

위성신호보정기지국 이용 가이드

TRIMBLE BD982 GNSS Receiver



GNSS Module

Performance specifications

Feature	Specification
Measurements	<ul style="list-style-type: none"> Position antenna based on a 220-channel Maxwell 6 chip: <ul style="list-style-type: none"> GPS: Simultaneous L1 C/A, L2E, L2C, L5 GLONASS: Simultaneous L1 C/A, L1 P, L2 C/A (GLONASS M Only), L2 P SBAS: Simultaneous L1 C/A, L5 GALILEO: Simultaneous L1 BOC, E5A, E5B, E5AltBOC BeiDou: Simultaneous B1, B2 QZSS: Simultaneous L1 C/A, L1 SAIF, L2C, L5 L-Band OmniSTAR VBS, HP, and XP Vector antenna based on a second 220-channel Maxwell 6 chip: <ul style="list-style-type: none"> GPS: Simultaneous L1 C/A, L2E, L2C GLONASS: Simultaneous L1 C/A, L1 P, L2 C/A, L2 P BeiDou: Simultaneous B1 Advanced Trimble Maxwell 6 Custom Survey GNSS Technology High precision multiple correlator for GNSS pseudorange measurements Unfiltered, unsmoothed pseudorange measurements data for low noise, low multipath error, low time domain correlation and high dynamic response Very low noise GNSS carrier phase measurements with <1 mm precision in a 1 Hz bandwidth Signal-to-Noise ratios reported in dB-Hz Proven Trimble low elevation tracking technology
Code differential GPS positioning accuracy ¹	0.25 m + 1 ppm Horizontal 0.50 m + 1 ppm Vertical
SBAS accuracy ²	<5 m 3DRMS
RTK positioning accuracy (<30 km)	Horizontal: $\pm(8 \text{ mm} + 1 \text{ ppm})$ RMS Vertical: $\pm(15 \text{ mm} + 1 \text{ ppm})$ RMS Heading: 2 m baseline <0.09°; 10 m baseline <0.05°
Initialization time	Typically, less than 10 seconds

Physical specifications

Feature	Specification
Dimensions (L x W x H)	100 mm x 84.9 mm x 11.6 mm
Vibration	MIL810F, tailored Random 6.2 gRMS operating Random 8 gRMS survival
Mechanical shock	MIL810D ±40 g operating ±75 g survival
I/O connector	40-pin header (Samtec TMM-120-03-L-D) (Rated for 1000 cycles)
Antenna connector	2 x MMCX receptacle (Huber-Suhner 82MMCX-50-0-1/111) (Rated for 500 cycles); mating connectors are MMCX plug (Suhner 11MMCX-50-2-1C) or right-angle plug (Suhner 16MMCX-50-2-1C, or 16MMCX-50-2-10)

Electrical specifications

Feature	Specification
Voltage	3.3 V DC +5%/-3%
Power consumption	Typically, 2.1 W (L1/L2 GPS) Typically, 2.2 W (L1/L2 GPS and G1/G2 GLONASS) Typically, 3.1 W (L1/L2/L5 GPS, G1/G2 GLONASS, B1/B2 BeiDou, L1/E5 Galileo) Typically, 3.4 W (L1/L2/L5 GPS, G1/G2 GLONASS, B1/B2 BeiDou, L1/E5 Galileo, OmniSTAR/SPOT) Note – These values were characterized using v4.84 firmware.
Minimum required LNA gain	32.5 dB Note – This receiver is designed to operate with the Zephyr Model 2 antenna which has a gain of 50 dB. Higher-gain antennas have not been tested.

Environmental specifications

Feature	Specification
Temperature	Operating: -40°C to 75°C (-40°F to 167°F) Storage: -55°C to 85°C (-67°F to 185°F)
Vibration	MIL810F, tailored Random 6.2 gRMS operating Random 8 gRMS survival
Mechanical shock	MIL810D +/- 40 g operating +/- 75 g survival
Operating humidity	5% to 95% R.H. non-condensing, at +60°C (140°F)

Communication specifications

Feature	Specification
Communications	<div>1 LAN port</div> <ul style="list-style-type: none"> Supports links to 10BaseT/100BaseT networks. All functions are performed through a single IP address simultaneously – including web interface access and data streaming. <div>4 x RS-232 ports Baud rates up to 460,800</div> <div>1 USB 2.0 port</div>
Receiver position update rate	1 Hz, 2 Hz, 5 Hz, 10 Hz, 20 Hz and 50 Hz positioning
Correction data input	CMR, CMR+™, sCMRx, RTCM 2.0–2.3, RTCM 3.0, 3.1
Correction data output	CMR, CMR+, sCMRx, RTCM 2.0 DGPS (select RTCM 2.1), RTCM 2.1–2.3, RTCM 3.0
Data outputs	1PPS, NMEA, Binary GSOE, ASCII Time Tags

APPENDIX

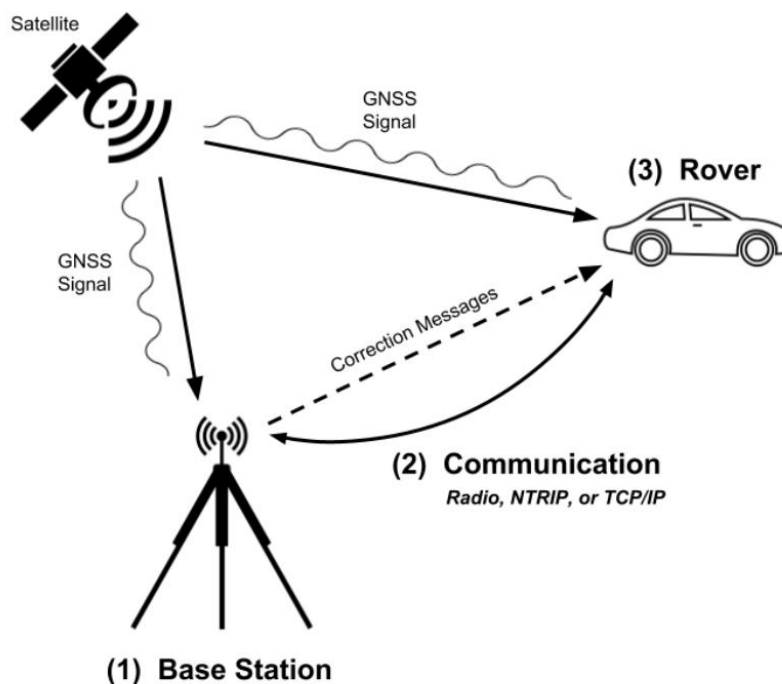
Test Environments

feature	Specification
Device	GNSS Receiver: ublox C94-M8P
PC	CPU: i5-8250U CPU@1.60GHz 1.8GHz Memory: 16.0GB
OS	Windows 10 Home x64
Software	u-center 20.01v
Internet	LTE, Wi-Fi, TCP/IP
Protocol	NMEA, RTCM3.x



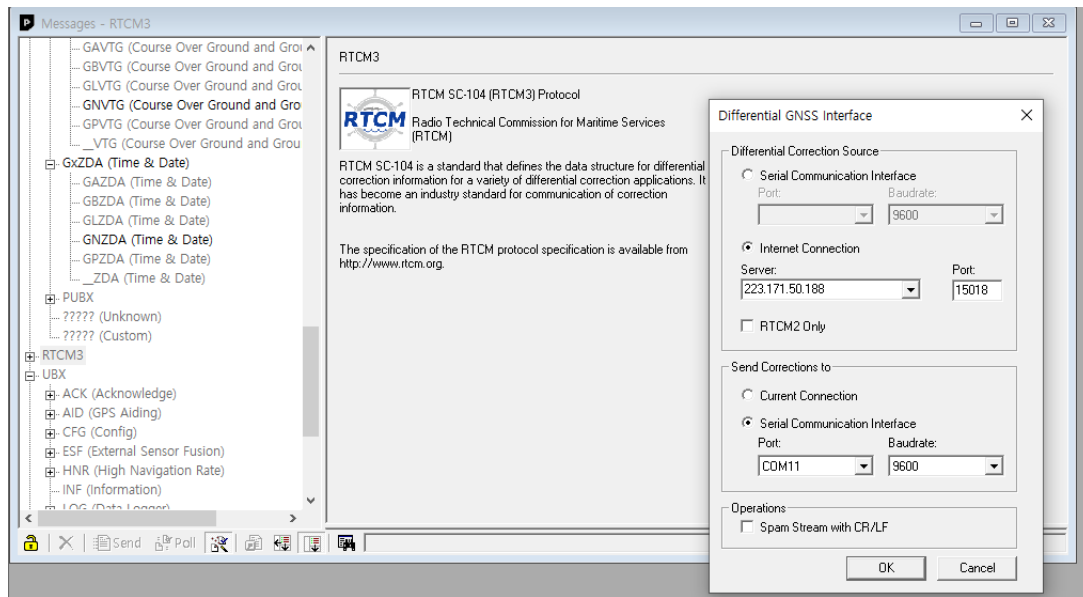
<테스트 환경 구성>

1. 위성신호보정기지국(Base station)은 고정된 위치에서 Rover station 에게 위성보정신호를 전송한다.

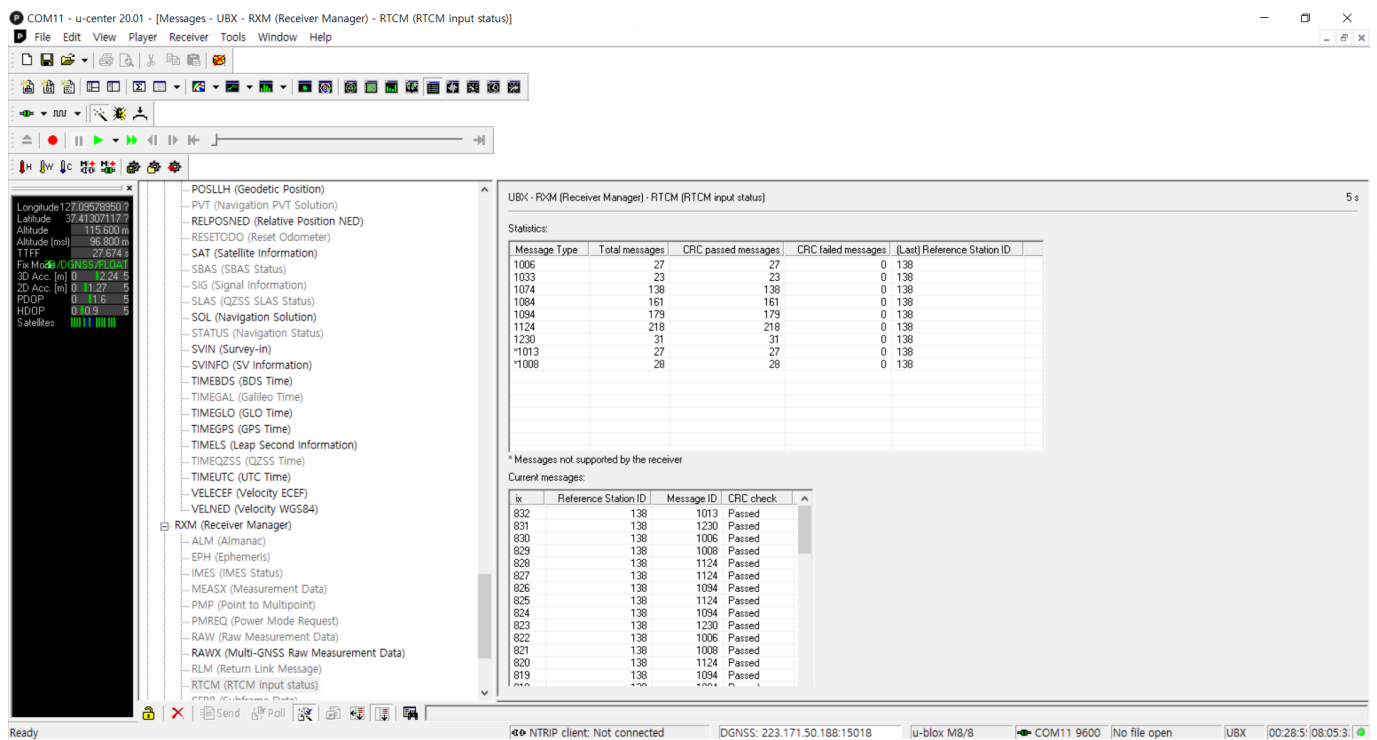


2. Rover station 의 위성수신기는 보정된 신호를 전달받기 위하여 아래의 주소로 접속을 한다.

- TCP/IP 223.171.50.188:15018



3. 접속완료 후 시계열이 확보되는 지역에서 RTCM 메시지 및 위성 수신상태를 확인한다.



4. RTK 수신 정보를 확인한다.

COM11 - u-center 20.01 - [Messages - NMEA - GxGGA (Global Positioning System Fix Data)]

File Edit View Player Receiver Tools Window Help

Longitude 127.086734007
Latitude 37.4130669007
Altitude 110.600 m
Altitude (msl) 91.800 m
TTFF 22.674 s
Fix Mode 2D/3D
3D Acc. [m] 0 14.6810
2D Acc. [m] 0 9.18 10
PDOP 0 1.5 5
HDOP 0 1.1 5
Satellites 00 01 00 00

NMEA

- GxDTM (Datum Reference)
- GxGBS (Satellite fault Detection)
- GxGGA (Global Positioning System Fix Data)
 - GAGGA (Global Positioning System Fix Data)
 - GBGGA (Global Positioning System Fix Data)
 - GLGGA (Global Positioning System Fix Data)
 - GNGGA (Global Positioning System Fix Data)
 - GPGGA (Global Positioning System Fix Data)
 - _GGA (Global Positioning System Fix Data)
- GxGLL (Geographic Position - Latitude/Longitude)
 - GAGLL (Geographic Position - Latitude/Longitude)
 - GBGLL (Geographic Position - Latitude/Longitude)
 - GLGLL (Geographic Position - Latitude/Longitude)
 - GNGLL (Geographic Position - Latitude/Longitude)
 - GPGLL (Geographic Position - Latitude/Longitude)
 - _GLL (Geographic Position - Latitude/Longitude)
- GxGNS (GNSS Fix Data)
- GxGRS (GNSS Range Residuals)
- GxGSA (GNSS DOP and Active Satellites)
 - GAGSA (GNSS DOP and Active Satellites)
 - GBGSA (GNSS DOP and Active Satellites)
 - GLGSA (GNSS DOP and Active Satellites)
 - GNGSA (GNSS DOP and Active Satellites)
 - GPGSA (GNSS DOP and Active Satellites)
 - _GSA (GNSS DOP and Active Satellites)
- GxGST (GNSS Pseudorange Error Statistics)
 - GAGST (GNSS Pseudorange Error Statistics)
 - GBGST (GNSS Pseudorange Error Statistics)
 - GLGST (GNSS Pseudorange Error Statistics)
 - GNGST (GNSS Pseudorange Error Statistics)
 - GPGST (GNSS Pseudorange Error Statistics)
 - _GST (GNSS Pseudorange Error Statistics)

NMEA - GxGGA (Global Positioning System Fix Data) 1 s

Parameter	Value	Unit	Description
UTC	080228.00	hhmmss.sss	Universal time coordinated
Lat	3724.78330	ddmm.mmmm	Latitude
Northing Indicator	N		N=North, S=South
Lon	12705.74404	ddmm.mmmm	Longitude
Easting Indicator	E		E=East, W=West
Status	5		0=Invalid, 1=2D/3D, 2=DGNSS, 4=Fixed RTK, 5=Float RTK, 6=Dead Reckoning
SVs Used	12		Number of SVs used for Navigation
HDOP	1.10		Horizontal Dilution of Precision
Alt (MSL)	91.8	m	Altitude (above means sea level)
Unit	M		M=Meters
Geoid Sep.	18.8	m	Geoid Separation = A(HAE) - A(MSL)
Unit	M		M=Meters
Age of DGNSS Corr	1.0	s	Age of Differential Corrections
DGNSS Ref Station	0138		ID of DGNSS Reference Station

Ready

NTRIP client: Not connected DGNSS: 223.171.50.196:15018 u-blox MB/8 COM11 9600 No file open UBX 00:25:51 08:02:21