

R&S® TSMX-PPS2

GPS Module

GPS receiver module with PPS output and dead reckoning



R&S®TSMX-PPS2 GPS Module At a glance

The R&S®TSMX-PPS2 is a GPS receiver module with time synchronization pulse/PPS output and automotive dead reckoning (ADR) for high-precision measurements, e.g. in combination with the R&S®TSMx drive test scanners.

The accuracy of scanner measurements is highly dependent on synchronization with the wanted signals. Synchronization can be achieved by means of synchronization signals that are found inside mobile radios but that nevertheless exhibit a certain lack of accuracy. This is why the R&S®TSMX-PPS2 GPS module is a better alternative. It evaluates GPS signals and returns position data and a highly precise time reference at the PPS connector.

The module is small, handy and versatile. The integrated u-blox chipset offers maximum sensitivity so that position measurements can be performed even inside buildings. The integrated ADR allows navigation even in locations with limited or no GPS signal, e.g. in tunnels, parking garages and street canyons. All that is needed are pulses from speed and direction sensors (forward/reverse), usually available and accessible in vehicles. The USB-fed power supply eliminates the need for an external power supply. An integrated backup unit permits rapid positioning after a cold start.

The R&S®TSMX-PPS2 must be used if base station localization is performed with an R&S®TSMx and the R&S®ROMES3LOC option from R&S®ROMES.

Key facts

- Highly sensitive GPS receiver with integrated automotive dead reckoning (ADR)
- Pulses per second (PPS) output
- 50 channels
- Update rate of 1 Hz
- Compact, light and versatile



Benefits and key features

Automotive dead reckoning

- Position information even in locations with no GPS reception (e.g. in tunnels or buildings)
- External pulse generator required (e.g. vehicle speed sensor)

High sensitivity

- Usable in buildings
- High accuracy

Time synchronisation/PPS output

- Precise synchronization of an R&S®TSMx drive test scanner

Supported instruments

R&S®TSMX-PPS2 with time synchronisation/PPS pulses can be used in combination with one of the following instruments:

- R&S®TSMQ
- R&S®TSML-C/-G/-W
- R&S®TSML-CW/-GW
- R&S®TSMU with R&S®TSMU-K11/-K12/-K13

System configuration

- Independent (configuration 1):
R&S®TSMX-PPS2 and supplied USB cable for connecting to a PC for positioning
- R&S®TSMX-PPS2 and R&S®TSMX (configuration 2):
Connection same as in configuration 1 except with additional time synchronisation/PPS pulse
- Automotive dead reckoning (configuration 1 and 2):
Supplied open-ended cable for connecting the R&S®TSMX-PPS2 to the output of vehicle speed or direction sensors (optional)

Configuration 2 and the R&S®ROMES4LOC option from R&S®ROMES can be used to accurately locate all relevant types of base stations (GSM, WCDMA, LTE, CDMA2000®, EVDO, WiMAX™, TETRA).

Specifications

GPS receiver

GPS chipset	u-blox LEA-6R
Number of channels	50
Sensitivity ¹⁾	typ. -160 dBm
Update rate	1 Hz
Accuracy ²⁾	typ. 2.5 m CEP
Startup time ³⁾	
Cold start	typ. < 32 s
Hot start	typ. < 3 s

Physical characteristics

Operating temperature range	0°C to +50°C
Power consumption at 5 V	450 mW

Connectors

GPS antenna (GPS ANT)	SMA
PPS output (PPS OUT)	SMA
Sensor input for ADR (SENSOR IN)	ODU MINI-SNAP (6-pin)
USB (signal and voltage supply)	type B

¹⁾ Sensitivity with supplied antenna, for "acquisition and reacquisition" and tracking. Cold start requires higher signal level.

²⁾ Circular error probability (CEP): radius of a horizontal circle at the true antenna site that includes 50% of all position calculations.

³⁾ Measured with good satellite view and -130 dBm signal level.

Ordering information

Designation	Type	Order No.
GPS Module	R&S®TSMX-PPS2	1515.7120.02
Includes: GPS module, active GPS antenna, USB cable, SMA/BNC adapter for PPS connector, open-ended sensor cable for connecting to vehicle speed/direction sensors		
Radio network analyzer		
Quad Tech Drive Test Receiver	R&S®TSMQ	1153.6000.50
CDMA Radio Network Analyzer	R&S®TSML-C	1153.6000.12
GSM Radio Network Analyzer	R&S®TSML-G	1153.6000.13
WCDMA Radio Network Analyzer	R&S®TSML-W	1153.6000.11
CW Radio Network Analyzer	R&S®TSML-CW	1153.6000.15
GSM WCDMA Radio Network Analyzer	R&S®TSML-GW	1153.6000.20
Radio Network Analyzer	R&S®TSMU	1153.6000.02
WCDMA PN Scanner Option for R&S®TSMU	R&S®TSMU-K11	1153.4550.02
CDMA PN Scanner Option for R&S®TSMU	R&S®TSMU-K12	1153.4608.02
GSM Network Scanner Option for R&S®TSMU	R&S®TSMU-K13	1153.4572.02
Software		
Drive Test Software Platform	R&S®ROMES4	1117.6885.04
Driver for BTS Positioning	R&S®ROMES4LOC	1117.6885.32
Driver for R&S®TSMU, R&S®TSML, R&S®TSMQ Scanner	R&S®ROMES4T1Q	1117.6885.40

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