

z050 Timing & Navigation Module



*USB GPS Dongle with PPS**

PPS usable by timing applications
via serial port emulation

** The **Pulse Per Second (PPS)** is an electrical signal that very precisely indicates the start of a second. The z050 GPS chipset delivers the PPS signal with an accuracy ± 25 nanoseconds.*

The z050 USB dongle provides an L1 Frequency GPS receiver, with NMEA protocol from a USB port and also a **PPS timing output**. The z050 unit is based on a GPS receiver from Trimble with 22-channel continuous tracking and high sensitivity (tracking -160dBm).

With its higher sensitivity, performance and faster startup times, the z050 module is a complete GPS receiver that generates position fixes with high accuracy in extremely challenging environments and under poor signal conditions (down to -160dBm), velocity and time data with leading edge acquisition times. In addition, the GPS receiver provides a configurable 1 PPS synchronized to GPS/UTC, typically within 25 nanoseconds (one sigma) at chipset level and an update rate up to 5Hz.

The z050 module is capable of receiving Satellite Based Augmentation System (SBAS) corrections, including the U.S. Wide Area Augmentation System (WAAS) and the European Geostationary Overlay Service (EGNOS). GPS assistance (aGPS) is also supported.

When the USB dongle is connected to your equipment (desktop, laptop, netbook, UMPC ...), a virtual serial port is available after installation of the driver by the operating system - for example: USB Serial Port (Com x).

Drivers are available which allow the z050 USB dongle to work with the following operating systems:

- [Windows Server 2008 R2, Windows Server 2008, Windows Server 2008 x64](#)
- [Windows 7 , Windows 7 x64](#)
- [Windows Vista, Windows Vista x64](#)
- [Windows Server 2003, Windows Server 2003 x64](#)
- [Windows XP, Windows XP x64](#)
- [Windows 2000, Windows ME , Windows 98](#)
- [Windows CE.NET \(Version 4.2 and greater\)](#)
- [Linux](#)
- [Mac OS X, Mac OS 9 , Mac OS 8](#)

For most of these operating systems two types of driver are available: Virtual COM Port (VCP) drivers and direct (D2XX) drivers. The VCP driver emulates a standard PC serial port such that the USB device may be communicated with as a standard RS232 device. The D2XX driver allows direct access to a USB device via a DLL interface.

Virtual COM port (VCP) drivers cause the USB device to appear as an additional COM port available to the PC. Application software can access the USB device in the same way as it would access a standard COM port.

The USB dongle contains a USB to serial UART interface and the PPS signal provided by the GPS chipset is connected internally to pin 8 (CTS). So, the PPS signal delivered by the USB dongle is available by using the CTS signal on the virtual com port used.

Applications	Benefits
Timing and Synchronization	Ultra compact GPS receiver with high accuracy by using the PPS signal for timing applications
Vehicle Navigation Automatic Vehicle Location	Accurate GPS positioning within 2.0 meters

Key Features

- Trimble chipset, GPS L1 Frequency C/A code receiver with high sensitivity, 22 channels
- NMEA output and input
- SBAS (WAAS, EGNOS, MSAS) capable
- aGPS capable
- Update rate up to 5 Hz
- **PPS timing output**
- **Built in GPS Ceramic Patch Antenna** (18x18x4mm) or use of an external active GPS Antenna
- Compact Design with a size of a USB key (USB 2.0 Interface)
- Suitable for Laptop, Desktop, Mobile Device, UMPC, Eee PC, Notebooks and Netbooks
- RoHS Compliance



GPS Performance Specifications

GPS performance statistics are clear view, stationary. Sensitivity based on signals measured at the antenna.

Parameter	Value
Update Rate	1 Hz (default), up to 5 Hz
Number of channels	22
Accuracy	
Position (autonomous)	<2.5 m 50%, <5 m 90%
Position (SBAS)	<2 m 50%, <4 m 90%
Altitude (autonomous)	<5 m 50%, <8 m 90%
PPS	< ±25 ns @ 50%
Acquisition time	
Re-Acquisition	2 s 50%
Hot Start	2 s 50%
Warm Start	35 s 50%
Cold Start	38 s 50%
Sensitivity	
Tracking	-160 dBm
Acquisition	-146 dBm
Dynamics	
Acceleration	2 g
Operational Limits	Altitude <18,000m (60,000 ft) or velocity <515m/s (1,151 mph). Either limit may be exceeded but not both (COCOM limit)

GPS Communication Parameters

GPS output is available from a USB Interface. The output adheres to NMEA 0183 protocol with the following characteristics.

Parameter	Value(s)
Protocol	NMEA 0183
Baud Rate	
Default	57600
Other	4800, 9600, 19200, 38400, 115200
Message Output Rate	Up to 5 Hz
Number of message types restricted by Baud Rate	









NMEA 0183 Messages

Message	Default	Description
GGA	Default	GPS fix data
GSA	Default	GPS DOP and active satellites
GSV	Default	GPS satellites in view
RMC	Default	Recommended minimum specific GPS/Transit data
CHN	Other	GPS channel status
GLL	Other	Geographic position – Latitude/Longitude
VTG	Other	Track Made Good and Ground Speed
ZDA	Other	Time and date

Mechanical and Environmental

Dimensions (including USB connector)	78.3mm L x 22.3mm W x 14.1mm H
High Speed USB 2.0 (480 Mbit/s)	USB A-type Male Plug for connection to a USB host or Hub port. The maximum cable length is 5 meters according to the USB 2.0 specification.
External Aerial Connector	MCX
Operating Temperature	-40°C to +85°C
Storage Temperature	-55°C to +105°C
Humidity	5% to 95% non-condensing @ 60°C
Weight	20g
Warranty	1-Year
Environmental	RoHS
Power	Voltage DC 5V via USB port, Current < 55mA (tracking)

Ordering Information

Reference	Description
<p>z050-USB</p>	<p>z050 Timing & Navigation / USB GPS Dongle with PPS *</p> <p>Contains: z050 USB GPS Dongle with PPS + USB Extension Cable + CD-ROM (Software & Documentation).</p> <div style="border: 1px solid gray; border-radius: 15px; padding: 10px; text-align: center;"> <p>z050 Timing & Navigation / USB GPS Dongle with PPS</p>   <p>USB Extension Cable</p>  <p>GPS Patch antenna with 5m cable and MCX connector</p> <p>CD-ROM (Software & Documentation)</p>  </div>
<p>z050-STK</p>	<p>z050-STK (Starter Kit) = z050-USB + TSS-P Software</p> <p>Contains: z050 USB GPS Dongle with PPS + USB Extension Cable + CD-ROM (Software & Documentation) with Windows TSS-P software – one license (TSS-P = Time Service Software updates the PC clock with 1ms guaranteed accuracy).</p> <div style="border: 1px solid gray; border-radius: 15px; padding: 10px; text-align: center;"> <p>z050 Timing & Navigation / USB GPS Dongle with PPS</p>   <p>USB Extension Cable</p>  <p>GPS Patch antenna with 5m cable and MCX connector</p> <p>CD-ROM (Software & Documentation) with Windows TSS-P software – one license (TSS-P = Time Service Software updates the PC clock with 1 millisecond guaranteed accuracy)</p>  </div>

* Product designed and manufactured in France.