Setup a Base and Rover using Carlson SurvCE

HOWTO is for Engineers using Internal Peer-to-Peer UHF radio communications for RTK.

Selecting the location for a Base Point

1. Use a PM (NAMRIA) or Concrete Monument where possible. If none available erect the tripod over a "known point" or….
2. Select a suitable site for the Base Point where it will be easily relocated for future use.
3. Mark the point with a "PIN" 150-200mm long driven into the soil. Push the pin through a 50mm disc of aluminum foil or similar to make it easy to locate.

Preparing the Base Receiver

1. Erect the tripod over the Base Point.
2. Attach the GPS tribrach and extension pole to the tripod.
3. Position the center of the tribrach over the PIN and level the tribrach.
4. Install both batteries into the Altus APS-3 base receiver, attach the UHF antenna and screw the receiver to the top of the extension pole.
5. Turn on the receiver. Initially the central RED LED will illuminate, then the GREEN LED will begin blinking rapidly (searching for satellites).
6. The GREEN LED will then blink slowly. The receiver is ready......

Configuring the Base Receiver

1. Turn on the Controller, select Carlson SurvCE from the Menu.
2. From the File menu select Job, Create a NEW JOB (name as required - keep it short), select GREEN tick.
3. Set Distance to METRIC, and Projection to UTM/WGS845/UTM Zone xxxx, select GREEN tick.
4. Select the Equipment tab, select 2. GPS Base
5. Current tab, from the Manufacturer list select Altus, below the APS-3 will display
6. Select Comms tab. If the base receiver serial number appears on the list select and select Receiver tab.
7. As we leave the Comms tab the receiver will illuminate the BLUE LED, We have Bluetooth connection between the Controller and the Base Receiver.
8. The settings will be retrieved from the Receiver.

9. Set to Slant option, fill in Base Receiver height (slant distance from GREY/ORANGE line on the receiver and the top of the PIN).
10. Select RTK tab, Set Device to Internal ARWest for receivers purchased before January 2015 or Internal Satel for current model APS-3 receivers.
11. Set Message type to RTCM V3.0, Select the "Tools" to the right of Device type, SurvCE will retrieve the current settings from the receiver.
12. Select PLD w/EOT or PacCrest, set the Power to 1W,
13. Set Modulation to GMSK or DBPSK,
14. Channel Spacing 25kHz
15. Tick Forward Error correction,
16. Take a photo of the settings screen on a smart phone,
17. Select GREEN tick.
18. Select GREEN tick.

Setting Base Coordinates

1. The next screen shows 3 options, if working from a "known point" (ideal situation),
2. Select Enter Grid System Coordinates then type coordinates into the boxes: Northing, Easting and Height. If the data is to be used in a GIS in future we recommend a Static Survey to obtain an accurate position where NO state accuracy base points are available (see HOWTO Static Survey).
3. As a last resort, if the NEW base point has unknown coordinates, select Read From GPS. At this point you can set the time or number of positions required to average a point.
4. The defaults are adequate to provide a point accurate to approximately one meter Northing and Easting and five meters in height.
5. Answer Yes to continue Base setup,
6. Save the base file if required,
7. Select GREEN tick. - the Base Receiver setup is complete.

 The YELLOW LED is now illuminated, showing RTK data is transmitting via UFH radio.

Configuring the Rover Receiver

Move away from the Base receiver 5-10 meters before setting up the Rover for better UHF signal.

1. Select the Equipment tab, select 3. GPS Rover,
2. Current tab, from the Manufacturer list select Altus, below the APS-3 will display,
3. Select Comms tab. If the base receiver serial number appears on the list select it and select Receiver tab.
4. As we leave the Comms tab the receiver will illuminate the BLUE LED, We have Bluetooth connection between the Controller and the Base Receiver. The settings will be retrieved from the Receiver.
5. Set to Slant, fill in Default Rover Pole height (1.8m).

6. Select RTK tab, Set Device to Internal ARWest for APS-3 receivers purchased before January 2015 or Internal Satel for current model APS-3 receivers.
7. Set Message type to RTCM V3.0, Select the "Tools" to the right of Device type, SurvCE will retrieve the current settings from the receiver.
8. Select PLD w/EOT or PacCrest, set the Power to 1W,
9. Set Modulation to GMSK or DBPSK,
10. Set Channel Spacing 25kHz
11. Tick Forward Error Correction,
12. Check photo of the settings on the smart phone making sure they are identical except for the Power can be set to 100mW to save receiver battery power if working close to the Base, otherwise select 1W,
13. Select GREEN tick.
14. Select GREEN tick.

NOTE: The YELLOW LED will be flashing (approximately once per second) if RTK messages are being received from the Base receiver

Surveying Points

1. Select the Survey tab, select Store Points.
2. All systems are working correctly if the word Fixed appears in the top Left Hand Corner of the screen.
3. If Autonomous is displayed the Base is unreachable (distance to great) or the settings for RTK are not matched perfectly (other than Power).
4. DGPS indicates the Base data being transmitted is obstructed (HINT: raise rover pole height) or too many trees absorbing UHF signals as the signals being received greater than 1 second apart..