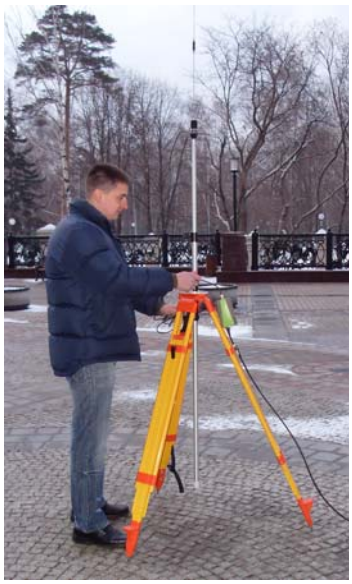
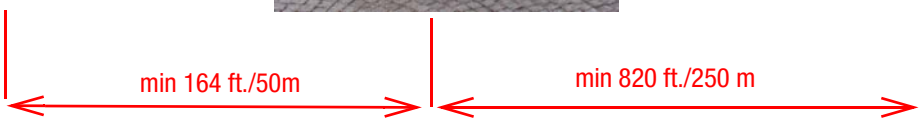
UHF Repeater

Configuration Example

Version 1.2
Last Revised April 21, 2010

UHF Repeater Configuration Example





Triumph-1 as UHF Base **HPT435 as Repeater** **Triumph-1 as UHF Rover**

TRIUMPH-1 as UHF Base Station Configuration

Please do not forget to attach the UHF/GSM antenna to TRIUMPH-1.

Attaching UHF/GSM Antenna

A broadband, rugged, in-building or outdoor antenna designed to service the whole 406-470 MHz UHF band and GSM quad band. With modest dimensions of 25 mm (OD) x 182 mm (height), this antenna radiates with a typical peak omnidirectional gain of +1 dBi. Internally, the radiating element is DC shunted to help protect the transceiver from nearby, but not direct ElectroStatic Discharge (ESD).

The TRIUMPH-1 modem antenna can be mounted on standard poles (5/8-11inches thread). Attached to the TRIUMPH-1 receiver this antenna gets a part of survey pole, making handling with receiver easy and simple.

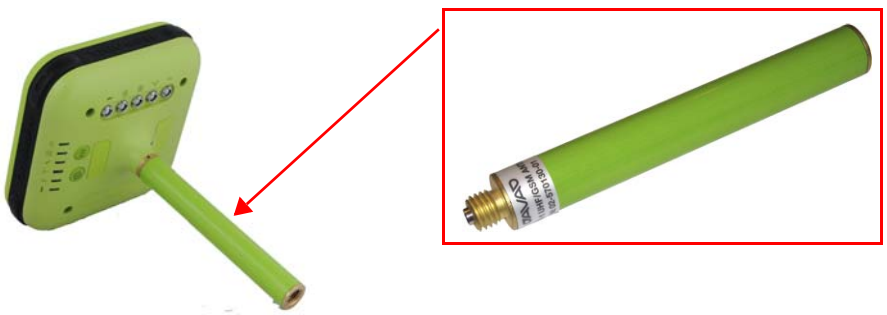


Figure 2-1. TRIUMPH-1 External UHF/GSM Antenna

1. Start ModemVU.
2. Select *Triumph 1X Internal Radio* and click OK (Figure 2-2).

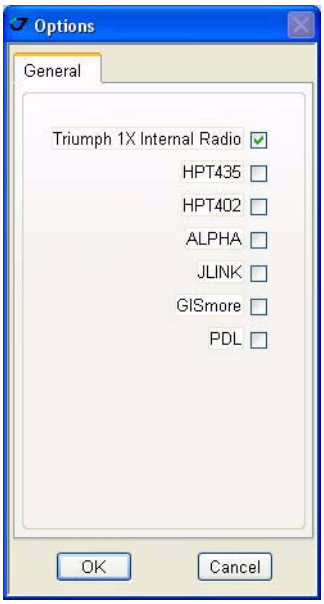


Figure 2-2. ModemVU. Options window

3. Select the port receiver is connected to and click *Connect* (Figure 2-3).

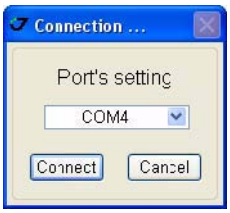


Figure 2-3. ModemVU. Connection

4. Select the *ON* mode for *Radio*, click *Apply*, and then click *Connect Radio* button (Figure 2-4).

Figure 2-4. ModemVU TRIUMPH Internal Radio selection

5. In the *Radio Link* tab set the following parameters, and click *Apply* (Figure 2-5):

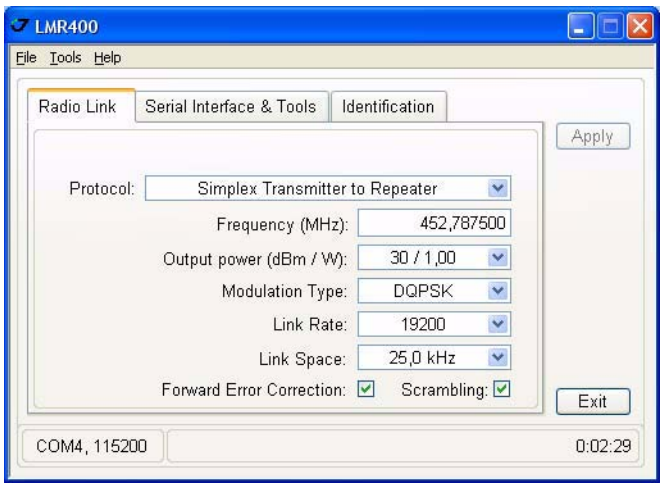


Figure 2-5. Radio Link tab settings

- Protocol: Simplex Transmitter to Repeater
- Frequency (MHz): 406 to 470
- Output power (dBm/W): 30/1.00
- Modulation Type: DQPSK
- Link Rate: 19200
- Link Space: 25.0 kHz
- Forward Error Corrections: ON
- Scrambling: ON

6. Quit ModemVU by clicking *Exit* button.

7. Start TriVU. Select port the receiver is connected to and click OK (Figure 2-6).

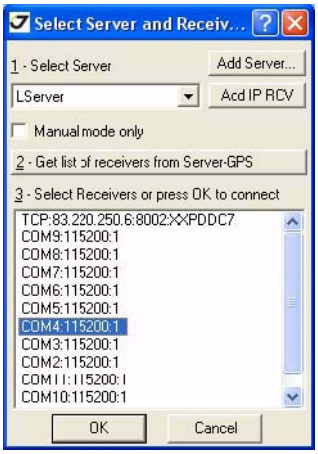


Figure 2-6. TriVU. Selecting port

8. Click *Configuration* ▸ *Receiver.*
9. In the *Base* tab click the *Get from receiver* button. Reference geodetic coordinates appear. Click *Apply* (Figure 2-7).

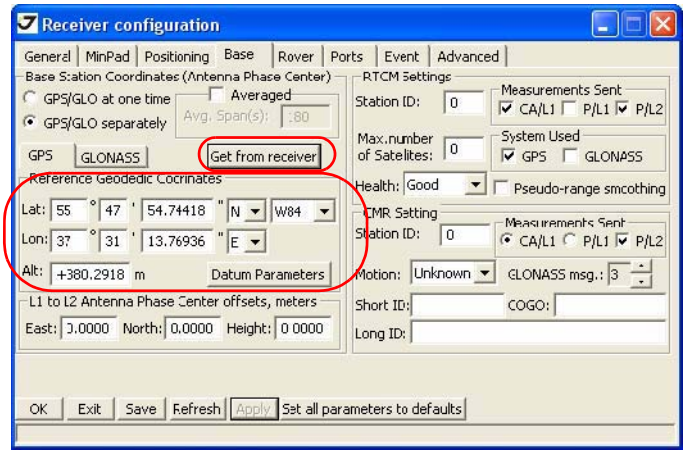


Figure 2-7. Base tab

10. In the *Ports* tab set the Port D *Output mode* to RTK CMR, and click *Apply*, then OK (Figure 2-8).

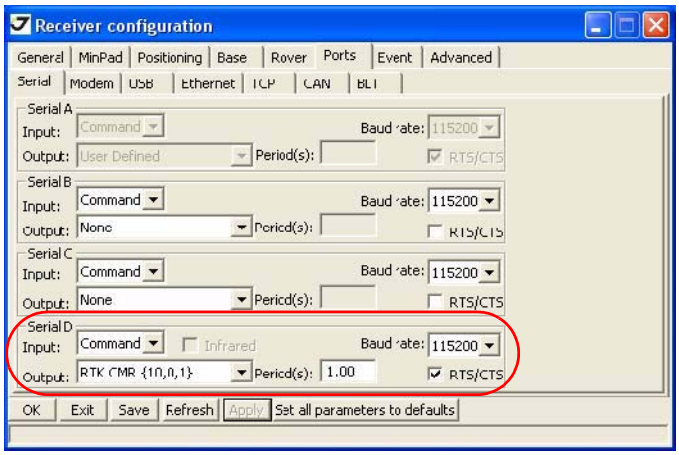


Figure 2-8. Rover tab

HPT435 as Repeater Configuration

Paying attention to a few factors and selecting such system that suits your surveying needs and business strategy enables you to improve the performance, enhance the cost-effectiveness, and increase the user-satisfaction of your RTK survey system.

Antenna Installation

Select the type of antenna that best fits your application and the one that offers the highest dB gain. In addition, setup your system in the highest possible location to minimize obstacles between the transmitting and receiving systems. Always place the antenna on the highest point available. At a minimum, set the antenna to at least ten feet above the terrain using an antenna mast.

Some antennas intended to be attached to the pole mount adaptor (p/n 14-578117-01) are designed to be operated with a ground plane and some without it. Antennas operating without ground plane marked in our catalogue as NGP, e.g. UHF NGP Antenna 1/2, 2.4 dB gain, NMO:

- p/n 30-587307-01 UHF NGP Antenna 406-430 MHz, 1/2, 2.4 dB, NMO
- p/n 30-587308-01 UHF NGP Antenna 430-450 MHz, 1/2, 2.4 dB, NMO
- p/n 30-587309-01 UHF NGP Antenna 450-470 MHz, 1/2, 2.4 dB, NMO

This antennas are NO GROUND PLANE antennas with gain 2.4 dB and NMO specified connector type with should match with your antenna adapter (pole mount or magnet mount). Antennas designed to be operated with ground plane

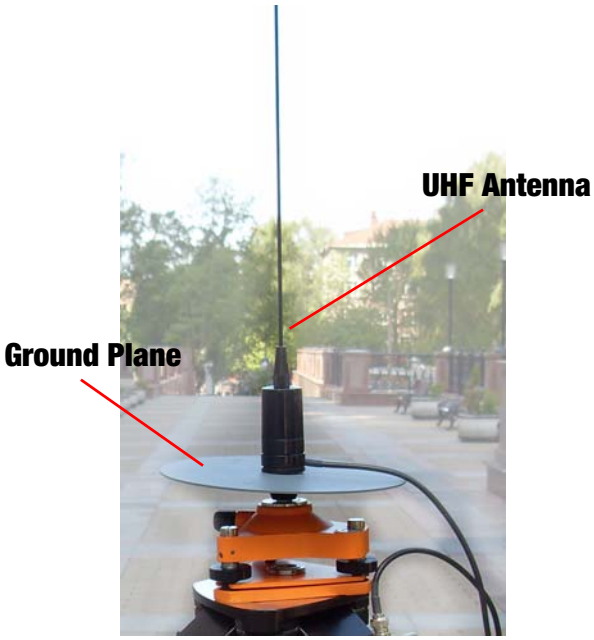
- p/n 30-587303-01 UHF Antenna 406-430 MHz, 5/8, 5 dB, NMO
- p/n 30-587304-01 UHF Antenna 430-450 MHz, 5/8, 5 dB, NMO
- p/n 30-587305-01 UHF Antenna 450-470 MHz, 5/8, 5 dB, NMO

provide better gain, but to achieve the best performance of your antenna, add a UHF Antenna Ground Plane Disk (p/n 10-587400-01) to the bottom of the antenna for a ground plane. UHF antenna Ground Plane disk improves VSWR and as result increase RF power delivered from transmitter to antenna and system distance range.

To install antenna with ground plane disc (see pictures below):

1. Unscrew the cone-shaped cable part;
2. Place the ground plane disc between cable parts and screw all parts together;
3. Attach cable with ground plane to the UHF antenna;

4. Place the antenna on the pole.



Use coaxial cable and connectors that are impedance-matched with the radio equipment, and make sure to use the shortest length of cable to move the signal between the radio and the antenna, e.g.

- p/n 14-578115-01 Accessory UHF Ant Cable BNC/Magn Mount, 12ft[1]
- p/n 14-578116-01 Accessory UHF Ant Cable BNC/Mini-Magn Mount, 12ft[1]

p/n 14-578117-01 Accessory UHF Ant Cable BNC/Pole Mount, 12ft

1. Start ModemVU.

1. For this type of antenna a metal surface, e.g. car's roof, serves as ground plane.

2. Select *HPT435* and click OK (Figure 2-9).

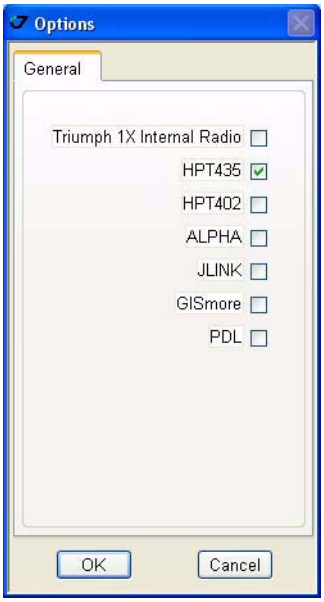


Figure 2-9. ModemVU. Options window

3. Select the port receiver is connected to and click *Connect* (Figure 2-10).

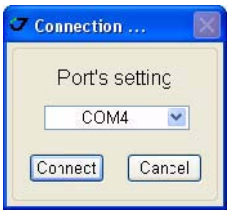


Figure 2-10. ModemVU. Connection

4. In the *Radio Link* tab set the following parameters, and click *Apply* (Figure 2-11):

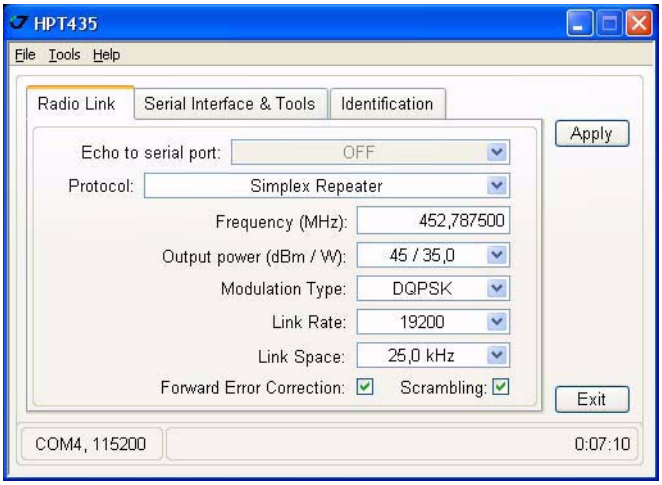


Figure 2-11. Radio Link tab settings

- Protocol: Simplex Repeater
- Frequency (MHz): 406 to 470
- Output power (dBm/W): 45/35.0
- Modulation Type: DQPSK
- Link Rate: 19200
- Link Space: 25.0 kHz
- Forward Error Correction: ON
- Scrambling: ON

5. Quit ModemVU by clicking *Exit* button.

TRIUMPH-1 as UHF Rover Station

1. Attach the UHF/GSM antenna to TRIUMPH-1.
2. Start ModemVU.
3. Select *Triumph 1X Internal Radio* and click OK (Figure 2-9).

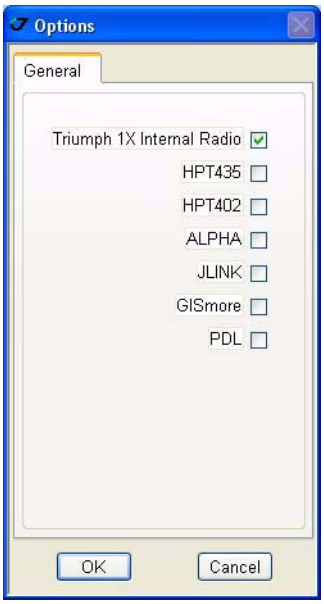


Figure 2-12. ModemVU. Options window

4. Select the port receiver is connected to and click *Connect* (Figure 2-10).

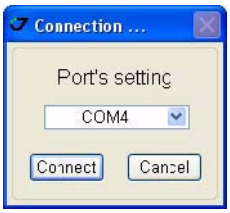


Figure 2-13. ModemVU. Connection

5. Select the *ON* mode for *Radio*, click *Apply* and click *Connect Radio* button (Figure 2-14).

Figure 2-14. ModemVU TRIUMPH Internal Radio selection

6. In the *Radio Link* tab set the following parameters, and click *Apply* (Figure 2-11):

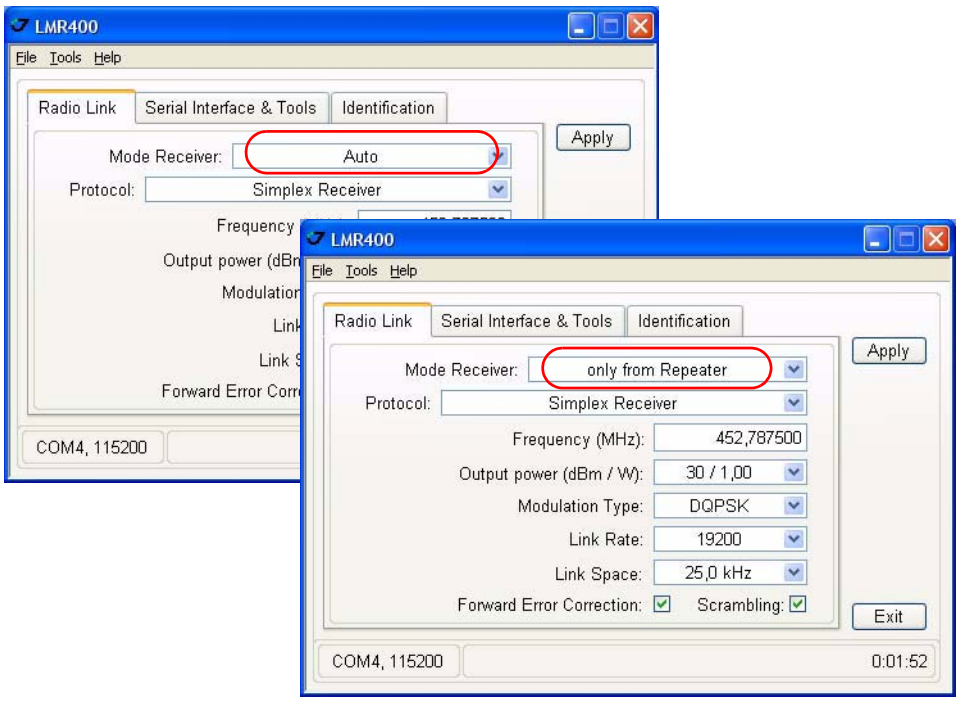


Figure 2-15. Radio Link tab settings

- Protocol: Simplex Receiver
  -
- Frequency (MHz): 406 to 470
- Output power (dBm/W): 30/1.00
- Modulation Type: DQPSK
- Link Rate: 19200
- Link Space: 25.0 kHz
- Forward Error Corrections: ON

- Scrambling: ON

7. Quit ModemVU by clicking *Exit* button.
8. Start TriVU. Select port the receiver is connected to and click OK (Figure 2-6).

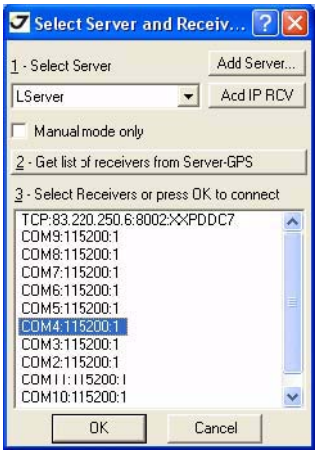


Figure 2-16. TriVU. Selecting port

9. Click *Configuration* ▸ *Receiver.*
10. In the *Positioning* tab set RTK fixed Positioning Mode, then click *Apply* (Figure 2-17).

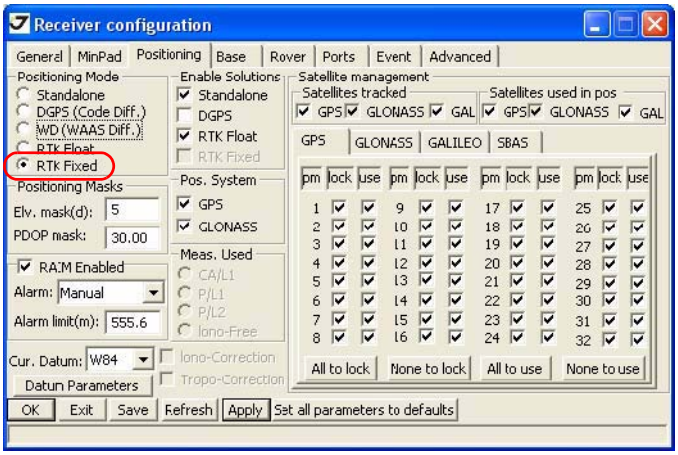


Figure 2-17. Positioning tab

11. In the *Rover* tab set Positioning Mode to RTK fixed mode (Figure 2-18), then click *Apply*:

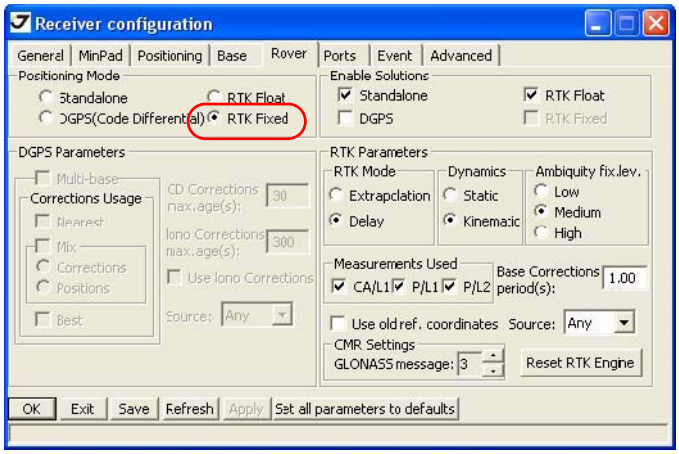


Figure 2-18. Rover tab

12. In the *Ports* tab set the *Input* mode for port D to CMR, then click *Apply* and OK (Figure 2-19).

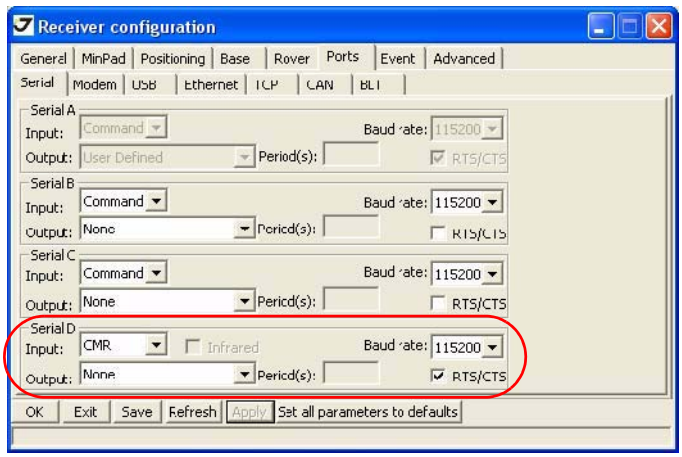


Figure 2-19. Ports tab

13. The receiver will obtain the RTK Fixed solution (Figure 2-20).

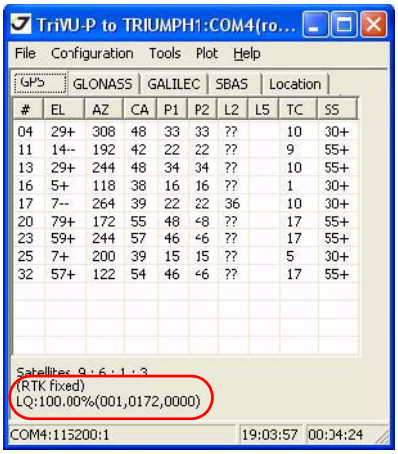


Figure 2-20. TriVU. RTK fixed

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