

# GNSS - Unicorecomm UB482/UB4B0M

GPS/BDS/GLONASS/Galileo All-constellation and Multi-frequency Receiver.

[#gnss](#)

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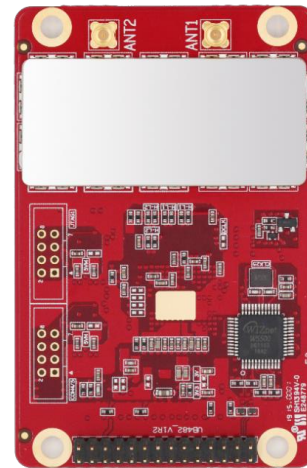
## 1. UB482

UB482 is a classic compact high-precision board developed by Unicore Communications, Inc., targeting precision agriculture, robots and intelligent drive applications. It supports all-constellation multi-frequency RTK and heading.

The UB482 can provide reliable centimeter-level accuracy and high accuracy heading output at high update rate.



*UB482 - front*



*UB482 - rear*

### Key features

- All-constellation multi-frequency high-precision RTK and heading board, support BDS B1I/B2I + GPS L1/L2+GLONASS L1/L2+Galileo E1/E5b+QZSS L1/L2
- Precise RTK positioning and heading
- Fast RTK Initialization time < 5s. As tested, RTK Float status is acquired in 5s, but RTK Fix status needs more time.
- 20Hz data output rate
- Adaptive recognition of RTCM input data format
- Support LAN
- Support odometer input and external high-performance IMU interface (still no document provided for using with external IMU)

### Accuracy

- Single point: H = 1.5 m, V = 2.5 m
- DGPS & SAAB: H = 0.4 m, V = 0.8 m
- RTK: H = 1 cm, V = 1.5 m (RTK Fix only)

### Connectivity

- 3 x UART (UART1 is required for firmware update)
- 1 x I2C
- 1 x SPI
- 1 x Event Input
- 1 x PPS Output
- 1 x LAN
- 2 x MMCX Antennas

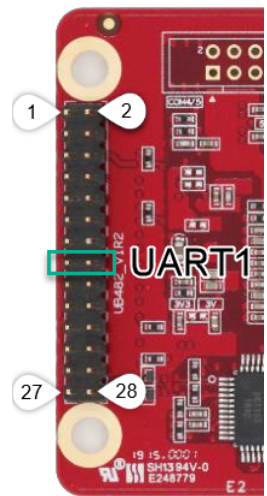
## Header/Jumper

The 28-pin male connector in format of 2 x 14 Dual Row, 2.0 mm pitch. Beware of the pin pitch and head width.

## Operation conditions

All I/O pins are LV-TTL Level.

The module needs a stable power source, from 3.3 V to 5 V, with ripple rate is < 50 mA. Be aware that if connect to 3.3 V power, the drop voltage may happen and board will not work.

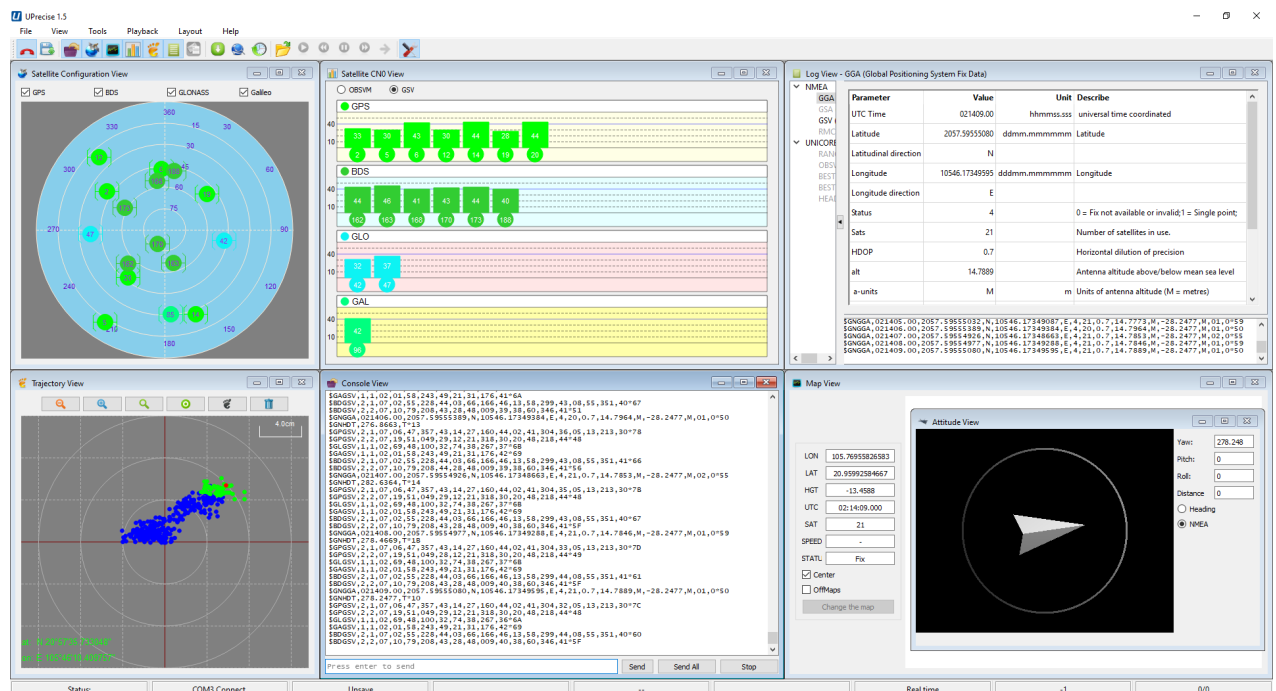


UB482 Pins

It is recommended to use a power chip with current output capacity greater than 2A to power the board. Power consumption may reach 2.6 W.

## 2. UPrecise GUI

UPrecise software provides a graphical interface to control and display the operation of the receiver.



UPrecise GUI

Right after connecting to the board through a UART port, UPrecise sends some commands as below:

```
unlog      # stop print out all logs
gngga 1    # log position
gngsv 1    # log satellite in view
```

## 3. Commands

### 3.1. Reset

Factory reset, clear all user configurations:

```
freset
```

System reset:

```
reset
```

### 3.2. Information

Read version:

```
versiona
```

```
#VERSIONA,90,GPS,FINE,2171,345750000,0,0,18,28;"UB482","R3.00Build20655","B123G12R12E15
HRBMDFS0011N1-S20-P20-A3L:2120/Jan/6","2330319000062-
GN1201212700556","1432034796888","2019/Aug/27"*cf090e25
```

Check antennas:

```
antennaa
```

```
#ANTENNAA,COM2,0,93.0,FINE,2171,347565.800,793915,4,18;ON,ON,OFF,0*ff8fa62e
```

### 3.3. Configuration

Get current settings:

```
config
```

```
$command,config,response: OK*54
$CONFIG,COM1,CONFIG COM1 115200*23
$CONFIG,COM2,CONFIG COM2 115200*23
$CONFIG,COM3,CONFIG COM3 115200*23
```

```
$CONFIG,PPS,CONFIG PPS ENABLE GPS POSITIVE 500000 1000 0 0*6E
$CONFIG,INS,CONFIG INS DISABLE*70
$CONFIG,INS,CONFIG INS ANGLE 0,0,0*75
$CONFIG,INS,CONFIG INS ALIGNMENTVEL 5.0*2F
$CONFIG,INS,CONFIG INS TIMEOUT 200*6D
$CONFIG,INS,CONFIG IMUTOANT OFFSET 0 0 0 0 0 0*6C
$CONFIG,INS,CONFIG IMUTOANT2 OFFSET 0 0 0 0 0 0*5E
$CONFIG,INS,CONFIG INSSOL OFFSET 0.0 0.0 0.0*77
$CONFIG,UNDULATION,CONFIG UNDULATION AUTO*2B
$CONFIG,EVENT,CONFIG EVENT DISABLE*70
$CONFIG,DGPSTIMEOUT,CONFIG DGPS TIMEOUT 300*37
$CONFIG,RTKTIMEOUT,CONFIG RTK TIMEOUT 100*35
$CONFIG,HEADING,CONFIG HEADING FIXLENGTH*6F
$CONFIG,PSRSMOOTH,CONFIG PSRSMOOTH DISABLE*70
```

Save settings:

```
saveconfig
```

Get current mode:

```
mode
```

```
#MODE,94,GPS,FINE,2171,345803000,0,0,18,982;mode rover,HEADINGMODE FIXLENGTH*2F
```

### 3.4. NMEA Messages

Get Position:

```
gngga <period>
```

Get satellites in view:

```
gngsv <period>
```

Get heading:

```
gphdt <period>
```

Get timestamp:

```
gnrmc <period>
```

## 4. Rover mode

Here is a test for Rover to check the accuracy.

By default, after factory reset, receiver will work in Rover Dynamic mode, which is the same as the below config:

```
mode rover
```

The receiver will automatically start RTK positioning when receiving correction data from any serial ports.

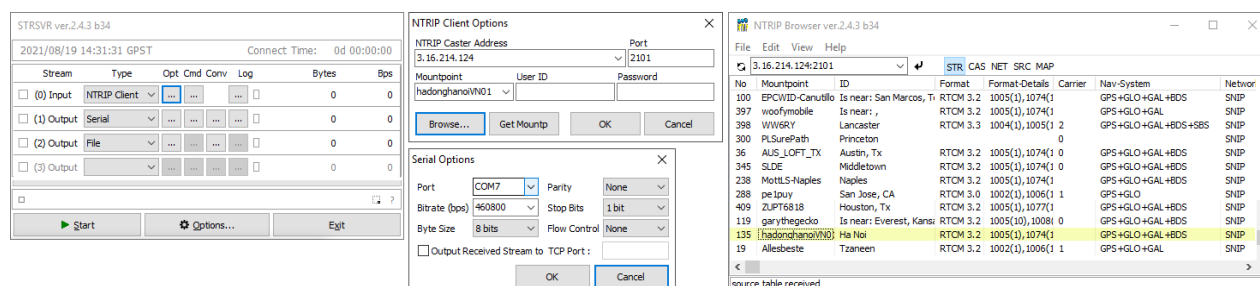
### 4.1. Setup NTRIP client

The site hosts free mount points for NTRIP casters. Accessing will get a list of casters. A NTRIP client can access to its via either URL at **rtk2go.com:2101** or via IP Address at **3.16.214.124:2101**.

The open source has a tool **STRSVR** to stream NTRIP data from a caster. It firstly lists the available mount points to select, and then can forward the data stream to the UB482's COM2 (displayed as a COMx in host PC).

**i** The COM2 has to be set at high baudrate to be able to get correction message quickly:

```
config com2 460800
```

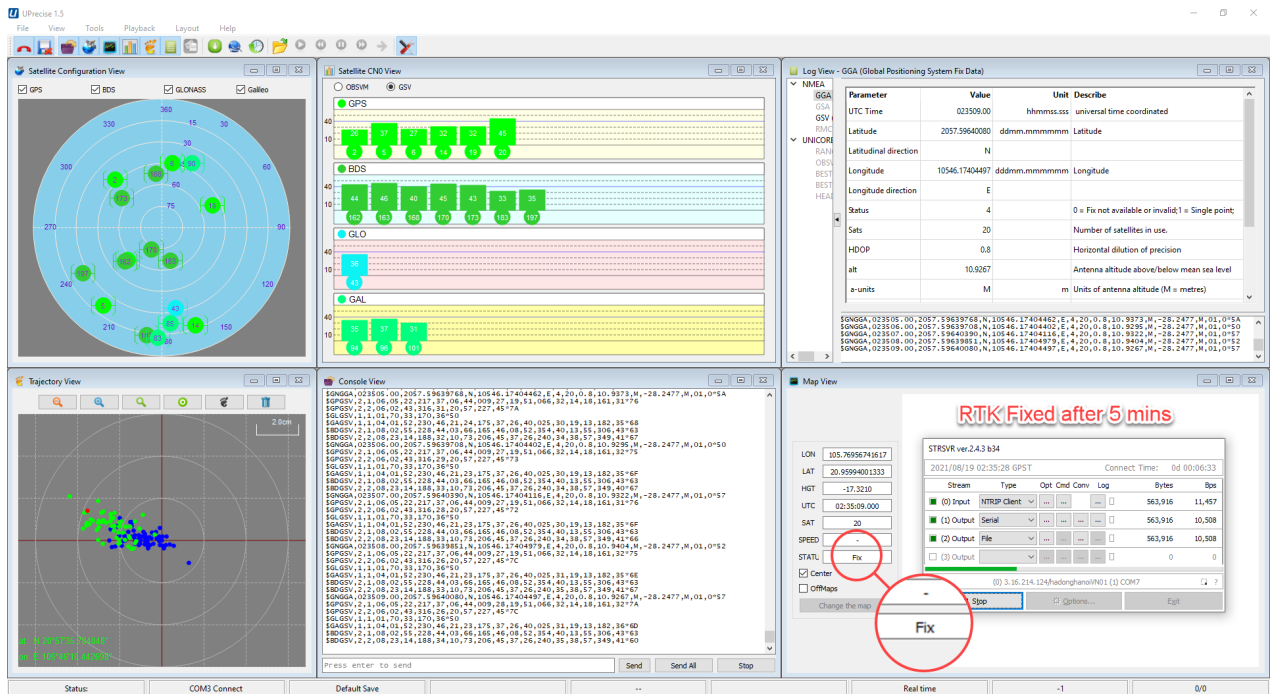


*RTKLib Stream Server*

### 4.2. RTK performance

Right after UB482 gets correction messages from NTRIP from its COM2 port:

- take 2 seconds to get DGPS/ SAAB accuracy (meter)
- take 5 seconds to get RTK Float accuracy (decimeter)
- take 5 minutes to get RTK Fix accuracy (centimeter)



RTK Fix accuracy

## 4.3. Some issues

1. Sometimes, system stays in RTK Float, and there is no RTK Fix in long time  
→ Need to check the conditions
2. In Rover mode, there is no way to export raw observation data to use in post-processing. RTCM messages are only printed out in Base mode.  
→ Unicore data has some observation messages. Need to check if they can be used for post-processing.
3. There are some commands which do not work event are listed in UPrecise or in documents:
  - Command `interfacemode com2 rtcmv3 unicore on` returns wrong syntax.
  - Turning on IMU with `config ins enable` returns OK, but running `rawimua` returns an Unknown IMU type.

## 5. Appendix

Emlid provides RTK GNSS modules such as REACH M+ (at \$265) which use U-Blox GNSS module and an integrated IMU. These modules support raw output for post-processing. A cheaper module named Navio2 is a good choice for an Autopilot HAT on Raspberry Pi.



Emlid also provides free [NTRIP Caster](#) mount points to send corrections over the internet. It is similar to [rtk2go](#).