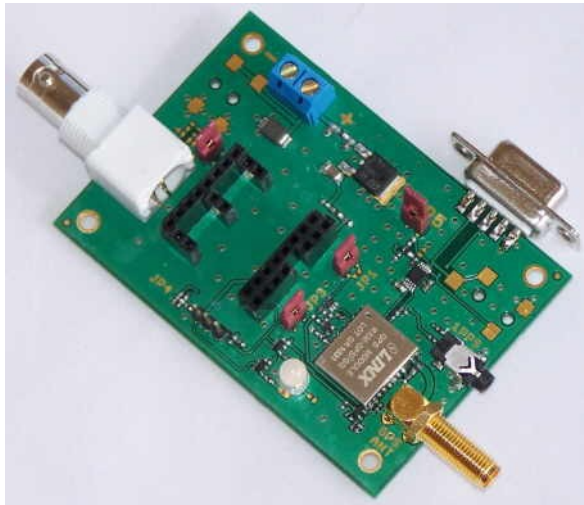


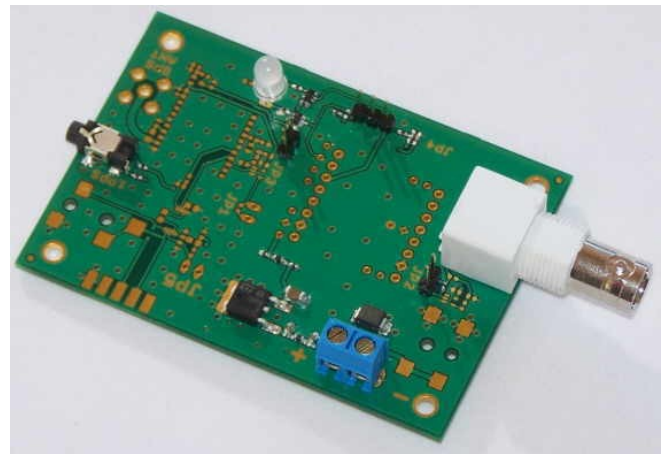
## RS-TBGGO

### Test board for RS-GGOxx modules

The RS-TBGGO is suited for testing of all RS-GGOxx modules, the TCXO based RS-GGOxx-T(2) and RS-GGOxx-T(2)G as well as the OCXO based RS-GGOxx-O and RS-GGOxx-OG. It can also be used as a sub-board for integration of the RS-GGOxx modules into systems.



RS-TBGGO



RS-TBGGO-NGS

#### Benefits and Features:

- Testing and debugging of RS-GGOxx-T\_, RS-GGOxx-O\_ and RS-GGOxx-T2\_ modules
- Ideal for incoming inspection
- Ease of determining and locating problems in production
- Common platform for design-in and trouble shooting support
- Integration into systems
- optional integrated GPS receiver

The RS-TBGGO is supplied without an RS-GGOxx and the user has to decide what version is desired. The RS-GGOxx can either be directly soldered onto the board (-\_S) or sockets can be installed (or are installed) to enable easy exchange of the modules.

**Preparation:**

RS-TBGGO is supplied either with installed sockets for the DUT or with loose sockets (-\_S). The later version can be used with a soldered in RS-GGOxx or the supplied sockets can be used to make it a test fixture for these modules. The sockets have to be soldered in as shown. For the single pins of the RS-GGOxx-T\_ and RS-GGOxx-O\_ dual sockets are supplied. The unused position has to be inwards. Push the sockets on an RS-GGOxx module, insert into the board and solder all pins. This will make sure that they are correctly aligned. Both footprint sockets can be installed at the same time.

**Jumpers:**

Before making any connections to the board the jumpers have to be set to the desired configuration. ON means that the jumper is shorting the pins of the connector, OFF is no jumper inserted.

Jumper 1 (JP1): ON connects the 1PPS output of the on-board GPS receiver to the input of the RS-GGOxx. In OFF position the 1PPS signal has to be applied via the 2.5mm coaxial connector labeled 1PPS. The 1PPS signal has to have 3.3V CMOS level. With the jumper in ON position the internal 1PPS signal can be monitored at this connector. The 1PPS connector pinout is tip=+5V, centre=1PPS, ring=GND.

**Caution:** for RS-GGOxx-yG JP1 has to be in the OFF position! The 1PPS signal of the integrated GPS can be monitored at the 1PPS connector. Never have the on-board GPS connected (JP1 closed = ON) when an RS-GGOxx-yG module is tested!

Jumper 2 (JP2): ON = RF output is DC coupled (~3.3V CMOS). OFF = output is AC coupled (~3.3Vpp).

Jumper 3 (JP3): ON = LED mode, OFF = 2-wire mode. This jumper can be changed during operation.

Jumper 4 (JP4): this is not a jumper but the I/O for the 2-wire bus. The pin close to the JP4 label is SCL, centre is GND and the remaining pin is SDA. Pull-up resistors are installed.

Jumper 5 (JP5): ON turns the on-board RS232 level converter on, OFF turns it off. This RS232 connection allows reading from and writing to the on-board GPS module. For test software please download the appropriate programs from <http://www.linxtechnologies.com/Support/Software> (GPS Master Development Software). The command list can be found on the same site (model RXM-GPS-SG).

**Connections:**

Once an RS-GGOxx is installed and all jumpers are in the desired position only few connections have to be made. For RS-TBGGO connect an active GPS antenna (3.3V supply at max. 35mA) to the SMA connector labeled GPS\_ANT and for RS-TBGGO-NG a 1PPS signal to the connector labeled 1PPS. Testing an RS-GGOxx-yG requires that the GPS antenna is attached directly to the U.FL connector at the bottom of the module!

Connect an 8-12VDC power supply to the Euro-style board-edge connector (+ and -) and whatever test equipment you want to use to the BNC output connector.

Except for the RS-GGO10-O\_ DO NOT connect directly to a 50Ω load as the output is specified at 10kΩ //15pF!

If the LED is enabled it will initially be red until a stable 1PPS signal is detected. Then it will turn amber (yellow) during acquisition and finally it will turn green once full lock is achieved.

**CAUTION:** When testing RS-GGOxx-T\_ make sure to cover the DUT with insulating material. Due to the extreme improvements achieved with the GPS lock these circuits are sensitive to airflow and vibration. RS-GGO10-O\_ are less sensitive but sudden changes of the ambient temperature can also lead to offsets.

**Available models:**

RS-TBGGO	includes GPS receiver and all I/O's, For all models of RS-GGOxx
RS-TBGGO-S	includes GPS receiver and all I/O's, For all models of RS-GGOxx, sockets not installed
RS-TBGGO-NG	no GPS receiver nor RS232 interface. For -xG versions or with external GPS receiver
RS-TBGGO-NGS	no GPS receiver nor RS232 interface. For -xG versions or with external GPS receiver, sockets not installed



All RF-SUISSE product comply with RoHS requirements current at the date of manufacturing.

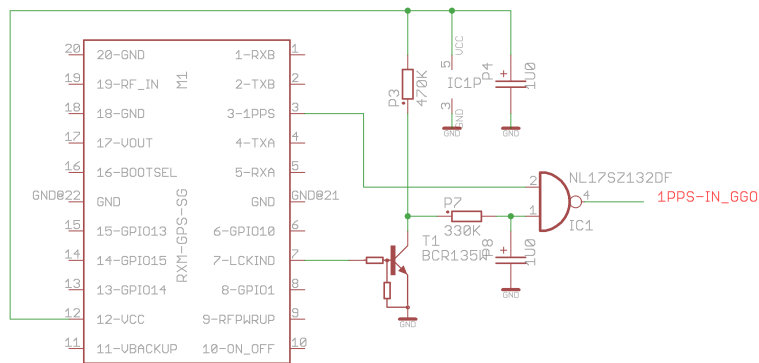
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All product manufactured and sold by INWAVE AG under the RF-SUISSE brand is intended for laboratory use or are components (modules) not suitable for consumer use. Thus they are not required to and do not carry CE certification.

Inquiries, quote requests and questions: please email to [info@rf-suisse.ch](mailto:info@rf-suisse.ch) or your INWAVE AG / RF-SUISSE representative. For technical questions please email to [tech@rf-suisse.ch](mailto:tech@rf-suisse.ch)

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**NOTE:** with a special circuit to detect a missing GPS signal the RS-TBGGO will turn off the 1PPS signal despite the fact that the GPS module is build with a CSR/SiRF GPS IC. This is a solution for some of the modules available on the market. (NL17SZ132SZ = 74LX1G132CTR = M74VHC1G132DF = MC74VHC1G132DF)



## Specifications

### GPS receiver (RS-TBGGO only):

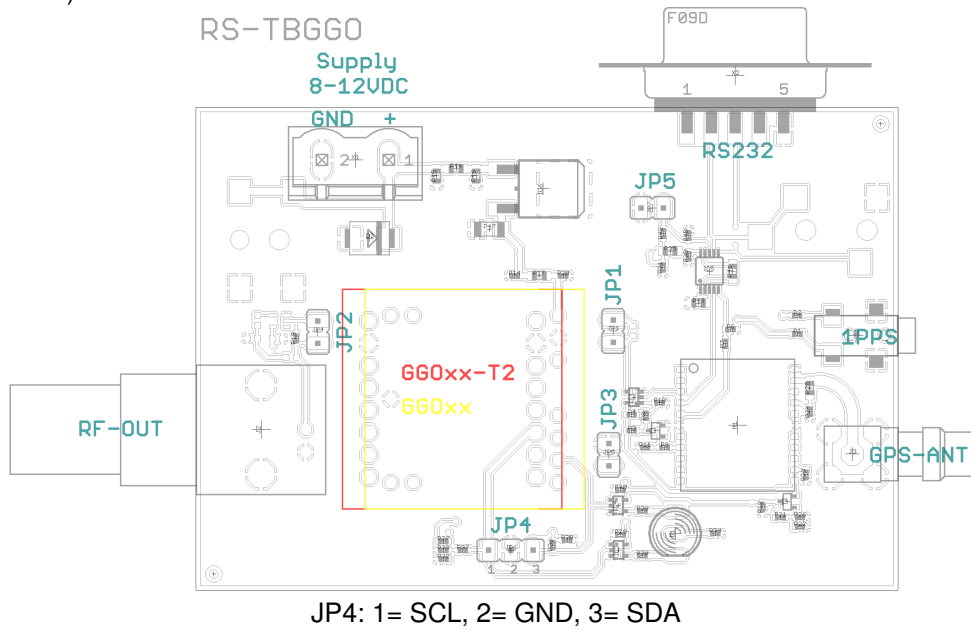
Receiver type :	20 Channels; GPS L1 frequency, C/A Code	
Time-To-First-Fix:	Cold Start (Autonomous):	35s
	Hot Start (outdoor):	2s
	Hot Start (indoor):	15s
Sensitivity:	Tracking & Navigation:	-159 dBm
	Cold Start (Autonomous):	-144 dBm
Horizontal position accuracy:	Autonomous:	< 10 m
	SBAS:	< 5 m
Time Pulse:	1Hz, 1 $\mu$ s width positive pulse, 1 $\mu$ s accuracy to GPS time pulse	
Max navigation update rate:	1Hz	
Operational limits:	Altitude	60000ft
	Velocity	1000 knots

### General:

DUT sockets:	-T and -T2 socket configuration for -T, -T2, -O, -TG, -OG, -T2 and -T2G
Output:	AC or DC coupled, jumper selectable
2-wire interface:	3-pin connector. 1= SCL, 2= GND, 3= SDA. Pull-up resistors integrated
RS232:	full level RS232 with enable for GPS module. D-sub 9-pin female connector. TXD= pin 2, RXD=pin 3, GND=pin 5 *)
1PPS I/O:	2.5mm audio socket. Tip=+5VDC, ring=1PPS, case=GND
Supply voltage:	8-15VDC via 2-pole terminal connector
Dimension:	80*51mm
Accessories (included):	U.FL to SMA-female cable (for -_G models), ~15cm long
	2* 8-pin, 1*4-pin, 1*3-pin, 3*2-pin sockets (-_S models only)
	2.5mm audio plug (for 1PPS connector)
Accessories (required):	8-12VDC power supply
	RS232 cable (for GPS module only)

\*) some terminal programs require additional connections which have to be made externally: pin 1+4+6 and pin 7+8

PCB (RS-TBGGO):



PCB (RS-TBGGO-NG):

