



z100

GPS Time Device Timing & Navigation



Outdoor Antenna

Revision 4

PRESENTATION

ZTI has selected a GPS Time & Navigation receiver produced by Heol Design (France), based on the Trimble Copernicus technology (Trimble OEM).

The sensitive Copernicus GPS receiver can autonomously acquire GPS satellite signals and quickly generate reliable position fixes in extremely challenging environments and under poor signal conditions.

It is recommended to use an outdoor antenna for the best results.

Two versions are available: RS232 (standard delivery) or RS422 (on request).

The **z100** GPS Time Device needs an outdoor antenna and is dedicated for use in measurement and industrial applications. The RS422 version provides transportation of positional and timing over long distances.



The **z100** module is RoHS (lead free) compliant.

Note: the specifications in this document are subject to change without notice. ZTI is not responsible for the operation or failure of operation of GPS satellites or the availability of GPS satellite signals.

MAIN FEATURES

- Complete 12-channel GPS receiver
- Ultra-high sensitivity of **-152dBm (-182dBw)**, enabling high performance in urban canyon environments. Supports SBAS satellite system, for improved position accuracy.
- Time to First Fix is quicker than **40s** (cold start).
- The reacquisition time when hot (thanks to the back-up capacitor) is extremely short (~2s 90% of the time).
- Low power consumption (typ.): 60 mA @ 12 V.
- Highly accurate pps (pulse per second) signal (**±50ns**) available on SUB-D9 front panel. RS232, RS422 or TTL level.
- Configuration parameters backed-up to an EEPROM.
- Active antenna is **voltage selectable**: 3.3V or 5V (patented).
- **Protection** against short circuit and overvoltage on the antenna.
- **Robust** power supply, protected against transients and reverse polarity.
- Optional **Back-up** capacitor with an autonomy of 30 hours for hot start-up after a power cut.
- Communication port outlet in **RS232** or **RS422** level (with transient protection), depending on the version. NMEA and TSIP protocols, with configurable baudrate.
- RS232/RS422 port is **15kV ESD** protected + **60V fault** protected.
- Compact ruggedized **metal housing**.

References of the configurations

⇒ z100 (232)

This is the standard RS232 version. The port use RS232 input/output for communication (RX/TX) and both supply the PPS (Pulse Per Second) in RS232 level.

⇒ z100 (422)

This is the RS422 version. The port use RS422 input/output for communication (RX/TX) and both supply the PPS (Pulse Per Second) in RS422 level.

Connectors description

Connectors are compliant with **automotive standards**.

- For the communication and pps signal: female DB9

Pin DB9	z100 (232)	z100 (422)
1	NMEA Tx	Serial connection Tx+
2	TSIP Tx	Serial connection Tx-
3	TSIP Rx	Serial connection Rx-
4	No Connect	Serial connection Rx+
5	Ground	Ground
6	Optional External Power supply	Optional External Power supply
7	NMEA Rx	Pulse Per Second signal -
8	Pulse Per Second signal (RS232 or 5V level)	Pulse Per Second signal +
9	No Connect	No Connect
Shield	Ground	Ground

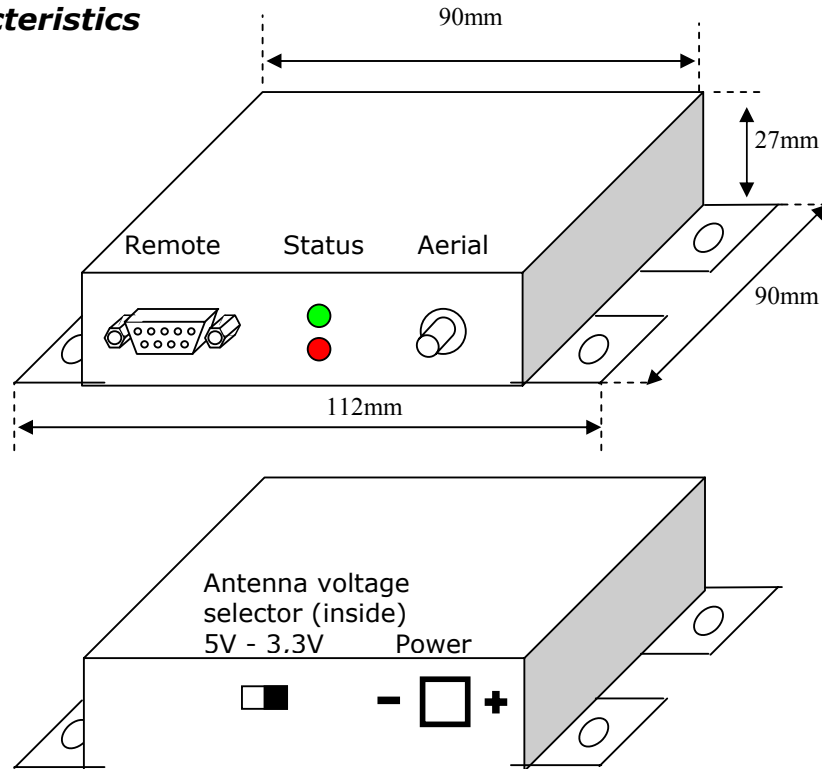
Remark: In configuration, the polarities indicated can be inverted with respect to the polarity of the equipment of other manufacturers. This is not serious, as inversion of the polarity when connecting will not damage the equipment, if there is no output, try changing over the + and -.

- For the power supply: automobile type locking connector (the power supply connector should be removed by pressing on the top of it to clear the locking lug)
- For the aerial: SMB type.

SUMMARY OF THE CHARACTERISTICS

GPS Receiver	Type	12 channels
	Sensitivity	Tracking -150dBm to -152dBm Acquisition -142 dBm
Accuracy	Horizontal	<2.5 meters (50%), <5 meters (90%)
	Altitude	<5 meters (50%), <8 meters (90%)
	Horizontal (with SBAS)	<2 meters (50%), <4 meters (90%)
	Altitude (with SBAS)	<3 meters (50%), <5 meters (90%)
	Speed	0,06 m/sec (nominal)*
	Time (pps)	±100 ns RMS
Initial acquisition time	Cold (Time to First Fix)	< 39 seconds (90%)*
	Warm start	< 35 seconds (90%)*
	Hot start	< 3 seconds (90%)*
Interfaces	5V/3.3V Active antenna	SMB FAKRA (SMA or MCX on request)
	Remote RS232/RS422	SUB-D9, 38400/8/No/1 (factory setting, user configurable)
	Protocols	In /Out : NMEA 0183v3.0 , TSIP , TAIP
Power supply	Input Voltage	•12/24 VDC, automotive (A option) → Full automotive ISO7637 qualification •9 to 50 VDC for industrial (J option)
	Power consumption	30mA @12V (passive antenna)
Environmental	Operating Temperature	-40 / +85°C
	Storage Temperature	-55 / +105°C
	Humidity	90% non-condensing
	Dimensions (mm)	112 x 91 x 26
	Weight	240g

* Aerial field cleared

Mechanical characteristics**Connecting the GPS antenna**

On the antenna connector, connect a 3V or 5V active antenna. This input is protected against short circuit that could occur on the antenna cable.

By default the z100 is configured for a 5V active antenna. To use a 3V active antenna, you must open the cover and move the switch near main power connector (use a Facom 84E.2x75 hexagonal screwdriver).

Connecting the host system and the power

Power should be applied :

- Aux power plug. The connector type is AMP connector (ref 176271), included in the package. Contact ZTI for AC adapter availability.
- OR on pin6 of RS232/RS422 connector.

Monitoring the LEDs

The LEDs available on the front panel are:

- Green LED: blinks every second (synchronized to pps); can also be configured to blink only when position is valid.
- Red LED: indicates that there is a problem with the antenna. It is not connected or is in short-circuit.

EMC compatibility

The **z100** product has successfully completed compliance testing against the following standards listed below (in accordance with the **CE** directive):

- EN55022/55011 class B : conducted and radiated emissions.
- EN61000-4-2 : Immunity to electrostatic discharges.
- EN61000-4-3 : Immunity tests on electromagnetic fields radiated at radio-electrical frequencies, with 10V/m electromagnetic field.
- EN61000-4-4 : Immunity to rapid transients.
- EN61000-4-5 : Immunity to surge.
- EN61000-4-6 : Immunity tests on conducted interference, induced by radio-electrical fields.
- ISO7637-1/2/3 (for automotive applications).

For Information

The EN61000-4-3 standard is identical to the CEI 1000-4-3 standard and replaces ENV50140.

The EN61000-4-3 standard (see note A) is mentioned in the EN50082-generic standard for electrical and electronic equipment designed for use in industrial environments.

The NF EN61000-4-6 standard is identical to the CEI 1000-4-6 standard and replaces ENV50141. The EN61000-4-6 standard (see note B) is mentioned in the EN50082-2 generic standard for electrical and electronic equipment designed for use in industrial environments.