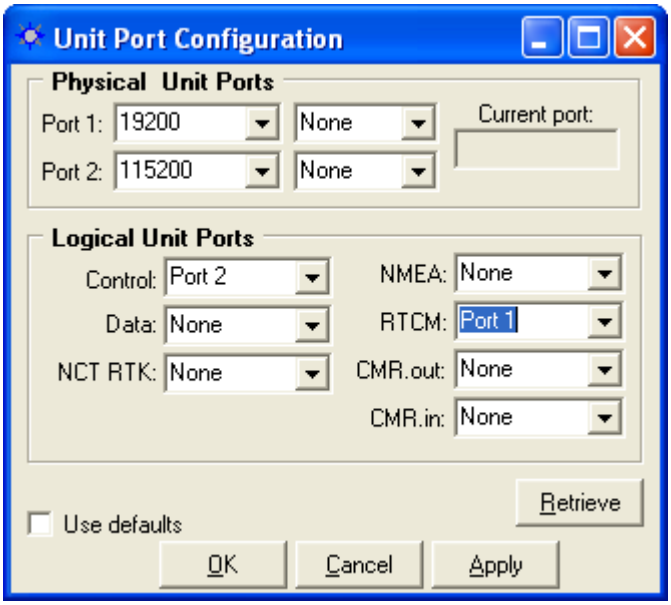
This guide will step you through configuring a dynamic base station and moving rover GPS receiver via NavCom's StarUtil GUI program. This procedure provides the ability to maintain relative positioning accuracy between two or more GPS receivers on a moving platform.

Requirements – The Base GPS receiver must be operating in a DGPS Rover mode. In other words, the base receiver must be calculating it's own differential GPS position with the aid of an SBAS or other qualified DGPS stationary reference station. The Base receiver can accept DGPS corrections from either an external radio via the appropriate data port or from an internal radio: either the StarFire receiver, CDMA radio modem, other SBAS source (WAAS, EGNOS, etc.). The Dynamic Base station must output corrections to the Rover via a cable, or other suitable communications interface (i.e. a radio modem).

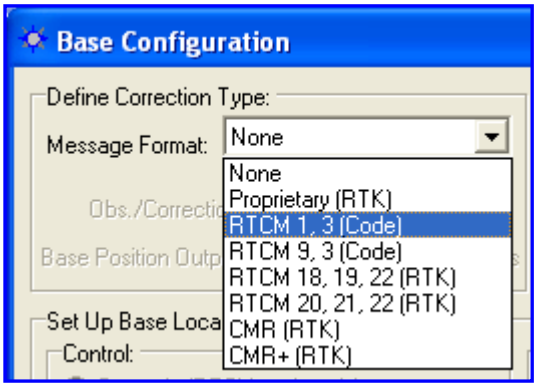
Software Setup – Using StarUtil

Base Station and Rover Port Configuration

- ✓ Set *Unit Port Configuration* 
  - o These instructions set the communication between the radio modem and the GPS receivers. Set the Base and the Rover to the same RTCM port assignment
  - o Set *Physical Unit Ports*
    - ▪ Port 1 baud rate as appropriate for the interface between the Base and Rover (19200 default)
    - ▪ Port 1 parity to *None*
  - o Set *Logical Unit Ports*
    - ▪ *RTCM:* to *Port 1* (equivalent to Com1). This setting permits the reception of RTCM corrections from a stationary reference station so that the base receiver can determine a DGPS solution (if a stationary RTCM base station is in use) and is also used to broadcast the dynamic base station corrections to the rover.
    - ▪ If using the internal radio to receive corrections from a stationary reference station (available on some models), set *NCT RTK:* to *Port Radio*
    - ▪ If using an external radio to receive corrections from a stationary base station for CMR corrections, set *CMR.in:* to *Port 1*
    - ▪ Click *Apply*
    - ▪ Click *Retrieve*
  - o Verify settings are correct

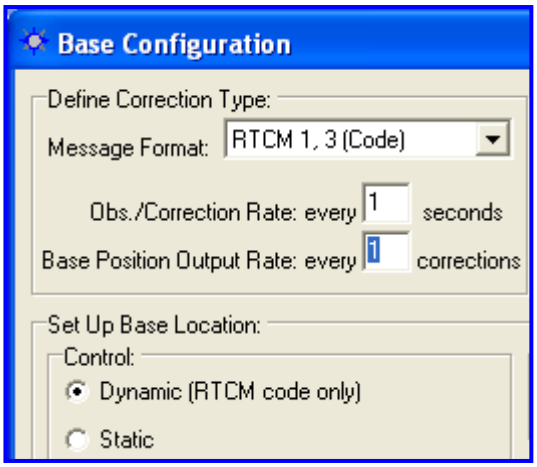


Base Station Configuration



- ✓ Click *Base* 

- ✓ *Define Correction Type*
  - o *Message Format*
    - ▪ RTCM Correction Type
    - ▪ Select either *RTCM 1,3(Code)*or *RTCM 9,3(Code)* from the drop down menu



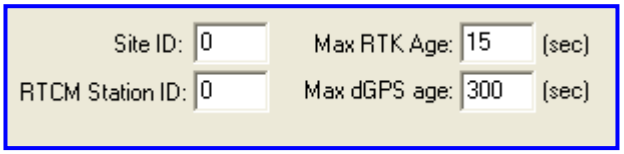
- ✓ Set *Obs./Correction Rate:every*: to *1*
- ✓ Set *Base Position Output Rate: every*: to *1*

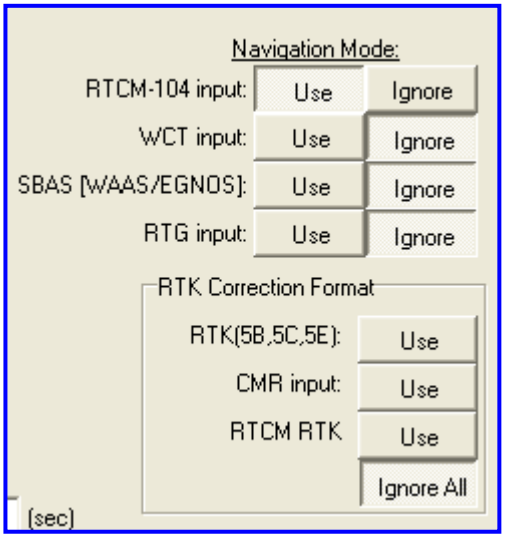
  The Base Position must be output once every second, otherwise the Rover position will include the bias caused by the lack of an updated Base Position message. For example, if both the Base and Rover are travelling in the same direction at 45 feet per second and the Base Position output rate is once every 10 seconds, at the 9 second interval, the rover position will have a 405 foot position bias error. At the 10 second interval, a new base position is received, and the rover position will jump to the correct position.
- ✓ *Set Up Base Location:*
  - o *Control*
    - ▪ Set *Dynamic (RTCM code only)*
- ✓ Click *Apply*

Rover Configuration

- ✓ Click *Rover* 

- ✓ Set the *Navigation Mode:*.
  - o *RTCM-104 input* to *Use*.
  - o All other modes to *Ignore.*
- ✓ Set the *RTCM Station ID* to *0* or that of the dynamic base station.

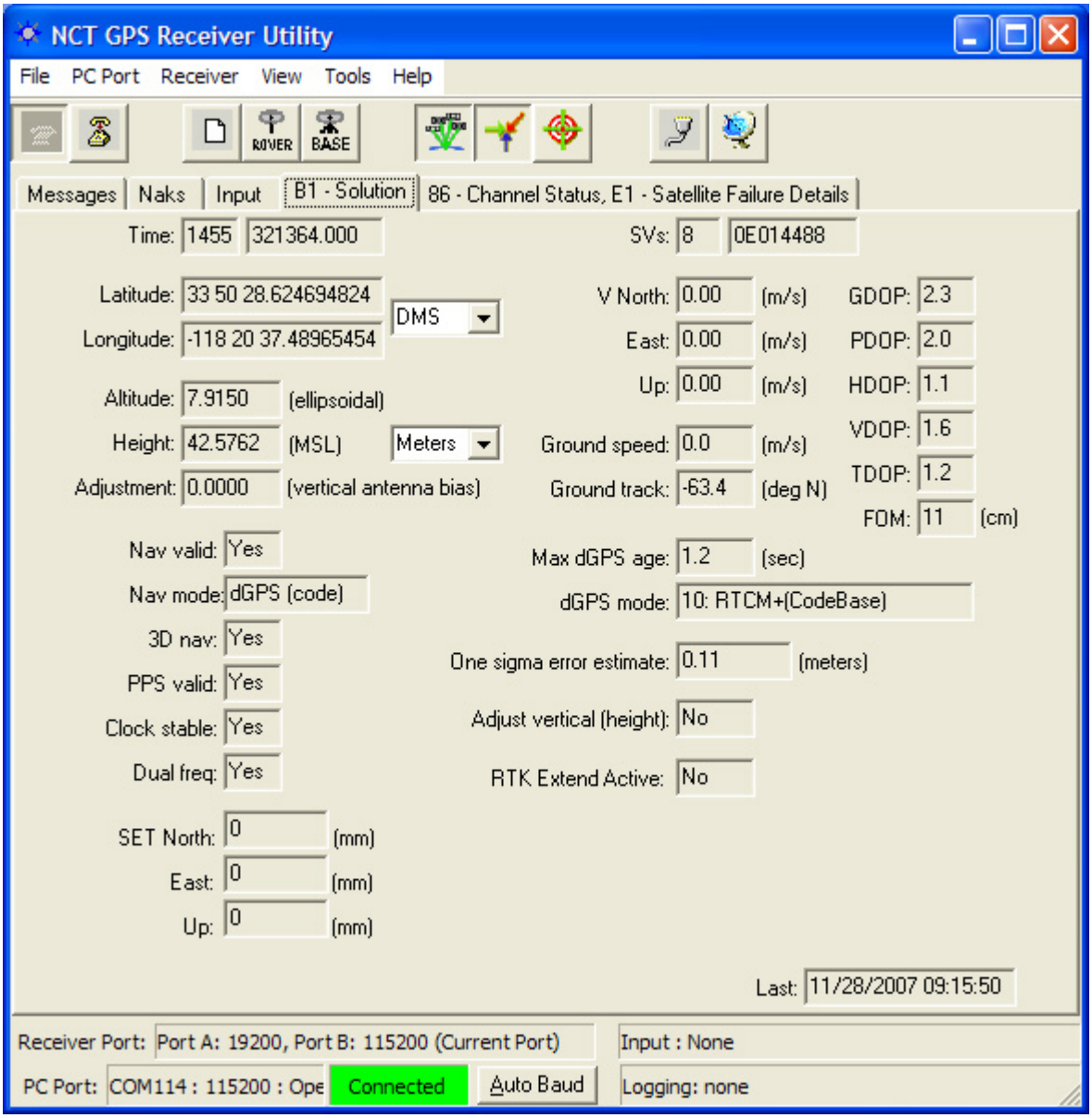




- ✓ Set *Max dGPS age:* to *>10.*
- ✓ Click *Apply.*

Verify Performance

✓ Once properly configured, the Rover will display it's position as *dGPS mode: 10: RTCM+(CodeBase)*



The *FOM* and *One sigma error estimate* levels are closely tied to the Dynamic Base positioning mode. In other words, if WAAS is the dGPS correction source for the Dynamic Base, then the rover FOM will be somewhere in the 50 to 60cm vicinity. Likewise, if StarFire is the dGPS correction source for the Dynamic Base, then the rover FOM will be somewhere in the 10 to 15cm vicinity. Again, the Dynamic Base must be operating in a dGPS mode other than *0: Non Differential* for the Dynamic Base to generate corrections for the Rover.