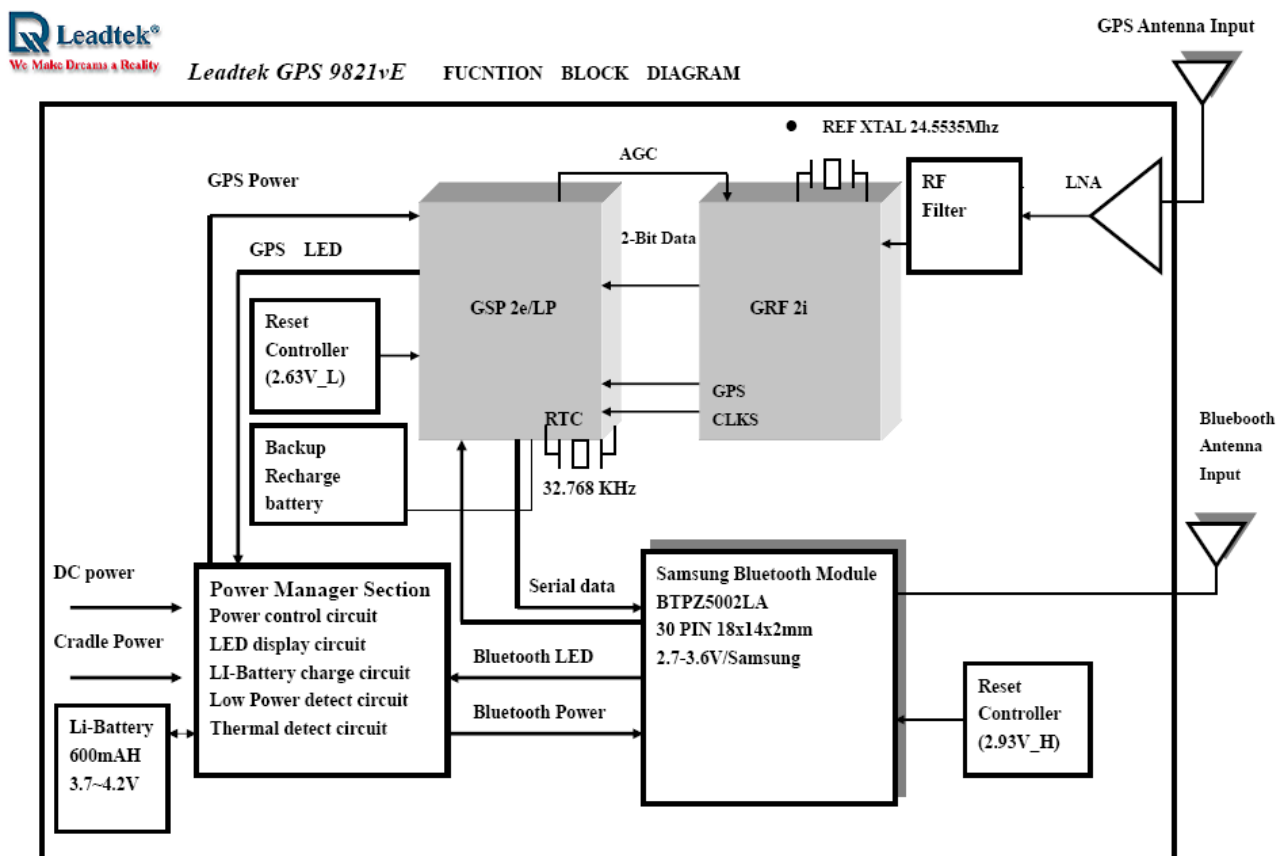# Description of Operation

Overview

The Wireless GPS receiver is a Global Positioning System Receiver with Bluetooth wireless technology. This wireless GPS receiver allows you to receive GPS data on mobile handheld wirelessly. By sending GPS position data over Bluetooth, you can position the receiver for the best possible reception all without wires. The advent of wireless GPS receiver will become the next level of GPS receivers.

Block Diagram

Leadtek® We Make Dreams a Reality

Leadtek GPS 9821vE FUCNTION BLOCK DIAGRAM

GPS Antenna Input

REF XTAL 24.5535Mhz

AGC

GPS Power

RF Filter — LNA

GPS   LED

2-Bit Data

GSP 2e/LP — GRF 2i

Reset Controller (2.63V_L)

GPS CLKS

Backup Recharge battery

RTC

32.768 KHz

Bluebooth Antenna Input

DC power

Power Manager Section
Power control circuit
LED display circuit
LI-Battery charge circuit
Low Power detect circuit
Thermal detect circuit

Serial data

Samsung Bluetooth Module BTPZ5002LA 30 PIN 18x14x2mm 2.7-3.6V/Samsung

Cradle Power

Bluetooth LED

Bluetooth Power

Reset Controller (2.93V_H)

Li-Battery 600mAH 3.7~4.2V

Bluetooth Transmit mode

EUT is a Bluetooth Serial and USB Adapter with 79 channels. This device provided of transmitting speed 19200bps. The device of RF carrier is GFSK. The device adapts Frequency Hopping Spread Spectrum modulation (FHSS). An embedded system can become Bluetooth enabled by inserting the Bluetooth RF module that interfaces to the embedded processor via Serial interface. The antenna is Chip Antenna, and there is no antenna connector.

With embedded system becoming Bluetooth-enable by the Bluetooth Modules, many wireless applications will become possible, such as:

Communicate with each other wirelessly (between embedded systems, laptops, PCs, and others), including sharing or exchanges of data (i.e. wireless file transfers between bluetooth-enabled devices).

Technical Specifications

■Electrical Characteristics

	Items	Description
Chipset	GSP2e/LP	SiRF starII LP technology
General	Frequency	L1, 1575.42 MHz
	C/A code	1.023 MHz chip rate
	Channels	12
	Antenna	Built-in Ceramic patch antenna External antenna optional
Accuracy	Position	10 meters, 2D RMS
	Velocity	0.1 meters/second
	Time	1 microsecond synchronized to GPS time
Datum	Default	WGS-84
Acquisition Rate(Open Sky & Stationary Requirements)	Reacquisition	0.1 sec., average
	Snap start	2 sec., average
	Hot start	8 sec., average typical TTFF
	Warm start	38 sec., average typical TTFF
	Cold start	45 sec., average typical TTFF
Dynamic Conditions	Altitude	18,000 meters (60,000 feet) max.
	Velocity	515 meters/second (1000 knots) max.
	Acceleration	4g, max.
	Jerk	20 meters/second^3, max.
Power	Main power input	3.3±10%V DC input.
	Charging Power	5VDC±10%
	Battery Source	Rechargeable 600mAh Lithium-Ion battery with 5V DC input charging circuit
	Supply Current	Please refer to the following table. **<Note 1>**
	Battery Charging	Full charge 2 hours
	Backup Power	3.3V(internal onboard rechargeable backup battery).
	Operational Current	The device is enabled by Lithium-Ion battery only.
	Type Operation	Typical use 6-8 hours GPS and Bluetooth fully active 5~6 hours
Bluetooth Module	CSR chip solution	Samsung Bluetooth Module

<Note 1> Current consumption

9821vE	GPS position(patch)		GPS not position(patch)	
BT connect state	Yes	No	Yes	No

Current consumption	107~113mA	80~90mA	110mA	83~96mA
Remark	1.Battery is not charging state. 2.The current consumption of active antenna is 21mA			

■Other Characteristics

	Items	Description
Environmental Characteristics	Humidity range	5% to 95% No condensing
	Operating temperature range	-20ºC to +60ºC (-4ºF to 140ºF)
	Battery discharge	-20ºC to +60ºC (-4ºF to 140ºF)
	Battery charge	-10ºC to +55ºC (-4ºF to 104ºF)
	Short period storage temperature (1 month)	-20ºC to +50ºC (-4ºF to 112ºF)
	Long time storage temperature (>1 month)	-20ºC to +35ºC (-4ºF to 95ºF)
Physical Characteristics	Length	86 mm (3.38in)
	Width	46 mm (1.81 in)
	Height	19 mm (0.75 in)
	Weight	75g(2.6 oz)
	Antenna connector	MC plug**<Note2>**
	Power connector	3.5mm
	Cradle connector	Power connector for TomTom Wireless GPS cradle with cover
Antenna	Active antenna	3.3V Active antenna
	Passive antenna	With LR 9410 LNA module

<Note2> The internal antenna will be disabled when an external antenna is connected.

.

■Firmware Characteristics

Items	Description
Core of firmware	HS Version 2.0 (SiRF Xtrac)
Baud rate	4800
Code type	NMEA-0183 ASCII
Datum	WGS-84
Protocol message	NMEA-0183 Version 2.20 output protocol, Default output format: GGA(1sec), GSA(5sec), GSV(5sec), RMC(1sec), VTG(1sec)

Operation
■Hardware Description

The Bluetooth GPS has two LED light which each has two colors. One is GPS & Charge status LED, that is named LED 2, and the other is Bluetooth & low power status LED, that is named LED 1. The status table of LED shows as follows:

<State Table of LED>

LED1

BT & Low Power LED	Description	
LED1 Color and Action	Bluetooth Active	Low Power
Blue Flash	Yes	No
Purple–Red Flash	Yes	Yes

LED2

GPS & Charge LED	Description	
LED2 Color and Action	Battery Charged	Position Fixed
Dark	No	No
Green Flash	No	Yes
Orange	Yes	No
Orange-Red Flash	Yes	Yes

4.2 Turn on/off

Turn on
To turn on the receiver, press the power button on the topside briefly (0.5 seconds). The right LED(LED 2) indicator will flash briefly. The left LED(LED 1) indicator will start flashing. Note: When the Receiver is in the cradle, it will switch on when power to the cradle is switched on (to synchronize with vehicle ignition).

Turn off
To turn off the receiver, press the power button on the topside for 3 seconds. The LED indicator will flash briefly before switching off the receiver. Note: When the receiver is in the cradle, the receiver will switch off if the power to the cradle is

interrupted or switched off (to synchronize with vehicle ignition).

4.3 Charging

Low Power   The left LED(LED 1) indicator will turn RED (normally BLUE) when battery power becomes low. Connect the receiver to a powers source to continue operation and to recharge the battery.

Charging   The right LED(LED 2) indicator will turn RED (or ORANGE) when the battery is being charged. When fully charged, the RED indicator will switch off.

4.4 Bluetooth Communication

Waiting to connect   The left LED(LED 1) indicator will flash if there is no communication between the receiver and another device.

Connected   The left LED(LED 1) indicator will turn to continuous lighting when the receiver is connected through the wireless link with another device.

4.5 GPS

Navigating   The right LED will flash GREEN (or ORANGE when charging) if the receiver is able to determine the current position.

4.6 PIN CODE

The **PIN** code means Personal Identification Number for Bluetooth device and it is also called as **Pass Key**. The Bluetooth GPS receiver has the default PIN Code, and is "**0000**". Generally speaking, there are two steps in Bluetooth connecting. One is pairing process, the other is link process. If you need PIN code to pairing and connect, you can use the default pin code, "**0000**" to connect Bluetooth device. Our GPS receiver belongs to non-safety connecting, you can use in general application to finish connecting.