

TECHNICAL SUPPORT – PRODUCT WORKFLOW

Using SDR v 5 software with SDR 8100 for GPS

Section 1. Creating a Job

1. <Func> + <Job> + <New>
2. Type in the name you desire for Job. <Enter>
3. Determine if you want to work in a XFM (known system) or if you want to calibrate to a local (or known) coordinate system. **Note:** If you want to work in a XFM, then skip to section 4. If you are going to calibrate (transform) to a local system, then read on.
4. The point ID field may be set to Numeric4 or Alpha14 depending on your application. You can toggle this with the right arrow on the keyboard as well as the pull-down menu on the touch screen. <Enter>
5. If all of your atmospheric corrections look sufficient, then hit <Alt> + <Enter> to confirm the whole screen.
6. Hit <Alt> + <Enter> to confirm the Job notes screen.

Section 2. Collecting Data in Topography

1. Select <Func> and <Units> to verify if you are in the correct units for your project area. Your choices are: USFeet, Feet (intr'l) and Meters.
2. Select <Surv>, <Keyboard Input> and <Coordinates>.
3. Here, you must keyboard input the known coordinates for your survey area that you plan on calibrating to. **Note:** Make sure that you give the point id's something that is easy to remember, because these will become important when it is time to calibrate the job. You can <Enter> through the fields, and then hit <Alt> + <Enter> to save the point in the database. You can hit <Alt> + <V> to see that it is in there. Repeat this for all calibration points you have.
4. Select <Func> and <Instrument>.
5. Type should be "GPS RTK", and model should be "Radian"(or whatever receiver you have). Rcvr mode should be "Rover". Hit <Alt> + <Enter> to confirm this and establish communications.
6. Select <Surv> and <Topography>.
7. Key in a starting coordinate STN. Generally, you will want to start with point 0001 for your GSTN and key in 0,0,0 for northing, easting and elevation. Note: your Antenna height is for the BASE not the rover. You are essentially keying in starting grid coordinates for the BASE receiver. 0,0,0 is fine to use here because we will be calibrating to a real coordinate system later. Hit <Alt> + <Enter> to confirm the GSTN.
8. You should be presented with a screen that shows you latitude, longitude and elevation. This is referred to as the projection record. To confirm this, you must hit <Alt> + <Enter>.
9. You should now be in the idle "Take Reading" screen. To take readings, make sure you are in ALPHA mode and then hit the TRIGGER keys on the side of the SDR 8100. A reading should be initiated, and you should see your RAW data populated in the screen (Hobs, Vobs, Sdist). **Note:** You can choose what reading type you want by selecting <Func> and <Configure Reading>. Here, in the <End Obsvn> field you can select from three types: 3DRMS (easiest), Epoch (countdown from 10) and Manual (you dictate the length of reading by using Start – Stop). In 3DRMS, you define a precision tolerance that will automatically take readings if under a certain tolerance. Usually this can be left to default (.025m), but can be set for higher.
10. It now comes to the time to calibrate the job. Take readings on each of your calibration points in the field (Alt + Enter), and make SURE you give them the SAME point Id's as what they existed as when you keyed them in (in Keyboard input earlier). Since these points already exist in the database, it will prompt you for an action when you try to store it. Here, you need to arrow right until it says STORE GOBS and enter it. Repeat this process for all of your calibration points.
11. Select <Surv> and <GPS Coord System>.
12. You should see a list of your calibration points (it puts all points that have keybd inputs and GOBS in there).

13. Hit <Alt> + <Enter> and select from one of the three calibration types: Horizontal only (min. 2 pts.), Vertical only (min. 1 pt) or Horizontal/Vertical (min. 3 pts.). Hit <Enter> on one of them.
14. You will see the results of the calibration. Take note of scale factor (it should be near 1). Hit <Alt> + <Enter> to accept the calibration. Your job is now on the new coordinate system. Repeat the TRIGGER function on the side of the collector for more topography readings. This must be done from the "Take Reading" screen.

Section 3: Staking Out a Coordinate

1. Select <Cogo> and <Set Out Coords>.
2. Enter in the point ID that you want to "Stake Out" and hit <Enter> after highlighting it.
3. You should now see your navigation information. "Azimuth" is telling you the direction that you need to go to arrive at your stakeout point (0-360). "Hdist" is telling you the distance to the point. "Fill" is telling you how far above or below the point you are. Note: If you are not using elevations, then this field will be <Null>.
4. Hit <Enter> when satisfied with the staking information.
5. Hit the <Store> softkey, or hit <Enter> again to store the staking information. You may also <Read> the point again if desired.
6. A nice feature with the SDR software is the <Alt> + <P> hotkey. When in the navigation mode, press this combination of keys and you will be presented with a graphical navigation screen (bullseye) that contains much of the same navigation information as earlier.

Section 4: Creating and Using XFM jobs

1. Select <Func> and <Job>
2. <New> <Enter>
3. Type in the desired job name and hit <Enter> (or down arrow).
4. Toggle the "Select XFM" field to YES. <Enter>
5. For Transformation, you will more than likely want State Plane Coordinates 1983. This exists as "ussp83" in the list. You may have to use the down arrow key to find it. <Enter>
6. For "Zone", you must input the correct zone that you will be surveying in: (ex. Kansas – North).
7. For the Coord System, you will more than likely want to select "Known", but "Unknown" may be used as well. Here is the difference between the two: Known is assuming that you are going to set the BASE up over a known SPC coordinate. It then will expect you to later key this coordinate in as your GSTN (starting) coordinate. The Unknown option will still allow you to do a calibration, but to only one point. You would key your GSTN coordinate in as something like 0,0,0. You then key a state plane coordinate in under <Surv> and <Keyboard Input> and key your single state plane coordinate. You would then take a rover topography reading to the point giving it the same point id (as the keyboard input) and store it. Then go into <Surv> and <GPS Coordinate System> to calibrate to the one point. For further details on calibration, see Section 2.
8. If you are using Known, then you key in the coordinates (known SPC83) of the BASE as your GSTN after selecting <Surv> and <Topography> and then you are ready to do your topography from there on out. No calibration necessary.

Section 5: SDR8100 Troubleshooting Tips

1. If the TRIGGER key on the side of the SDR8100 will not work, press the <ALPHA/NUM> key, and then try the button. The unit must be in Alpha mode in order to READ.
2. It is a good idea to make sure that the SDR8100 does not go into "sleep" mode, this may cause problems with the unit in the idle topography screen. To set the time out to 5minutes (max), then select <Start>, <Settings> and <Power>. Then select the "Power Off" tab, and set it to 5 minutes.
3. If collector becomes "frozen" in the level 5 software, select <Start> and <Reboot> from the menu. No data will be lost, but you must re-enter the program by selecting <Start>, <File Explorer>, <Application>, <Sokkia SDR> and then double click on the **SDR.EXE** file. This will take you right back into the SDR software. You may need to reselect the job you were working on.
4. When you are using a XFM job, you lose the ROAD-ing functionality.
5. There are two FEET options in the software. FEET is actually the International foot. USFEET is the US Survey foot. The units setting should be the first thing checked before any coordinates are keyed in or any other data is entered.

6. All GPS precision messages (3DRMS, Residual) are reported in METERS. Generally, good values are .025m or under.
7. When getting "Radio Link Down" messages, double check the base and rover radios. Make sure the base is blinking red TX at a one second pulse. Make sure the rover is blinking RX at a one second pulse. If not, then you may need to change to a less "noisy" channel. Ideally, it would be advantageous to purchase a FCC license for your own frequency to use in the field. Double check the satellite LED's on base and rover to verify that ample satellite data is available. If issue still cannot be resolved, it is best to RESET base and rover receivers. Consult owner's manual for proper resetting instructions.
8. When getting "PDOP, HDOP, VDOP exceeded tolerance" messages, this would be a GPS error message (not radio). Select <Surv>, <GPS Status> and then select the <Geometry> option. This will give you all of your GPS information. If your PDOP is too high (poor satellite geometry), then you must wait for it to work itself back down. Anywhere below 3.0 is usually acceptable. It will usually go down within a few minutes, but sometimes a "spike" may last a half-hour.