enter a project name and then click **OK**.
3. Click **Import Raw Data from Files**.
4. Browse your computer to change to the folder containing the data files you have just downloaded.
5. Select the files you want to import and click **Open**. The **Importing GPS Data** dialog lists the files you want to import (top). Each row describes one of these files (filename, associated Site ID, etc.)



6. At the bottom of the window, define which of the sites is the control point (base) and enter or check its known coordinates. You can also fix the control point if necessary by selecting one of the options available in the **Fixed** column. If you select **<Blank>**, the point won't be fixed.
7. Click **OK>To Import** to import the data into the project. Depending on the type of survey, you can go even faster by running, in one operation, the Import, Process and Adjust functions.

Downloading RTK Data Collected With FAST Survey

1. On the ProMark3 RTK:
   - Clip the I/O module as shown opposite.
   - Turn on the ProMark3 RTK.
   - Connect the USB cable between the ProMark3 unit and your PC.

     ⚠ The first time you connect ProMark3 to the office PC, you may be asked to install a USB driver on the PC (although this driver should normally have been installed when installing GNSS Solutions). This driver is located on the GNSS Solutions CD in the ".../USB Driver/PROMARK/" folder. Once you have inserted the CD in your CD drive, ask the PC to search for this driver on the installation CD and then follow the on-screen instructions to complete the driver installation.
   - Double-tap the FAST Survey icon.
   - Select File>6. Data Transfer. This opens the Data Transfer window.
   - At the bottom of this window, select "USB (COMx)" from the COM Port combo box.
   - Tap the SurvCom Transfer button. This opens the File Transfer window.
2. On the PC:
   - Launch GNSS Solutions and then click Create a new Project.
   - Name the project and click OK.
   - Select the same coordinate system (spatial reference system) as one the used in FAST Survey for the job you want to download. Select the appropriate time zone and then click OK.
   - Click Do Not Import Anything Now. A new empty project opens in GNSS Solutions.

- Select Tools>Preferences and make sure Show RTK functions is enabled otherwise check it and then click OK.
- From the menu bar, select Project>Download Positions from External Device.
- In the dialog that opens, select RTK Results in the left pane and then FAST Survey data collector in the right pane.
- Click OK. This opens the Data Transfer dialog box.
- Select the PC port connected to the ProMark3 RTK (USBx) and then click OK. A new dialog appears listing the .crd job files stored in the ProMark3 RTK.
- Click on the job you want to download. The name of the selected job appears in the upper field.
- Click OK. The job is then downloaded to the project open in GNSS Solutions. On the PC, a job folder is created in the open project folder to store all the downloaded files. At the end of the transfer, the job results can be seen on the project's Survey view.

Working on Field Data Collected With "Mobile Mapping"

Downloading GIS Data

Follow the same procedure as when you download raw data files. See *Downloading Raw Data on page 62*. The only differences are:

1. On the ProMark3, run the Mobile Mapping application instead of the Surveying application before running the office software. On the PC, select Start>Programs>MobileMapper Office>MobileMapper Transfer from the Windows task bar. This runs the Download utility.
2. The files you need to download are those with the MMJ extension.

Exporting Data to a GIS

The most important processing of your field data is its export to a GIS. Exporting field data has two processes: conversion of the data files to a standard format a GIS can read and then the actual transfer of the file.

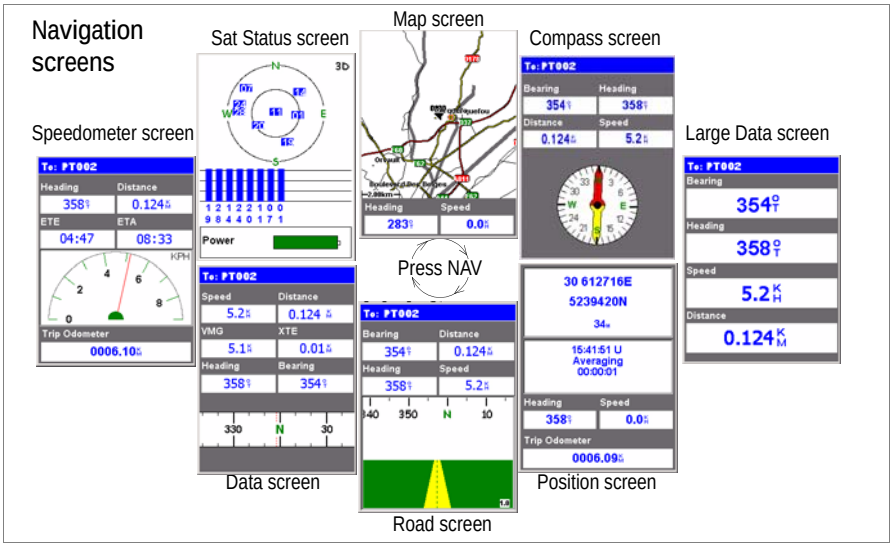
1. On your office computer, launch MobileMapper Office
2. From the menu bar, select File>Open
3. Select the folder where you downloaded your files.
4. Select the MMJ file you want to open and then click Open. MobileMapper Office now views the data collected in the field.
5. From the menu bar, select File>Export.
6. Select one of the formats displayed and you will see a "Browse for Folder" window that allows you to select the directory to which the reformatted file will be transferred. If you don't know where to put this file, just select a temporary location.
7. Click Export. Your job will be automatically formatted and transferred to the selected folder. You can select any folder that is accessible by your PC - including any GIS folders that may be on your network. When you start recording real data to export to a GIS, you will typically export data to a GIS database.

9. Navigation Tools

Whether you are performing survey or GIS jobs, you can always rely on ProMark3's integrated navigation screens to help you find your working area of the day or find more easily some particular locations you need to go to.

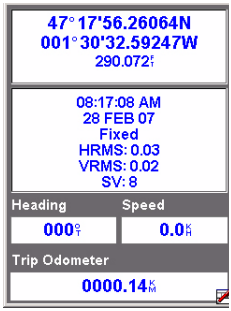
NAV Key

As shown in the diagram below, you simply have to press the NAV key repeatedly until the screen displays the navigation screen you would like to use as your favorite guidance tool. You can also use the ESC key to scroll through the navigation screens in reverse order.



Map screen: Shows a map of the area around your current location. Use the IN and OUT buttons to adjust the scale.

Compass screen: Displays your heading graphically. The direction followed is always oriented vertically and upward.



Large Data screen: Displays 4 navigation parameters in digital form using big characters to be seen from farther.

Position screen: Shows all of the basic position, time and satellite information. Additionally, current navigation information is shown in the bottom half of the screen.

The Position screen shows the current position solution status. When using Mobile Mapping in RTK (ProMark3 RTK only), this screen is the only screen that shows whether the position solution is fixed or not (see screen opposite).

Road screen: Presents your route as if you were traveling on a road. Feature/waypoint and destination icons will be displayed relative to your position as they come into view.

Data screen: Displays a high density of information, namely six data fields plus an active compass.

Speedometer screen: Displays your speed in a familiar graphical format. There are also four additional data fields plus a trip odometer.

Satellite Status screen: The Satellite Status screen is included with the navigation screens. It indicates conditions of GPS reception: number of tracked satellites, their IDs and positions in the sky, strength of received signals + battery life indicator.

Turning Off Unused Screens

Because some of the available navigation screens may be useless in your application, you may want to turn them off.

To do this, press MENU, highlight the Setup option, press ENTER, highlight the Nav Screens option and press ENTER again.

You are then asked to turn off or on each of the available navigation screens. Choose “Off” and press ENTER for all these screens that you are not currently using.

Note that the Map screen cannot be turned off.

10. Appendices

Bluetooth Manager Toolbar Memo

Icon	Function
	Terminates the search sequence in progress.
	Launches a search sequence (“Searching...” is displayed in the status bar) to find all the Bluetooth devices present in the vicinity. New icons appear in the window as new devices are detected. “Ready” is displayed in the status bar at the end of the sequence. NOTE:  is only active after  has been tapped.
	Allows you to list the content of the parent folder. Valid when using the File Transfer service of a remote ProMark3 after you have opened a subfolder.
	Lists the shortcuts you created for the Bluetooth services found in the detected remote devices. Any shortcut can be deleted from the list.
	Is initially used to search all the remote Bluetooth devices present in the vicinity. Tapping this button after a search has been performed simply lists the Bluetooth devices that were detected during the last search sequence. Tap  to refresh the list of detected Bluetooth devices.
	Provides access to all Bluetooth local services available in the ProMark3 unit.
	Allows you to view or edit the properties of ProMark3’s Bluetooth device: General, Security and Options.
	Returns the software version of Bluetooth Manager software.
	Minimizes the Bluetooth Manager window (but keeps Bluetooth Manager running).

Unlocking RTK and FAST Survey

To change your ProMark3 into a ProMark3 RTK, you need to download the specific firmware from the Magellan FTP server and purchase an upgrade from Magellan.

Before your order the upgrade, please turn on your ProMark3, double-tap the Settings icon and then the Magellan System Info icon. At the top of the dialog is the ProMark3 Serial Number.

Please provide your local Magellan dealer, with this serial number when ordering the upgrade. You will receive a product key in return.

To activate the RTK engine, double-tap the Utilities icon and then the Unlock RTK Option icon. Enter the product key and then tap OK. A message will confirm that the option has successfully been unlocked.

Use the same procedure to unlock the FAST Survey option. From the same serial number, your local Magellan dealer will deliver a product key specific to your ProMark3 RTK. To activate the FAST Survey option, double-tap the Utilities icon and then the Unlock FAST Survey Option icon. Enter the product key and then tap OK. A message will confirm that the option has successfully been unlocked.

To purchase an optional FAST Survey function (Total Station or GPS), first run FAST Survey, go to Equip> About Fast Survey>Change Registration and read the registration code on the Product Registration screen. Provide your registration code when ordering an optional function. You will receive in return a Serial Number and a Change Key specific to your FAST Survey license. Enter these two codes on the same Product Registration screen to activate the function.

FAST Survey Function Key re-Allocation

The table below lists the keys affected by FAST Survey and how FAST Survey re-uses them.

Key	New Function
IN	Zooms in on all screens where  is displayed
OUT	Zooms out on all screens where  is displayed
MENU	Switches between MAP and MENU
NAV	Displays the Monitor Skyplot screen
LOG	Equivalent to tapping S on the different survey screens.

Because the NAV key is re-allocated, FAST Survey disables access to the 8 standard navigation screens.

Glossary

Base: A reference station operated in static mode.

Baseline: A three-dimensional vector connecting the base to the rover. The baseline length is the vector modulus.

DGPS: Differential GPS. A technique whereby data from a receiver at a known location is used to correct the data from a receiver at an unknown location. Differential corrections can be applied in real-time or by post-processing. Since most of the errors in GPS are common to users in a wide area, the DGPS-corrected solution is significantly more accurate than a normal autonomous solution.

Direct IP: (IP=Internet Protocol) A way of acquiring base data (corrections) from the Internet via GPRS. When setting Direct IP in a receiver, you must specify the IP address of the corrections provider.

Fixed: Position solution status achieved by a receiver operating successfully in RTK mode. Position accuracy is in the order of one centimeter.

Float: Intermediate position solution status obtained in a receiver attempting to operate in RTK mode. Position accuracy is also intermediate as it is only in the order of a few decimeters.

GNSS: *Global Navigation Satellite System*. GPS, GLONASS and the future Galileo are each a GNSS.

GPRS: *General Packet Radio Service*. A mobile data service available to cell phone users. GPRS data transfer is typically charged per megabyte of transferred data, while data communication via traditional circuit switching is billed per minute of connection time, independent of whether the user has actually transferred data or he has been in an idle state.

GPS: *Global Positioning System*. Passive, satellite-based navigation system operated by the Department of Defense of the USA. Its primary mission is to provide passive global positioning/navigation for land-, sea-, and air-based operations.

GSM: *Global System for Mobile* communications. The most popular standard for mobile phones in the world.

HRMS: *Horizontal Root Mean Square*. A statistical measure of the scatter of horizontal computed positions about a "best fit" position solution. It gives you a good indication of how well the unit performs.

Initialization: • A process used at power-on to help a GPS receiver more easily determine its own location. The solution is of the GPS standalone type (accuracy is a few meters).

• For an RTK rover, once GPS initialization is achieved, a process through which the receiver can solve integer ambiguity from which it can deliver a fixed solution with centimeter accuracy.

NTRIP: *Networked Transport of RTCM via Internet Protocol*. A protocol used by GNSS service providers to deliver corrections from their networks of reference stations. When setting NTRIP in a receiver, you must specify the mount point (an IP address) of the NTRIP provider as well as your personal user profile.

PDOP: *Position Dilution of Precision*. This number describes the geometry of the GPS constellation. The lower this number, the better the geometry of the constellation and the better the quality of the position solution.

Rover: The mobile unit that you carry with you during your field operations.

RTCM: *Radio Technical Commission for Maritime* services. RTCM standards are used internationally for Differential Global Navigation Satellite Systems and Electronic Chart Systems.

RTK: *Real Time Kinematic*. An algorithm run in a receiver that allows its position to be determined in real time, with centimeter accuracy.

UHF: *Ultra High Frequency* band. Magellan radio modems use this frequency band.

VRMS: *Vertical Root Mean Square*. A statistical measure of the scatter of vertical computed positions about a "best fit" position solution. It gives you a good indication of how well the unit performs.

English

Index

Symbols

A

B

C

D

E

F

G

H

I

L

M

N

O

P

R

S

T

U

V

ProMark™3 / ProMark3 RTK

Getting Started Guide

Magellan
Survey Solutions Contact Information:
In USA +1 408 615 3970 ▪ Fax +1 408 615 5200
Toll Free (Sales in USA/Canada) 1 800 922 2401
In South America +56 2 273 3214 ▪ Fax +56 2 273 3187
Email surveysales@magellangps.com

In Singapore +65 6235 3678 ▪ Fax +65 6235 4869
In China +86 10 6566 9866 ▪ Fax +86 10 6566 0246
Email surveysalesapac@magellangps.com

In France +33 2 28 09 38 00 ▪ Fax +33 2 28 09 39 39
In Germany +49 81 6564 7930 ▪ Fax +49 81 6564 7950
In Russia +7 495 956 5400 ▪ Fax +7 495 956 5360
In the Netherlands +31 78 61 57 988 ▪ Fax +31 78 61 52 027
Email surveysalesemea@magellangps.com
www.pro.magellanGPS.com

MAGELLAN®
PROFESSIONAL

Magellan follows a policy of continuous product improvement; specifications and descriptions are thus subject to change without notice. Please contact Magellan for the latest product information.
© 2005-2007 Magellan Navigation, Inc. All rights reserved. ProMark is a registered trademark of Magellan Navigation, Inc. All other product and brand names are trademarks of their respective holders.
P/N 631512-01D