



PT-101 and DP-1000S USER MANUAL

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REGULATORY COMPLIANCE

FCC

The GPRS modem was tested and certified to meet FCC Parts 15 in a stand-alone configuration, which demonstrated that it complies with Part 15 emission limits. The PT-101 uses an Enfora manufactured GPRS modem. FCC Part 22 & Part 24 is covered by the "modular approval" process for a transmitter. This approach, described by FCC Public Notice DA 00-131407 released June 26, 2000, is intended to afford relief to equipment manufacturers by eliminating the requirement for obtaining a new equipment authorization for the same transmitter when installed in a new device.

In order to approve it without additional FCC certification approvals, the installation must meet the following conditions:

For the transmitter to meet the MPE categorical exclusion requirements of 2.1091, the ERP must be less than 1.5 watts for personnel separation distance of at least 20 cm (7.9 in). Therefore, the maximum antenna gain cannot exceed +3.3dBi. If greater than 1.5 watts exists, then additional testing and FCC approval is required.

R&TTE -

The GPRS modem has been fully tested and complies with all the requirements of EN301 489-1, EN301 489-7 and EN60950-1:2001. Compliance to EN301 511 has been demonstrated by testing on the PT-101.

Disclaimer

The information and instructions contained within this publication comply with all FCC, GCF, PTCRB, R&TTE, IMEI and other applicable codes that are in effect at the time of publication. The PT-101 uses an Enfora manufactured GPRS modem.

CES Wireless Technologies disclaims all responsibility for any act or omissions, or for breach of law, code or regulation, including local or state codes, performed by a third party.

CES Wireless Technologies strongly recommends that all installations, hookups, transmissions, etc., be performed by persons who are experienced in the fields of radio frequency technologies. CES Wireless Technologies acknowledges that the installation, setup and transmission guidelines contained within this publication are guidelines, and that each installation may have variables outside of the guidelines contained herein. Said variables must be taken into consideration when installing or using the product, and CES Wireless Technologies shall not be responsible for installations or transmissions that fall outside of the parameters set forth in this publication.

CES Wireless Technologies shall not be liable for consequential or incidental damages, injury to any person or property, anticipated or lost profits, loss of time, or other losses incurred by Customer or any third party in connection with the installation of the Products or Customer's failure to comply with the information and instructions contained herein.

TABLE OF CONTENTS

REGULATORY COMPLIANCE.....	3
TABLE OF CONTENTS.....	7
TABLE OF FIGURES.....	8
TABLE OF TABLES	8
WARRANTY	10
COPYRIGHT.....	12
1.0 Introduction	14
1.1 About the PT-101	14
1.2 About This Manual.....	15
1.3 Basic Package Contents	15
1.4 Accessories.....	16
1.5 System Requirements	16
1.6 PT-101 Features.....	17
1.7 LED's Explained	20
2.0 Specifications	22
2.1 System Information	22
2.2 GPRS Packet Data.....	22
2.3 Environment	23
2.4 Certifications	23
2.5 SIM Card/Interface/I/O.....	23
2.6 Power	23
2.7 GSM Functionality	24
3.0 Battery Removal/Insertion/Charging.....	25
3.1 Removing the Battery	25
3.2 Inserting the Battery	26
3.3 Charging the Battery.....	26
4.0 SIM Card – Inserting and Removing	28
5.0 Dialing Preprogrammed Phone Numbers.....	32
5.1 Dialing Phone Number 1.....	32
5.2 Dialing Phone Number 2.....	32
6.0 Support.....	34
Appendix 1 – Troubleshooting.....	36
A1.1 Verifying the PT-101 has Established a GSM Connection	36
A1.2 Verifying the PT-101 has Established a GPRS Connection.....	38
A1.3 Verifying the PT-101 has Acquired a GPS Satellite Fix.....	39

TABLE OF FIGURES

Figure 1: PT-101 User Interface.....	17
Figure 2: LED Functionality	18
Figure 3: Headset Jack and USB Connector	19
Figure 4: SIM Card Holder	29
Figure 5: Open SIM Door.....	30

TABLE OF TABLES

Table 1: LED Functionality	21
Table 2: Sample Network APN ,User name and Password Information	Error! Bookmark not defined.
Table 3: Time-Distance Reporting Configuration.....	Error! Bookmark not defined.

WARRANTY

Complete Warranty details can be found at the CES Wireless web site: www.ceswireless.com

CES Wireless Technologies Corp., (CES Wireless), warrants this product to be free from defects in material and workmanship for 12 months from date of shipment. If such malfunction occurs, it will be repaired or replaced (at our option) without charge for materials or labor if returned to the factory. This warranty does not apply to parts damaged due to improper use- including accident, neglect, unreasonable use, and improper installation - or to unauthorized alterations or modifications of the equipment. It does not extend to damage incurred by natural causes such as lightning, fire, floods, or other such catastrophes, or to damage caused by environmental extremes, such as power surges and or transients. It does not extend to microprocessors if it is determined that the failure of a micro is due to static damage, application of improper voltages to the unit, or other problems not related to circuit design. In such case or in the case of a desire to update the micro to a different version of software, such request must be specified in writing, and there will be a charge agreed upon by both parties.

Software products provided by CES Wireless are only compatible with currently supported Microsoft® operating systems.

This product is warranted to meet published specifications and to operation as specified only properly programmed and installed. CES Wireless is not responsible for any operational problems caused by system design, cellular coverage, outside interference, or improper installation. A qualified two-way radio technician or engineer must complete installation and programming of this CES Wireless product.

Equipment for repair must be returned to the factory, freight prepaid, only with prior authorization. Please call 407-679-9440 for an RMA number. A brief letter describing the nature of the defect should be included with the merchandise. Repair by other than CES Wireless will void this warranty. In-warranty merchandise must be shipped, freight prepaid, to CES. CES Wireless will return the repaired or replaced equipment prepaid to purchaser, within the United States. Outside the US the customer must pay freight.

This warranty applies to the original purchaser of the equipment only. CES Wireless is not liable under this warranty, or any implied warranty, for loss of use or for other consequential loss or damage experienced by the purchaser. Some states do not permit the exclusion or limitation of implied warranties or consequential damages. This warranty provides special legal rights, and the purchaser may have other rights that vary from state to state. Complete current Warranty details can be found at the CES Wireless web site: www.ceswireless.com

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1.0 Introduction

The PT-101 is one of the smallest and most economical GPS asset tracking devices available today. The device is battery powered and is about the size of a deck of cards.

GPS and event data is made available on-board the PT-101 for transmission to FleetLinc™ (CES web based subscriber fleet management service).

The PT-101 can also be licensed for use with POWER-trak™ PC/Server software. Please contact CES for further direction with this.

1.1 About the PT-101

The PT-101 is an Automated Vehicle Locating (AVL) device that utilizes a GSM/GPRS cellular modem and a Global Positioning Satellite (GPS) module. Working together, these technologies allow the PT-101 to simultaneously act as a stand alone GPS reporting device and wireless data retrieval unit. The PT-101 is also capable of receiving voice calls and can call one of the two preprogrammed phone numbers.

The PT-101 is designed to work as a stand-alone device in a vehicle, on a person or pet. It does not require DC power or an antenna as it has an internal battery. It does need to be recharged periodically. How often depends on how it is programmed.

1.2 About This Manual

This manual contains instructions on how configure the PT-101. Please follow the instructions closely to avoid damaging the PT-101.

1.3 Basic Package Contents

The basic package will contain the following:

- PT-101 - GPS/GSM/GPRS Tracking and Fleet Management Device
- Belt Clip

1.4 Accessories

The following accessories are available from CES Wireless Technologies:

- PRG-## Programming and Charging Cable
- DP-1000S Programming Software (can be downloaded from the CES FTP site, and is also available on CD-SOFT1 CD).
- ### In Vehicle Power Adapter
- ### AC Power Adapter

1.5 System Requirements

It is necessary to have a computer running Windows 2000, Windows XP or Windows Server 2003 to program the device. The system must include a USB port and the PT-101 device driver must be installed. The PT-101 device driver can be downloaded from the CES FTP site and is also available on the CD-SOFT1 CD.

1.6 PT-101 Features

The image below displays the location of the Geo-Fence, Push To Call, User-Defined, Volume Down and Volume Up buttons as well as the location of the LED's, Speaker and Microphone.



Figure 1: PT-101 User Interface

The image below shows the functionality of each of the LED's.



Figure 2: LED Functionality

A headset can also be connected to the PT-101. The image below shows the headset jack and the USB connector that is used for programming and recharging the battery.



Figure 3: Headset Jack and USB Connector

1.7 LED's Explained

The LED's are used to provide status information to the user as noted in the table below.

Power Mode	CALL	ON	GPS	BAT
LED Color	<i>Yellow</i>	<i>Yellow</i>	<i>Yellow</i>	<i>Red</i>
Hibernate	OFF	OFF	OFF	Low Battery, less than 20%: Slow Blink 250mS/10Sec Low Battery, less than 5%: OFF
Active / Battery	Blink when receiving or originating call 500mS/1 Sec Blink for missed call 2 Sec/2 Sec Solid during call	Slow blink 500mS/10 Sec	Blink when locked 500mS/2 Sec	Low Battery, less than 20%: Slow Blink 250mS/10Sec Low Battery, 5% or less, or turns OFF
Active / Aux	Blink when receiving or originating call 500mS/1 Sec Blink for missed call 2 Sec/2 Sec Solid during call	ON solid	Blink when locked 500mS/2 Sec	Fast Blink, during charge 500mS/2 Sec OFF when charged

Table 1: LED Functionality

2.0 Specifications

Note: Specifications subject to change without notice.

2.1 System Information

Dimensions	L x W x H: 3.95 x 2.32 x 1.00 in L x W x H: 100.33 x 58.92 x 25.4 mm
Weight	4.8 oz 136 g
Interface	USB
Housing	Polycarbonate
TX Power	Class 4 (2W @850/900 MHz) Class 1 (1W @1800/1900 MHz)
Frequency	850/900/1800/1900 MHz

2.2 GPRS Packet Data

Mode	Class B, Multislot 10
Protocol	GPRS Release 97, SMG 31
Coding Schemes	CS1-CS4
Packet Channel	PBCCH/PCCCH

2.3 Environment

Operatin	-20°C to +60°C
Storage	-40°C to +85°C
Humidity	Up to 95% non-condensing

2.4 Certifications

FCC	Part 2, 15, 22 & 24
GCF	Version 3.21.0
PTCRB	Version 3.7.1
Industry Canada	CSA0 RoHS Compliant

2.5 SIM Card/Interface/I/O

SIM Access	Internal 3V SIM accessed via battery compartment
Interface	Mini USB Jack for power and programming 2.5mm Headset Jack

2.6 Power

Battery	Rechargeable Lithium Ion
Standard	1340mAh
GSM Hibernate	100µA
GSM 1TX/1RX (Ave.)	150mA
GSM1RX (Ave.)	75mA

2.7 GSM Functionality

Voice	Full Rate, Enhanced full rate and half rate, AMR
CS Data	Asynchronous, transparent and non transparent up to

GSM SMS

9.6 KB
PDU, MO/MT Cell
broadcast

3.0 Battery Removal/Insertion/Charging

A 1340mA/H Lithium Ion rechargeable battery with built in safety features is supplied with the PT-101. To insert the SIM card and to turn the PT-101 off (for shipping and travel) the battery must be removed. The instructions that follow will explain the steps to remove or replace the battery.

NOTE: The PT-101 cannot be used without a battery. Using the PT-101 with only USB power is not supported.

3.1 Removing the Battery

To access the battery the battery door on the bottom of the PT-101 must be removed. Firmly press the battery cover latch and pull the battery door open. To remove the battery, pull up on the battery using the thumb latch until the retention clips release the battery. Slide the battery away from the contacts and remove it from the PT-101.

NOTE: If the PT-101 was not preprogrammed at the CES Wireless Technologies factory then it may have a red protective cover over the terminals. Peel the protective cover off of the battery to expose the terminals and discard it.

3.2 Inserting the Battery

With the battery cover removed, align the contacts on the battery with the contacts of the PT-101. Hold the battery at a 45 degree angle and insert the contact end first. Push the battery towards the contacts and then down firmly until it is fully seated. Replace the battery door. Ensure that the latch is locked.

3.3 Charging the Battery

NOTE: Before using for the first time the PT-101 must be charged for twelve hours.

The PT-101 is charged using a standard USB cable (CES P/N ###) connected to a desktop personal computer.

NOTE: To charge the PT-101 the PC must be turned on and must not be in standby/hibernate mode.

The PT-101 can also be charged in a vehicle with the option vehicle power adapter (CES P/N ###).

NOTE: On many vehicles the accessory jack does not provide power unless the vehicle ignition is on.

Last, the PT-101 can be charged using AC power with the optional AC Power Adapter (CES P/N: ###).

To charge the PT-101, connect one end of the USB cable to the USB jack on the PT-101. Connect the other end to your power source. While the PT-101 is charging, the ON LED will be on solid and the BAT LED will flash.

The PT-101 is fully charged when the BAT LED no longer flashes while connected to a power source.

4.0 SIM Card – Inserting and Removing

The SIM card is an integral part of any GSM terminal device. The SIM card may be installed by simply removing the belt clip, battery cover and battery. The SIM holder is under the battery as shown below.

To install the SIM card into the PT-101 device, follow these steps:

1. Remove the battery cover from the underside of the PT-101 by pushing the tab in the direction that the arrow is pointing.
2. Remove the battery.
3. You will see the SIM card holder in the PT-101 (Figure 4).
4. Slide the SIM card holder to the right, and the door will lift up (Figure 5).
5. Slide the SIM card into SIM door. Make sure the notch on the SIM is aligned with the notch in the SIM holder.
6. Close the SIM door.
7. Slide the SIM lock to the left. The SIM card holder **MUST** be locked.
8. Place the battery back in the PT-101, making sure the connectors are aligned properly.
9. Replace the battery cover.



Figure 4: SIM Card Holder



Figure 5: Open SIM Door

NOTE: Not all PT-101s are provided with SIM cards. The SIM card will be provided by CES Wireless Technologies only if GSM/GPRS data service is purchased along with the device. If purchasing the SIM card separately take steps to ensure that the SIM card is provisioned by the operator for data.

NOTE: Always take care to protect the SIM card. The PT-101's GSM/GPRS related functionality will not operate without the SIM card installed.



CES Wireless Technologies is not liable for damages to the PT-101 when inserting a SIM card inside the device.

5.0 Dialing Preprogrammed Phone Numbers

The PT-101 can be preprogrammed with two phone numbers. These are the only phone numbers that the device is capable of calling. It can receive a call from any phone number.

The first phone number can be any phone number. The second phone number should be programmed with the correct emergency number for the region where the PT-101 will operate.

5.1 Dialing Phone Number 1

This is the phone number that is called when the Push To Call (PTC) button is pressed. To call the number, depress the PTC button until the PT-101 beeps.

5.2 Dialing Phone Number 2

NOTE: The PT-101 will allow emergency communications without a SIM card installed.

Initiating an emergency call is done by depressing the PTC button and the “>” button (User Defined button) simultaneously. The ON, GPS, and BAT LED’s will flash in unison. At this point, momentarily release the PTC button and the CALL LED will flash. Re-depress the PTC button and confirm the LED’s flash in unison again. Release the “>” and the PTC buttons.

6.0 Support

If you need help, we are easily accessible

Telephone: Call 407-679-9440, and ask for product support.

Fax: 407-679-8110

Email: support@ceswireless.com

Skype: Please email support@ceswireless.com to obtain your currently assigned support engineer's Skype address.

Product support may ask you to **PRINT** a copy of the programmed parameters, and fax to for analysis. To do this, go to **FILE** on the DP1000S main menu, and click on **PRINT**.

Support Resources: www.ceswireless.com

FTP Site: Please go to www.ceswireless.com and register for a FTP site User Name and Password

Appendix 1 – Troubleshooting

All the troubleshooting steps require the DP1000S to be in “Manual Mode”. To enable this mode select the Program menu and select “Mode – Manual”. If this selection is not shown the software is in this mode already. The software can return to automatic mode by selecting the Program menu and then selecting “Mode – Auto”.

A1.1 Verifying the PT-101 has Established a GSM Connection

To verify that the PT-101 has established a GSM connection follow these steps.

- Is the antenna attached?
- Is the SIM card installed? The SIM card must be installed to establish a connection.
- In the DP1000S, Select Function section select Query Commands. This selection is only displayed when the software is in Manual Mode.
- In the Query Commands section click on the “Verify GSM Status” button.
- The modem will reply in the text box at the bottom of the software. If you do not get a reply from the modem verify that has power (12V) and that the correct serial port is selected in the software.
- Modems response: the modem responds with “+CREG: followed by two parameters, comma separated.
 - The desired response is “+CREG: 0,1” or “+CREG: 0,5”.
 - Parameter 1
 - 0: disable network registration unsolicited result code
 - 1: enable network registration unsolicited result code
 - 2: enable network registration and location information unsolicited result code
 - Parameter 2
 - 0: not registered, ME is not currently searching a new operator to register to
 - 1: registered, home network
 - 2: not registered, but ME is currently searching a new operator to register to
 - 3: registration denied
 - 4: unknown
 - 5: registered, roaming
 - If the desired response is not received please discuss the programming of the SIM card with your cellular service provider.

A1.2 Verifying the PT-101 has Established a GPRS Connection

To verify that the PT-101 has established a GPRS connection follow these steps.

- Is the antenna attached?
- Is the SIM card installed? The SIM card must be installed to establish a connection.
- In the DP1000S, Select Function section select Query Commands. This selection is only displayed when the software is in Manual Mode.
- In the Query Commands section click on the “Verify GPRS Status” button.
- The modem will reply in the text box at the bottom of the software. If you do not get a reply from the modem verify that has power (12V) and that the correct serial port is selected in the software.
- Modems response: the modem responds with “%CGREG: followed by two parameters, comma separated.
 - The desired response is “%CGREG: 0,1” or “%CGREG: 0,5”.
 - Parameter 1
 - 0: disable network registration unsolicited result code
 - 1: enable network registration unsolicited result code +CGREG
 - 2: enable network registration and location information unsolicited result code +CGREG

- Parameter 2
 - 0: not registered, ME is not currently searching a new operator to register to
 - 1: registered, home network
 - 2: not registered, but ME is currently searching a new operator to register to
 - 3: registration denied
 - 4: unknown
 - 5: registered, roaming
- If the desired response is not received please discuss the programming of the SIM card with your cellular service provider.
- If the desired response is received but there is still an issue then the GPRS Activation needs to be verified.
 - Click on the Verify GPRS Activation button in the Query Commands section.
 - The modem's response will be "\$NETIP:" followed by 3 IP Addresses. For example, the modem should return something similar to this:


```
$NETIP: "166.214.220.151", "066.102.163.232", "066.209.010.202"
```
 - If AT\$NETIP returns all zeros, send the following command: AT\$CGEER. This can be done by typing the command into the "Command to send" field in the Other section on the Query Commands view. There are three common responses:
 - \$CGEER: no PDP reject cause (Everything should be working OK)
 - \$CGEER: requested service option not subscribed (APN is incorrect or SIM has not been enabled for data mode.)
 - \$CGEER: user authentication failed (username and/or password is incorrect.)
 - If these three IP Addresses are not returned received please discuss the programming of the SIM card with your cellular service provider. The information from the CGEER command may assist the carrier in determining the cause of the issue.

A1.3 Verifying the PT-101 has Acquired a GPS Satellite Fix

To verify that the PT-101 has established a acquired a GPS Satellite fix follow these steps. Please note that it does take a few minutes for the GPS receiver to acquire a fix the first time. After that it should acquire a fix fairly quickly.

- Is the antenna attached?
- Does the antenna have a clear view of the sky? The PT-101 cannot establish a GPS fix if the antenna is inside a building or if the sky is obscured by trees, buildings, tunnels, etc. It is also quite difficult for it to establish a fix if the antenna has only a partial view of the sky (i.e. it is near a window).
- In the DP1000S, Select Function section select Query Commands. This selection is only displayed when the software is in Manual Mode.
- In the Query Commands section click on the "GPS?" button.
- The modem will reply in the text box at the bottom of the software. If you do not get a reply from the modem verify that has power (12V) and that the correct serial port is selected in the software.
- Modems response: the modem responds with a series of sentences that are produced by the internal GPS receiver. Of particular interest is the "\$GPRMC" sentence which should be the next to last sentence that is produced.
 - "\$GPRMC,,V,,,,,,,,,N*53" is a sample of an invalid sentence.
 - "\$GPRMC,042159.00,A,2835.1039,N,08118.3645,W,000.0,000.0,090407,03.7,W,A*03" is a sample of a valid sentence.
 - For information on the "GPRMC" sentence please search the internet. Entering "GPRMC Sentence", without the quotes, into your favorite search engine will return the desired results.