

Multiband GNSS Receiver Board

M-GNSSB-RX Previously named SI-L1000301 Multiband GNSS Receiver

Overview

The M-GNSSB-RX receiver board operates over GNSS bands L1 and B1 and is biased from a 3.3V d.c. supply connected at J4_1, with ground connected to J4_3. As it typically draws only 25mA, it can easily be run from a 3V battery supply. An RS485 option is fitted on the board and requires an additional 5V d/c power supply.



Features

- Operation over GNSS bands L1 and B1.

Applications

- Transportation.
 - Road user.
 - Rail operators.
 - Harbour traffic.
 - HGVs and logistics fleets.
- Defence.
- Hiking.
- Urban canyons (tall buildings).

Receiver Schematic

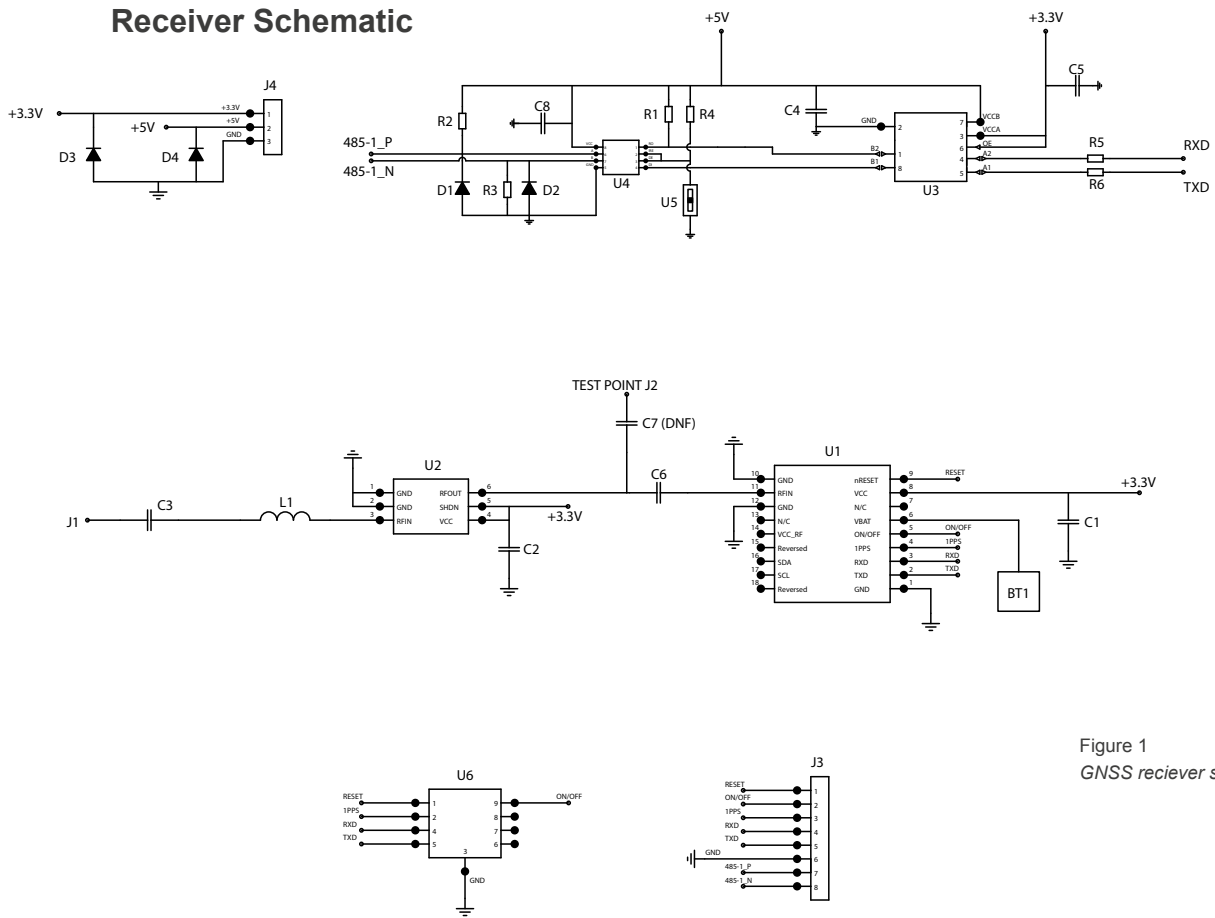


Figure 1
GNSS receiver schematic

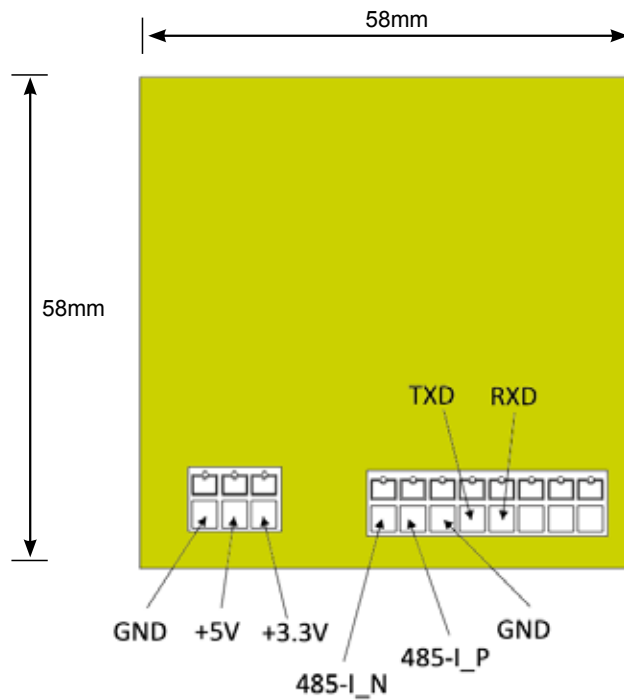


Figure 2
Receiver dimensions

Bill of Materials

| Designator | Description |
|----------------|---|
| BT1 | S8421-45R, Backup Battery Coin Cell Holder, Suitable for CR2032 |
| C1 | 10uF 0805, 10%, 6.3 V, X5R |
| C2, C4, C5, C8 | 0.1uF 0402, 10%, 6.3 V, X5R |
| C3, C6 | 27pF 0402, 10%, 6.3 V, X5R |
| D1, D2 | SMAJ15A-E3/5A, Transient Voltage Suppressor |
| D3, D4 | SMAJ6.0A-E3/61, Transient Voltage Suppressor |
| J1 | SMA connector - DC - 18GHz |
| J3 | 8-pin Terminal Block, 3.5mm pitch, 24-16 AWG |
| J4 | 3-pin Terminal Block, 3.5mm pitch, 24-16 AWG |
| L1 | 6.8nH inductor |
| R1, R4 | 10kR 0603, 1% |
| R2, R3 | 1kR 0603, 1% |
| R5, R6 | 0R 0603, 1% (required for RS485 output only) |
| U1 | ATGM336H-5N |
| U2 | AT2659 |
| U3 | TXS0102DCUR, 2-Bit Bidirectional Voltage-Level Translator for Open-Drain and Push-Pull Applications |
| U4 | LTC1483IS8 |
| U5 | A6S1101H , DIP Switch, 1 circuit, SPST, SMD, 24 VDC |
| U6 | TVS diode, 3.3 V reverse stand-off voltage, ESD/EFT/Surge protection |

GNSS Receiver

The receiver is biased from a 3.3V d.c. supply connected at J4_1 with ground connected to J4_3 and a 5V supply connected at to J4_2 if an RS485 output is required. As it typically draws only 25mA, it can easily be run from a battery supply. The positional output information comes in RS485 format and appears on PIN 7(P) and PIN 8(N) of J3 (J3_7, J3_8). For UART output, J4_2 must be connected with components R5 and R6 removed and signals can be received on pins J4_4 and J4_5. No digital decoding is performed on this board.

The data, which is outputted in binary format, can be translated into an ASCII string and will be of the form:-
\$GPGGA,HHMMSS.SS,DDMM.MMMMM,K,DDDMM.MMMMM,L,N,QQ,PP.P,AAAA.AA,M,±XX XX,M,SSS,RRRR*CC
where:

| Message Component | Description |
|-------------------|--|
| \$AAAAA | Specific satellite system used |
| HHMMSS.SS | UTC time in hours, minutes, and seconds of the position |
| DDMM.MMMMM | Latitude in degrees, minutes, and decimal minutes |
| K | Latitude indicator; value is N (North latitude) or S (South latitude) |
| DDDMM.MMMMM | Longitude in degrees, minutes, and decimal minutes |
| L | Longitude indicator; value is E (East longitude) or W (West longitude) |
| N | Quality indicator; value is: 0 = no position 1 = undifferentially corrected position (autonomous) 2 = differentially corrected position (SBAS, DGPS, L-band DGPS service, L-Dif and e-Dif) 4 = RTK fixed integer (Crescent RTK, Eclipse RTK), L-band high precision services converged 5 = RTK float, L-band high precision services converging |
| QQ | Number of satellites used in position solution |
| P.P | Horizontal dilution of precision (HDOP) |
| A.A | Antenna altitude, in meters, re: mean-sea-level (geoid) |
| M | Units of antenna altitude (M = meters) |
| G.G | Geoidal separation (in meters) |
| M | Units of geoidal separation (M = meters) |
| SSS | Age of differential corrections, in seconds |
| RRRR | Differential reference station ID |
| *CC | Checksum |
| <CR> | Carriage return |
| <LF> | Line fee |

The input of the antenna should be connected to J1 on the receiver board.

Reference Pictures

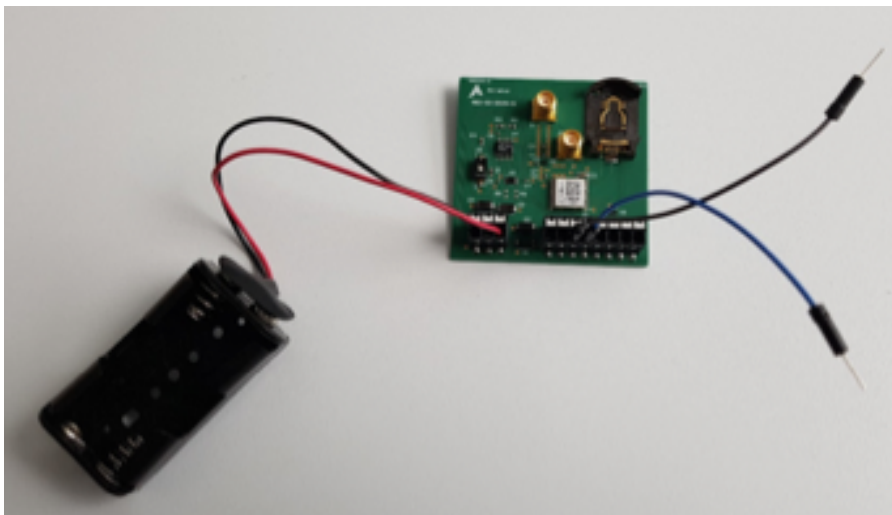


Figure 4
Receiver Board with Battery
Supply connected and Output
Cables (UART output)

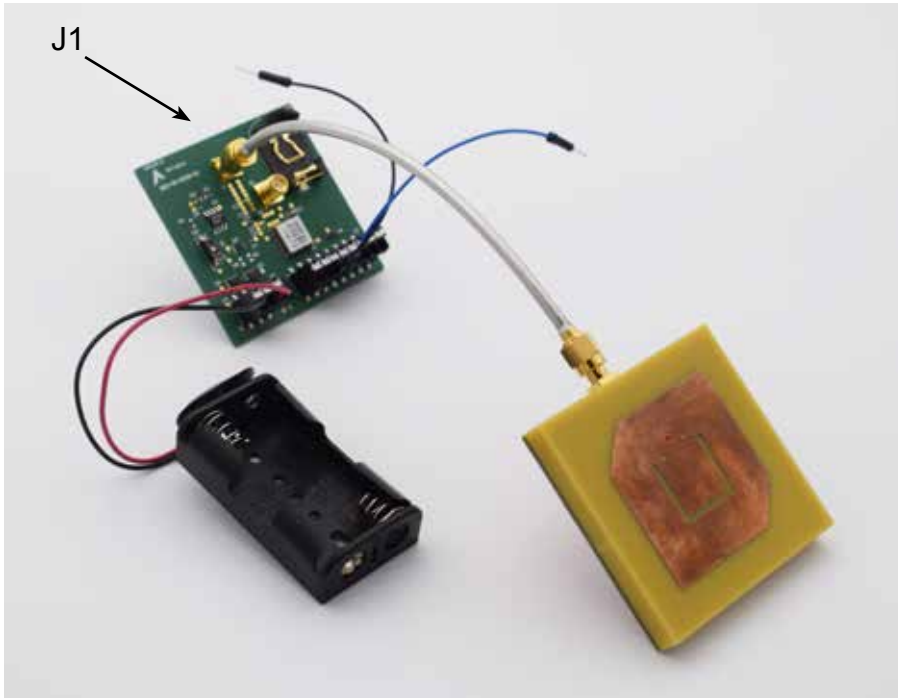


Figure 5
Antenna Connection
The input of the antenna should be connected to J1 on the receiver board.

Disclaimer

The information contained herein is believed to be reliable; however, Arralis makes no warranties regarding the information and assumes no responsibility or liability whatsoever for the use of the information contained herein. All information is subject to change without notice, therefore customers should obtain the latest relevant information before placing orders for Arralis products. The information contained herein does not grant, explicitly or implicitly, to any party any patent rights, licenses, or any other intellectual property rights.

This information does not constitute a warranty with respect to the product described, and Arralis disclaims any and all warranties either expressed or implied, relating to sale and/or use of Arralis products including liability or warranties relating to fitness for a particular purpose, consequential or incidental damages, merchantability, or infringement of any patent, copyright or other intellectual property right.

Without limiting the generality of the foregoing, Arralis products are not warranted or authorised for use as critical components in medical, life-saving, or life-sustaining applications, or other applications where a failure would reasonably be expected to cause severe personal injury or death.

Copyright 2021 © Arralis

| | | | | | |
|---|----------------|------------|-------------------------|-----------|-------------|
|  | GNSS Datasheet | M-GNSSB-RX | Issue date: 30 April 21 | DOC REV 3 | Page 6 of 7 |
|---|----------------|------------|-------------------------|-----------|-------------|

©2021 Arralis Ltd. All rights reserved. Trademarks and registered trademarks are the property of their respective owners.

Arralis European Offices
t: +(44) 1793 239670 (UK)
e: sales@arralis.com

arralis.com

Arralis USA Office
+(1) 386 301 3249 (USA)
e: emilie.wren@arralis.com

| | | | | | |
|---|-----------------------|-------------------|-------------------------|------------------|-------------|
|  | GNSS Datasheet | M-GNSSB-RX | Issue date: 30 April 21 | DOC REV 3 | Page 7 of 7 |
|---|-----------------------|-------------------|-------------------------|------------------|-------------|

No licence is granted under any patent or any patent rights of Arralis. Information furnished by Arralis is believed to be accurate. No responsibility is assumed by Arralis for its use, nor for any infringements on the rights of other parties that may result for the use of the information herein. All specifications are subject to change without notice.