



MobileMapper™ 100



Getting Started Guide



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What is MobileMapper 100?

Thank you for purchasing a MobileMapper 100 from Ashtech. This guide will provide useful information about your receiver. It will also guide you through your first steps of using MobileMapper 100 in the field.

Designed for GIS data collection and mapping, the MobileMapper 100 integrates an open operating system, built-in communications and the Ashtech's powerful BLADE technology.

BLADE allows the MobileMapper 100 to operate in extreme GNSS environments while maintaining high levels of accuracy most GIS professionals are seeking.

Ashtech MobileMapper 100 delivers state-of-the-art features in a smart, compact, and lightweight handheld concept that will give you the ultimate field experience.

Combined with MobileMapper Field proprietary software or Ashtech Business partners' offerings, MobileMapper 100 will bring the openness, flexibility and scalability needed to answer all your mobile GIS requirements.



First-Time Use

Unpacking

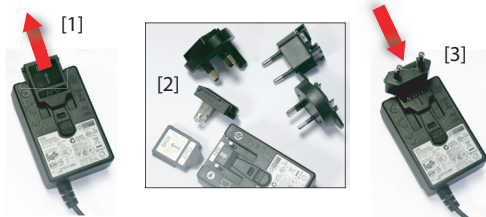
Open the receiver box and unpack the following items:

- Receiver
- Battery
- Docking station
- Universal AC adapter
- USB cable

Charging the Battery for the First Time

The fastest way to charge the battery before first use is to plug it directly onto the back of the docking station and leave it there for less than 4 hours until it's fully charged. Follow the instructions below.

- Prepare the AC adapter:
 - Remove the protective cover [1] by pushing the button then sliding the cover forward.



- Choose the plug that fits your country's AC outlet standard (see [2]) and slide it into the AC adapter [3]. (A "click" must be heard when fully inserted.)
 - Connect the AC adapter to an electric outlet.
- Put the docking station [4] on a horizontal plane.



- Connect the output cable [5] of the AC adapter to the docking station.
- Insert the battery [6] vertically, label inwards, into the slot located at the back of the docking station. The light indicator [7] turns red, meaning the battery is being charged.
- When the light indicator [7] turns green, this means the battery is fully charged and you can remove it from the docking station.

Inserting the Battery Into the Receiver

When the battery has been charged, do the following:

- Turn over the receiver and rotate the finger screw counter-clockwise a quarter turn and pull the trap door open.
- Insert the battery as shown. The label must be outwards and the right way up.



- Put the trap door back into place by first inserting the two clips located at the top of the trap door.
- Then push the door against the case and rotate the finger screw clockwise by one-quarter turn for a secure and sealed closure.

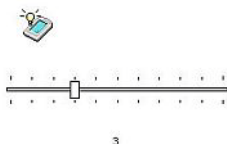
Turning the Receiver On

Press the Power button [8] until the screen lights up.



Then let the receiver run its boot sequence. Wait until the screen displays the Windows Mobile 6.5 Start screen.

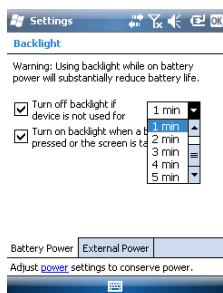
Adjusting Backlight Level



The screen backlight may be adjusted to match the ambient light for optimized visibility. You don't need the same level of screen backlight in dark areas than in hot sun.

- From the Start screen, tap successively on **Start**, **Settings**, **System** and **Brightness**.
- Drag the cursor to the right or left to set the screen backlight to the desired level (between 0 and 10). The resulting brightness is obtained when you release the cursor.
- Tap **OK** to save your setting and return to the Start screen.

Setting Backlight Idle Time



One way of saving the battery is to avoid those periods of time during which the screen backlight is unnecessarily on.

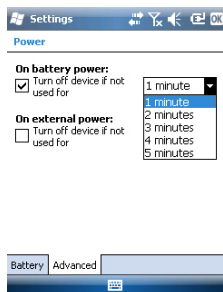
As the receiver automatically counts the time during which neither the keypad nor the touch screen is active, you can set the receiver to turn off the backlight automatically after a certain idle time.

- From the Start screen, tap successively on **Start**, **Settings**, **System** and **Backlight**.
- Choose the idle time before the backlight is turned off (10 seconds, 30 seconds or 1 to 5 minutes). For maximum power saving, you may clear the option that re-activates the screen backlight on touching the screen or pressing a key.

Different settings may be made for these two parameters depending on the power source used (battery or external).

- Tap **OK** to save your settings and return to the Start screen.

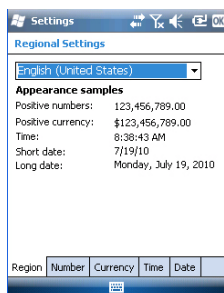
Power Management



A more radical way of saving the battery is to turn the receiver off automatically after a certain period of inactivity.

- From the start screen, tap successively on **Start**, **Settings** and **Power**.
- Tap on the **Advanced** tab. This tab allows you to ask for the receiver to switch automatically to Suspend mode if it stays idle for the period of time you choose. You may choose a different setting depending on whether the receiver is powered from the internal battery or from an external power source.
- Tap **OK** to save your settings and return to the Start screen.

Regional Settings



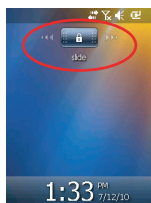
It's a good idea to customize your receiver so that it complies with a number of local preferences, such as country's currency, decimal point representation, time and date formats, etc.

- From the Start screen, tap successively on **Start**, **Settings**, **System** and **Regional Settings**.
- On the **Region** tab, select your country.
- Use the other tabs to set your local settings:
 - Number format
 - Currency choice
 - Time and date formats
- Tap **OK** to save your settings and return to the Start screen.

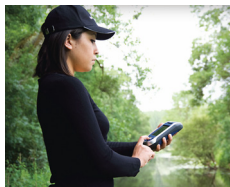
Locking the Screen and the Keypad

At some stage in your work, you may need to lock the receiver to make sure no user intervention from the screen or keypad can affect the work in progress.

- From the Start screen, tap on **Start**.
- At the bottom of the screen, tap **Lock**. As a result, the touch screen and keypad are made inactive.
- To unlock the touch screen and keypad, just drag the on-screen slide button either to the left or right. This will take you back to the Start screen.



How to Hold the Receiver



Tracking satellites with your receiver requires that you hold it in an appropriate manner.

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 your body.

You can check that your receiver is tracking enough satellites by running the GNSS Toolbox, and more particularly the GNSS Status function (see *GNSS Status* on page 64). When

Switching to Suspend Mode

enough satellites are tracked, you can start using your receiver and run your application software.

Switching the receiver to Suspend mode is the right thing to do when you need to make a short pause in your work. In Suspend mode, the receiver is idle, using the minimum of energy required to save the use context.

To switch to Suspend mode, just press briefly on the Power button **[8]**.



To wake up the receiver, hold the same button pressed until the screen wakes up. This will instantly restore the use context in which the receiver was before entering the Suspend mode.

Turning the Receiver Off

After you have finished your field work, turn off your receiver by holding the Power button **[8]** pressed until the message "Saving Parameters.." is displayed on the screen.

The power shutdown will be effective after about 25 seconds. Tapping **OK** in the upper-right corner of the screen will not affect the progress of the power shutdown sequence but simply close the message window. There is indeed no way of shortening or canceling the power shutdown sequence.

Receiver Front View

Display Screen

The display screen [1] is a 3.5-inch QVGA color touch screen (240 x 320 pixels).

Keypad, Scroll and Enter Buttons

The keypad [2] consists of the following buttons:

Button	Function
	The keypad includes two of these buttons, one on the right, the other on the left. Each of them is a convenient alternative to tapping on the functions appearing just above in the task bar at the bottom of the screen (e.g. Menu, Log, etc.). These buttons are active only for those software applications specifically designed to use them.
	Use this button to enlarge the map displayed on the screen (zoom in).
	Use this button to reduce the map displayed on the screen (zoom out).
	In some software applications, use this button to cancel the last action performed or return to the previous screen.
	Use this button to show or hide the virtual keyboard on the screen.



The Enter button [3] is used to accept highlighted input and initiate various functions.

The Scroll button [4] is the ring around the Enter button. It is used to move the cursor on the screen, from one data field to the next on a parameter screen, from one option to another in a menu, from one geographical location to another on a map screen.

Stylus and Stylus Holder

The stylus [5] can be used to work directly from the touch screen. When not used, the stylus can conveniently be stored in the receiver by inserting it into the dedicated holder [5].

Built-in GNSS Antenna

The receiver incorporates a built-in antenna [6]. The receiver should be held properly to optimize satellite reception.

Microphone

A microphone is used by the voice recorder. Keep the small aperture [7] clear when recording a vocal comment.

Built-in GSM Antenna

[8]: Location of the built-in GSM antenna used for mobile communications.

Built-in Bluetooth Antenna

[9]: Location of the built-in Bluetooth antenna for wireless communication with nearby Bluetooth-fitted equipment.

Receiver Rear View



Camera Lens

Keep the camera lens [10] clear when taking pictures or recording videos.

Loudspeaker

As a multi-media device, the receiver includes a high-quality loudspeaker [11], which can be used by any voice-based software application.

Battery Compartment

The receiver makes use of a rechargeable battery pack. Loosen the quarter-turn finger screw [12] to access the battery compartment [13],

Receiver Side View (Left)



Power Button

- With the receiver off, pressing the Power button [14] briefly will turn on the receiver.
- After the receiver has completed the boot sequence, another short press on the Power button will put the receiver in Suspend mode. Please refer to *Power Modes on page 12* for more information on the Suspend mode.
- To quit the Suspend mode, hold the Power button pressed for a few seconds until the screen wakes up. The receiver will then restore the context in which it was before being switched to Suspend mode.
- With the receiver on, holding the Power button pressed for about 3 seconds will result in a receiver being turned off after about 30 seconds. In the sequence before effective receiver shutdown, the screen will display the message: "Saving Parameters..."

Power & Battery LED

The three-color LED [15] gives indications on the receiver power status, and on the battery state, in relation with the use of the docking station. Please refer to *LED Indicator on page 13* for more information on the LED indications.



SD Card Slot

Gives access to an SD card slot [16], protected by a rubber flap. Use a finger nail or the tip of a pen to open the flap. Whenever possible, keep the flap close.

Inserting an SD card: Push the SD card in until you hear a “click”.

Removing an SD card: Push a bit further in and let go.

External Antenna Input

Use the external antenna input [17] to connect an external antenna to the receiver. When an external antenna is connected, the built-in antenna is automatically disconnected from the receiver input.

The antenna input connector is protected by a rubber flap.

Warning! Always keep the flap close when no external antenna is used.

Receiver Bottom View



Power/Data Connector

This connector ([18]) is used to connect the receiver to the docking station. This is achieved by simply inserting the receiver in an almost vertical position into the docking station. A secure connection is obtained once the receiver naturally rests on the docking station.

There is also a threaded hole in the middle of the connector allowing you to secure the connection of the POGO cable to the receiver.

Docking Station

The docking station basically is a holder for the receiver. It may be used at the office for various and combined purposes:

- As a safe and convenient tool for temporary receiver storage. The receiver is held firmly minimizing the risk of fall or scratches.
- As a battery charger once powered by the AC adapter. The docking station can charge the battery inserted in the

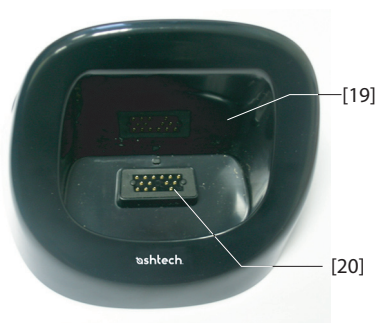
receiver as well as an additional battery placed at the back of the docking station.

When two batteries are charged simultaneously, fast charging (< 4 hours) is for the battery in the receiver and slow charging (about 11 hours) for the spare battery located at the back of the docking station.

Charging for the spare battery switches to fast charging once the receiver battery is fully charged or the receiver is removed from the docking station.

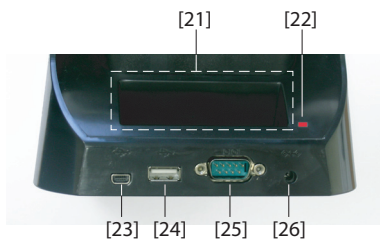
- As an interface with a computer for office work, using a serial data line and Microsoft ActiveSync.

Top View



The top view of the docking station shows the slot [19] in which to insert the receiver from above the docking station. At the bottom of the slot is the 16-contact connector [20]. When resting on the docking station, the receiver is automatically powered from the AC adapter (if connected) and the charging status of its internal battery tested.

Rear View



The following elements can be found at the rear of the docking station:

- Back slot **[21]** for charging a second battery
- Charging indicator **[22]** for back slot:
 - Steady red: Battery charging in progress
 - Steady green: Battery fully charged
 - Off: No battery connected
 - Blinking red, every second: Battery internal temperature exceeds upper limit. Charging suspended until temperature is back to normal. If persisting, remove battery and resume charging later. If this occurs several times with the same battery, consider changing the battery. Dispose of the battery according to regulations.
- Mini USB connector **[23]**: Use this connector to let the receiver communicate with your computer through Microsoft ActiveSync.
- USB connector **[24]**, Use this connector to plug a USB key.
- RS232 SubD 9-C connector **[25]**: Use this port to connect the receiver to an external device.
- Power input **[26]**. Connect the output of the AC adapter to this input.

Special Features

Power Modes

The receiver can be powered from one of two different sources:

- Its internal battery (typically for field operations)
- The power line, through the AC adapter and the docking station (typically for office work). These two items are part of the basic supply.

The receiver can operate in two different power modes:

- *Full power* mode: This is the normal power mode used during field work for which all the receiver functions are active.
- *Suspend* mode: This is a power saving mode typically used in the field to allow a quick restart after a pause. In this mode, only some parts of the receiver are powered for the sole purpose of restoring the context of use in which the receiver was when it was switched to Suspend mode. GNSS reception is not however maintained in that mode.

The receiver can also enter the Suspend mode automatically after an idle time that you can set through **Start, Settings, Power (Advanced tab)** (See also *Power Management on page 4*) or in case of a very low battery after dismissing successively the two “low battery” alerts.

Please note the following points whenever the receiver is connected to a docking station powered by the AC adapter:

- If the receiver is currently on, the power input is switched automatically from the internal battery to the AC adapter.
- Whether the receiver is on or off, the internal battery is tested for its charging status. If it is discharged, a charging sequence is started automatically. The end of charging is also automatically detected, meaning you are allowed to keep the battery and/or the receiver on the docking station without any risk of overcharging.
- The AC adapter and docking station are designed to provide power to the receiver while ensuring the charging of two batteries (one in the receiver and the other connected at the back of the docking station).
- The receiver can also be switched to Suspend mode while being connected to the docking station.

LED Indicator

The tables below summarize the different statuses reported by the Power/Charging LED [1]:

Table 1. Standalone Receiver

Power Mode	LED Indication
On	Green a few seconds at power on, then off. 
Off	Off
Suspend	Green flash every 5 seconds.      

Table 2. Receiver on Powered Docking Station, Normal Statuses

LED Indication	Power Mode	Internal Battery Status
Steady red 	On or off	Charging
Steady red with green flash every 5 seconds 	Suspend	Charging
Steady green 	On, off or Suspend	Charge complete

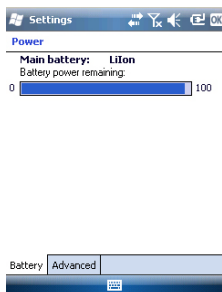
Table 3. Receiver on Powered Docking Station, Abnormal Statuses

LED Indication	Power Mode	Internal Battery Status	Comment
Blinking red at 1-sec. time interval 	On or off	Battery charging suspended because battery temperature too high.	This should be a temporary situation. Charging will be resumed as soon as the temperature drops below the upper limit. If a persisting situation, consider using a new battery and disposing of that one.
Blinking green then orange at 1-sec. time interval 	On or off	Charge complete, battery temperature too high.	Remove the receiver from the docking station. The battery may be suspect. If this happens later with the same battery, consider using a new battery and disposing of that one.



Internal Battery

When used in the field with its internal battery, the receiver will automatically inform you of the battery discharging status as follows:



- At the top of the screen in the title bar, a permanently displayed icon (top right) gives a rough indication of the battery status. When the battery is high, the battery icon looks like this:
- At any time you can read more in detail the battery status by selecting **Start, Settings, Power** (see screen example).
- When the remaining charge drops below 1/3rd of full charge, you will see the message “Main Battery Low” prompting you to replace or recharge the battery. Tap **Dismiss** in the task bar. You may continue using the receiver for a while.

You will also see this icon in the title bar:

- About an hour later, with only about 1/5th of remaining charge, a new message will pop up: “Main Battery Very Low”. Tap **Dismiss** in the task bar to continue using the receiver. Ashtech however recommends that you turn off the receiver and replace the battery. Place the low battery at the back of the docking station at the office so that it can be quickly recharged.

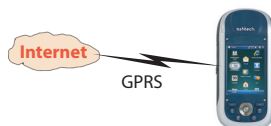
At this stage, if you persist in using the receiver with its low battery, it won't be long before the receiver is forced to switch to Suspend mode, meaning the battery is no longer charged enough to ensure proper operation of the receiver. Ashtech recommends you do not go that far in the use of the internal battery as this may irreversibly damage it.



In case of long-time storage, remember Li-Ion batteries must always be recharged regularly, about every six months. This is to prevent irreversible damage of the batteries.

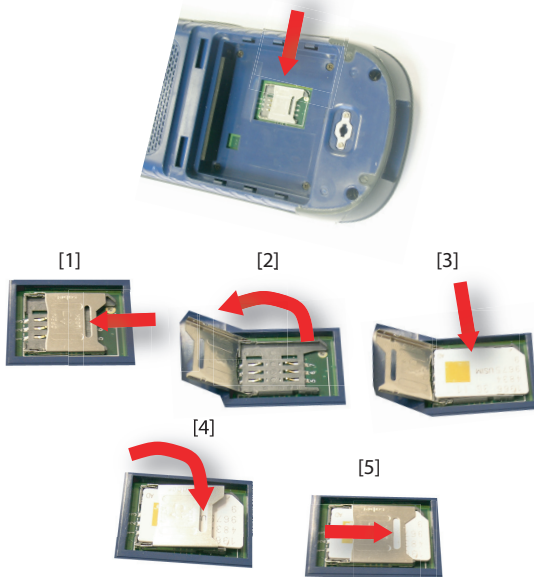
GPRS Connection Using the Internal Modem

Using the internal modem requires that you purchase a SIM card from an Internet Service Provider (ISP) and you get some information from this provider to use it. With the SIM card inserted in the dedicated slot and the built-in Phone function enabled, the receiver will be able to perform an Internet connection via that provider.



Inserting a SIM Card

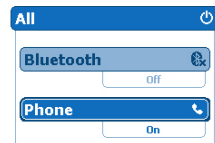
Remove the battery door and the battery to access the SIM card holder. Refer to the figure below to insert the card. The holder should be opened before you can place the SIM card.



Make sure you properly lock the SIM card holder before putting back the battery and locking the battery door.

Enabling the Phone Function

- Tap **Start, Settings, Connections, Wireless Manager**. This opens the Wireless Manager window.
- Tap anywhere on the blue Phone bar. This turns on the Phone function. The color of the Phone bar turns dark blue with a phone icon showing up on the right.
- Tap **Done** (at the bottom of the screen) to close the window and return to the Start screen.



Setting the GPRS Connection

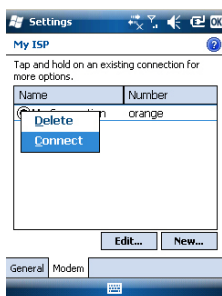
- Tap **Start, Settings, Connections and Connections**.
- Tap on the hyperlink: **Add a new modem connection**.
- Name the new modem connection you are creating.
- Select "Cellular Line (GPRS)" from the **Select a modem** field.

- Tap **Next** (bottom of the screen).
- Enter the **Access point name**. This information should have been passed on to you by your ISP.
- Tap **Next**.
- Enter the following information, also passed on to you by your ISP when purchasing the SIM card:
 - **User Name**
 - **Password**
 - **Domain** (if required by your ISP)
- Tap **Finish**. This takes you back to the initial Connections screen on which a new hyperlink is now displayed (**Manage existing connections**).
You will use this hyperlink to re-access the connection profile you have just created (see below).

Activating the Internet Connection

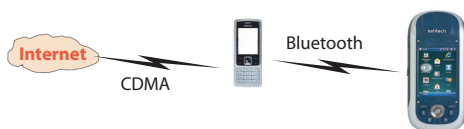
- Tap **Start**, **Settings**, **Connections** and **Connections**.
- Tap on the hyperlink: **Manage existing connections**.
- Tap and hold the name of the connection profile you have just created (e.g. "My Connection") and select **Connect**.
- Take a look at the Start bar and check that the Connect icon looks like this after the GPRS connection has been established: 

A click on this icon will show you the active connection(s).



CDMA Connection Using an External Mobile Phone

Connecting the receiver to a CDMA network requires the use of an external mobile phone compatible with this type of network.



The receiver will communicate with the CDMA network via the mobile phone, and a Bluetooth connection will be used between the receiver and the mobile phone.

It is therefore the SIM card inserted in the mobile phone that will control the connection to the network, and not the receiver itself. The receiver does not need a SIM card and its phone function can stay off.

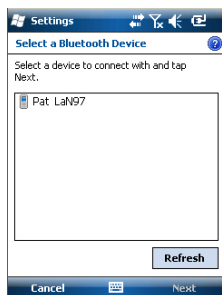
Note that this type of network connection cannot be combined with Microsoft ActiveSync used in a USB connection between the receiver and a local computer.

Setting Up the Bluetooth Connection

- Make sure your mobile phone is fitted with the appropriate SIM card for a connection to the CDMA network.
- Turn on the mobile phone and make sure its Bluetooth is enabled and visible. If necessary, refer to the phone manufacturer's documentation for more information on how to operate Bluetooth in this phone.
- Keep the mobile phone at a distance less than 10 meters from the receiver.
- On the receiver, tap **Start, Settings, Connections, Wireless Manager**. This opens the Wireless Manager window.
- Tap anywhere on the Bluetooth bar. This turns on the receiver's Bluetooth. The color of the Bluetooth bar turns dark blue with a Bluetooth icon showing up on the right.
- Tap **Menu** and select **Bluetooth Settings**.
- Tap on the **Add New Device...** line in the list box. Bluetooth then starts searching.

At the end of the search sequence, the names of the detected units are listed on the screen. Your mobile phone should normally be part of the list.

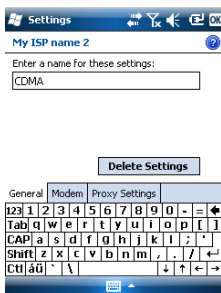
- Tap on the name of your mobile phone and then tap **Next** (bottom right).
- Using the virtual keyboard, enter a passcode of your choice (a two-digit figure for example). This step is for pairing and securing the connection with the mobile phone. (Not all mobile phones require a password at this stage)
- Tap **Next**. Wait until the spinning hourglass disappears.
- Whatever the model used, your mobile phone should now respond by asking you to confirm the Bluetooth connection to the receiver and enter the same passcode. In the meantime, a spinning hourglass is shown on the receiver screen.



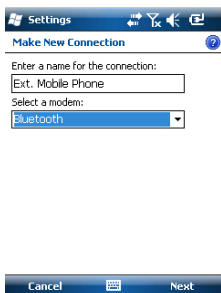


- When the Bluetooth connection is established, the receiver screen lists the Bluetooth services available from your mobile phone. Make sure the **Dialup Networking** option is enabled.
- Tap **Save** to complete the connection procedure. This takes you back to the Bluetooth Settings window on which you can now see your phone as a properly connected unit.
- Tap **OK** to close this window.
- Tap **Done** (at the bottom of the screen) to close the window and return to the Start screen.

Setting Up the Internet Connection



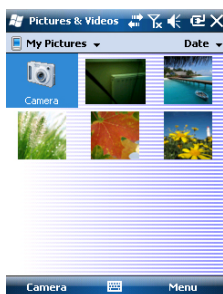
- Tap **Start, Settings, Connections, Connections**
- Tap on the **Advanced** tab
- Tap on the **Select Networks** button, then on the **New** button
- Enter a name identifying the network connection (e.g. "CDMA")
- Tap on the **Modem** tab, then on the **New** button



- Enter a name identifying the connection to this network (e.g. "Ext. Mobile Phone")
- In the field underneath, select "Bluetooth" as the modem used.
- Tap **Next**

To be completed..

Using the Camera

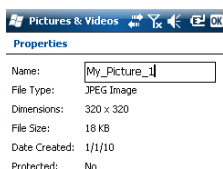


Taking a Picture

- Tap **Start** and **Pictures & Videos**. This opens the “My Pictures” folder in which you can see the list of existing images and videos. The first item in the list is the Camera, the tool you will now be using to take pictures. The light-blue background means the camera is currently selected.
- Tap **Camera**, or press the Enter button, to turn on the camera. Wait a couple of seconds until the center of the window displays the viewfinder of the camera.
- Now use the receiver as a camera. Look at the viewfinder to frame the picture you want to take.
- When you are ready, stay as still as possible and press the Enter button to take the picture. You can hear the click of the camera.
- Tap **OK** to turn off the camera and close the window. The picture you have taken is now visible in the “My Pictures” folder.

Renaming a Picture

- With the “My Pictures” folder open, tap on the desired picture. This opens a new window showing the picture.
- Tap **Menu** and **Properties**.
- Rename the file and tap **OK**.



Rotating a Picture

- With the “My Pictures” folder open, tap on the desired picture (or tap on **View** in the task bar). This opens a new window showing the picture.
- Tap **Menu** and **Edit**.
- Tap **Rotate** in the task bar. This rotates the image 90° clockwise. Repeat the operation until the image has the right orientation.
- Tap **OK** to save the image.

Cropping a Picture

- With the “My Pictures” folder open, tap on the desired picture (or tap on **View** in the task bar). This opens a new window showing the picture.
- Tap **Menu** and **Edit**.
- Tap **Menu** again and select **Crop**.
- As instructed, drag a rectangle on the picture representing what the final image should be like, then tap inside the rectangle to complete the crop operation. If you're not



happy with the result, you can always come back to the initial image by selecting **Menu** and **Revert to Saved**.

- Tap **OK** to save the picture.

Auto-correcting a Picture

- With the “My Pictures” folder open, tap on the desired picture (or tap on **View** in the task bar). This opens a new window showing the picture.
- Tap **Menu** and **Edit**.
- Tap **Menu** again and select **Auto Correct**. This refines the picture’s brightness, contrast and colors.
- Tap **OK** to save the picture.

Deleting a Picture

- With the “My Pictures” folder open, tap and hold the desired picture.
- Select **Delete** in the context-sensitive menu.
- Tap **Yes** to confirm file deletion.

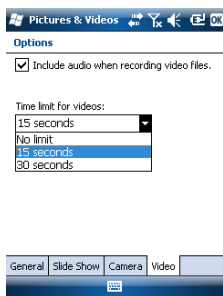
Changing Picture Settings

- Tap **Start** and **Pictures & Videos**. This opens the “My Pictures” folder.
- Tap **Camera** to turn on the camera. Wait a couple of seconds until the center of the window displays the viewfinder of the camera.
- Tap **Menu**, then **Resolution**. Choose one of the dimensions available (expressed in pixels). The resolution setting impacts the quality and size of the picture you take.
- Tap **Menu**, then **Mode**. Choose between **Normal** (one picture taken), **Burst** (five pictures taken at a one-second interval once you have pressed Enter) and **Timer** (picture taken 5 seconds after pressing Enter).

Making a Video

Setting the Duration of a Video Film

- Tap **Start** and then **Pictures & Videos**. This opens the “My Pictures” folder in which you can see the list of existing images and videos.
- Tap **Menu**, **Tools** and then **Options**.
- Tap on the **Video** tab.



- Tap within the **Time limit...** field and select one of the options below:
 - **No limit:** Choose this option to be able to film a video over an unlimited period of time.
 - **15 seconds:** Choose this option to limit the duration of every video you'll film to 15 seconds.
 - **30 seconds:** Choose this option to limit the duration of every video you'll film to 30 seconds.
- Tap **OK** to accept the changes and close the Options window.

Starting a Video

- Tap **Camera** to turn on the camera. Wait a couple of seconds until the center of the window displays the viewfinder of the camera.
- When you are ready to film, tap **Menu** and then **Video**.
- Press the Enter button to start filming.

Ending a Video

- Depending on the video settings, the video camera will stop filming as explained below:
 - With a preset time limit (15 or 30 seconds), the video camera will stop filming automatically and close the video file after this time has elapsed. A down counter under the viewfinder will keep you informed of the remaining time as you film.
 - With no time limit, the video camera will film indefinitely. A counter under the viewfinder will tell you the current duration of the video. To stop filming and close the video file, press the Enter button again.
- At the end of the video shooting, the viewfinder freezes while the end of the video is being processed.
- When the spinning hourglass disappears, tap **OK** to turn off the camera and close the window. The video file you have created is now listed in the “My Pictures” folder.

Playing Back a Video

- With the “My Pictures” folder open, tap on the desired video file. This will automatically launch the Windows Media player.
- Tap  to close Windows Media player and return to the “My Pictures” folder.

Renaming a Video

- With the “My Pictures” folder open, select the desired video file using the Scroll button.
- Tap **Menu**, **Tools** and then **Properties**.
- Rename the file and tap **OK**.

Deleting a Video

- With the “My Pictures” folder open, tap and hold the desired video file.
- Select **Delete** in the context-sensitive menu.
- Tap **Yes** to confirm file deletion.

Using Windows Mobile 6.5

The operating system used in the receiver is the standard Microsoft Windows Mobile version 6.5 software. For more information on how to use the different applications, you can visit the Microsoft web site:

<http://www.microsoft.com/windowsmobile/en-us/help/v6-5/Basics.aspx>

Note that although made extremely visible on the Start screen, the Phone function inherited from Windows Mobile 6.5 CANNOT be used in voice mode on this Ashtech platform. The Phone function should however be activated when a GPRS connection is required in such differential modes as Direct IP or NTRIP (see *Differential Mode on page 63*).

Installing MobileMapper Field

This section describes how to install MobileMapper Field from the CD provided, using an office computer.

If Windows XP (or older OS version) is used on your computer, you first need to install Microsoft Active Sync on your office computer.

If Vista is used, you don't normally need to install an additional program on your computer. However, if the installation of the MobileMapper Field software fails, you will have first to install Windows Mobile Device Center and then resume the installation of MobileMapper Field.

The latest versions of ActiveSync and Device Center can be downloaded from <http://www.microsoft.com/windowsmobile/activesync/default.aspx> at no cost. ActiveSync 4.5 and Device Center 6.1 can be installed directly from your MobileMapper Field CD.

If you are upgrading MobileMapper Field, Ashtech recommends you first uninstall the previous version of MobileMapper Field from the receiver using **Start, Settings, System, Remove Programs**.

Installation Procedure

- [Place the receiver on the docking station](#).
- Connect the [docking station](#) to your office computer using the USB data cable provided.
- Turn on the receiver.
- Insert the MobileMapper Field CD in your office computer. This automatically starts the setup file stored on the CD.
- Click on the **Install MobileMapper Field** option. This starts the MobileMapper Field Setup Wizard.
- Click **Next>** *twice*.
- Keep the default settings and just click **Next>**.
- Confirm installation by clicking **Next>** again. The wizard starts copying the [Ashtech Required Data](#) files to the receiver. At the end of this phase, a message window appears asking you to check your mobile device screen to see if additional steps are needed to complete the installation.
- The receiver asks you to confirm the location where to install [Ashtech Required Data.CAB](#) ("Device" is the default choice). [Choose the option offering the largest memory size](#).

- Tap **Install** at the bottom of the screen. The CAB file is being installed.
- Go back to your computer and click **OK** to close the message window and proceed. The installer on the computer then runs the same sequence as the previous one, this time to copy the MobileMapper Field installation files to the receiver.
- Again, a message on the computer tells you to check the receiver screen. Click **OK** then **Close** to complete the installation on the computer side.
- As previously, the receiver asks you to choose the location where to install the MobileMapper Field files. Choose the same location as before for the Ashtech Required Data.CAB file and tap **Install**.

Wait until the installation is complete. The receiver then re-boots automatically. Once re-booted, the MobileMapper Field option can be seen on the Start screen.

Entering the Activation Code

You will not be able to use MobileMapper Field until you enter an activation code. This code can be seen on the adhesive label placed on the MobileMapper Field CD box. This code was generated from the serial number you provided to Ashtech when ordering the software. To enter the activation code:

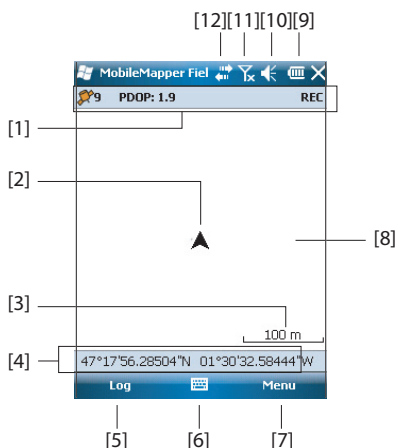
- Tap on the “MobileMapper Field” line on the start screen. A message is displayed showing the serial number of your receiver and a blank activation code field.
- Type your activation code in the blank field.
- Tap **OK** to validate the code entry. If the “serial number/activation code” pair matches, then MobileMapper Field is normally started right after tapping **OK**.

Getting Started With MobileMapper Field

Launching MobileMapper Field

From the Start screen, tap **Start>MobileMapper Field** or tap **MobileMapper Field** on the Today screen. The main MobileMapper Field window is described below.

Description of the MobileMapper Field Main Window



- [1]: Number of satellites currently used in position computation; current value of PDOP; “DGPS” when the receiver is operating in SBAS differential mode; and “REC” if the raw data logging option is unlocked and active. This information line will not appear until the receiver can determine its own position.
- [2]: This symbol shows your current position. The long axis of the symbol points in your last walking direction.
- [3]: Current zoom setting. The current value of scale is provided, based on the currently selected unit.
- [4]: Current position of the receiver (no coordinates displayed if the receiver has not determined its position yet).
- [5]: Log button. Use this button to log features. The button is grayed until GPS positions are computed and a layer is added to the open job. You can use either the on-screen Log button or the LOG key on the keyboard to access the Log function.
- [6]: Button used to show or hide the virtual keyboard. When the keyboard is displayed, the up arrow on the right of the button allows you to change keyboard settings or options.
- [7]: Menu button. Gives access to the MobileMapper Field function menu. You can use either the on-screen Menu

button or the MENU key on the keyboard to show or hide the function menu.

Menu Option	Function
Pause	Use this option to pause the current feature logging.
Stop	Use this option to stop the current feature logging.
Layers...	Use this option to add, modify or remove layers.
Find...	Use this option to find a feature previously logged in the open job.
Go To...	Use this option to let MobileMapper 6 guide you to the selected target (a feature name or any coordinates).
Zoom In	Increases the scale of the map view by one step.
Zoom Out	Decreases the scale of the map view by one step.
Job	Gives access to job-related functions: New, Open (and Properties if a job is already open).
Options	Allows you to access the following settings: Units, Antenna, Recording, Map, View, E-compass, Filter and External Devices.
Status	Gives access to three tabs describing the current GPS reception status, in digital (Position) or graphical (Satellites, Signal) form. (In fact the GNSS Status function from the GNSS Toolbox.)
About	Displays the installed version of MobileMapper Field.
Exit	Quits MobileMapper Field.

- [8]: Area showing a map of the working site (map screen).
- [9]: [Battery status](#)
- [10]: Volume setting
- [11]: [Phone status](#)
- [12]: [Connectivity status.](#)

Dragging the Map on the Screen

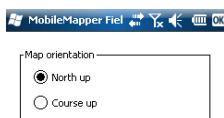
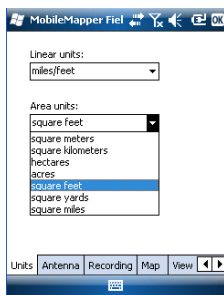
Use one of the following two methods.

- Press the ESC key to move the triangle symbol representing your current position back to the center of the map screen. Following this action, the whole screen is updated to reflect the map shift.
- Drag the stylus in the desired direction.

Setting Units, Antenna Height, PDOP Max. Background Maps and View Options

1. Tap **Menu>Options....** A new screen is displayed on which you can choose the measurements units:
 - **Distance units:** Choose between kilometers/meters or miles/feet.

- **Area units:** Choose between square meters, square kilometers, hectares, acres, square feet, square yards or square miles.



2. Tap on the **Antenna** tab and then enter the vertical distance you will maintain between the top of the receiver (where the GPS antenna is) and the ground while executing the job. This value has to do with your own size since you will be holding the receiver in your hand throughout the job. Enter the distance value according to the selected linear unit. This setting makes sense only for 3D jobs. It can be ignored for 2D jobs
3. Tap on the **Filter** tab and then enter the maximum permitted PDOP value. All measurements collected with a current PDOP greater than this value will be made invalid (default: 100).
4. Tap on the **View** tab located at the bottom of the screen. A new screen is displayed allowing you to orientate the map:
 - **North Up:** Map orientation is fixed. The top of the map screen will always give the North direction.
 - **Course Up:** Map orientation will change as you walk. The map will rotate in order to have your course always orientated upward on the map screen. This option cannot be used if a georeferenced background map is displayed.
5. For background maps, see Adding Background Maps on page 17
6. Tap **ok** to validate all your choices.

Minimizing the MobileMapper Field Window

Tap  in the upper-right corner of the map screen.

To re-open the MobileMapper Field window, either tap on "MobileMapper Field" on the Today screen or the icon at the bottom of the Today screen.



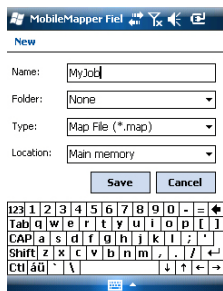
Saving MobileMapper Field Settings

To save the MobileMapper Field settings you changed during your work session (including activation code entry), first use the **Menu>Exit** option to quit MobileMapper Field and then switch to suspend mode through a short press on the Power button. Only then can you shut down the receiver and be sure all your settings have been properly saved.

Quitting MobileMapper Field

Use the **Menu>Exit** option to quit the program.

Creating a New Job



Caution! Tapping  in the upper-right corner of the screen only minimizes the MobileMapper Field window and so does not fully exit the program.

During your First MobileMapper Field Session

After entering the activation code, MobileMapper Field displays the map screen. Do the following to create a new job.

1. Tap **Menu>Job>New...**

2. Enter the following parameters:

- **Name:** Enter a name for your job using the virtual keyboard.
- **Folder:** Choose a folder and storage location where to store the job file you are creating (see also **Location** parameter below).

The **None** option stands for either the “My Documents” folder in the main memory, the root folder of the storage card **or the “Storage Disk” folder in the main memory**. Any other option available from the drop-down menu can only be a sub-folder of the “My Documents” folder in the main memory, the root folder of the storage card **or the “Storage Disk” folder in the main memory**.

If you want to use a special folder to store your job files, first create it using File Explorer. You can only create new folders in the “My Documents” folder, on the storage card, **or in the “Storage Disk” folder**.

- **Type:** For the job file format, choose between “Map files (*.map)”, the native MobileMapper Field format and “DXF File (*.dxf)”, which is a standard format for vector files.

A *.map job is just an “envelope” text file containing the definition of the coordinate system used as well as the filenames of all the layers that are part of the job (layers are held in separate files). The features you will log through that job will be saved to the corresponding layer files.

In contrast, a DXF job only consists of a single file, not only containing the definition of the coordinate system used, but also all the layers created for the job. The features you will log through that job will also be saved to the DXF file.

- **Location:** Choose the storage medium where to store the job file. You can choose between “Main memory”,

“Storage Disk” (resident memory), or “Storage Card” (if there is an SD card inserted in the receiver).

3. Tap **Save** to create the job file. What you then get on the screen depends on the format (map or dxf) you chose for the job. See *Creating New Layers on page 10* for more details.

After you have saved a new job, the software closes the currently open job and opens the new one instead.

Subsequent Uses of MobileMapper Field

The next time you launch MobileMapper Field, the program will open the job you last opened.

If this job is no longer present in the receiver, then a message will warn you that the program has been unable to open any job. You will then have to create a new job or open an existing one.

Opening an Existing Job

- Tap **Menu>Job>Open....** MobileMapper Field browses all the folders in search of all the *.map jobs stored in the receiver. A new window then opens listing all these jobs. To list all the DXF jobs stored in the receiver, select the DXF extension from the **Type** combo box.
- After you have found the job you wish to open, tap on its name in the list. This opens the job and takes you to the map screen where you can see the features already logged in the different layers.

Viewing the Properties of the Open Job

- Tap **Menu>Job>Properties**. MobileMapper Field then displays a two-tab window. The first tab provides the job's name, type and location (folder). The second one views the properties (projection and datum) of the coordinate system used in the job.
- Tap **OK** or press ESC to return to the map screen.

Creating New Layers

Introduction

Creating a layer consists of defining a specific profile for features you would like to log in the field. The layer creation process will be different depending on whether you chose “MAP” or “DXF” for the job format:

- MAP format: Each layer is held in an individual file. The layer format can be either “SHP”, “MIF” or “CSV”.

- An SHP layer can only contain a single type of feature. When creating a new layer, you should first indicate if it is created to hold 2D/3D point, 2D/3D line or 2D/3D polygon features.
- A MIF layer can contain any type of feature (point, line or polygon).
- A CSV layer can only support point features.
- DXF format: Each layer is embedded into the file and can contain any type of feature (point, line or polygon).

Attaching Layers to a Map Job

Here are the two different contexts in which you can create a new layer to be attached to a Map job:

- With a job open in the current MobileMapper Field session, you tap **Menu>Job>New...** to create a new *.map job for which the program will ask you directly to add new layers, either by creating new ones or by selecting existing ones.
- With a job open in the current MobileMapper Field session, you tap **Menu>Layers...** and then you tap on the **Add** button.



Create a new layer

Select an existing layer



From the screen displaying the **Create a new layer** button, do the following:

1. Tap the **Create a new layer** button.
2. Enter the following parameters:
 - **Name:** Enter a name for the layer using the virtual keyboard. The name of the layer should depict the type of features you will collect with this layer (e.g. Points, Lines, Areas, etc.).
 - **Folder:** Choose a folder where you want to store the layer you are creating. This choice should be made in conjunction with the choice of the storage medium (see **Location**).

The **None** option stands for either the “My Documents” folder or the “Storage Disk” folder in the main memory, or the root folder of the storage card. All other options available in the drop-down menu will be a sub-folder of the “My Documents” folder or the “Storage Disk” folder in the main memory, or the root folder of the storage card.

If you want to use a special folder to store your layers, first create it using File Explorer. You can only create



New

Name:

Folder:

Type:

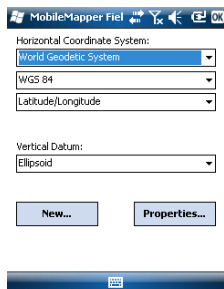
Location:



new folders in the “My Documents” folder, [in the “Storage Disk” folder](#) or on the storage card. **It is highly recommended to create layers in the same folder as the job file using these layers. Observing this rule will simplify the download procedure.**

- **Type:** Choose the type and/or format of the layer you want to create:
 SHP layer: Depending on your choice the layer will hold 2D/3D points, 2D/3D lines, or 2D/3D polygons.
 MIF layer (can hold any type of feature).
 CSV layer (point feature type only).
- **Location:** Choose the storage medium where you want to store the layer. You can choose either “Main memory”, [Storage Disk folder](#) (resident memory) or “Storage Card” (if there is an SD card inserted in the receiver).

3. Tap the **Save** button to proceed. If you are defining the second or next layers, go directly to step 5. If you are defining the first layer in the open job, the program will first ask you to define a [horizontal](#) coordinate system for the job:
 - First field: Choose the country you are working in. You may also choose a worldwide system such as UTM or Worldwide Geodetic System.
 - Second field: The number of options available in this field depends on the selected country. Select the datum that is suitable for your job.
 See also *Coordinate Systems on page 49*.
 - Third field: The number of options available in this field depends on the selected country. Choose a projection that is suitable for your job. Select Latitude/Longitude for no projection.
 - [Fourth field:](#) Choose a vertical datum in which to express the Z coordinate.
 “Ellipsoid” (no geoid used) and “EGM84” (global earth geoid model) are the two default options. Other geoids may be prompted in this field after you have downloaded them to the receiver from the [MobileMapper Software CD](#).
4. Tap **OK**.



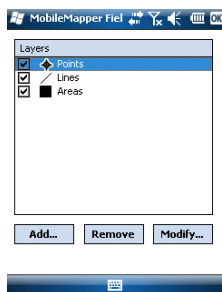
5. The program now asks you to define the properties of the layer. The table below summarizes the different properties you should define for the layer, according to its type.

Properties	2D or 3D Point	2D or 3D Line	2D or 3D Polygon	Mif layer	Csv layer
Symbol	*			*	*
Color		*	*	*	
Style		*		*	
Fill			*	*	
Attributes	*	*	*	*	*
Label	*	*	*	*	*
Scale	*	*	*	*	*

For more information on layer properties and how to define attributes, see *Layer Properties on page 33*.

6. Tap **OK** when you are finished with the properties of the layer. A message then asks you whether you want to add a new layer.
7. Add as many layers as necessary, using the above procedure.

Very Important! As long as you do not log a feature through a given layer, you can still add new attributes to the layer but once a feature has been logged, no more changes, apart from those linked to the appearance you give to the features on the screen, are allowed in the layer.

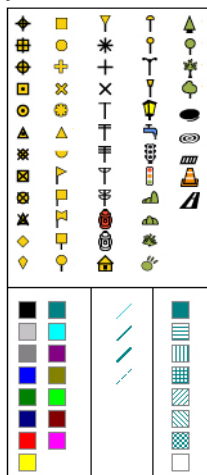


Adding Layers into a DXF Job

The procedure is quite similar to attaching a layer to a Map job. Among the similarities are first the prior necessity to define a coordinate system for the job and second, the availability of the same viewing options and attributes for the features you will log through a given layer (see *Adding Existing Layers to a Map Job on page 35* for the details).

But unlike Map jobs where layers are separate files, DXF jobs cannot use or re-use layers that are external to the job. With DXF jobs, you can only create one or more new layers within the job, right after defining the coordinate system. Another difference lies in the absence of an assumed feature geometry in a layer, which means all types of features, whether points, lines or polygons, can be logged through the layer.

Symbol.



Layer Properties

57 different symbols are available to represent a point feature on the map screen.

Color. 15 different colors are available to represent a line feature or the contour of a polygon feature on the map screen.

Style. The line style (thin, medium, thick or dash) is used to represent a line feature on the map screen.

Fill. Eight different patterns are used on the map screen to fill the area covered by a polygon feature.

Attributes. Attributes are an important part of a layer since they are designed to hold specific information (other than position) that you want to collect for each feature.

There is no limit in the number of attributes you can create in a layer.



Name:

Type:

Maximum:



Each attribute is defined by a name (22 characters max.) and a type. There are eight different attribute types of attributes, as summarized below.

Attribute Type	Purpose	Additional Information Needed
Text	Entering comment, etc.	Maximum number of characters.
Menu	Choosing an option (menu item) that suits the attribute for the visited feature.	All possible menu items for this attribute.
Image	Attaching a picture taken with the built-in camera to the visited feature.	-
Voice	Recording voice comment	-
Numeric	Entering a number.	Max. number of digits and decimal places.
Date	Entering the current logging date (mm/dd/yy).	-
Time	Entering the current logging time (hh:mm:ss)	-
Yes/No	Choosing "Yes" or "No" in response to the statement suggested by the attribute name for the visited feature.	-

NOTE: For best quality voice recording, see *Voice Setting on page 50*.

Some useful attributes with preset names are displayed for each layer type (see table below). It's up to you whether or not to create them.

Attribute Name	Attribute Type	Point Layer	Line Layer	Polygon Layer	MapInfo layer
Picture	Image	*	*	*	*
Sound	Voice	*	*	*	*
Length	Numeric		*		
Perimeter	Numeric			*	
Area	Numeric			*	

Using “Length” allows the program to automatically assign the length of a line as one of its attributes. The length of the line is computed as you walk along the line. The result of the computation only appears after you have stopped logging the line, when you review all its attributes. The same is true with the “Perimeter” and “Area” attributes for a polygon.

Very Important! Once created, the attributes of a layer cannot be deleted or modified. If you are creating a new layer and make a mistake in defining one of its attributes, then you will have to delete the layer and re-create it.

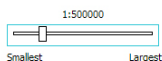
Adding attributes to a layer:

- From the **Attributes** tab of the layer properties window, tap the **Add...** button.
- Enter a name for the attribute using the virtual keyboard.
- Select a type for this attribute. If applicable, set the additional one or two parameters.
- Tap on the **Add** button. This takes you back to the **Attributes** tab where is now listed the attribute you have just created.
- Resume the previous four steps until all the attributes have been created.

Label. This setting is used to select the label you want to see on the map screen, next to the features collected through that layer. The label can only be one of the attribute values pertaining to the feature. Choosing “None” means there won't be any label displayed.

Scale.

Hide this layer when scale is smaller than:



This setting is used to display or hide the layer on the map screen, depending on the current scale value used. The scale property of the layer operates as a threshold, which will order the layer to be hidden if the scale value on the map screen is less than this threshold.

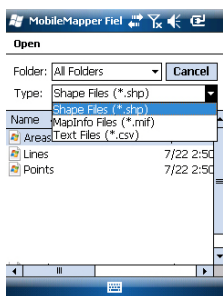
Showing/Hiding Features on the Map Screen

- Tap **Menu>Layers...**
- Enable or clear the check box placed before each layer name to respectively show or hide the layer on the map screen. Showing a layer means showing all the features logged in that layer.
- Open the job in which to add layers, using **Menu>Job>Open...**
- Tap **Menu>Layers**. A new window opens listing all the layers currently attached to the map.
- Tap on the **Add...** button
- Tap in the **Type** field and select “*.shp”, “*.csv” or “*.mif”. MobileMapper Field browses all the folders in search of all the layers of that type stored in the receiver.
- Select the file you want to add to the job as a layer. This opens a new window showing the viewing options, attributes and scale defined for this file.
- Tap **OK**. This takes you back to the screen showing all the layers attached to the job, including the new layer you’ve just selected.
- Tap **OK** to return to the map screen. The new layer is now available for feature logging.

NOTE 1: Adding an existing layer to a new job as the first layer in this job will cause the layer’s coordinate system to definitively become the coordinate system attached to the new job.

NOTE 2: Attempting to add a layer that is incompatible with the coordinate system used by the job will cause a warning message to be displayed. You can however override the message and ask MobileMapper Field to add this layer. In this case, be aware that the layer will contain positional information based on different coordinate systems. It will be your responsibility to identify which coordinate system is used in the description of each feature.

Adding Existing Layers to a Map Job



Adding Background Maps

Background maps are raster files that can be displayed on the map screen to help you better locate the different features found in the working area.

In order to be used in MobileMapper Field, a background map must be in image format (BMP, GIF, GeoTIFF, JPG or JP2) and properly georeferenced.

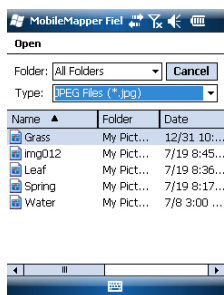
Georeferencing may have been done earlier using a third-party tool.

Georeferencing can also be done after adding the background map. This can be done in two different ways:

1. You know the coordinates of the reference points used to georeference the image. You will have to tap successively on each of these points on the map. For each point, you will have to enter its coordinates.
2. You go to the field and stand successively on each reference point used to georeference the image. (You should choose reference points that can easily be spotted both on the map and in the field.) You will have to tap successively on each of these points on the map. Each time, the receiver will automatically fill in the corresponding fields on the screen with the computed coordinates of your current location.

MobileMapper Field may accept several background maps, each holding a different geographical area. All logged features will always appear over the background map.

- Tap **Menu>Options** and then on the **Map** tab.
- Tap on the **Add...** button
- Tap in the **Type** field and select the format of the file containing the background map:
 - Bitmap (bmp)
 - GIF (gif)
 - GeoTIFF (tif)
 - JPEG (jpg)
 - JPEG2000 (jp2)



MobileMapper Field then browses all the folders in search of all the image files stored in the receiver meeting the current **Type** selection.

- Select the name of the image file you want to add. This automatically adds the file to the list of background maps. A message will warn you if you are attempting to add an already georeferenced background map that uses a coordinate system different from the one used in the open job.

Like layers, each of the added background maps can be shown or hidden on the map screen. Set accordingly each of the check boxes placed before the names of the background maps (cleared= hidden, ticked= shown).

- Tap **OK** to return to the map screen. Note that the map screen will show the background map(s) only after the

receiver can compute a position. Remember you may also have to press the ESC button so that the map screen can show the location of the first logged feature.

Georeferencing an Image File

Georeferencing an image file means defining at least three reference points giving the position of the image in space.

Defining a reference point means entering its precise X-Y-Z or Lat-Lon-Height coordinates depending on the coordinate system used in the currently open job.

The larger the number of reference points you define, the more evenly distributed these points over the entire image, the better the georeferencing of the image.

To georeference an image, do the following after adding it to the list of available background maps:

- Select the name of the background map from the list.
- Tap on the **Modify** button.
- Find the point on the image for which coordinates are known. Adjust the zoom setting and drag the stylus on the image if necessary.
- Tap on the point location and then enter its ID and coordinates. If you are currently standing at that location and the receiver delivers a valid GPS position, you don't need to enter any coordinates. The receiver will do that for you.
- Tap **Add** to enter and complete the definition of this point.
- Resume the previous three steps until all the reference points have been defined. Each point on the map is represented by a red circle. If this happens, you can always delete a bad point by tapping on it and then tapping on the **Delete** button.
- Tap **OK** to complete the georeferencing process. This takes you back to the screen showing the list of background maps.

More about Background Maps

- The background map will be displayed only when it is geographically close to the computed GPS position and the zoom is set properly.
- For large background maps, you may have to zoom in several times before the map screen can start viewing details of the background map.
- If a background map is not properly georeferenced, the background map will never appear on the map screen, and



MobileMapper Field

New reference point

ID

Latitude

Longitude

Altitude

123	1	2	3	4	5	6	7	8	9	0	-	=	↩
Tab	q	w	e	r	t	y	u	i	o	p	[	]	
CAP	a	s	d	f	g	h	j	k	l	;	'		
Shift	z	x	c	v	b	n	m	.	/				
Ctl	au												

the reference points you incorrectly created on the background map will all be deleted. Try again, this time with correct point location and coordinates.

- **It is highly recommended to place the original image file used to create the background map in the same folder as the job file using it. Observing this rule will simplify the download procedure.**
- When georeferencing an image, the original image file is unchanged and three new files are created:

Created files	Designation
<image filename>.prj	Coordinate system used
<image filename>.xxw	Auxiliary data. "xx" in the extension stands for the first two letters in the extension of the original image file (e.g. "JP" for a jpg file)
<image filename>.<image file extension>.ref.txt	Coordinates of reference points and coordinate system used.

When the original image file is in TIF format, some of these three files may not be created.

Logging New Features

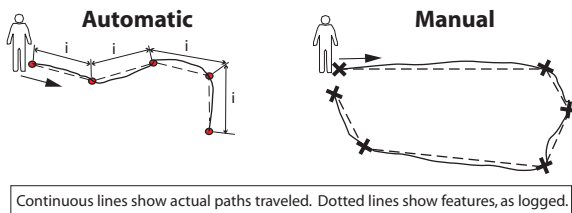
Introduction

For each new feature you log in the field, MobileMapper Field allows you to set the following parameters, just before it actually starts logging the feature:

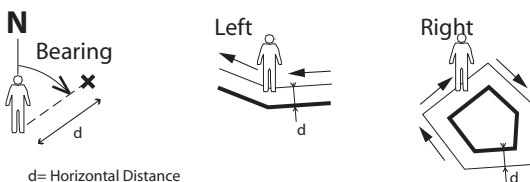
- On the **Layer** tab, you can choose:
 - The name of the layer corresponding to the feature you want to log (from the list of layers found in the job).
 - For MIF layers, and for those contained in a DXF job, the geometry (i.e. point, line or polygon) of the feature. This field is preset for CSV layers (points exclusively) and for SHP layers.
- On the **Settings** tab, you can set:
 - The position averaging time at the end of which the coordinates of a point feature will be logged. The longer the averaging time, the better the precision you get for each of your points. This implies staying still on the point throughout the averaging time.
 - The automatic or manual vertex logging mode for a line or polygon feature:

In **Automatic** mode, the receiver automatically picks up the position of each of the points (●) as you keep walking along the feature. The logging rate i is preset and represents either the time elapsed or the distance traveled.

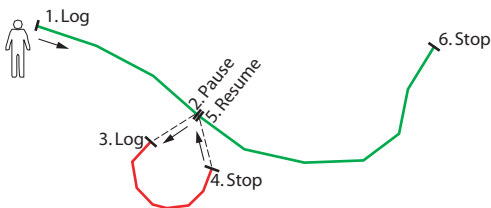
In **Manual** mode, you stop at each of the vertices (✕), on which the receiver computes a position averaged over n seconds



- On the **Offset** tab, you can set:
 - The bearing and horizontal distance if you wish to offset a point feature.
 - The direction (left or right) and horizontal distance if you wish to offset a line or polygon feature.

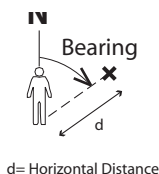
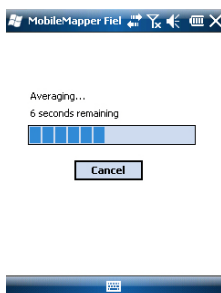
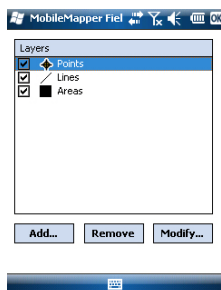


MobileMapper Field also allows the logging of two features to be run concurrently (“double logging”). This can be done through the appropriate use of the Pause/Resume/Stop functions. Double logging is useful to reduce both the time spent logging features and the distance walked in the field.



MobileMapper Field allows you to delete a logged feature directly from the map screen showing the location of this feature.

NOTE: You may need to tap on the ESC button after logging your first feature so that map screen can show the location of



the feature. By doing this, you will place the feature at the center of the map screen.

Prerequisites

- The receiver is on and MobileMapper Field running.
- A Map job is used, which contains three SHP layers: a point layer named "Points", a line layer named "Lines" and a polygon layer named "Areas". All layers are set to be seen on the map screen.
- The units used have been set to meet your requirements.
- The reception status is good (number of satellites>6, PDOP<3)

Logging a Point Feature

- Stand near the point you want to log.
- Tap **Log** (or press  underneath). A menu appears listing all the layers in the job.
- Tap on the point layer name ("Points" in our example).
- Tap on the **Settings** tab and check or change the averaging time expressed in seconds. As the last chosen averaging time is prompted by default, you may not have to view this tab every time you log a new point feature.
- To log the point with an offset, tap on the **Offset** tab and enter the following parameters (for no offset, just check that the horizontal distance is 0 on this tab and proceed to the next step):
 - **Bearing:** This field is filled automatically either from the GPS compass, the E-compass if this option is activated in **Menu> Options> E-compass**, at the time you access the **Offset** tab, or from the range finder, if there is one (see below).
If the E-compass is used, a valid measurement will be made if you take care to hold the receiver horizontally in the direction of the point feature, before you start logging the feature.
 - If neither the E-compass nor a range finder is used, then the GPS compass can provide this value by default. A valid measurement will be made if you take care to steadily walk in the direction of the point feature before you start logging the feature.
- **Horizontal Distance** field: Distance to the point feature.
If a range finder is used, tap on the **Read Range Finder** button once the range finder can provide valid

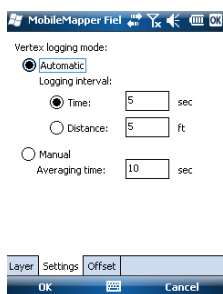
measurements. This action will automatically fill in the **Bearing** and **Horizontal Distance** fields.

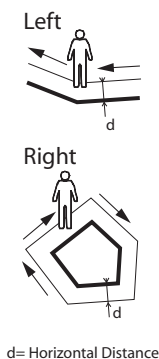
If no range finder is used, type an estimate of the horizontal distance directly in the field using the keyboard. The better you estimate the distance, the better the collected position.

- Tap **OK**. MobileMapper Field instantly starts logging the point. Wait for the end of the averaging process while holding the receiver still and keeping an eye on the progress bar. MobileMapper Field then automatically switches to the attribute list. Note that the computed coordinates of the point feature are displayed at the end of the list of attributes.
- Define each attribute for the point (see *Entering Values for Attributes on page 42*).
- Tap **OK** to return to the map screen, which now shows the location of the point according to the representation defined in the layer properties.

Logging a Line or Polygon Feature

- Stand at the beginning of the line or polygon you want to log.
- Tap **Log** (or press  underneath). A menu appears listing all the layers in the job.
- Tap on the desired layer name (“Lines” or “Areas” in our example).
- Tap on the **Settings** tab and check or change the vertex logging mode. As the last chosen mode is prompted by default, you may not have to view this tab every time you log a new line or polygon feature. Choose one of the options below:
 - **Automatic:** Selecting this option means the receiver will automatically log points along the line or polygon at regular intervals of time or distance. Enter the desired value for this interval, either in seconds or meters.
 - **Manual:** Selecting the option means you are only interested in logging the vertices of the line or polygon, and not points regularly distributed along the feature. Enter the position averaging time, in seconds, that you wish to spend on each vertex.
- To log the line or polygon with an offset, tap on the **Offset** tab (otherwise skip this step) and enter the following parameters (for no offset, just check that the horizontal distance is 0 on this tab and proceed to the next step):





- **Direction:** this parameter tells the program whether the real feature is on your left or right.
- **Horizontal Distance** field: Horizontal distance perpendicular to the line or polygon feature.

If a range finder is used to measure this distance, tap on the **Read Range Finder** button once the range finder has got a valid measurement. This will automatically fill in the field.

If no range finder is used, type an estimate of the horizontal distance directly in the field using the keyboard. The better you estimate the distance, the better the collected positions.

- Tap **OK**. MobileMapper Field instantly starts logging the feature.

If you have selected the automatic vertex mode, start walking along the feature. You will then see a line being drawn on the screen as you walk.

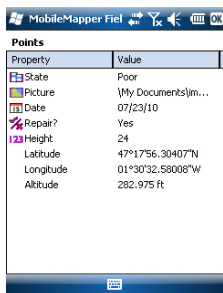
If you have selected the manual vertex mode, the receiver will assume you are standing on the first vertex and so it will log this vertex according to the chosen averaging time. You will then have to walk to the next vertex and then select **Menu>Resume** to log the position of the second vertex, etc.

- When you arrive at the end of the feature, tap **Menu** and select **Stop**. MobileMapper Field then automatically switches to the attribute list.
- Define each attribute for the line or polygon (see *Entering Values for Attributes on page 42*).
- Tap **OK** to return to the map screen, which now shows the location and shape of the feature according to the representation defined in the layer properties.

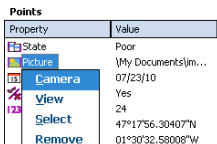
Entering Values for Attributes

Depending on the type of the attribute, you will have to perform the following:

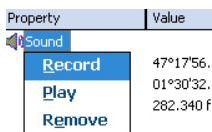
- For a text attribute, type your text using the virtual keyboard and then tap **OK**.



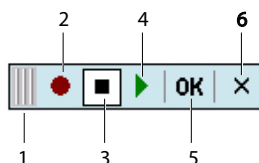
- For a numeric attribute, type your number using the virtual keyboard and then tap **OK**.
- For an image attribute, the following menu is displayed:



- **Camera:** Runs the camera utility so you can take a picture. For more information on using the built-in camera, see [Using the Camera on page 19](#).
NOTE: Picture attributes are saved as JPG files in the same folder as the layer they belong to. The file naming convention used is *Img#.jpg* where # is the picture number (1, 2, 3, etc.). The picture number is ascribed in chronological order, with no reference to any other file.
- **View:** Allows you to view the picture assigned to the attribute.
- **Select:** Allows you to display a slide show of all the pictures taken so you can choose which one to assign to the attribute.
- **Remove:** Allows you to disconnect the selected jpg file from the picture attribute. This does not delete the picture itself, which is still present in the slide show.
- For a voice attribute, the following menu is displayed:



- **Record:** Opens the recorder bar from which you can start, then, stop recording a voice message as an attribute of the current feature.



- 1: Drags the recorder bar.
 - 2: Starts voice recording.
 - 3: Pauses voice recording.
 - 4: Plays back voice recording.
 - 5: Stops voice recording.
 - 6: Closes the recorder bar
- **Play:** For check purposes, select this function to play back the voice message you’ve just recorded (equivalent to “4” button on recorder bar)
 - **Remove:** Select this function to delete the existing voice message. You will use this function when you wish to record a new voice message for the current feature.

NOTE: Voice attributes are saved as WAV files in the same folder as the layer they belong to. The file naming convention used is *Sound#.wav* where # is the record number (1, 2, 3, etc.). The record number is ascribed in chronological order, with no reference to any other file.

- For a date attribute, the current date is automatically assigned. To change the date, tap on the Date attribute and select the new date from the displayed calendar and then tap **OK**.
- For a “Yes/No” attribute, the default choice is “No”. Tap on the attribute name to change the setting and then tap **OK**.

Using the Pause/Resume Function

While logging a line or polygon, you may want to pause data logging because external events require that you do so or you want to start the logging of a second feature (double logging feature) (see *Double Logging on page 45*). Follow the instructions below.

- Tap **Menu>Pause** to pause data logging.

- Later when you are ready to resume data logging, go back to where you left the line or polygon, tap **Menu>Resume** to continue the data logging as you walk along the feature.

Double Logging

While logging a line or polygon, you may want to log another feature found along the way, whether a point, a line or a polygon. Follow the instructions below.

- Tap **Menu>Pause** to pause the data logging of the feature in progress.
- Move to the second feature you want to log.
- Tap **Log**, select the layer of the second feature, make the necessary settings and log this feature as you would in the usual case.
- Tap **Menu>Stop** when you are finished with the logging of the second feature.
- Go back to where you left the first feature.
- Tap **Menu>Resume** to continue with the logging of the first feature.
- Tap **Menu>Stop** when you are finished with the logging of the first feature.

More about Feature Logging

- The number of point features that can be logged in a session is only limited by the memory capacity of the storage medium used.
- Up to 10,000 points can be logged in a single line or polygon.
- When logging a long line or polygon, MobileMapper Field will automatically save the data to a temporary file every 10 minutes of data logging.

If a power failure occurs while logging a line or polygon, the feature is automatically saved before the power failure. Because line and area features are saved automatically every 10 minutes of actual logging, if a power failure occurs unexpectedly and you have been logging a line or polygon feature for the last 15 minutes, then most probably only the first 10 minutes of the feature will be saved.

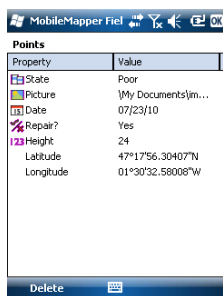
- If MobileMapper Field fails to save a feature because there is not enough memory left, you can still delete unnecessary files and try again. Follow the instructions below when this happens.
 - Minimize MobileMapper Field

- Run File Explorer
- Delete unnecessary files
- Return to MobileMapper Field and stop logging the feature. The feature will normally be saved if enough memory space has been cleared.

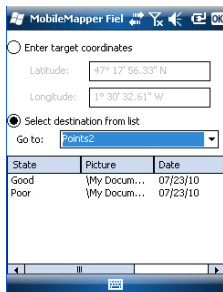
Deleting Features

For some reason or other, you may want to delete a feature, whether a point, a line or a polygon. This is possible from the map screen showing the location of the feature:

- Through zoom and drag operations, adjust the view of the map screen in order to see the location of the feature.
- Tap on the feature. This opens a new window showing the properties of the feature.
- Tap on the **Delete** function shown in the lower bar. The feature is deleted immediately from the corresponding layer, without prior confirmation, and its location removed from the map screen.

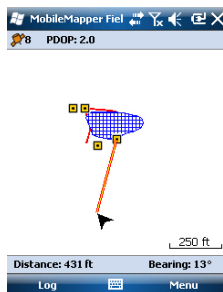


Revisiting Features



Going Back to a Feature

- Tap **Menu>Go To....** The receiver allows you to go back to a feature according to one of the following two methods:
 1. **Enter target coordinates:** Choose this option if you want to go back to a point feature for which you know the coordinates (latitude/longitude or Easting/Northing (X/Y) depending on the coordinate system used in the map file). After you have entered the two coordinates, tap **OK**. This takes you back to the map screen.
 2. **Select destination from list:** Choose this option if you want to go back to a feature stored in the open map. First of all, you have to select the layer the feature belongs to. Use the **Go to** drop-down menu to make this choice. As a result, the screen lists all the features contained in that layer. Features are listed from the nearest to the farthest from your current location. Select the desired one simply by tapping on its name. This takes you directly back to the map screen.



Whatever the method used, you can now see, on the map screen, a yellow/red segment connecting your current position to the feature.

For a line or polygon, MobileMapper Field will draw a segment between your current position and the point in the line or polygon the nearest to you.

In the lower bar, you can read the distance and the bearing to the feature.

- Walk in the direction indicated on the screen until you reach the feature.

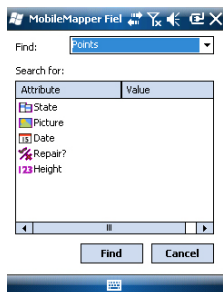
Editing a Feature

When the map screen displays the feature you want to edit and you know which changes need to be made to its attributes, do the following.

- Tap on the feature symbol.
- When you see a bold orange line surrounding the feature, release the stylus. The program then displays the list of attributes pertaining to the feature.
- Edit the attributes that need changes and then tap **OK**.

Find Feature Function

MobileMapper Field allows you to search for a particular feature you logged in a map. MobileMapper Field will ask you to indicate the layer it belongs to, and optionally, the known value of one or more of its attributes. As a result, MobileMapper Field will list all the features meeting your requirements.



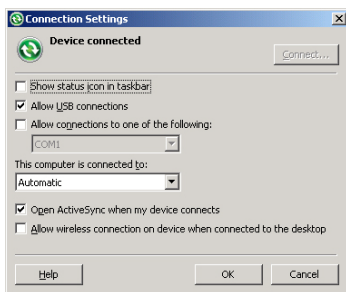
- Tap **Menu>Find...** MobileMapper Field displays one of the layers present in the map as well as the names of the different attributes attached to that layer.
- In the **Find** field, select the layer type of the feature you are searching for.
- Optionally, tap on each of the attributes for which you want to define a specific search criterion and then enter it.
- Tap on the **Find** button to start the search. MobileMapper Field will list all of the features in the map which meet the search requirements.

From this list you select the desired feature and see where this feature is located on the map screen. In addition, by selecting **Menu>Go To...**, MobileMapper Field will give you the option of navigating to this feature.

Upload/Download Functions

Using the USB data cable provided with [your receiver](#), you can exchange data between [the receiver](#) and your office computer.

With Vista running your computer, no particular settings are required. With Windows XP (or older), use the following settings in ActiveSync to make the connection automatic at [receiver](#) power up:



Use the procedure below to copy files from one unit to the other:

- [Place the receiver on the docking station](#)
- Connect the [docking station](#) to your office computer using the USB data cable.
- Turn on [the receiver](#).
- Wait until the connection is active.
- Do the following, depending on the OS used in your computer:
 - (Vista) In the auto-run window that opens, choose the option to explore the mobile device
 - (Windows XP or older) In the ActiveSync window, click **Explore**.
- From either of these windows, you can copy any file from [the receiver](#) to any folder on your office computer, or the other way around, using the usual copy, paste and browse functions.

A good practice is to have all the files used in a job (i.e. job file, layers, image files, sound files, all the files relevant to the background map used) to be saved to the same folder on the receiver. Apart from the raw data files, which are in a separate folder, downloading a job to MobileMapper Office will then only consist of copying the entire folder to the office computer.

Coordinate Systems

When creating a new DXF job or when creating a layer as the first layer in a new *.map job, MobileMapper Field asks you to define a coordinate system.

Choosing a Coordinate System

Proceed in this order:

1. Choose the World Geodetic System or the country where your field operations will take place
2. In the field just underneath, choose the datum used
3. In the field just underneath, choose the projection used.
4. Choose the vertical datum in the last field. The default possible choices are:
 - **Ellipsoid**: Each altitude or height value is simply determined with respect to the selected ellipsoid (second field above).
 - **EGM84**: Each altitude or height value is still initially determined with respect to the selected ellipsoid but a correction is applied to that value. The correction is read from the EGM84 geoid (Earth Geoid Model 1984, a global geoid model) and is specific to the computed horizontal position.

Other geoid models may be downloaded to the receiver from the MobileMapper Software CD. Once downloaded, they are made available as possible choices in the Vertical Datum field.

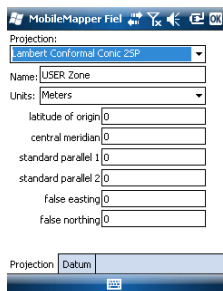
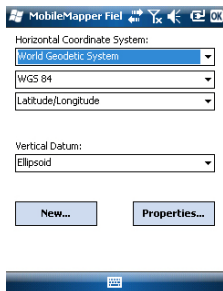
The **Properties...** button at the bottom of the screen allows you to view the properties of the selected datum and projection. The **New...** button at the bottom of the screen allows you to create a user system (datum + projection).

Defining a User System

- Tap on the **New** button.
- Select the type of projection you wish to use in your coordinate system. Depending on that choice, you will have to enter a certain number of parameters.

Remember every time you create a new projection and you have to enter the latitude and longitude of origin, or the central meridian, these must be expressed in degrees with eight decimal places (ddd.dddddddd). On the other hand, false eastings and false northings should always be expressed in meters, even if a different unit has been selected in the **Units** field on the same screen.

- After you have named and defined your new projection and datum, just tap **OK** to save the new system and choose



it as the system used in the current job. This will take you back to the coordinate system selection screen on which you will now be able to see how the new USER coordinate system has been defined (new projection and datum names displayed in the second and third fields respectively).

Viewing the Properties of the Coordinate System Used in a Job

- Tap **Menu>Job>Properties**.
- Tap on the **Coordinate System...** tab. The screen now shows the non-editable settings for the coordinate system used in the map. Tap on the **Properties** button to read the details of the datum and projection used in the coordinate system.

Voice Setting

For best quality voice recording, you need to change the default voice sampling setting as follows:

- Tap **Start, Notes**
- If this action directly opens a note file, please close it before proceeding.
- Tap **Menu>Options**.
- Tap on the **Global Input Options** hyperlink.
- Tap on the **Options** tab.
- Select “44,100 Hz, 16 Bit, Mono (86 KB/s)” from the **Voice recording format** drop-down list.
- Tap **OK** to enter the new setting.
- Tap **OK** then  to return to the **Start** screen.

Post-Processing Option and MobileMapper Office

Unlocking the Post-Processing Option in the Receiver

When you purchase the post-processing option, Ashtech delivers an activation code specific to your receiver so you can unlock this option in the receiver. Follow the instructions below the first time you want to use the post-processing option:

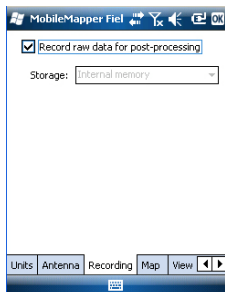
- Tap **Menu>Options**.
- Tap on the **Recording** tab.
- Enable the **Record raw data for post-processing** option.
- Tap **OK**. A new screen is displayed showing the serial number of your receiver and a blank activation code field.
- Type the activation code provided by Ashtech in the blank field.
- Tap **OK** to validate the code entry. If the “serial number/activation code” pair matches, then the option is unlocked instantaneously. The receiver will start logging raw data as soon as the reception conditions are good. Remember also that the **Record raw data for post-processing** setting remains unchanged through all the subsequent power cycles of the receiver, until you decide to change it.

Logging Raw Data

Here are a few key points that will help you understand how the raw data logging function operates in your receiver.

- A single raw data file is created per working session, independently of the number of jobs you open and close during that session.
(A working session is defined as the period of time during which MobileMapper Field is run uninterruptedly, with the **Record raw data for post-processing** option on).
- With the **Record raw data for post-processing** option on, raw data logging will start automatically when enough satellites are received (>3). Raw data logging is effective when “REC” is displayed in MobileMapper Field’s status bar (see *Getting Started With MobileMapper Field on page 24*).

NOTICE. It is a good practice to wait about 1 minute from the time at least 4 satellites are received and the PDOP is less than 3 before you start logging your first feature. (You don’t need to be static during this wait time). The amount of extra raw data will advantageously be used in MobileMapper Office to secure the post-processing of your features.



Raw data can only be saved in the internal memory, in the “Storage Disk” folder. The raw data files will be found in the “GNSS Raw Data” sub-folder.

- Raw data files are named as follows:

nnnnnyymmddss.grw

Where:

Parameters	Description
nnnn	Last four digits of the receiver serial number
yy	Last two digits of year (“08” for 2008)
mm	Current month number (1-12)
dd	Current day number (1-31)
ss	Session number, starting from 00. May consist of more digits, if necessary.
grw	File extension

NOTE: The coordinate file created during a work session uses the same naming convention. Only the extension is different (“crw” instead of “grw”).

- During raw data collection, even if you are not logging any feature but just moving from one feature to another, remember you should keep holding the receiver at an angle of 45° above the horizontal.
- Never switch the receiver to suspend mode while collecting raw data (this would end raw data collection). If you want to save battery power while collecting data, you may turn off the screen backlight using the Backlight icon on the MobileMapper Today tool bar. However, if you are also using the e-compass while collecting raw data, remember the backlight setting must be left unchanged.
- Always collect raw data for at least 10 minutes, including for those projects where GIS feature collection can be completed in less time. Remember the more you collect raw data for a given project, the better the results of the post-processing will be.

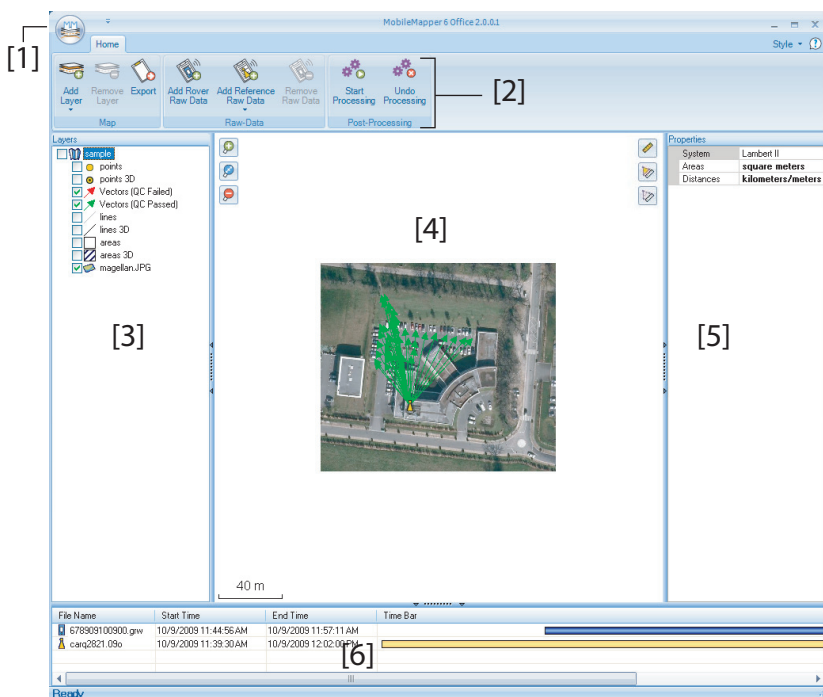
Installing MobileMapper Office Software

- Insert the installation CD in your computer. Wait until the welcome screen is displayed.
- Click on **Install MobileMapper Office**. The installation program starts analyzing the configuration of your computer.
- The installation program may ask you to install one or several Microsoft applications on your computer. If this happens, please accept. These are:

- Microsoft .NET Framework 2.0
- Microsoft Visual C++ Runtime Libraries
- Microsoft Windows Installer 3.1
- The installation program then installs MobileMapper Office.
- At the end of the installation, MobileMapper Office is automatically launched.

Post-Processing With Mobile- Mapper Office Software

- Using the data transfer procedure (see *Upload/Download Functions on page 48*), copy the following field data files from [the receiver](#) to a folder of your choice on the computer:
 - *.map files
 - *.shp files
 - img*.jpg files
 - sound*.wav files
 - *.grw file (raw data file). It is your responsibility to know which raw data file is associated with your project.
 - *.crw file relevant to the downloaded *.grw file.
- Run MobileMapper Office on your computer. The main window looks like this:



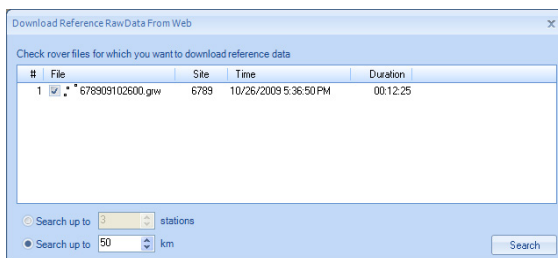
The different areas are described below:

- [1]: Open/Create Map button
- [2]: Menu bar
- [3]: MAP filename and Layers list
- [4]: Map screen showing the content of the open job, Also includes zoom buttons on the left and [distance/angle/area tool buttons](#) on the right.
- [5]: Depending on what is currently selected in area [3], [4] or [6], this area shows job properties (coordinate system and units used), layer attributes and appearance, or raw data file properties (observation time span, etc.). When selecting a feature on the map screen, the sound and image attributes pertaining to the feature can be heard and viewed by clicking on the three dots button after the file path in the corresponding field. Clicking on this button will start your computer's default editor used for respectively WAV and JPG files.

- [6]: Observation times covered by the raw data files added to the project. A green bar stands for a [receiver](#) raw data file, and a yellow bar, for a base raw data file.

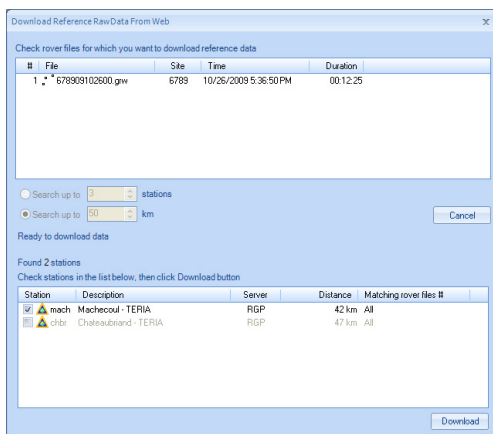


- Click  and select **Open**. Browse to the folder containing your field data files.
- Select the Map file and click **Open**. MobileMapper Office shows the content of the project in areas [3], [4] and [5] (see screen above).
- Click on **Add Rover Raw Data**. Select the raw data file corresponding to the project (from the same folder as previously) and click **Open**. MobileMapper Office imports the GRW file and then shows the file properties in areas [5] and [6]:
- Assuming you are working with a third-party reference station, click successively on **Add Reference Raw Data** then **From Web**. A new window then opens in which you have to indicate how you wish to search for the reference station you will use for post-processing your job.



- Choose one of the following two search criteria:
 - **Search up to x stations:** Specify a preset number of stations you want to list before choosing one. All the listed stations will be the closest to your working area, but there is no range limit for these stations.
 - **Search up to x km:** Specify a limit of distance between your working site and the stations. The shorter the distance, the better the raw data from the station, but the smaller the number of stations that can potentially be used.
- Click **Search**, then wait until the search is complete. At the end of the search, MobileMapper Field lists the stations meeting the search request.

- Select the most suitable reference station, mainly according to the distance (baseline) to that station.



- Click **Download**. MobileMapper Office imports the base raw data and then show its properties in areas [5] and [6].
NOTE: Ashtech does not guarantee 100% quality results when using raw data files from reference stations that are situated beyond 200 km (125 mi) from your working area.
- Click on **Start Processing**. MobileMapper Office post-processes the different files present in the project. At the end of the post-processing, the map screen graphically displays the post-processed, more-accurate position of each GIS feature.

Additionally, MobileMapper Office adds a vector layer into the project. Each feature in the layer can be edited individually. Vector attributes include useful quality information about vector determination.

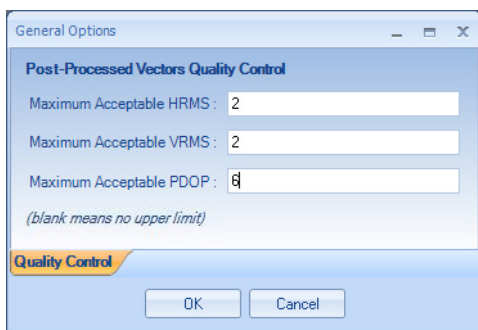
The post-processed SHP files are automatically updated with the new positions and then saved. Beforehand, backup files (<layer_name>.bak.shp) are created preserving the original content of the <layer_name>.shp files. Being also SHP files, backup files can be added to the project as layers, allowing you to compare the results of the post-processing against the original positions of your features.

NOTE: DXF job files, MIF and CSV layers are not supported in this version of MobileMapper Office.

Quality Control in Post-Processing

You can place a quality control filter through which MobileMapper Office will rate the post-processing results according to your own requirements. Following the post-processing of your job, MobileMapper Office will associate the resulting vectors to two different layers: one containing the vectors that passed the quality control (green vectors), and a layer containing those that failed (red vectors).

- Click  and then on the **Options** button located in the lower-right corner of the pop-up window.
- Enter your three quality control settings, i.e. the maximum permitted values for HRMS, VRMS and PDOP. (see screen example below).



- Click **OK** to confirm your filter settings.
All the vectors for which the HRMS, VRMS and PDOP are less than those specified here will pass the quality control whereas all the others, if any, will fail.

Note that the quality control filter is applicable to all the jobs you open in MobileMapper Office, until you modify the filter settings. To remove the filter, you just need to set the three fields blank and click **OK**.

Note also that the PDOP characterizes each point when it was logged (the PDOP is re-calculated by MobileMapper Office, based on the content of the job file). In contrast, the HRMS and VRMS are part of the post-processing results and characterize the post-processed positions.

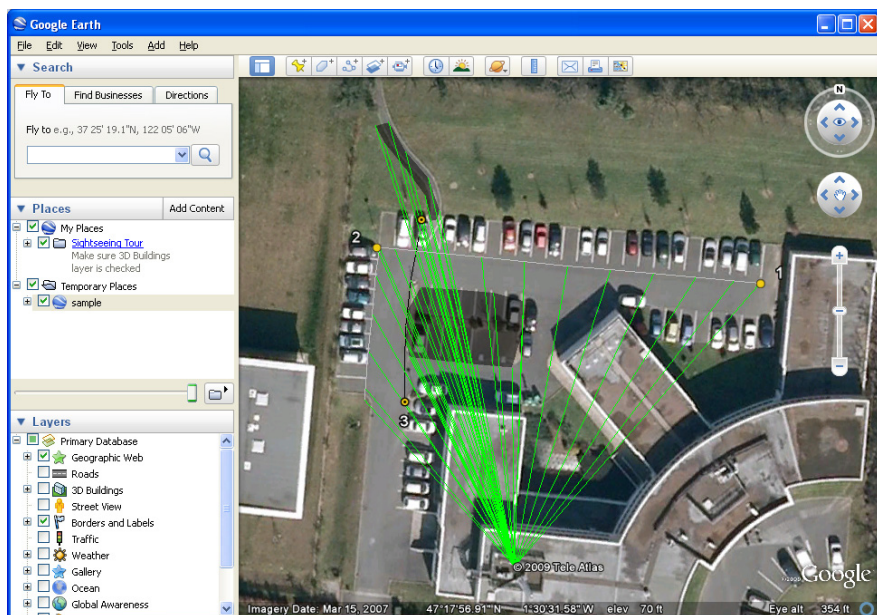
Export Function

MobileMapper Office can export the visible layers from the open job to two different formats:

- ASCII format (*.csv). Each selected layer will result in a separate csv file.

- Google Earth format (*.kml). All the selected layers will be merged into a single kml file.

Opening a kml file from the Google Earth initial view will cause the Earth representation to be gradually rotated and zoomed in to show the exact location of the features held in the kml file.



Follow the instructions below to export layers:

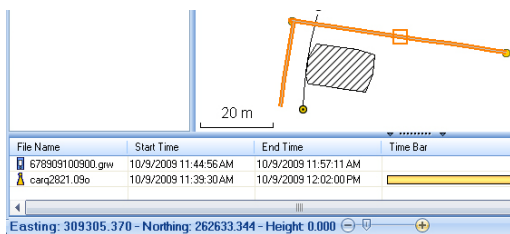
- Open your job.
- Make visible the layers you want to export (turn on the corresponding check boxes). As background maps will not be exported, they can stay visible in the job
- Click on  and then select the format and destination of the file(s) generated by the Export function.
- Click **Save** to complete the Export sequence.

More About MobileMapper Office

- **Undo Post-processing:** If the post-processing results do not meet your expectations, you can reverse to the original SHP files by selecting the **Undo Processing** command.

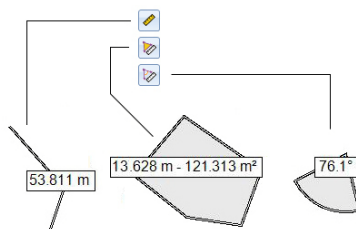
- **Zoom settings:** In addition to the zoom buttons in the menu bar and on the map screen, MobileMapper Office offers another useful way of adjusting the zoom setting. Double-click on a feature in the map screen. This takes the feature to the center of the map screen. You can then adjust the zoom setting around the feature, which stays at the center of the screen, using the mouse wheel (turn forward to zoom in, turn backward to zoom out).
- **Viewing the background map:** Use **Add Layer>Select Existing**. In the Open dialog box, choose “Raster file” as the file type and then select the background map file from the job folder. Click **Open**. There may be a message warning you about the coordinate system used by the background map, if different from the one used in the job. Note that background maps are seen as layers in the job.
- **Status Bar:** The status bar is located at the bottom of the main window. Whatever the feature selected on the map screen, the status bar displays the coordinates of the selected point.

For a line or polygon feature, the status bar additionally shows a sliding bar allowing you to move the cursor on the map screen from one point to the next or previous point using respectively the “plus” or “minus” button at the two ends of the sliding bar.



The location of the cursor on the sliding bar is representative of the position of the selected point in the line or polygon.

- **Layer Editor:** MobileMapper Office also allows you to edit SHP files in a way much similar to MobileMapper Field's Edit/Create Layer function.
- **Measuring distances, angles and areas on the map screen:** Use the three icons in the right-upper corner. The upper one is for distances, the second one for areas and the lower one for angles.



For each tool, the first click on the icon will activate the tool and change the cursor shape. The second click will turn off the tool and the cursor will recover its initial shape.

Distance measurement:

- Click on the first point from where to start the distance measurement.
- Click on the second point defining the first measured segment. Any new click on the map will create a new segment from the previous point. From the second point, the indicated distance value stands for the total distance measured from the start point.
- Anticipate the end of measurement by double-clicking on the last point. This will freeze the distance measurement.
- Click on  to quit the distance measurement tool.

Area measurement: Same as distance measurement. The area measurement is effective only after you have defined three points on the map. The value of perimeter is also provided.

Angle measurement:

- Click successively on the first then on the second point defining the segment providing the reference direction. The tool then draws the angle measured and gives its current value as you move the mouse cursor on the map screen. If you click anywhere, the tool freezes on the angle defined by this last click and gives its value.
 - Click on  to quit the angle measurement tool.
- **Adding base raw data from a file:** This function is convenient when the useful base raw data files have

already been downloaded from the Internet or if they come from a reference station that is not connected to the Internet, like for example an Ashtech ProMark3 base. In either case, click on **Add Reference Raw Data>From File** and select the base raw data files.

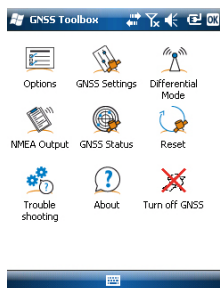
- **Removing a layer from a map:** Select the layer in area [3] on the screen and press the Del key or click on **Remove Layer**.
- **Recommendations on folders:** Ashtech recommends you store all the files pertaining to a project in the same folder. By doing this, you will be able to open your Map files equally in your receiver and MobileMapper Office software without losing a single SHP layer.

Post-Processing Demo

Click on the diagram below to start a short demo on how to quickly post-process your field data files in MobileMapper Office. (Under Construction)



GNSS Toolbox



GNSS Toolbox is used to control and monitor important functions in your receiver. These are listed and detailed below.

- **Options:** Lists the installed firmware options and allows you to install new options.
- **GNSS Settings:** Constellations and frequencies used in the receiver.
- **Differential Mode:** Used to make the necessary settings to allow the receiver to process corrections it acquires from the specified communication means (radio, network, modem or other).
- **NMEA Output:** Used to set the output of standard NMEA messages on a serial port (RS232 or Bluetooth).
- **GNSS Status:** Views GNSS reception monitoring screens.
- **Reset:** Resets the receiver.
- **Troubleshooting:** Allows data to be recorded for debugging purposes.
- **About:** Views versions of installed software and firmware.
- **Turn off GNSS:** Allows you to turn off the GNSS section of the receiver when GNSS reception is temporarily unnecessary for the tasks you are currently running with your receiver. Turning off GNSS reception will significantly save the battery operating time.

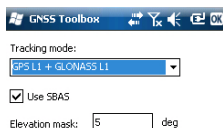
Options

- Open the **GNSS Toolbox** and tap on **Options**. This opens a new window listing the currently installed firmware options.
- Use the **Install** button if you want to install new firmware options in the receiver. The **Option** field lists all the firmware options that can still be installed in your receiver.

To install a new option:

- Select this option from the **Option** field
- Enter the activation key in the **Key** field. This key was provided by Ashtech after you purchased this option.
- Tap **OK** to complete the installation of the option, which will then appear in the list of installed options.

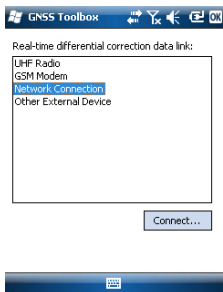
GNSS Settings



- Open the **GNSS Toolbox** and tap on **GNSS Settings**. This opens a new window where you can make the following settings:
 - **Tracking mode:** Depending on the installed firmware options, one or more combinations of constellations and frequencies may be listed here. Choose the suitable one.
 - **Use SBAS** check box: Check this box to enable SBAS reception, clear it otherwise.
 - **Elevation mask:** Any satellite seen from the receiver with an elevation angle less than the specified elevation mask will be rejected. The default value is 5 degrees.
- Tap **OK** to confirm your choices and return to the GNSS Toolbox window.

Differential Mode

The table below summarizes the different settings required for each type of communication used to acquire real-time differential corrections.



Corrections Source	UHF Radio	GSM Modem (1)	Network Connection (3)		Other External Device
			Direct IP	NTRIP	
Radio Type	•				
Radio Parameters (1)	•				
Phone Number		•			
Host IP Address			•	•	
IP Port			•	•	
Login				•	
Password				•	
Network				•	
Station (Mount Point)				•	
"Send Position to Network" Setting				•	
Port used					•
Baud Rate					•

(1) Radio parameters include channel number, data protocol, over-the-air speed, etc.

(2) Internal modem used in CSD mode

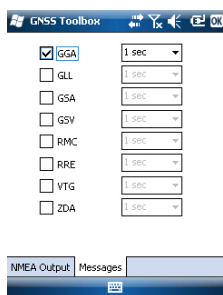
(3) Using a network connection requires prior steps, illustrated in the diagrams below, for the receiver to connect to a GPRS or CDMA network. See also *GPRS Connection Using the Internal Modem* on page 14 for GPRS, *CDMA*

Connection Using an External Mobile Phone on page 16 for CDMA.

Connect to Network ...	ISP data required: APN, user, password,...
ISP data required: APN, user, password,...	Modem connection used: via Bluetooth
Modem connection used: Cellular line (GPRS)	Bluetooth Connection between Receiver and External CDMA Mobile Phone
Activate Phone function	
Insert SIM card	

(under construction)

NMEA Output



- Open the **GNSS Toolbox** and tap on **Differential Mode**.
- On the **NMEA Output** tab, select the output port (COMx) and choose a baud rate for that port.

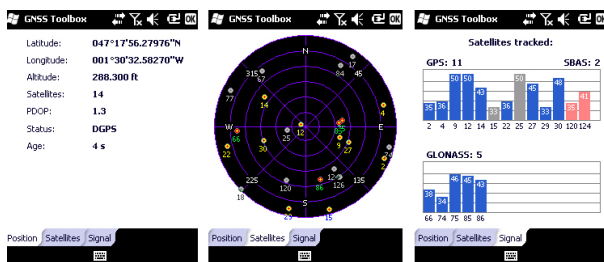
Read the port allocation table below to select the right port. Baud rates range from 300 to 115200 Bd.

Virtual Port	Physical Output
COM1-COM4	Reserved. Please do not use these ports.
COM5	DB9 connector on docking station (RS232)
COM6	Reserved. Please do not use this port.
COM7	Internal Bluetooth port used by Bluetooth for Dial-Up Networking (DUN)
COM8-COM9	Reserved. Please do not use these ports.

- On the **Messages** tab, select the NMEA messages you want to output. For each message, the output rate can be set to one of the preset values ranging from 1 second to 1 minute. The available NMEA messages are GGA, GLL, GSA, GSV, RMC, RRE, VTG and ZDA.

GNSS Status

- Open the **GNSS Toolbox** and tap on **GNSS Status**.



The default **Position** tab shows the latitude, longitude and altitude of the current position, as computed by the receiver, as well the number of satellites used and the current PDOP value.

If SBAS is used, the screen also shows the position computation mode used and the age of corrections.

In RTK mode, the screen additionally shows the current position status, the HRMS and VRMS, the baseline length and, if the receiver has not fixed the position yet, the time elapsed since power up or since the last time a fixed position was available.

The unit used to express the current altitude (meters or feet) depends on the region (language and country) you selected in **Start, Settings, System, Regional Settings**.

- The **Satellites** tab displays a polar diagram showing the locations in the sky of the tracked satellites. Different colors are used to display the numbers of the visible satellites:
 - Yellow characters: GPS satellites used
 - Green characters: GLONASS satellites used
 - Grey characters:
 - Grey characters: Visible SBAS satellites. Also rejected GPS and GLONASS satellites, because unhealthy or under the elevation mask.
- The **Signal** tab shows the signal level for each of the tracked satellites:
 - Dark blue bars for all GPS and GLONASS satellites used
 - Red bars for all SBAS satellites used
 - Grey bars for all tracked, but not used, GPS and GLONASS satellites

GPS satellites are numbered from 1 to 32, GLONASS satellites from 38 to 61 and SBAS satellites from 120 to 138.

- Reset**
- Open the **GNSS Toolbox** and tap on **Reset**. A message then asks you if you want to reset the receiver now. Use this option only if you think the receiver is not working properly.

Troubleshooting



For some reason, the Ashtech Technical Support may ask you to use this function to help them solve the problem you are reporting. Should this happen, please proceed that way:

- Open the **GNSS Toolbox** and tap on **Troubleshooting**.
- Activate the **Enable debug file output** check box.
- Choose the memory where to store the data file ("Internal Memory" or "Storage Card").
- Tap **OK**.
- Let the receiver record data for the time requested by the Ashtech Technical Support. You will then come back to the Troubleshooting screen to clear the **Enable debug file output** check box and tap **OK**.

The procedure is then as follows:

- Back at the office, place the receiver on the docking station.
- Connect the docking station to your computer using the USB cable provided.
- Using Microsoft ActiveSync, open one of these folders:
 - "Storage Disk" if "Internal Memory" was selected for data recording.
 - "Storage Card" if "Storage Card" was selected for data recording.

This folder contains a folder named "GNSS Raw Data" in which you will find a file of this type:

ATL_yymmdd_hhmmss.log

(e.g. "ATL_100715_162514.log" for a file logged on July 15, 2010 at 4:25:14 pm)

- Send an email to Ashtech Technical Support with this file attached to the email. The file uses a proprietary format and so can only be parsed by Ashtech.

Note: If you are using Windows Mobile' E-mail, you can send the file directly from your receiver.

About

In addition to providing the software version of the GNSS Toolbox, this function also reports the following:

- GNSS firmware version
- System firmware version
- Receiver serial number

Turn Off GNSS

- Open the **GNSS Toolbox** and tap on **Turn off GNSS**. The message “Power off GNSS receiver?” is displayed asking you to confirm or cancel your power-off request.
- Tap **Yes** to confirm. This will instantly turn off the GNSS section of the receiver and take you back to the Start screen.

Note that from that moment, you won't be able to launch the GNSS Toolbox until you shutdown the receiver and then turn it back on.

Installing Geoids

Ashtech makes available a collection of geoids for use in many countries around the world. This collection is hosted on the Ashtech website and is regularly updated.

To download a geoid, use the **Geoids (models & tools)** option in the welcome menu of the MobileMapper Software CD delivered with the receiver.

In absence of the CD, you can still list and download the available geoids using your web browser to connect to the following URL: <http://resources.ashtech.com/GEOIDS>.

After a new geoid has been downloaded to your computer, MobileMapper Office will automatically prompt you to install the new geoid on your receiver.

This step may be run right after downloading the geoid to the computer if the receiver is currently connected to the computer via ActiveSync and the docking station, or later, as soon as you connect the receiver to the computer. In both cases, please accept.

(Still under construction. Web page listing geoids no longer accessible at the time of writing - July 28)

GNSS Characteristics

- 45 parallel all-in-view channels
 - GPS
 - GLONASS
 - L1 C/A
 - SBAS: WAAS/EGNOS/MSAS
- Ashtech BLADE technology for optimal performance
- DGPS, RTK and post processing with Ashtech software
- Up to 20 Hz GPS, GLONASS, SBAS position output and raw data (code and carrier)
- NMEA 183 messages output
- RTCM2.3, RTCM3.1, CMR and CMR+, DBEN, ATOM (Ashtech Optimized Messaging)
- RTK Network: VRS, FKP, MAC

RMS Horizontal Accuracy Figures

- Real-time SBAS: < 50 cm typical
- Real-time DGPS: < 30 cm typical
- Real-time RTK: < 30 cm down to 1 cm
- Post-processing: < 30 cm down to 1 cm

Note: Handheld accuracy performance achieved in good conditions with PDOP <4 and more than 5 satellites in view. Accuracy specifications may be affected by atmospheric conditions, signal multipath, satellite geometry and corrections availability and quality.

Processor

- Marwel PXA 320
- Clock frequency: 806 MHz

Operating System

- Microsoft Windows Mobile version 6.5
- Installed language at delivery: English, French, Spanish, German, Portuguese, Italian, Simplified & Traditional Chinese, Japanese or Korean.
- Software package includes:
 - GNSS Toolbox
 - Internet Explorer
 - Microsoft Office Mobile
 - ActiveSync
 - Transcriber (handwriting recognition)

Communication

Cellular:

- Built-in GPRS, EDGE class 12 modem
- Quad-band, 850/900 MHz, 1800/1900 MHz

Bluetooth:

- Bluetooth 2.1 (class 2) with DER
- Profiles: SPP, DUN, FTP, OPP, HSP, A2DP

Other:

- RS232, USB through docking station
- Wireless LAN 802.11b/g (SDIO slot)

Physical Characteristics

- Receiver size: 190 x 90 x 43 mm (7.5 x 3.5 x 1.7")
- Receiver weight (batteries included): 620 g (1.43 lb)
- Receiver alone: 0.48 kg (1.06 lb)
- Screen size: 2.7" (6.86 cm)
- Screen resolution: QVGA (240 x 320 pixels)
- Environmental: IPX7, -20° to +50°C, withstands 1-meter drop.

User Interface

Keyboard:

- Alphanumeric virtual keyboard
- 4-way navigation scroll button; OK, Menu, Escape, Zoom In/Out keys + context-sensitive keys
- Illuminated keyboard

Display Screen:

- Color TFT, high-resolution display, sunlight readable, with touch screen, LED backlight.
- Size: 3.5", portrait

Memory

- 256-MB SDRAM
- 1-GB NAND Flash (for user data storage)
- SDHC memory card slot

Environmental Characteristics

- Operating temperature: -20° to +60°C (-4 to 140°F)
- Storage temperature: -25° to +70°C (-13 to 158°F)
- Humidity: 10 to 90% non condensing
- Waterproof
- Vibration and Shock: ETS300 019, vibration Mil STD 810 method 514.5
- Free drop: 1.2 m on concrete

Power Requirements

- Removable battery: Li-Ion, 6600mAh
- Battery life: > 8 hours @ 20 °C, with GNSS on and Bluetooth, WLAN and screen backlight disabled.
- Battery charging time: 3 hours (in standalone or with turned-off receiver)
- External power: 9-28 V DC

Multimedia & Sensors

- 3-Megapixel camera
- E-Compass
- G-Sensor
- Speaker
- Microphone

Standard Accessories

- Integrated stylus
- Docking station
- Universal AC adapter
- USB data cable

Optional Accessories

- External GPS+GLONASS L1 precision antenna with cable
- Pole bracket

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