



Topcon Receiver Utility



Reference Manual



Topcon Receiver Utility

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Preface

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Manual Conventions

This manual uses the following conventions:

Example	Explanation
File ► Exit	Tap/press the File menu then tap/press Exit.
Ctrl+M	Press the ‘Ctrl’ and ‘M’ keys.
Export	Tap/press the button or key labeled Export.
<i>Name</i>	Indicates a field or tab on a dialog box or screen.
Export OAF	Indicates the name of a dialog box or screen.



TIP

Supplementary information that can help you configure, maintain, or set up a system.



NOTICE

Supplementary information that can have an affect on system operation, system performance, measurements, or personal safety.

Notes:

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

Getting Started

Topcon Receiver Utility (the Application) is Topcon's hardware configuration software available for installation on desktop computers and hand-held controllers.

This manual describes the Mobile version of the software.

The Application is primarily designed for advanced users who need to configure the receiver hardware, or peripheral devices (internal, and external modems, Bluetooth boards, etc.).

The Application currently has two modes, Terminal and Receiver Managing, which include the following functionality:

- Manual mode
- Receiver Info dialog
- Authorization options management
- Uploading OAF files to a receiver
- Uploading GPS firmware (to the power board, GPS receiver, internal Bluetooth board, and modem)
- Sending commands (Clear NVRAM, Reset Receiver)

Starting Topcon Receiver Utility (TRU)

The Application can be installed on a PC with Microsoft Windows 2000 or later, or into controllers with Microsoft Windows CE.NET 4.2 or later, or Windows Mobile 5.0 or later. Two type of installers are available: one for PC and one for Mobile devices.

To install Topcon Receiver Utility onto the controller, Run the Mobile Installer on the PC. The Installer automatically detects the mobile platform connected to the PC (CPU, OS, specific hardware),

and installs an appropriate edition of the Application on to the controller. After installation, shortcuts on the desktop and in the Program menu are created.

To start TRU, double-click the shortcut or launch the Application from the Start menu. The main application window displays (Figure 1-1).

Main Window

The TRU main window consists of a menu bar, tool area, and a status bar.

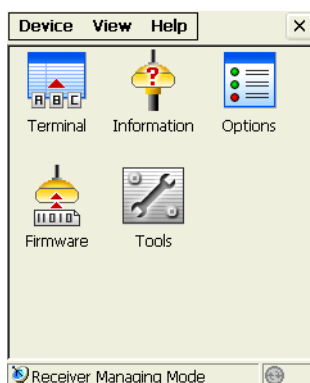


Figure 1-1. Main Window

The Menu Bar

The menu bar has the following components:

- *Device* – contains options which allow connecting to a device, changing connection, hardware specific parameters, and the application mode.
- *View* – shows or hides the status bar.
- *Help* – shows information on the current version and edition of the Application.

The Tool Bar

The tool area contains icons for the tools included in the current mode. The tool area is inactive until a connection to a device is established (the connection icon in the status bar is green).

The Status Bar

The status bar shows the current mode, and the connection status icon (the green icon indicates that TRU is connected, the gray indicates that there is no connection).

Application Modes

Topcon Receiver Utility has two main modes:

- Simple Terminal – In this mode, TRU is used only as a terminal. This mode is also used for firmware updating of inoperative receivers. For details on this mode, see “Simple Terminal” on page 3-1.
- Receiver Managing (default) – In this mode, TRU is used for configuring receiver hardware. For details on this mode, see “Receiver Managing” on page 4-1.

You can choose the application mode from the Device menu:

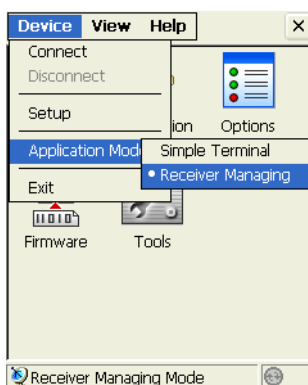


Figure 1-2. Application Modes

About Topcon Receiver Utility

Click on the Help menu to display the TRU dialog box. The TRU dialog box displays the following fields:

- TRU Version – version number of software and date created.
- Edition – application edition.
- Copyright information – name of publishing company.

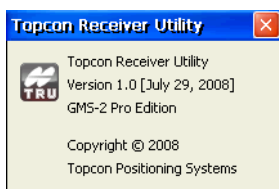


Figure 1-3. About Topcon Receiver Utility

Table 1-1 lists Application editions for Mobile devices currently available.

Table 1-1. TRU Editions and Supported Platforms

#	Edition	CPU	OS	Topcon controllers	3rd party controllers	Bluetooth
1	Universal	ARMV4	CE.NET 4.2-5.99	-	Any	No
2	FC-100	ARMV4	CE.NET 4.2-5.99	FC-100/ 2000	-	No
3	FC-200	ARMV4I	CE.NET 5.0-5.99	FC-110/ 120/200	-	Microsoft
4	FC-2200	ARMV4I	CE.NET 5.0-5.99	FC-2200	-	AveLink
5	GMS-2	ARMV4I	CE.NET 5.0-5.99	GMS-2	-	GMS-2
6	GMS-2	ARMV4I	CE.NET 5.0-5.99	GMS-2 Pro	-	Microsoft
7	Universal	ARMV4I	Windows Mobile 5.0-6.99	FC-110/ 120/200	Any	Microsoft

**TIP**

When installing the Application, the Mobile Installer will automatically select the appropriate edition for the controller.

**NOTICE**

It is guaranteed that the Application will work on any Topcon controller listed in Table 1-1. We also support 3rd party controllers, but there is no guarantee that the Application will work on any 3rd party controller. Every mobile device has its own and unique OS edition, and the OS may not have components necessary for the Application to function properly.

Setup

By default, the Application does not change the computer default settings. To change defaults, you may select Device Setup from the main menu. Select **Device ► Setup** from the main menu.

The **Setup** dialog box contains at least one *General* tab that allows changing general-purpose parameters (Figure 1-4).

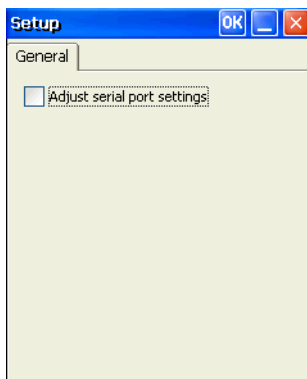


Figure 1-4. Setup/General-purpose Settings

- *Adjust serial port settings* – when enabled, allows the Application to change both controller's and receiver's serial port settings (baud rate, flow control, etc.) to improve connection rate with the receiver. Otherwise, the Application will detect and use current settings of the receiver's serial port.

NOTICE NOTICE

This parameter effects operations in Receiver Managing mode only.

On some platforms (GMS-2 and GMS-2 Pro) there is an additional tab on the **Setup** dialog box with hardware-specific parameters (Figure 1-5). The **GMS** tab controls power parameters of the internal GPS receiver.

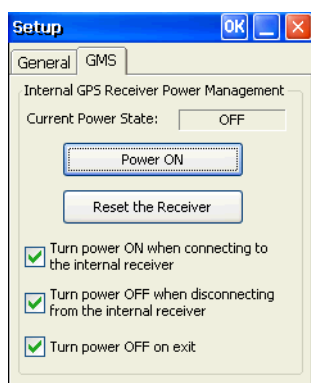


Figure 1-5. Setup / GMS-specific Settings

- *Current power state* – shows the current power state of the internal GPS board of GMS-2/GMS-2 Pro, either ON or OFF.
- **Power ON/OFF** – turns on/off the GPS receiver power.
- **Reset the receiver** – performs a hardware reset of the internal GPS receiver.
- *Turn power ON when connecting to the internal receiver* – check mark this box for the Application to turn ON the internal GPS board, when connecting to it.

- *Turn power OFF when connecting to the internal receiver* – check mark this box for the Application to turn OFF the internal GPS board, when connecting to it.
- *Turn power OFF on exit* – check mark this box for the Application to always turn OFF the internal GPS receiver power on exit.

Notes:

[illegible]

Connection

To establish a connection to the device, select **Device ▶ Connect** from the main menu (Figure 2-1).

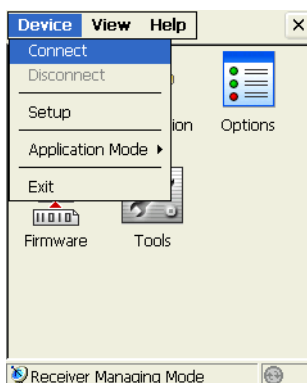


Figure 2-1. Connect Device

The *Connection Parameters* dialog box displays (see Figure 2-2 on page 2-2).

Connection Parameters

The *Connection Parameters* dialog box displays different parameters, depending on the current application mode (Figure 2-2).

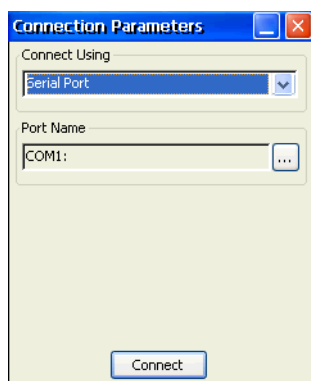


Figure 2-2. Connection Parameters for Simple Terminal and Receiver Managing Modes

- *Connect Using* – select either *Serial Port* or *Bluetooth* device for communication.

NOTICE NOTICE

Bluetooth transport may not be available in the following situations: the device-specific Bluetooth stack is not supported by the Application, or the Bluetooth power is turned off. If the Bluetooth power is off, please turn on the Bluetooth power before using the Bluetooth manager.

NOTICE NOTICE

If the Application edition for the specified platform doesn't support the installed Bluetooth stack, please use virtual serial ports provided by Bluetooth manager for your Bluetooth radio.

- *Port name* – shows physical and friendly name for the port. The Application remembers the last used transport, and the last

successful port/device name for every transport, so it is easy to connect to the same device.

If there is a friendly name for the port/device, you will see both the friendly and physical name. Otherwise, only the physical name is displayed. Press the list button to choose a port from the **Select a Port** dialog (Figure 2-3).

- **Connect** – press to choose a port. The **Select a Port** dialog box displays.

The **Select a Port** dialog box also displays both friendly and physical names (if available).

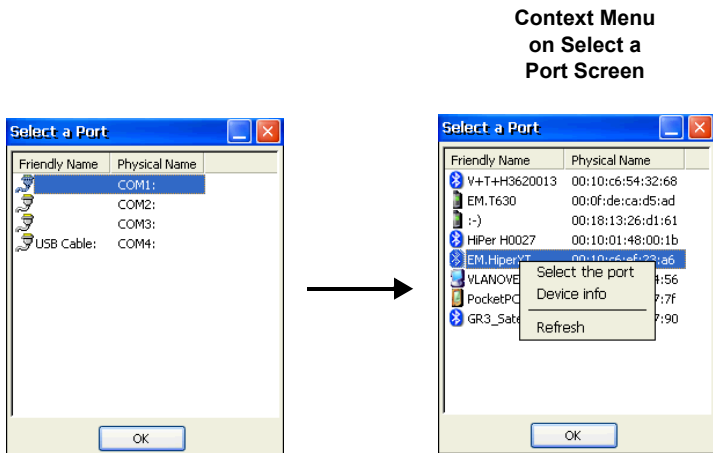


Figure 2-3. Select a Port / Context Menu

On the **Select a Port** dialog box, click and hold on either a *Friendly* or *Port* name to either select that port or get device information (Figure 2-4 on page 2-4) on that port.

Use the context menu to refresh the contents of the **Select a Port** dialog box, and open the **Device Info** dialog box to view information about the selected serial port or Bluetooth device.

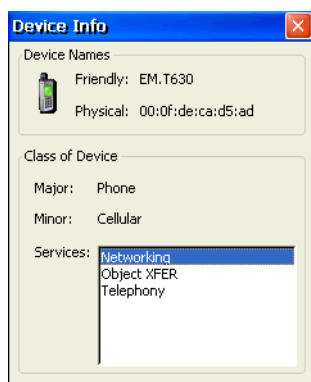


Figure 2-4. Device Information

The *Device Info* dialog box shows both the physical and friendly names of the serial port or Bluetooth device. The *Class of Device* for Bluetooth devices also displays.

Detecting Hardware

Pressing the Connect button on the *Connection Parameters* dialog box (see Figure 2-2 on page 2-2) establishes a connection to the device you selected.

When the Application is in Simple Terminal mode, it just opens the port. The Application won't either try to detect the hardware connected to the port, or change the port settings.

When the Application is in Receiver Managing mode, it will attempt to detect the device connected to the port.

When detecting a receiver, the *detecting a receiver* dialog box (Figure 2-5 on page 2-5) displays. An ActiveSync animated icon and a Cancel button displays. Additional parameters display when using serial transport, i.e., baud rate and flow control as shown in Figure 2-5 on page 2-5

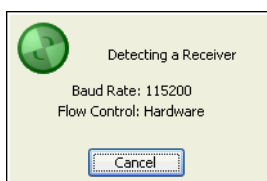


Figure 2-5. Detecting a Receiver

Press the **Cancel** button to terminate the process.

The Application always remembers the last successful port settings. When you try to establish a new connection, the Application first tries to use the last selected settings. The connection is established right away if you are connecting to the same device.

Disconnecting Auto Detection

When in Receiver Managing mode the Application periodically checks if the device is still connected by obtaining the receiver ID. If connection to the device is lost, the following error message displays (Figure 2-6).



Figure 2-6. Error Message – Connection to Receiver is Lost

The Application then closes the established connection and makes the tool area inactive. The Application will not try to reconnect to the device. You must choose an appropriate application mode and transport, then initialize a new connection by selecting **Device ► Connect** from the main menu.



TIP

Disconnection auto detection does not work when in Simple Terminal mode or in Receiver Managing mode while using the Terminal or Firmware Upload tools.



NOTICE

When using a Bluetooth connection the OS can notify the Application that the connection has physically been broken (e.g., the remote device was switched off, or it was moved too far from the controller). In that case, TRU also closes the established connection irrespective of the current application mode or active tool.

Simple Terminal

In Simple Terminal mode, Topcon Receiver Utility (TRU) does not:

- detect a device
- adjust port settings
- send any data to the port

This mode is intended for advanced users. Everything is decided by the user in this pure manual mode.

Simple Manual mode can be used for the following:

- when you want to connect to a device that TRU doesn't support.
- when you need to export firmware files to an inoperative receiver that cannot even be detected (e.g., if the previous firmware update has not been completed, and the receiver cannot be detected in Receiver Managing mode).

If you choose Simple Terminal mode, you will see the following icons on the desktop (Figure 3-1):

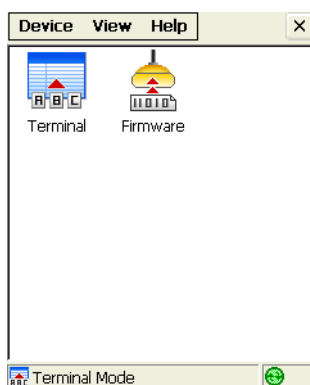


Figure 3-1. Simple Terminal – Main Window

Table 3-1 describes the tool icons.

Table 3-1. Tool Icons

Button	Description
	Simple terminal icon
	Firmware updating icon



TIP

To make the tool area active, first establish a port connection on the controller using the *Connect* option from the *Device* menu.

Terminal

Click the **Terminal** icon to open the *Terminal* dialog box (Figure 3-2).

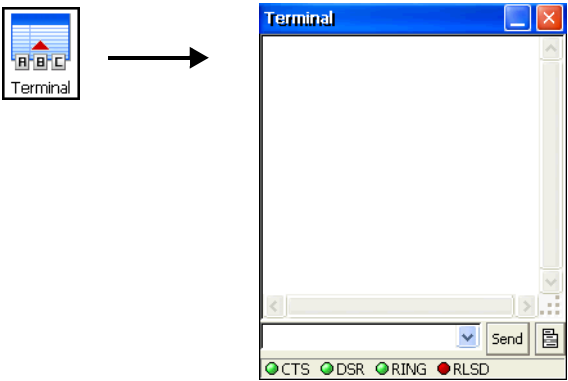


Figure 3-2. Simple Terminal Screen

- The Terminal screen allows you to send commands through the selected port using the edit area at the bottom of the dialog box, and the **Send** button. The combo box remembers previous commands, which can be selected from the drop-down list at the bottom of the dialog.
- The status bar in the lower part of the dialog shows the current state of transport for specific signals.
- The menu icon in the lower right corner of the *Terminal* dialog box opens the pop-up menu of four options (Figure 3-3).

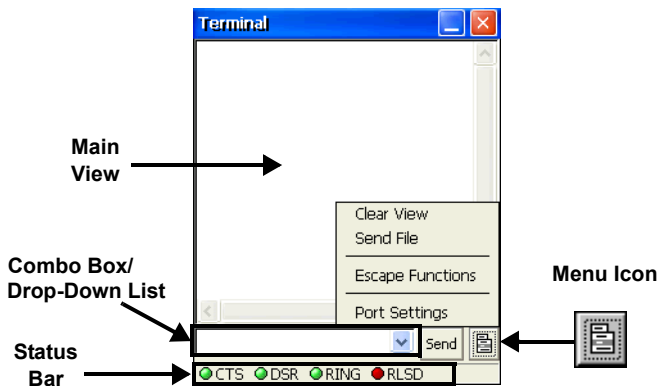


Figure 3-3. Terminal Pop-up Menu

- *Clear View* – clears the main view.
- *Send File* – sends a file, that contains either commands or binary data.

NOTICE NOTICE

The Send File option sends files as is. The Application will not change encoding or charset, add carriage returns, or line feed characters.

- *Escape Functions* – opens the **Escape** dialog box to send transport specific commands.

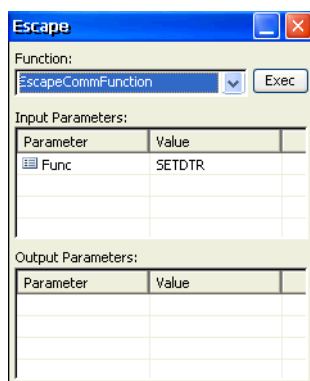


Figure 3-4. Escape Dialog Box – Send Transport Specific Commands

- *Port Settings* – opens the **Port Settings** dialog box to adjust port settings (see Figure 3-5 on page 3-4).

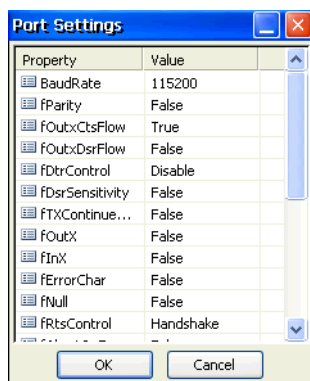


Figure 3-5. Port Settings Dialog Box – (for serial transport)

NOTICE NOTICE

When the Application is in Simple Terminal mode, it does not change port settings.

NOTICE

Port settings depend on the OS. Usually the OS for the PC remembers the previous port state, so if the port baud rate was changed, the assigned value will be kept. CE.NET and Windows Mobile will usually reset port settings by default. I.e., the next time you open a serial port, you should adjust port settings again.

Firmware

Click the **Firmware** icon to upload the firmware files to a non-functioning receiver. The **Upload Firmware** dialog box displays.

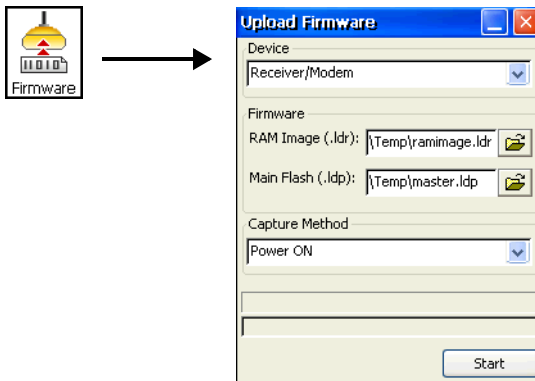


Figure 3-6. Upload Firmware

- **Device** – selects the device from the drop-down list, either *Receiver/Modem* or *Power Board*.
- **Firmware** – press the folder  icon to select the firmware files that correspond to the device.
- **Capture Method** – only the *Power On* capture method is available.
- **Start** – press to begin uploading firmware to the receiver in Receiver Managing mode.



NOTICE

Normally firmware updating is performed in Receiver Managing mode. However, if a receiver becomes inoperative, e.g., the previous receiver firmware updating was not successful; only the Simple Terminal mode will be available for use.

The firmware updating process in Simple Terminal mode is similar to that discussed in Chapter 4, “Receiver Managing”. There is only one exception; when it is in Simple Terminal mode, only the Power ON capture method is available.

Receiver Managing

Receiver Managing mode is intended for configuring Topcon GNSS receivers and firmware updating of GNSS receivers, internal modems, power, and Bluetooth boards.

When in Receiver Managing mode, the Application tries to detect a receiver at the time of connection. If there is no receiver, or if it doesn't respond, a connection cannot be established.

In Receiver Managing mode, you will see the following icons in the tools area (Figure 4-1):

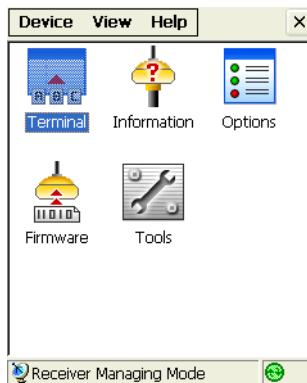


Figure 4-1. Receiver Managing – Main Window

Table 4-1 describes the icons in Receiver Managing mode.

Table 4-1. Receiver Managing Tools Icons

Icon	Description
	Opens the Terminal. to adjust port settings.
	View receiver information.
	Current receiver options and allows uploading OAF files.
	Updates firmware.
	Opens a dialog that allows clearing NVRAM, or resetting the receiver.



TIP

Initially, the Tools area is inactive. To make the tools area active, first establish a port connection on the PC using the Connect option from the Device menu (For details on connection, see Chapter 2.)

Terminal

The same terminal dialog displays as that shown in Simple Terminal mode (see Figure 3-2 on page 3-2).

There is only one difference between *Simple Terminal* and *Receiver Managing* modes. While in Simple Terminal mode you have to manually adjust port settings (for a serial cable connection). In Receiver Managing mode the Application itself adjusts the port settings automatically.

Information

Click on the **Information** icon to view receiver information. The *Receiver Info* dialog box displays (Figure 4-2 on page 4-4) basic information about the currently connected receiver (hardware and firmware versions, RAM size, batteries condition, etc.):

- Name – shows the name of a parameter.
- Value – shows the current value of the parameter.
- **Refresh** – refreshes the parameter list.
- **Save to File** – saves the parameter names and their values to a Unicode text file. By default the TRU sets the <receiver ID>.txt file name.



NOTICE

Parameters not supported by the receiver are not shown.

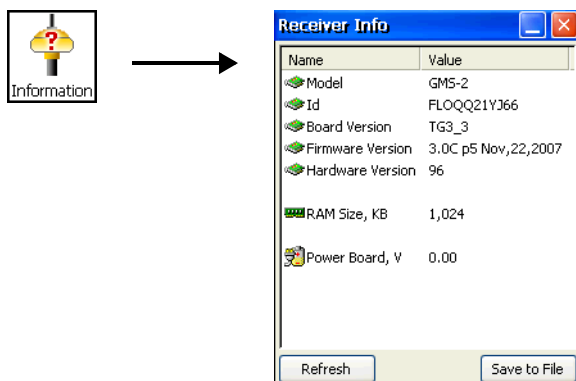


Figure 4-2. Receiver Information

Options

Click on the **Options** icon to manage receiver options. The **Receiver Options** dialog box displays (Figure 4-3 on page 4-5) that allows you to view the current authorization options and upload new ones.

The **Receiver Options** dialog box (Figure 4-3) has the following parameters:

- **Option Name** – displays the current names for the receiver options.
- **Current** – indicates whether the option is in force at the present or not.
- **Purchased** – indicates whether the option is purchased or not.
- **Leased** – indicates whether the option is leased or not.
- **Exp. Date** – indicates the date the leased option will be disabled, if applicable.
- **Refresh** – refreshes contents of the options.
- **Upload OAF** – uploads a new OAF file. By default, TRU offers to use the <receiver ID>.tpo file name. The **Upload OAF** dialog box displays (Figure 4-4 on page 4-5).

- **Save to File** – saves the dialog contents to a Unicode text file. By default, TRU sets the <receiver ID>.opt.txt file name (Figure 4-4).



Figure 4-3. Receiver Options

Upload OAF

After pressing the **Upload OAF** button from the *Receiver Options* dialog box, you will be asked to enter the full path name of a file that contains new authorization options for the receiver.

Then *Upload OAF* dialog displays information about the selected OAF file (Figure 4-4). You can select another OAF if needed.

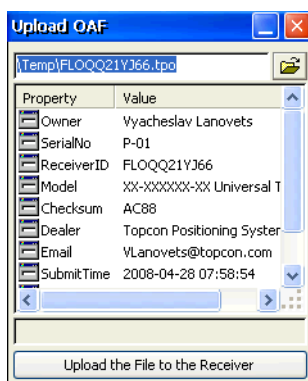


Figure 4-4. Upload OAF

Topcon Receiver Utility (TRU) initially checks to see if the file you selected is compatible with the currently connected receiver.

If you chose a file not intended for this receiver, TRU displays an error icon next to the Receiver ID and disables the **Upload OAF** button (Figure 4-5).

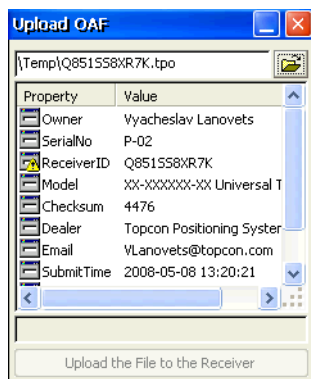


Figure 4-5. Selecting Wrong OAF

1. After you press the **Upload OAF** button, the contents of the dialog box will change. It will show the options that have been installed with the new OAF, and the progress bar (Figure 4-6).

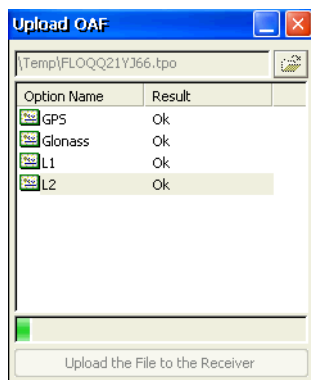


Figure 4-6. Options Uploading in Progress

If you are updating authorization options for a TruPath receiver, or another receiver model that supports the new Digest cipher, neither option names, nor the result will be displayed. When the OAF file is

uploaded to the receiver, the TRU will display a message box informing you about the results (Figure 4-7).

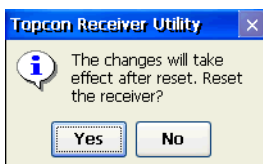


Figure 4-7. Reset the Receiver

If an OAF file is uploaded to the receiver, the Application will offer to reset the receiver to put new authorization options into operation (Figure 4-7).

Firmware

To upload firmware files to Topcon receivers, press the **Firmware** icon. The **Upload Firmware** dialog box displays (Figure 4-8 on page 4-8). This dialog allows you to upload firmware files to the receiver that is connected to the computer and has the following parameters:



NOTICE

Don't use a Bluetooth connection (either native Bluetooth connection, or via a virtual serial port) when updating firmware. The Firmware updating procedure resets the receiver to switch it into firmware updating mode. Resetting the Receiver may break the Bluetooth connection and this in turn may interrupt the firmware uploading process.



NOTICE

Be extremely attentive when selecting firmware updating parameters, especially when updating modem firmware. Some modem models don't allow terminating of the firmware updating process. So if you choose incorrect

parameter combinations, or interrupt the firmware updating process, it may damage your equipment. If this happens, and you cannot update firmware using even the Power On capture, you will need to have the hardware serviced.

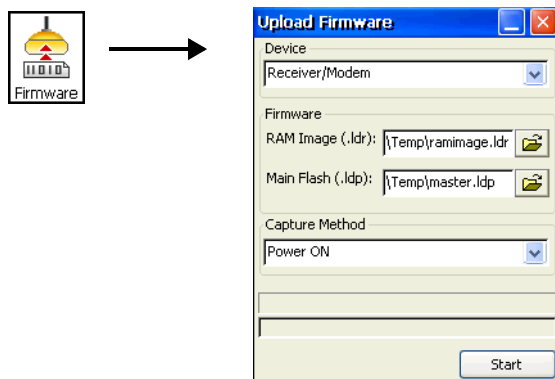


Figure 4-8. Upload Firmware

- **Device** – select either *Receiver/Modem* or *Power Board* from the *Device* drop-down list.



TIP

If you are updating firmware for a power board, you must select Power Board from the combo box. Otherwise (if you are updating GPS, modem, or Bluetooth firmware), you must select the Receiver/Modem option.

- **Firmware** – specify the full path to firmware files corresponding to the device by pressing the folder  icon or enter the full path manually.

**TIP**

If you are updating power board firmware, you should specify only the path to the RAM file (it usually has an .ldr extension). Otherwise, you should specify full paths to both RAM and Flash files (the flash file usually has an .ldr extension).

**NOTICE**

Attention GMS-2, and GMS-2 Pro users. Firmware for the GMS receiver board consists of one RAM file and two Flash files (usually Master.ldr, and Slave.ldr). You have to update receiver firmware in two iterations. The first time you should select the RAM file and the first Flash file. Once firmware is successfully uploaded, you should select the same RAM file, and the other Flash file, and repeat firmware upgrading.

- **Capture Method** – select either the *Soft Break*, or the *Power ON* capture method. If you select the *Soft Break* method, the receiver will be switched into firmware updating mode through the software. If you select the *Power ON* capture method, after you press the **Start** button, you will need to press the **reset** button on the receiver, or turn it off, then on again.

**NOTICE**

Attention GMS-2, and GMS-2 Pro users. If you are updating firmware using the Power ON capture method when connecting to the internal GMS receiver, you will not have to reset the receiver. The Application does it automatically.

- **Start** – press to begin uploading firmware to the receiver in Receiver Managing mode. After you press the button, it toggles to **Cancel**. Pressing this button terminates the firmware updating process.

**NOTICE**

If the firmware updating process for a device has not been completed, the device may become inoperative.

After the firmware updating process has been successful (uploaded), the following message displays (Figure 4-9):



Figure 4-9. Successful Updating Firmware

Otherwise, one of the following error messages found in Table 4-2 will display.

To detect and fix the problem, please use troubleshooting procedures described in Table 4-2 below.

Table 4-2. Firmware Updating Error Messages, and Troubleshooting

Error Message	Troubleshooting
Unknown error	Repeat firmware updating. If the error repeats, please contact your dealer or manufacturer. It usually means that there is a hardware problem, or your Flash file was corrupted.
The RAM file is not compatible with the hardware	The RAM (.ldr) file you selected is not compatible with your hardware. Please select appropriate .ldr file and repeat firmware updating.
The Flash file is not compatible with the hardware	The Flash (.ldp) file you selected is not compatible with your hardware. Please select the appropriate .ldp file and repeat firmware updating.
The specified device requires a newer version of the loader	The version of the Application you are using cannot upload firmware to your device. You need to receive a more recent Application version from your dealer.

Table 4-2. Firmware Updating Error Messages, and Troubleshooting

Error Message	Troubleshooting
The RAM file, checksum is incorrect	Repeat firmware updating. If the error repeats, it means that the RAM file you have was corrupted, and it needs to be replaced with correct RAM file.
No response from the device	Usually this means that the device was disconnected from the controller. Make sure that a cable is reliably attached to both the device, and the controller, and repeat firmware updating.

Tools

The *Tools* icon opens the *Send Command* dialog box that allows you to reset the receiver and to clear the NVRAM.

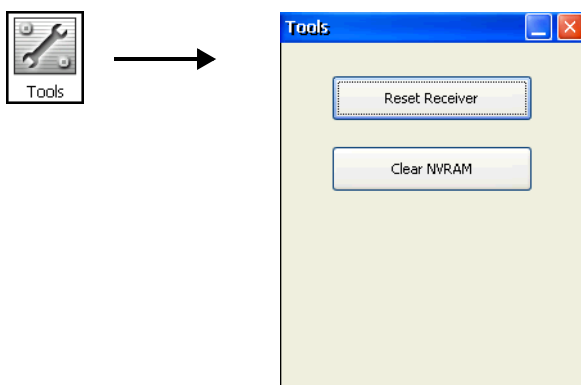


Figure 4-10. Send Command

- **Reset Receiver** – leaves all files intact. Resetting the receiver is similar to a hot resetting of the computer, but without going through a power cycle.

After a receiver reset operation, the receiver requires a few seconds to a few minutes to begin tracking satellites and logging data.

- **Clear NVRAM** – this command will not delete any files from the receiver memory. It will reset the receiver parameters to factory default values (such as active antenna input, elevation mask and recording interval, and information about the receiver’s internal file system).

After clearing the NVRAM, the receiver will require some time to collect new ephemerides and almanacs (around 15 minutes). Clearing the NVRAM can be interpreted as a “cold reset” of your computer.

[illegible]

Notes:

[illegible]



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