



# iTegno 3932 Integration with Garmin PND

## User Guide



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## Document History

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1.0	27 Oct 2011	Initial Release

## GENERAL NOTE

The aim of this document is to support the application of the device(s) described in this document is intended for testing, evaluation, integration, and information purposes.

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## 1 INTRODUCTION

For advanced users who develop their own custom software applications for communicating with Garmin PND products, iTegno 3932 modem offers an instant wireless (PND), transforming a PND to a tracking device. Simply plug-in to iTegno modem to Garmin PND and you are ready to communicate.

This manual provides an overview of the operation of iTegno 3932. It includes technical information on integrating the iTegno 3932 modem with Garmin PND to transfers data between Garmin GPS device and your control monitoring centre.

### Benefits

- Easy to use

Quick path to offer an in-vehicle communication environment with simple integration

- Transforming a PND to a tracking device

Plug-in to the device, configure and ready to track

- Enabling an effective fleet management

Offer benefits of real-time navigation & route planning, 2-way communications

## 1.1 Abbreviations

The following abbreviations are used in this document:

Abbreviation	Description
DC	Direct Current
AT	Attention; prefix for modem command
V	Voltage
LED	Light Emitting Diode
CTS	Clear to Send
DTE	Data Terminal Equipment
IMEI	International Mobile Equipment Identification
GND	Ground
GPS	Global Positioning System
DTE	Data Terminal Equipment (refers to the host terminal/ application in control)
DCD	Data Carrier Detect
DCE	Data Communication Equipment (refers to the device controlled by the host)
I/O	Input / Output
PND	Portable Navigation Device
PVT	Position/Velocity/Time
RI	Ring Indicator
RTS	Request To Send
RXD	Receive Serial Data
TXD	Transmit Serial Data

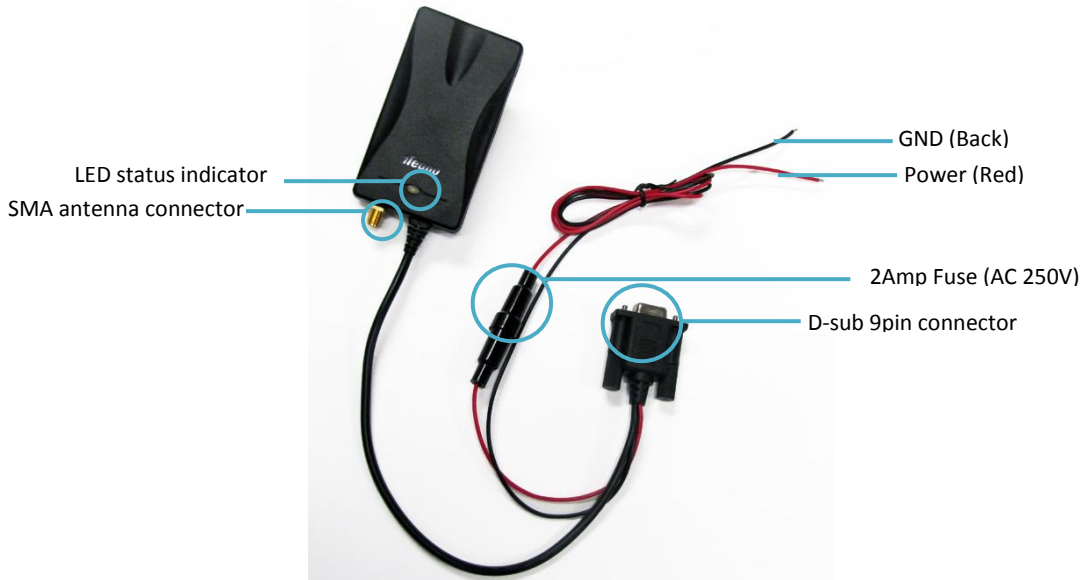
## 1.2 References

S/N	Document	Our Reference
1	iTegno 39XX Hardware User Guide	02000C18
2	iTegno 39XX AT Commands Guide	02000C17
3	Garmin Proprietary Sentences Specification	-
4	Garmin Device Interface Specification	-

## 2 HARDWARE INTERFACE

### 2.1 Overview of iTegno 3932 Modem

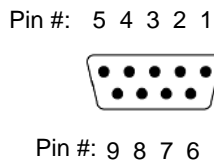
The general interfaces are shown in the figure below:



**Modem Interface Overview**

#### 2.1.1 Serial Link Interface Cable

The iTegno 3932 communicates with other devices via the RS-232 serial link cable. The diagram below shows the pin assignment of the DB9 connector.

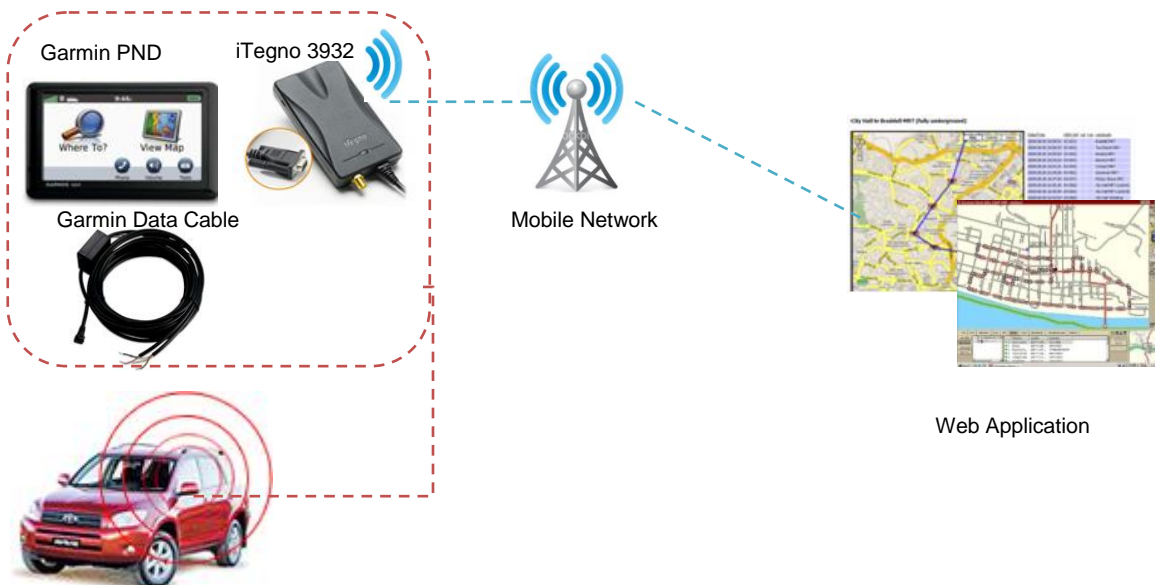


Pin#	Signal	I/O	Description
1	DCD	O	RS-232 Data Carrier Detect
2	RXD	O	RS-232 Receive Serial Data
3	TXD	I	RS-232 Transmit Serial Data
4	DTR	I	RS-232 Data Terminal Ready
5	Ground	-	Signal Ground (SG)
6	DSR	O	RS-232 Data Set Ready
7	RTS	I	RS-232 Request To Send
8	CTS	O	RS-232 Clear To Send
9	RI	O	RS-232 Ring Indicator

**RS-232 DB9 Pin Assignments**

## 2.2 How it works

Garmin PND is installed in each vehicle, along with iTegno 3932 modem. The PND is connected to iTegno 3932 modem via a serial port, and the iTegno modem acts as a gateway to transmit wirelessly the Garmin PVT data to the monitoring control centre. Please refer to Garmin Device Interface Specification.



### 2.2.1 Garmin PND Compatibility

Garmin maintains a list of PND's which are enabled with the Fleet Management Interface (FMI) and can interface with iTegno 3932 modem. For more information on the lists of Garmin FMI enabled PND, refer to <http://www8.garmin.com/solutions/pnd/supportedproducts.jsp>.

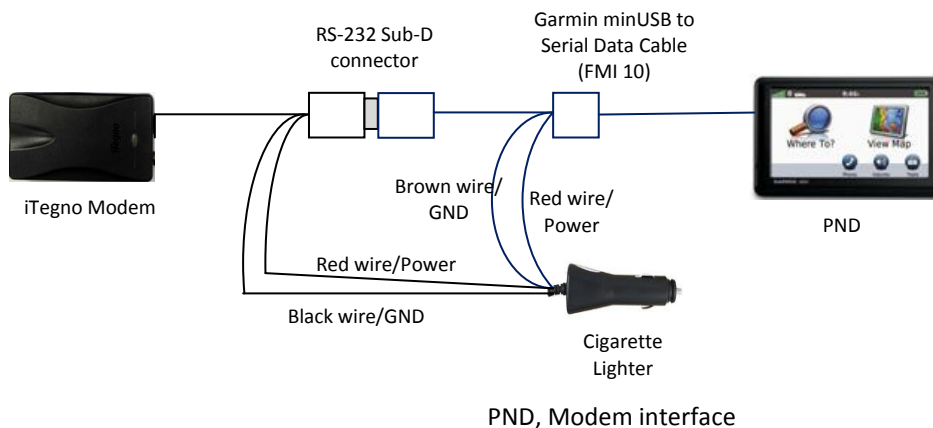
The available job and messaging functionality can vary between Garmin PND models and to assist with the selection of a suitable Garmin PND, iTegno 3932 modem has been tested with the following models. You can contact us if you require testing of other model.

- < Garmin nuvi 1460
- < Garmin nuvi 1300



## 2.2.2 PND and Modem Interface

The Garmin PND and iTegno 3932 modem can be safely installed in a vehicle. The wiring diagram below illustrates how to connect the iTegno 3932 modem with PND to the vehicle power supply via a cigarette lighter connection.



## 2.2.3 Initiate Set-up of Modem

The following describes the initial set-up to implement the use of auto GPRS on the modem and user defined positioning settings. For more detailed AT commands and parameters definitions, please refer to the AT Commands Guide.

First, connect the iTegno 3932 modem to PC with Hyper-Terminal software application. Run Hyper-Terminal and open the com port and perform the AT command before modem entered datamode. Make sure the following port setting is in place.

- Š Bits per second: 9600
- Š Data bits: 8
- Š Parity: None
- Š Stop bits: 1
- Š Flow control: None

Command	Possible Response(s)	Explanation
AT\$GPSAPN="apn","userid","password" e.g. AT\$GPSAPN=" s u n s u r f " ,	OK	Set APN server
AT\$GPSAPN?	\$APN: " s u n s u r OK	View GPRS settings.
AT\$GPSIPPORT="serverip",serverport For example: AT\$GPSIPPORT=, " 2 0 0 . 3 4 . 5 6	OK	Set modem to operate as a TCP client. Remote TCP server IP address and port is specified
AT\$GPRSRTIME=sec e.g AT\$GPRSRTIME=300	OK	Set reporting time interval from the last report sent.  <u>Define:</u> sec 0 – disable 5 – 3600 sec 300sec – default
AT\$GPRSRTIME?	\$GPRSRTIME:300 OK	View reporting time interval setting
AT\$GPSDISCHG=dist,sec e.g. AT\$GPSDISCHG=200,10	OK	Set reporting interval based on distance travelled within a minimal timer.  <u>Define:</u> dist 0 – disable 10 – 1000 m 200 m – default sec 0 – disable 5 – 600 sec 10 sec – default Default distance: 200,10(72km/h)
AT\$GPSDISCHG?	\$GPSDISCHG:200,10 OK	View distance report
AT\$GPSCOSCHG=degree,sec e.g. AT\$GPSCOSCHG=30,10	OK	Set report based on bearing change based on 30m travelled and a minimal timer.  <u>Define:</u> degree 0 – disable 15 – 180 degree 30 degree– default sec 0 – disable 5 – 60 sec 10 sec – default Default bearing change report: 30,10

Command	Possible Response(s)	Explanation
AT\$GPSCOSCHG?	\$GPSCOSCHG:30,10 OK	View bearing change report
AT\$GPSUPGD	OK	Save user defined positioning settings
AT\$CRST=1,"timer" e . g . A T \$ C R S T = 1 , " 0		Set time interval to reset modem. Recommend to implement a 12hrs reset.
AT&W	OK	Writes the active configuration into a non-volatile memory.

#### 2.2.4 Settings for Moving Map (real time tracking)

Once the Garmin PND with iTegno modem is powered up, the modem will initiate TCP Client Application using iCOMM Manager Stack. It will establish a GPRS connection, connect to the predefined TCP server automatically and send a message to the server together with modem IMEI and SIM Card number to the defined server. After the server received the message, the following settings need to be configured and enable PVT data at the Garmin device.

- Enable Fleet Management
- Request Product ID and support request
- Request unit ID/ESN
- Turn on PVT data

After the setting is done, the modem will be accessing Garmin GPS data and filter the PVT and satellite data package. It will drop the satellite package and filter the PVT package according to the user setting. If the condition matches, then the PVT package will send back to the backend server. Otherwise, the package will be dropped. When server received a PVT data, it must send "ACK" back to the modem. Otherwise, the modem will resend that data after timeout.

Based on the PVT data received, the user is ready to plot and provide a real time tracking on a map application.

## 3 SUPPORT/ CONTACT US

For online support (FAQs and drivers download), please visit [www.iTegno.com](http://www.iTegno.com).

For technical support, please contact our distributors/resellers or email us at [developers@iTegno.com](mailto:developers@iTegno.com).

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