RAYMING

TripNav™

TN-202 User's Guide v1.2

Compact Flash GPS Receiver

Table of Contents

TN202-UG V1.2

PACKAGE CONTENTS

- Quick-Start User's Guide
- TripNav TN-202 Compact Flash GPS Receiver
- CD-ROM which contains:
  User's Manual, PCMCIA Driver (for use with laptop PC)
  "GPSinfo.exe" (test software)
- PCMCIA to Compact Flash adapter
- External GPS Antenna

SYSTEM REQUIREMENTS

The TripNav TN-202 GPS requires a PDA using the Windows Pocket PC operating system or if being used on a laptop PC, running Windows 98/2000/XP. In addition, a 3rd party mapping software will also be required for conducting routing and navigation with the software of your choice. Your software will of course have its own system requirements, so please check with software vendor for the requirement details.

CD-ROM is required to view the User's Guide, install the PCMCIA driver and load the included GPS test software. An alternative to using the CD-ROM, you can download these files directly from our web-site at http://www.rayming.com/support/download.

WELCOME

Thank you for purchasing TripNav TN-202 Compact Flash GPS Receiver! TripNav allows real-time street navigation by using your PDA/laptop for graphical plotting and positioning of your route. Simply insert the TN-202 into your PDA, or load the TN-202's PCMCIA driver into your laptop (if not equipped with a Compact Flash slot).

You'll find that almost any NMEA compliant street mapping software is compatible with the TripNav TN-202 GPS receiver. Visit our web-site for recommended mapping programs that you can use.

TN202-UG V1.2

SAFETY AND LEGAL NOTICES

Please read this section carefully before using TripNav

Rayming Corporation will not accept any responsibility whatsoever for accidents resulting from failure to observe common sense precautions. Your personal judgement, traffic regulations, and common sense must always take precedence over any directions produced by TripNav or the mapping software

WARNING: Make sure that the GPS receiver is secure and does not interfere with driving visibility and safety.

It is your responsibility as the vehicle operator to securely place the GPS unit and antenna so that they will not interfere with driving and prevent operations of any safety device (such as the Airbag) in your vehicle. Do not mount the devices in a place where the driver or passengers may receive injury during vehicle operation or collision. For your safety, take care to route all cables away from shifters, pedals, accessory controls and mechanisms.

WARNING: Drive safely and use common sense.

It is your responsibility as the vehicle operator to drive safely, observe all traffic rules and above all use your own personal judgment while driving. If you feel that a route suggested by the navigation software instructs you to perform an unsafe or illegal maneuver, places you in an unsafe situation, or routes you into an area which you consider unsafe, do not follow the instructions.

WARNING: Keep your eyes on the road.

It is your responsibility as the vehicle operator to keep your eyes on the road and be an alert driver at all times, especially when the vehicle is moving. The vehicle's operator should not be distracted by the navigation equipment or software. Should there be a distraction with the ability to drive responsibly, please turn off the device. Should you want to look at the display for a prolonged time, park the car safely, while following all traffic regulations before looking at the display.

WARNING: To reduce the risk of fire or shock hazard, do not expose this product to rain or moisture. Do not remove covers or open housings, there are no user serviceable parts inside. Refer servicing to qualified personnel only.

TN202-UG V1.2

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c o r p o r a t i o n

1. GETTING STARTED WITH TRIPNAV

These are only a few simple steps that you need to follow before using your TripNav PDA GPS receiver:

- Install the TN-202 into the Compact Flash port of your PDA.
- Install your own personal street mapping software (configuration settings within your software may require you to select the Compact Flash port as the source of the GPS data).
- Your PDA should have a fully charged battery when using the TN-202, in addition to using an 12V PDA charging cable (optional) while in a vehicle to keep the battery voltage constant.

2. INSTALLING THE TRIPNAV TN-202 GPS RECEIVER

The TN-202 GPS supports plug and play.

For PDA Use:
- Plug in TN-202 GPS into a PDA equipped with a Compact Flash interface slot.
- Running suitable mapping/navigation software, select the correct COM port & baud rate: 4800,N,8,1. (Usually the COM port is COM2, but will depend on the actual PDA model).
- User's can utilize the included test program to detect the COM port that the TN-202 is using.

Image 1: TN202 installed in PDA

TN202-UG V1.2

For Notebook PC:
- Plug in TN-202 into the PCMCIA card slot of notebook PC using the included Compact Flash-to-PCMCIA adapter.
- Install the "Compact Flash to PCMCIA" driver for WIN98, 2000, XP
- Running a suitable mapping/navigation software, select the correct COM port assigned by the notebook port and be sure the baud rate is configured properly at: 4800,N,8,1.

NOTE: When using the PCMCIA adapter, please take care to insert the TN-202 GPS receiver into the adapter with the **GPS image label on the TN-202 facing upward, as well as the product ID label on the PCMCIA adapter facing upward.**
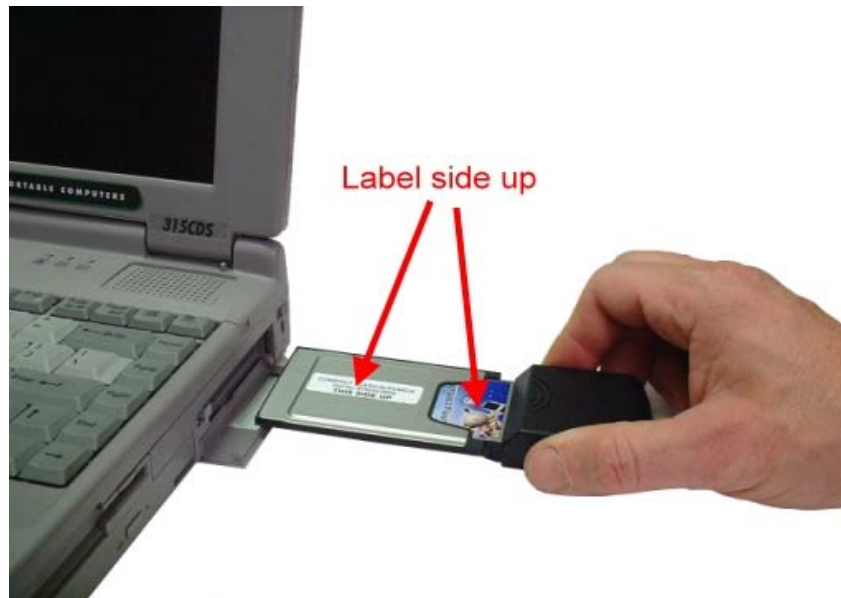

Image 5: Inserting the PCMCIA and TN-202 with label sides face up.

2.1 External Antenna Connector

External GPS
Antenna Port

Image 3: Optional external antenna port

The TN-202 Compact Flash GPS includes an external port for connecting an active external GPS antenna for maximum reception of GPS signals. Although the TN-202 has a built-in GPS antenna and should perform well as is, you may encounter situations where an external antenna would produce much more favorable results such as when driving downtown among tall buildings, or when the placement of the PDA unit within the vehicle has a limited or obstructed view to the sky. These types of situations may warrant the use of an external antenna.

Plug the external antenna with MMCX connector to the plug on TN-202. Place the magnetic external antenna on the roof of the car (magnet side facedown).

CAUTION:
You must grasp and hold at the antenna connector **NOT** and put strain on the cable, while you are connecting or disconnecting the external antenna, as excessive stress to the cable may cause damage not covered by your limited product warranty.

2.2 LED Fix Indicator

Image 4: LED Indicator

On the left-side of the TN-202 is a small LED, which indicates when the device is initializing a GPS fix and when enough satellites have been received to produce a GPS fix either in 2D or 3D. From your GPS software you should be able to see the signal status of whether you are receiving either 2-D (Latitude and Longitude) or a 3D (Latitude, Longitude and Altitude) fix. If you are not getting the desired results for GPS signal strength, or adequate satellite coverage using the built-in GPS antenna, you may want to consider using the included external GPS antenna.

LED OFF	GPS Receiver has no power
LED ON	Searching for GPS signals (NO FIX)
LED FLASHING	GPS Position obtained (FIX)

3. TESTING YOUR GPS USING YOUR PDA

The included "GPS Information" test program only supports the Microsoft Windows CE & Pocket PC based PDA platforms. From you laptop or local PC, run the "GPSinfo.exe" to execute the installation procedure of GPS test program. You will then transfer the program to your PDA using your personal sync program such as ActiveSync from Microsoft (http://www.microsoft.com/mobile/pocketpc/downloads/activesync35.asp).

1. Insert the TN-202 into your PDA.
2. Run the GPS test program from "Start → Program files" of the PDA. You can then see the results for detecting the COM port that the TN-202 is using and to check the GPS output data.

DESCRIPTION OF "GPS INFORMATION" TEST PROGRAM:
1. User must select COM port (CF_CARD-GENERIC)
2. Baud Rate (4800)
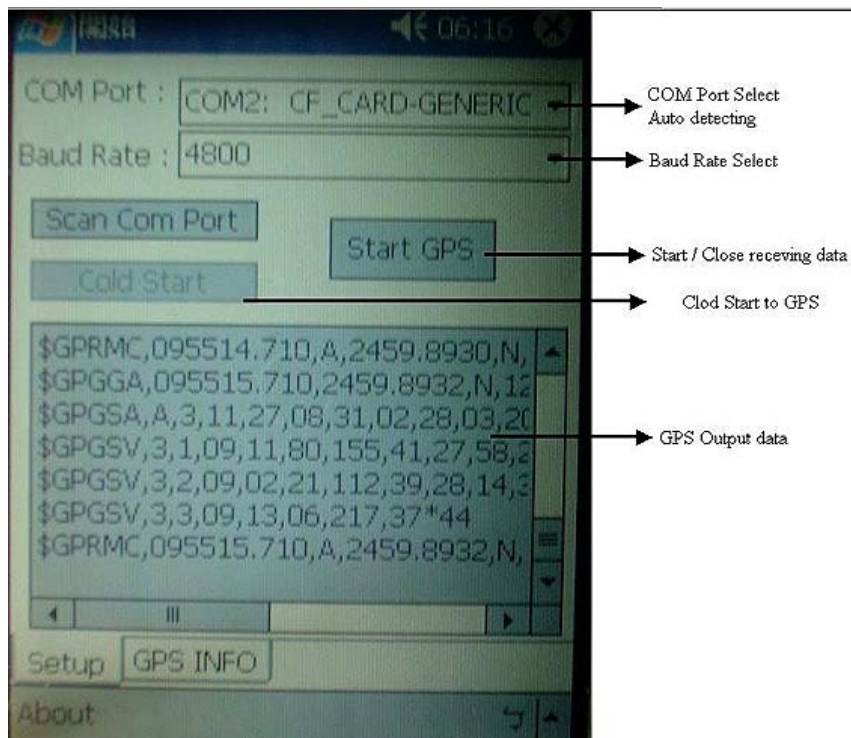3. Click on the [Start GPS] button to start receiving GPS data.

Image 6: GPS data & COM port set-up screen

Image7: GPS satellite info screen

4. TESTING YOUR GPS WITH YOUR LAPTOP AND THE PCMCIA ADAPTOR

Users can use the Hyper Terminal program of Windows to verify that the GPS is actually configured properly and working.

NOTE: Windows Hyper Terminal for Window 98 can not select COM ports above COM5, If your GPS is assigned a COM port higher than 5, you will need to test it directly with your map software.

1. Run the "Hypertrm.exe" from "Program → Accessories →Communications → Hyper Terminal".
2. Select the proper COM port for your GPS device.
3. Set COM port to :
   Baud rate: 4800
   Data bit: 8
   Parity: None
   Stop bit: 1
   Flow control: None

Assuming that no mistakes have been made in the configuration process there should be data being displayed in the window, which is confirmation that the communication between the GPS device and the "Hyper Terminal" software is working properly.

TN202-UG V1.2

5. INITIALIZING YOUR GPS

Before using your TripNav GPS for navigation (especially for the first time), the receiver must obtain a local GPS fix (coordinates) of the current position. To do this, take your PDA, or laptop PC, along with the appropriate mapping software loaded and properly configured, to an open area that has a clear view to the sky (such as a park or empty field). Start your street map software and wait for initialization of the GPS to become complete. This may take a few minutes depending on various factors such as the distance of the current coordinates from the last time the GPS receiver was activated, GPS signal strength and surrounding terrain (tall trees and buildings can block the satellite signals). The LED indicator will switch from solid ON to a Flashing mode one a GPS fix has been obtained. In some cases initialization can take up to several minutes depending on the conditions mentioned above before complete GPS data will be displayed on the screen.

NOTE: If viewing RAW GPS data coordinates from a GPS software, which are displaying zero's means, indicates that the COM port connection is correct, but the satellite data is not being received yet (possibly initializing has not yet completed, you may be located in an area with poor satellite reception).

6. USING TRIPNAV

Once the TripNav's and your personal mapping software have been installed and configured properly, you can begin to use TripNav navigation system .

Always select an area in the vehicle where the GPS unit will be secure and not obstruct normal driving, visibility and safety, but still maintaining a "view to the sky" in order to receive satellite data.

7. FAQ's

Will the TripNav work with other Street Mapping software?

TripNav standard NMEA data for mapping software to use and convert to coordinates and should work well with any NMEA compliant software on the market today.

How accurate is the GPS?

GPS accuracy can range from 5 to 50 meters. Most of the time the GPS is accurate to less than 15 meters.

Will the TN-202 add a drain to my PDA battery?

As with any peripheral device which is powered by the PDA's battery, it will cause the battery to discharge at a more rapid rate that without the device attached. For this purpose, we strongly suggest that you use a optional cigarette lighter charging cable while traveling and navigating in the vehicle to eliminate battery drain and keep your PDA's battery fully charged. An optional vehicle charging cable is available from your PDA dealer, or from Rayming's web-site.

What is ideal GPS environment?

The GPS requires an open, clear view of the sky. Buildings, covered parking areas, tunnels and dense foliage can cause the GPS receiver to be unable to get a location fix.

If you are parked in a covered parking lot or near a tall building, it is recommended that you drive away until you have a clear view of the sky before using the TripNav. You may need to give the GPS a few minutes to find or get a fix its location.

How do I know if the GPS is ON?

The TripNav must be plugged into your PDA's Compact Flash or your Laptop to obtain power. In addition, the TN-202 has a built-in LED indicator that works as follows:

> LED OFF: GPS receiver is off (no power)
> LED ON (solid): No fix, searching for GPS signals.
> LED FLASHING: Position fix established and GPS signals are being received.

Why does the GPS not work near buildings and other tall objects?

The GPS uses satellites in the space to find out where it is. Therefore it needs a clear view of the sky. Tall buildings and other objects that block the receiver's view to the sky make it infeasible to determine your location.

Sometimes the satellites are not overhead but near the horizon. In these cases the GPS must have a clear view of the horizon.

Why do I get an error message saying "Unable to open GPS Communication with port (COMx)? Please check your port configuration."

If you have followed the above installation steps but the GPS device still does not work, try unplugging the GPS device, close the mapping software and wait for at least 10 seconds, before re-connecting the GPS device.

Also verify if the COM port was entered in the mapping software correctly. Another possibility is that you may be in an area where there are no GPS signals available. The GPS receiver must have a view to the sky and will not work indoors, or in areas of dense foliage. Move to an open area and place the TripNav receiver in a location that will have a full exposure to the sky. Each time you initialize the GPS receiver, the device requires a boot-up period which can typically rage from to 8 seconds to 1 minute, but in areas where the GPS signal is weak, this period may be slightly extended. Please allow an adequate amount of time for the GPS receiver's boot-up process to complete before contacting Technical Support.

TN202-UG V1.2

8. CONTACT INFORMATION

It's important that you document the following before e-mail or calling for assistance:
- Which step, or function, were you attempting when the problem occurred?
- What was the error message displayed?
- What operating system are you using?
- Which model GPS receiver you have?
- Which model PDA you are using?
- Which mapping software are you using and what version?

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TN202-UG V1.2

9. LIMITED WARRANTY

Rayming Corporation warrants this product hardware against manufacturing defects in material and workmanship under normal use for one (1) year from the date of purchase from an authorized dealer. Except as provided herein, Rayming Corporation makes no express warranties', including but not limited to any warranties of merchantability or fitness for particular use, or non-infringement. You acknowledge that your use of the product or service is at your sole risk and you agree that the information provided are without warranty of any kind by Rayming Corporation.

Under no circumstances, including negligence, will Rayming Corporation or any of its affiliates, directors, officers or employees, or any third party be liable for any direct, indirect, incidental, special or consequential damages that results from your use, or your inability to use, or the performance of the product(s) with respect to any liability, loss, or arising out of any breach of this warranty, including, but not limited to any damages resulting from inconvenience, loss of time, data, property, revenue, or profit or any indirect, special incidental or consequential damages. You acknowledge that this limitation applies to all content information or other services available from Rayming Corporation, and whether or not Rayming Corporation has notice of the possibility of such damages, and whether or not to circumstances giving rise to such damages may have been within the control of Rayming Corporation.

Some states do not allow the exclusion of certain warranties, so some of the above exclusions may not apply to you. In those states, liability is limited to the fullest extent allowed by law By using the product(s), you agree to indemnify Rayming Corporation and its parents, subsidiaries, affiliates, officers and employees and hold them harmless from any and all claims and expenses, including reasonable attorney's fees, asserted third party due to, or arising out of your use of the service and the site.

In the event of a product defect during the first 30-days of the warranty period, return product and the sales receipt as proof of purchase date to place of original purchase. Defect discovered after 30-days from date of purchase, you must contact Rayming Corporation's Technical support for a Return Merchandise Authorization (RMA) number for return to manufacturer.

Rayming Corporation will, at its option, unless otherwise provided by law:
a.) Correct the defect by product repair without charge for parts and labor;
b.) Replace the product with one of the same or similar design; or
c.) Refund the purchase price. All replaced parts and products, and products on which a refund is made, become the property of Rayming Corporation. New or reconditioned parts may be used in the performance of warranty service. Repaired or replaced parts and products are warranted for the remainder of the original warranty period. You will be charged for repair or replacement of the product made after the expiration of the warranty period.

This warranty does not cover:
a.) Damage or failure caused by or attributable to acts of God, abuse, accident, misuse, improper or abnormal usage, failure to follow the instructions, improper installation or maintenance, alteration, lighting or other incidence of excess voltage or current;
b.) Any repairs other than those provided by Rayming Corporation;
c.) Consumables such as fuses or batteries;
d.) Cosmetic damage;
e.) Transportation, shipping or insurance costs;
f.) Costs of product removal, installation, set-up service adjustment or reinstallation.

This warranty gives you specific legal rights, and you may also have other rights, which may vary from state to state.

Additional products bundled in this package not manufactured by Rayming Corporation will hold separate warranties as expressed by the individual manufacturer of that product(s). Product specifications, functions and features are subject to change without notice.

TN202-UG V1.2

10. TECHNICAL SPECIFICATIONS FOR TN-202 GPS RECEIVER

Electrical Characteristics	
Interface	COMPACT FLASH
Frequency	L1, 1575.42 MHz
Channels	12 channel all-in-view tracking
Accuracy	
Position Accuracy	15m 2D RMS (SA off)
Datum	
Datum	WGS-84
Acquisition Rate	
Hot start	8 sec., average (with ephemeris and almanac valid)
Warm start	38 sec., average (with almanac but not ephemeris)
Cold start	48 sec., average (neither almanac nor ephemeris)
Reacquisition	100 ms. average
Protocol	
GPS output data	GGA, GSA, GSV, RMC, VTG, GLL
GPS transfer rate	4800,n,8,1
Max. update rate	1 Hz.
Dynamic Condition	
Altitude Limit	18,000 meters
Velocity Limit	515 meters/sec. (1,000 knots) max.
Temperature	
Operating	-10°~ 70°C
Storage	-40°~ 85°C
Humidity	95% non-condensing
Power	
Voltage	DC 3.3V ±10%
Current	90mA continuous mode
Physical Characteristics	
Dimension	3.75" x 1.88" x 0.75" (95mm x 48mm x 20mm)
Antenna type	Built-in active
External antenna interface	MMCX (optional)
LED indicator	GPS signal status: fix position or non-fix position

Due to continuous product improvements, all specifications are subject to change without notice.

TN202-UG V1.2

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