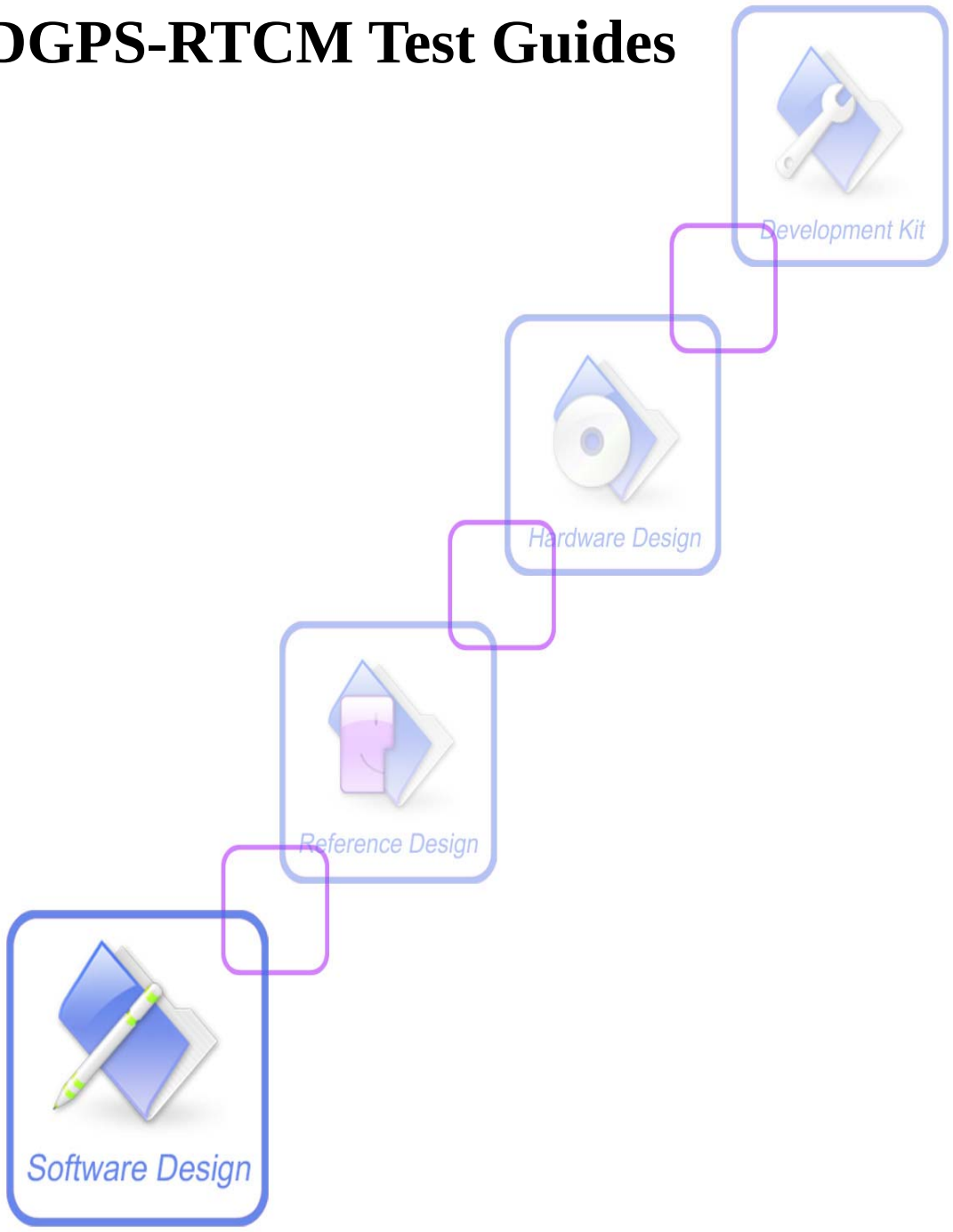
SIMCom

A company of SIM Tech

DGPS-RTCM Test Guides



General Notes

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1 Introduction

This document is designed to guide the use of RTCM function of SIMCom's GNSS module based on MTK's platform. Actually these module can only support these version of RTCM: v2.0,v2.1,v2.2, v2.3,and RTCM v3.x is not supported now.

We used a SIM68R module as a test model to show how to use this function.

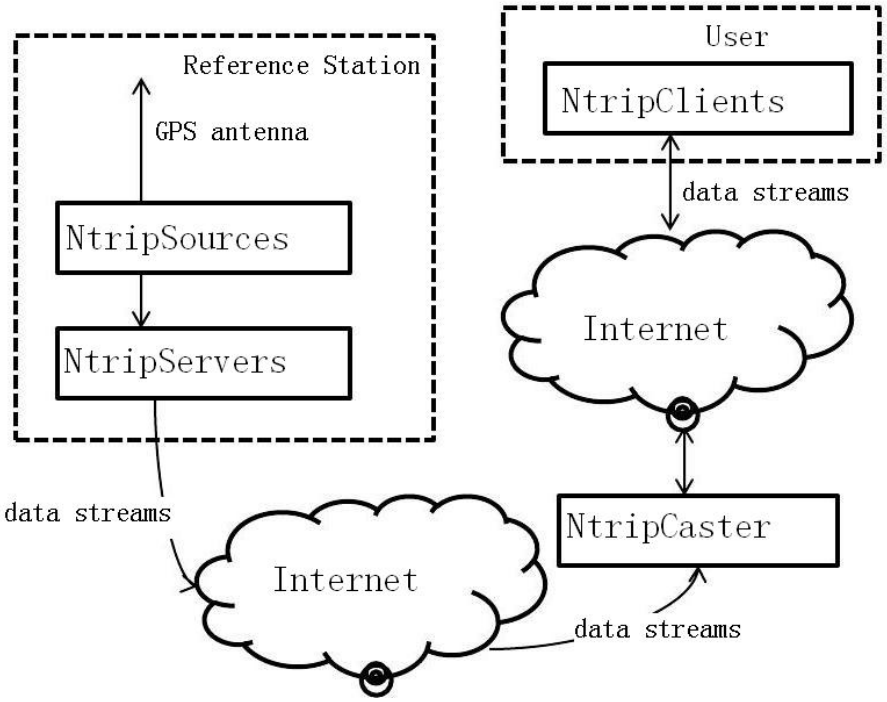
2 RTCM Test With Ntrip

2.1 Ntrip brief

Ntrip (Networked Transport of RTCM via Internet Protocol).

a) Ntrip is designed to disseminate differential correction data or other kinds of GNSS streaming data to stationary or mobile users over the Internet, allowing simultaneous PC, Laptop, PDA, or receiver connections to a broadcasting host.

b) This Ntrip system consists of the four elements: Ntrip Sources, NtripServers, NtripCaster, NtripClients



This Ntrip system consists of the following elements:

a) **NtripSources**, which generate data streams(correction data) at a specific location.

b) **NtripServers**, which transfer the data streams from a source to the NtripCaster.

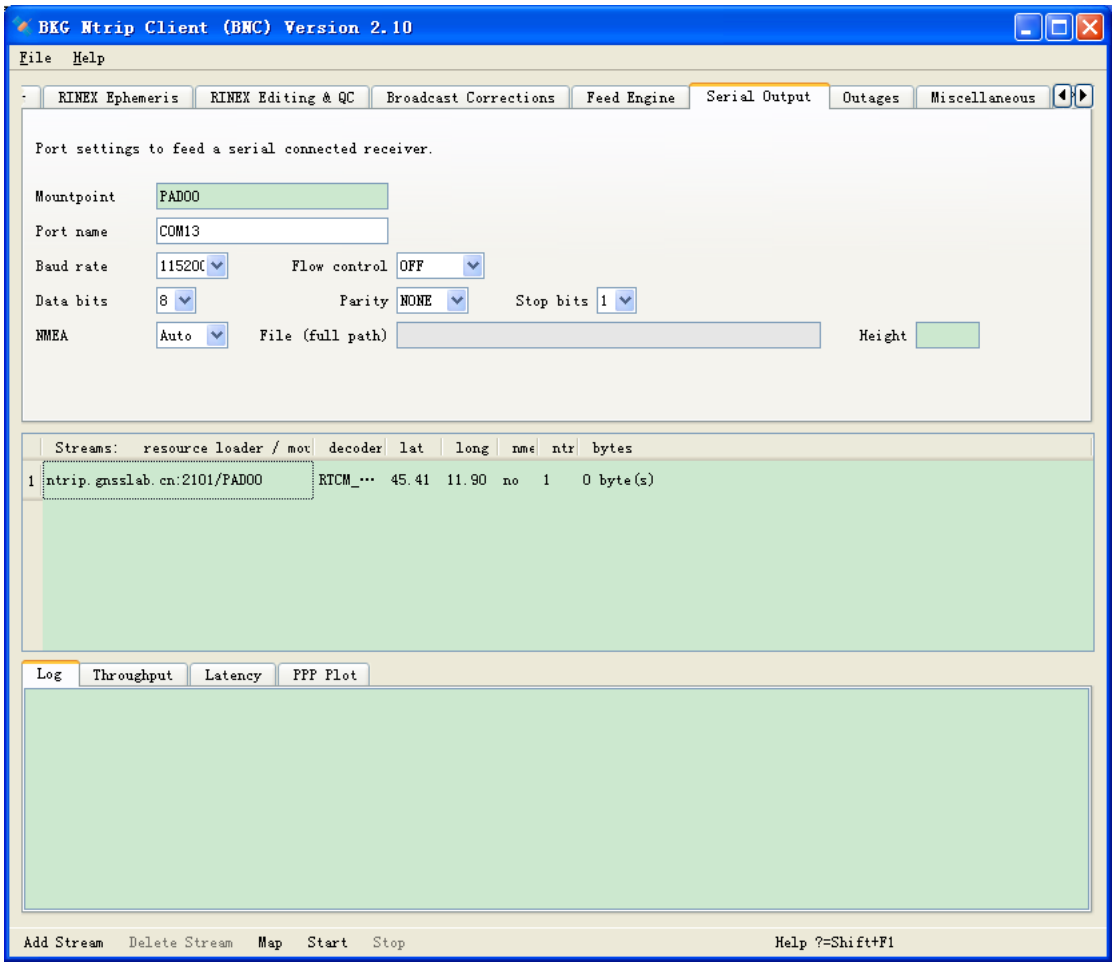
c) **NtripCaster**, the major system Component. Work as a server, Receive data streams from NtripServers from all the world, and respond to request from NtripClients and send data streams to them.

d) **NtripClients**, which finally access data streams of desired NtripSources on the NtripCaster.

2.2 RTCM Client set up

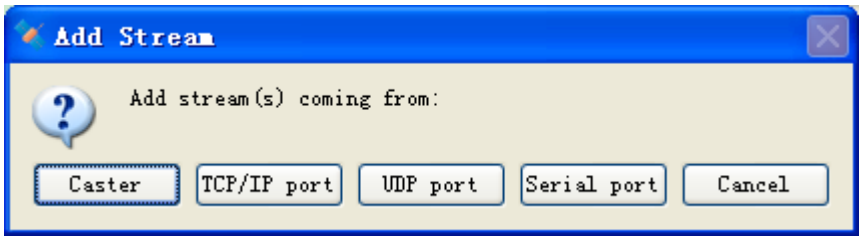
- User should only use RTCM client to receive data streams(differential correction data) from Internet.
- The RTCM Client using by SIMCom is “Bnc210-Windows-static.exe”, download address: http://igs.bkg.bund.de/ntrip/download

2.3 Ntrip Client Demo

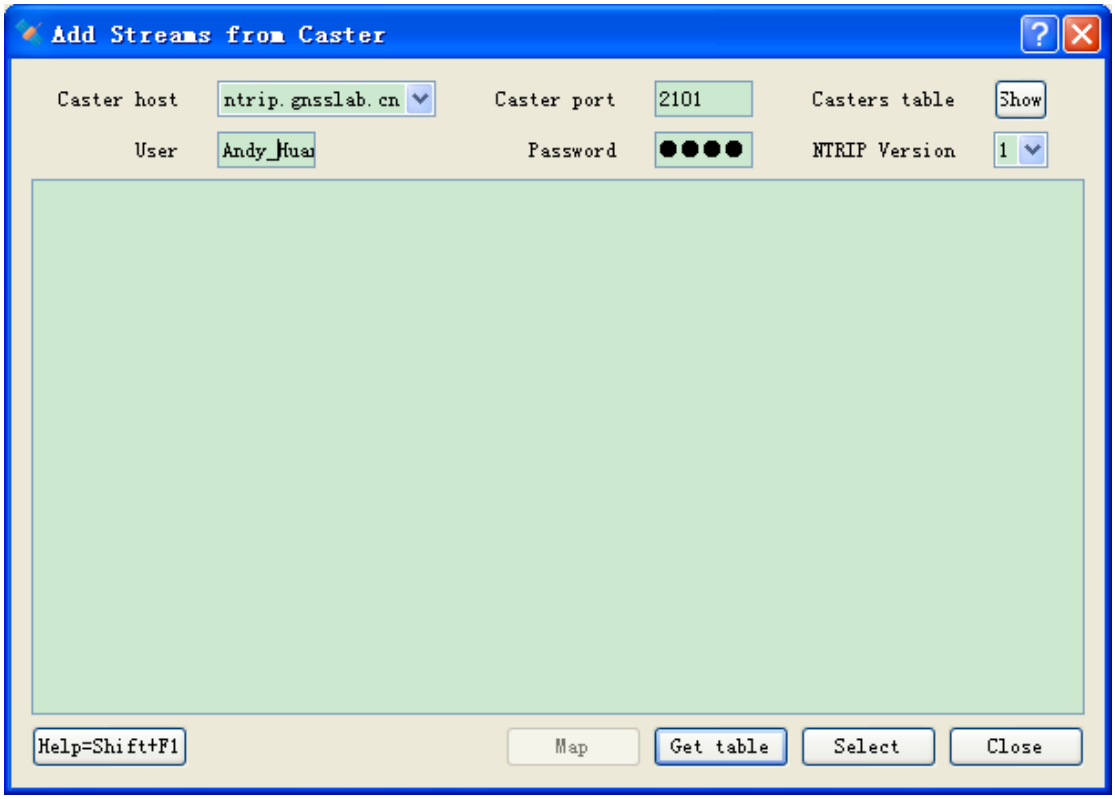


2.4 Add Stream window

Hit 'Add Stream' to open the 'Add Stream' window.



Hit 'Caster' to open the 'Add Stream from Caster' window.



Host and Port:

IP address and port of a NtripCaster, the selection of NtripCaster is arbitrary, but user must sure whether your network can visit IP address of NtripCaster. Note that the different NtripCaster have different data streams. These NtripCasters listen at ports '80' and '2101'.

User ID and Password:

User must apply for User-ID and password from NtripCaster .

NtripCaster Select:

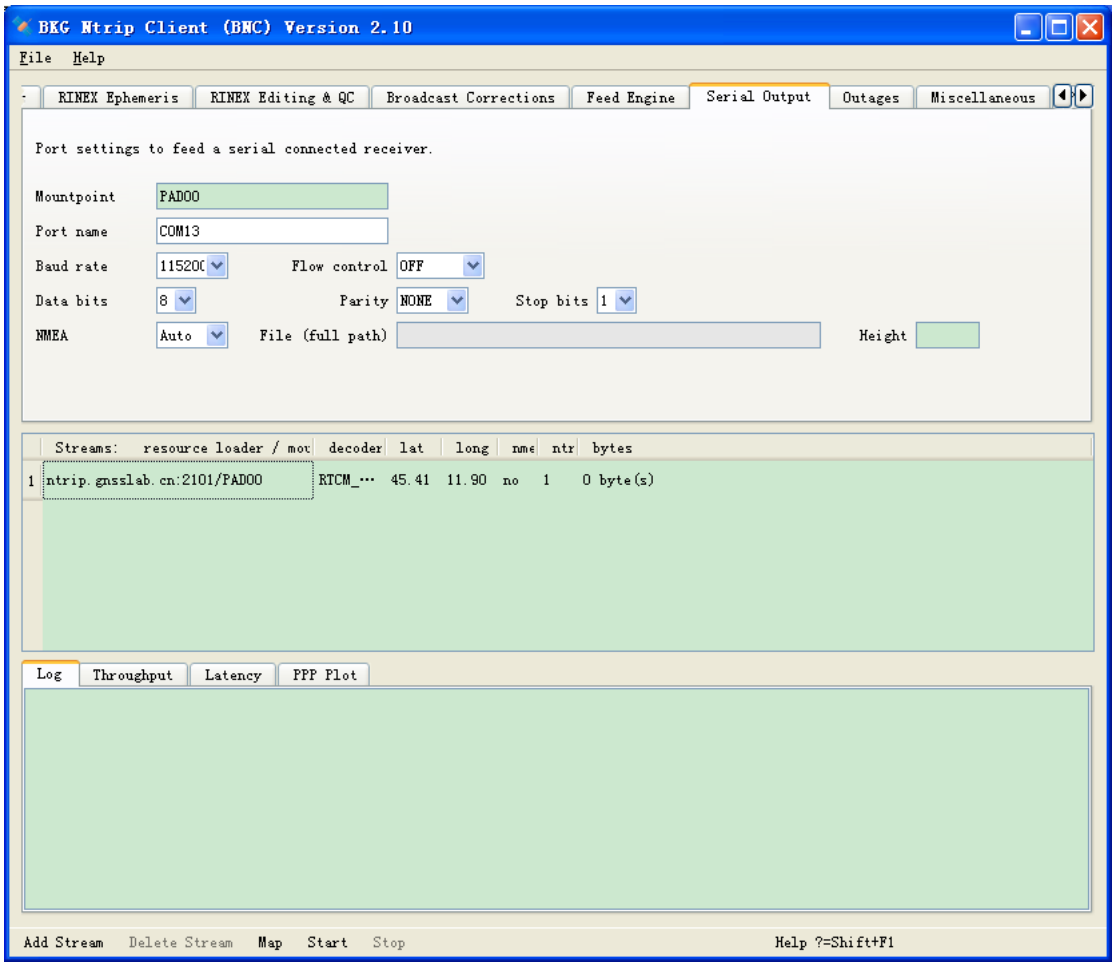
The detail information of NtripCaster : http://ntrip.org/

Hit 'Get table' to display stream.

	mtpoi	dentifie	format	format-details	rri	system	etworl	ountr	lat	lon
141	ONSA0	Onsala	RTCM 3.0	1004(1),1005(10),1…	2	GPS+…	IGS	SWE	57…	11…
142	ORID0	Ohrid	RTCM 3.0	1004(1),1006(10),1…	2	GPS+…	IGS	MKD	41…	20…
143	OUS20	Dunedin	RTCM 3.0	1004(1),1006(10),1…	2	GPS+…	IGS	NZL	-4…	17…
144	OUS27	Dunedin	RTCM 3.2	1077(1),1087(1),10…	2	GPS+…	IGS	NZL	-4…	17…
145	PADO0	Padova	RTCM 2.3	1(1),3(10),18(1),1…	2	GPS	IGS	ITA	45…	11…
146	PDELO	Ponta-Delgada	RTCM 3.0	1004(1),1006(60),1…	2	GPS+…	IGS	PRT	37…	33…
147	PENC0	Penc	RTCM 3.0	1004(1),1006(60),1…	2	GPS+…	IGS	HUN	47…	19…
148	POTS0	Potsdam	RTCM 3.0	1004(1),1006(10),1…	2	GPS+…	IGS	DEU	52…	13…
149	POTS7	Potsdam	RTCM	1077(1),1087(1),10…	2	GPS+…	IGS	DEU	52…	13…

Hit one mountpoint and Select to add stream.

2.5 Serial Output window



Mountpoint - optional

Enter a 'Mountpoint' to forward its corresponding stream to a serial connected GNSS receiver.

When selecting one of the serial communication options listed below, make sure that you pick those configured to the serial connected receiver.

Port Name - mandatory if 'Mountpoint' is set

Enter the serial 'Port name' selected on your host for communication with the serial connected receiver. Valid port names are

Windows: COM1, COM2

Baud rate:

Choose the right baud rate according to your test environment.

Flow Control - mandatory if 'Mountpoint' is set

Select a 'Flow control' for the serial output link. Note that your selection must equal the flow control configured to the serial connected device. Select 'OFF' if you don't know better.

Parity - mandatory if 'Mountpoint' is set

Select the 'Parity' for the serial output link. Note that parity is often set to 'NONE'.

Data Bits - mandatory if 'Mountpoint' is set

Select the number of 'Data bits' for the serial output link. Note that often '8' data bits are used.

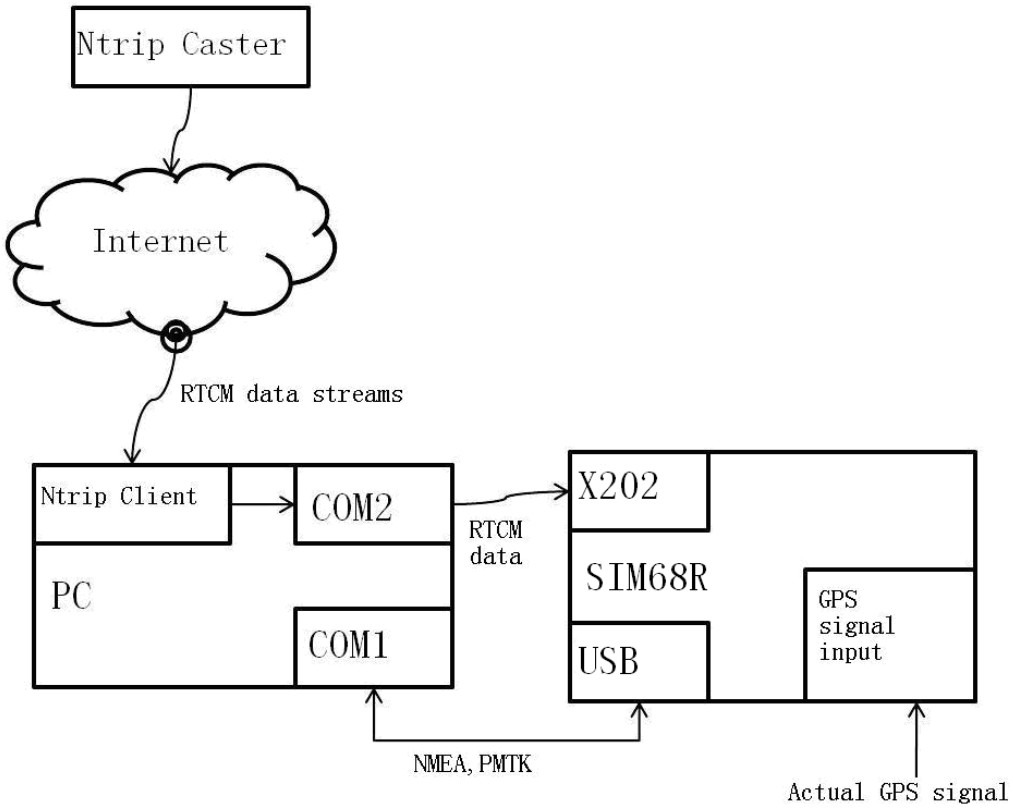
Stop Bits - mandatory if 'Mountpoint' is set

Select the number of 'Stop bits' for the serial output link. Note that often '1' stop bit is used.

NMEA - mandatory for VRS streams

Select 'Auto' to automatically forward all NMEA-GGA messages coming from your serial connected GNSS receiver to the NTRIP Broadcaster and/or save them in a file.

2.6 SIMCom Test Environment



Test model:

SIM68R

NtripCaster :

ntrip.gnsslab.cn(Located in WuHan,China)

Streams:

PADO0,RTCM format Version 2.3(NtripSources Located in Padova, Italy)

Note:

Because there is no NtripSources near Us, so we had to select a NtripSources far away from Us.

2.7 RTCM Test Procedure(fix witch RTCM)

a) Ntrip COM port Setting

Baud rate : 115200, Port number:COM2

Connect COM2 to DUT X202

b) Select the data streams: PADO0. Click “START”

c) Output SIM68R GPS signal port with actual GPS signal.

d) PowerGPS connection

e) Issue the following command in PowerGPS

–PMTK104

–PMTK301,1

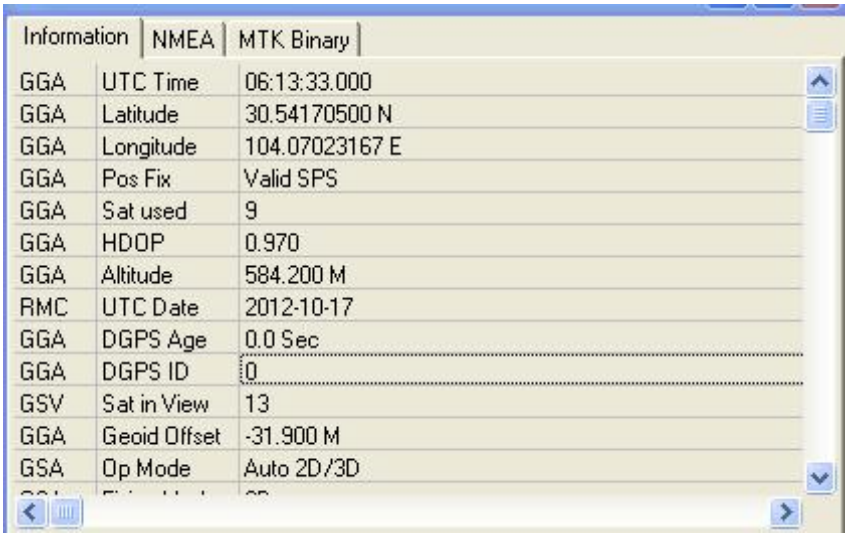
–PMTK251,9600

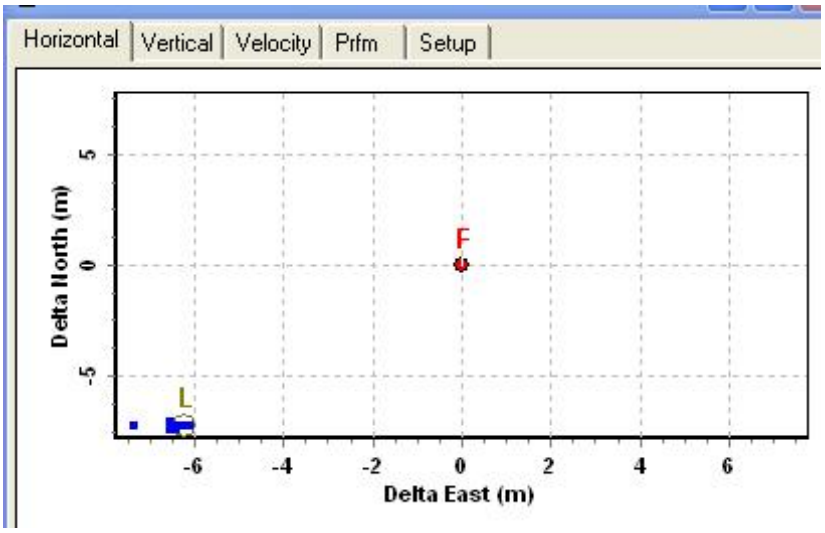
f) PowerGPS disconnection and select Baud 9600.

g) PowerGPS connection

h) Wait for Fix

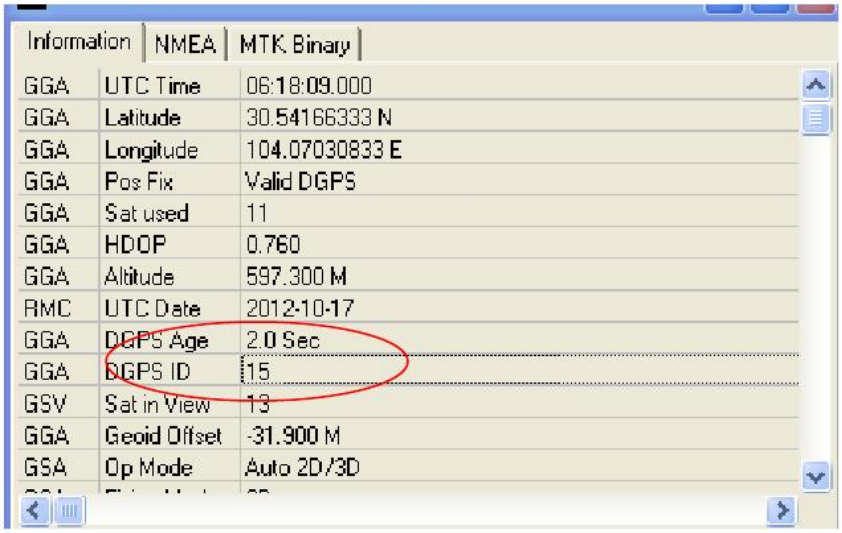
2.8 Fix without RTCM input

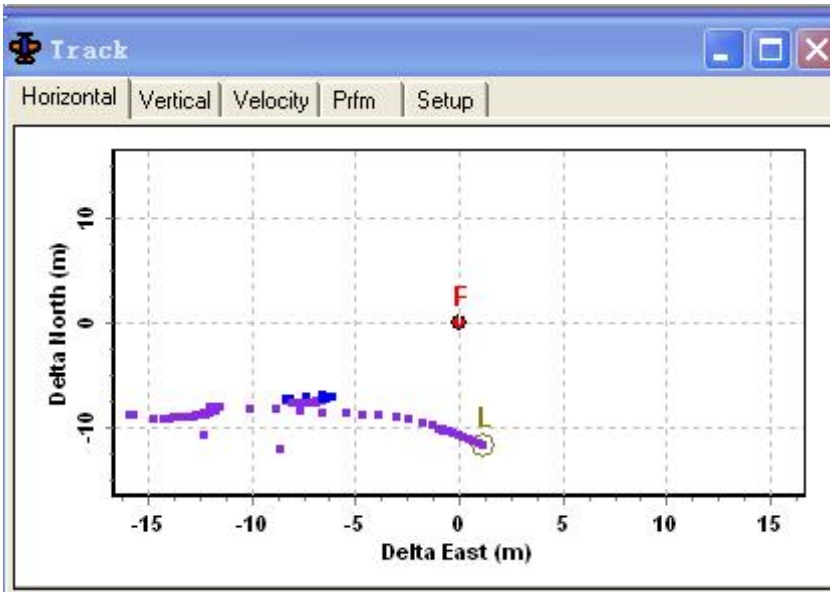




Using the strong GPS signal,position stably.

2.9 Fix with RTCM input.





As seen from above figure,GPS mode is DGPS,DGPS ID(Reference Station number) is 15,DGS Age is 2 Sec.

But we found that with the RTCM data input, accuracy get worse, position point start to drift.

Reason:The reference station (Padova,Italy) is far away from User . So the RTCM data work as interference.

Conclusion:NtripSources which be selected should be near user because Interference in NtripSources is almost similar to interference in user.

3 Customer FAQ

3.1 RTCM Version Supported by SIMCom

Customer:

SIMCom GNSS series module support what versions and support RTK-GPS or not.

SIMCom:

SIMCom GNSS series module can support RTCM. SIMCom GNSS series module can support these RTCM message types: type 1, 2, 3, and 9.These four message types were all defined in RTCM SC-104 v2.x spec, included v2.0,v2.1, v2.2, v2.3 . SIMCom GNSS series module can't support RTK. SIMCom GNSS series module can not support RTCM v3.x.

3.2 UART Settings

Customer:

We found that SIM68R 's RTCM input port is X202,while the NMEA output port is USB,can change the RTCM input to USB or X201?

SIMCom:

Sorry, it can't. Only X202 can receive RTCM data.We must find out SIMCom GNSS series module which com port can support RTCM input to test.

3.3 DGPS Info in NMEA

Customer:

How does SIMCom GNSS series module know that RTCM data has been received? Does NMEA sentence show something about getting RTCM data?

SIMCom:

GPGGA can show RTCM some information, about Quality indicator, DGPS Age, DGPS Station ID.

3.4 Accuracy improve less

Customer:

Reference Station is located at Incheon(far from 40Km) and RTCM Data received by Internet. Two kind version was tested. RTCM2.0 and RTCM2.3,but accuracy improve less.

SIMCom:

Correction method is defined as RTCM SC 104 Spec.

Correction Formula:PR(t) = PRM(t) + PRC(t).

Receiver should only get PRC(pseudorange correction) from RTCM messages and apply PRC on PRM(pseudorange measurement). So Receiver can not guarantee the validity of the data.

So if Accuracy improve less, possibly two reasons:1.Reference Station is far away from User. 2.Reference Station generate RTCM message incorrectly.

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