

# HAiCOM

## ***HAiCOM HI-408BT BLUETOOTH GPS RECEIVER***



Specifications Sheet

V1.1

## Introduction

The HAICOM HI-408BT, based on state of the art Mediatek Bluetooth and GPS chipset, of great sensitivity and supreme accuracy, is a Bluetooth receiver plus data logger function\*. The GPS receiver delivers an outstanding signal to noise (S/N) reception figure. The on-chip image-rejection mixer, plus SAW filter is alleviated, makes this 32-channel GPS Receiver acquires and tracks satellites in the shortest time even at low signal levels, providing fast TTFF (time-to-first-fix) which is to the strictest industrial standard. HAICOM HI-408BT can perfectly pair up with your Smart phones, PDA or UMPC without GPS technology, to assist the navigation during your journey.

## Features

- Bluetooth, V1.2 compliance, class 2
- 32 channel GPS L1(C/A code) receiver
- Cold/Warm/Hot Start Time: 38/36/1 sec. at open sky and stationary environments
- Reacquisition Time: 0.1 second
- -158 high sensitivity
- Operation hours: 10 hours in continuous mode
- GGA/GSA/GSV/RMC (Default Output). VTG/GLL (Optional).
- RoHS compliance
- Very attractive, petite, sleek and light design
- \*For data logger function-- waypoints: 30,000 points

\*Optional - HI-408BT/D

## Interface

- TTL level serial Port/ Bluetooth for GPS communications interface
- Protocol: NMEA-0183
- Baud Rate: 115200 bps

# Specifications

## Technical specification

Feature	Item	Description
Chipset	MT 3318f +6601	GPS single chip + Bluetooth chipset
General	Frequency	L1, 1575.42 MHz
	C/A code	1.023 MHz chip rate
	Channels	14/32
Accuracy	Position	3 meters, 2D RMS
		2.5 meters 2D RMS, WAAS corrected
		<2.5 meters (50%)
	Velocity	0.1 meters/second
Datum	Time	1 microsecond synchronized to GPS time
	Default	WGS-84
Time to First Fix (TTFF) (Open Sky & Stationary Requirements)	Other	selectable for other Datum
	Reacquisition	0.1 sec., average
	Hot start	1 sec., average typical TTFF
	Warm start	36 sec., average typical TTFF
Dynamic Conditions	Cold start	38 sec., average typical TTFF
	Altitude	18,000 meters (60,000 feet) max.
	Velocity	515 meters/second (1000 knots) max.
	Acceleration	4g, max.
	Jerk	20 meters/second <sup>3</sup> , max.
Power	Main power input	DC 5.0V
	Operation hours	10 hours in continuous mode
	Battery	670 mA
		Built-in Li-Polymer battery
Serial Port	Electrical	
	interface	UARTS
	Protocol	
	messages	NMEA-0183 V3.01@115200 bps (Default)

## Environmental Characteristics

Items	Description
Operating temperature range	-10 deg. C to +50 deg. C
Storage temperature range	-20 deg. C to +65 deg. C

## Physical Characteristics

Items	Description
Length	75.6mm ± 0.12 mm
Width	28.4mm ± 0.08 mm
Height	18.7mm ± 0.08 m
Weight	38 g (including rechargeable battery)

## Interface Specifications

Items	Description
Bluetooth	V1.2 compliance, class 2
USB	Mini USB for charging only

## LED Display

LED 1 (GPS)-Green			
State		Always on	Blinking
Description		3D fixed	GPS signal acquisition
LED 2 (Bluetooth)-Blue			
State	Blinking	Always on	
Description	BT on, but not connected yet	BT connected	
LED 3 (Power)-Red			
State	Always on	Quick blinking	No
Description	Battery is charging	Low power	Battery is fully charged

## Software

Item	Description
Core of firmware	MTK
Baud rate	115200 bps
Code type	NMEA-0183 ASCII
Datum	WGS-84
Protocol message	GGA(1sec), GSA(5sec), GSV(5sec), RMC(1sec), VTG(1sec)
Output frequency	1 Hz (default)

## Electrical Specifications

Power	
Item	Description
Main power input	DC 3.3~5.0V
Power consumption	185 mW (Acquisition mode) 106 mW (Tracking mode)
Supply Current	56 mA@3.3VDC (Acquisition mode) 32 mA@3.3VDC (Tracking mode)

Battery		
Item	Description	
Model Type	Lithium Ion Polymer	
Nominal Capacity	Characteristics	Remarks
	Minimum:650mAh Fully charged @1C to 4.2V for 2.5 hrs, then discharge to 3.0V @ 0.2C.	
	Typical: 670Ah	
Nominal Voltage	3.7V	
Weight	12.6 g	

### **\*Data Logger function**

Items	Description
Cycle time	15 sec
Waypoints	30,000 points

## Photos



## Glossary

### **A-GPS**

Assisted GPS or AGPS is a technology that uses an assistance server to cut down the time needed to find the location. Although GPS provides excellent position accuracy, position fixes require lines of sight to the satellites. In regular GPS networks there are only GPS satellites and GPS receivers.

In A-GPS networks, the receiver, being limited in processing power and normally under less than ideal locations for position fixing, communicates with the assistance server that has high processing power and access to a reference network. Although dependent on cellular coverage, AGPS processing is quicker and more efficient than regular GPS.

### **API**

An application programming interface is a set of definitions of the way one piece of computer software communicates with another. One of the primary purposes of an API is to provide a set of commonly used functions, such as to draw windows or icons on the screen. Programmers can then take advantage of the API by making use of its functionality, saving them the task of programming everything from scratch.

### **Baud Rate**

Is a measure of the signaling rate, which is the number of changes to the transmission media per second in a modulated signal?

For Example: 250 baud means that 250 signals are transmitted in one second. If each signal carries 4 bits of information then in each second 1000 bits are transmitted. This is abbreviated as 1000 bit/s.

## **Dead Reckoning**

The process of estimating your position by advancing a known position using course, speed, time and distance to be traveled. It is figuring out where you will be at a certain time if you hold the speed, time and course you plan to travel.

## **Differential GPS (DGPS)**

An extension of the GPS system that uses land-based radio beacons to transmit position corrections to GPS receivers. DGPS reduces the effect of selective availability, propagation delay, etc. and can improve position accuracy to better than 10 meters.

## **EGNOS (European Geostationary Navigation Overlay System)**

A satellite navigation system being developed by the European Space Agency, the European Commission, and EUROCONTROL. It is intended to supplement the GPS and GLONASS systems by reporting on the reliability and accuracy of the signals. According to specifications, horizontal position accuracy should be better than 7 meters. In practice, the horizontal position accuracy is at the meter level. It will consist of three geostationary satellites and a network of ground stations.

Similar service is provided in America by the WAAS system. See WAAS.

## **LNA (Low Noise Amplifier)**

A special type of electronic amplifier or amplifier used in communication systems to amplify very weak signals captured by an antenna. It is usually located at the antenna and is a key component, which is placed at the front-end of a receiver system.

## **Multi-path mitigation**

Anticipating errors caused when a satellite signal reaches the GPS receiver antenna by more than one path. Usually caused by one or more paths being bounced or reflected off of structures near the antenna and occurs to some extent everywhere. The signal which traverses a longer path will yield a larger pseudo range estimate and increase the error.

## **NMEA** (National Marine Electronics Association)

An U.S. standards committee that defines data message structure, contents, and protocols to allow the GPS receiver to communicate with other pieces of electronic equipment.

## **Time To First Fix (TTFF)**

The time it takes a GPS receiver to find satellites after you first turn it on, when the GPS receiver has lost memory, or has been moved over 300 miles from its last location. Standard TTFF

Timing consists of:

Mode	Requires	Timing
Snap Start	Hot + Clock + Sat Pos	3 minutes off
Hot Start	Warm + Ephemeris	30 minutes off
Warm Start	Position Accuracy	<500 KM
	Time Accuracy	<2 hours
	Almanac	<1 year
Cold Start Nothing N/A		

Specifications are typical times assuming good satellite visibility and above threshold signal strengths.

## **WAAS**

A system of satellites and ground stations that provide GPS signal corrections for better position accuracy. A WAAS-capable receiver can give you a position accuracy of better than three meters, 95 percent of the time. (At this time, the system is still in the development stage and is not fully operational.) WAAS consists of approximately 25 ground reference stations positioned across the United States that monitor GPS satellite data. Two master stations, located on either coast, collect data from the reference stations and create a GPS correction message.

Notice : The changes or modifications not expressly approved by □ the party responsible for compliance could void the user's □ authority to operate the equipment.□

IMPORTANT NOTE: To comply with the FCC RF exposure □ compliance requirements, no change to the antenna or the □ device is permitted. Any change to the antenna or the device □ could result in the device exceeding the RF exposure □ requirements and void user's authority to operate the device.

This device complies with Part 15 of the FCC Rules. □ Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this □ device must accept any interference received, including □ interference that may cause undesired operation.□

#### FCC INFORMATION□

The Federal Communication Commission Radio Frequency Interference□ Statement includes the following paragraph:□

□ The equipment has been tested and found to comply with the limits for a Class□ B Digital Device, pursuant to part 15 of the FCC Rules. These limits are designed□ to provide reasonable protection against harmful interference in a residential□ installation. This equipment generates, uses and can radiate radio frequency□ energy and, if not installed and used in accordance with the instruction, may cause□ harmful interference to radio communication. However, there is no grantee that□ interference will not occur in a particular installation. If this equipment dose cause□ harmful interference to radio or television reception, which can be determined by □ turning the equipment off and on , the user is encouraged to try to correct the □ interference by one or more of the following measures:□

□  
--Reorient or relocate the receiving antenna.□  
--Increase the separation between the equipment and receiver.□  
--Connect the equipment into an outlet on a circuit different from that to which the □ receiver is connected.□  
--Consult the dealer or an experienced radio/TV technician for help.□

□  
The user should not modify or change this equipment without written approval□ form HAICOM Electronics Corp.Modification could void authority to use this □ equipment.□



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