G301 Survey Module

Operator's Manual

Assembling the kit

- Attach the antenna:
  - Screw the antenna to the boss on the top of the pole.
  - Tighten gently.

- Attach the phone holder:
  - Depress the catch situated below the un/lock knob.
  - Insert the spigot into the hole and set the desired angle by aligning the pin into the ring of holes.
  - The catch should click out once fully inserted.

- Extend the pole:
  - Undo the un/lock knob approx. 1/2 turn.
  - Extend the pole slightly beyond the desired length and insert the pin at the nearest hole.
  - Retract the pole until the pin rests on the base to obtain an exact length (e.g. 160 cm).
  - Tighten the un/lock knob.
  - At the bottom of the pole, unscrew the tip protection cap.

Align with flats

- Attach the Survey Module:
  - Ensure the Survey Module is facing the correct way – ports must be facing down to shed water.
  - Align the clamp with the flats at the 125 cm mark on the pole. Push it on gently.
  - Rotate the clamp approx. 1/4 turn clockwise until the holes line up.
  - Insert the locking pin.

Twist ¼ turn

- Attach your phone:
  - Unscrew the phone holder to accommodate your device.
  - Gently screw it in to clamp your phone in place. Ensure the flanges do not interfere with any side buttons.

- Connect the cables:
  - Attach the 30 cm TNC->SMA cable between the antenna and Survey Module.
  - For Android or iPhone 15 and newer, use the USB-C->USB-C cable to connect the Survey Module to your phone.
  - For older iPhones, use the USB-C->Lightning cable.

Connecting to your phone

The Survey Module is designed to present itself as a generic Bluetooth GPS receiver; it should work with all devices and applications supporting GPS and NTRIP correction signals over Bluetooth LE.

Once the module is plugged into your phone and the unit is outside, the *GPS* LED will light up to indicate power. After approximately 20 seconds it will begin to flash, once GPS Fix has been established.

The *RTK* LED will start flashing when it receives valid correction data and will stay lit when RTK Fix is achieved.

Note regarding some Android devices: As a security feature, Android phones may not provide power to the unit until *USB OTG* is enabled. To do this, go to ***Settings > Connected Devices. Switch on OTG Connection.*** You will need to do this each time you connect the USB cable.

Connecting to other devices

The USB port on the Survey Module also presents as a serial port to devices such as PCs. To use mapping software on your PC, simply plug it in and select the appropriate serial port in your software.

Advanced users only: it is also possible to use U-Center software (freely available from U-blox) to write custom configurations to the GPS chip or to update firmware. Ensure you make a backup of the existing configuration before making any changes.

Basic operational workflow

The functionality has been tested primarily using SW Maps, a free app available for Android and iOS. The following steps are based around SW Maps, however the process will be broadly similar in a number of other apps.

The full manual for SW Maps can be found on the included USB drive or can be downloaded at: https://aviyaantech.com/SwMaps/assets/SW%20Maps%20Manual%20V3.0.pdf.

First steps

- Open SW Maps.
- Create New Project:
  - Name your project.

- Connect to the Survey Module:
  - Press *GNSS Connection* (see Fig. 1).
  - Set *Connection Mode* to *Bluetooth LE*.
  - A device called *CSEQ-xxxx* should appear (you may need to press the *Refresh* icon to scan). Click to select it.
  - Input the *Instrument Height*, corresponding to the pole length.
  - Press *Connect*.

- Connect to the NTRIP service:
  - Press *NTRIP Client*.
  - (First use only) press the + icon to create a new connection.
    - Name: CSEQ
    - Ntrip Version: V1
    - Address: ntrip.cseq.co.uk
    - Port: 2101
    - Mount Point: press the *Refresh* icon to select your nearest base station from the list.
    - Username/Password: to be supplied separately.
    - Press *Save*.
  - Select the profile *CSEQ*.
  - Press *Connect*.

- The status bar should look like Fig.3 within a few minutes. ΔH and ΔV represent the positional accuracy in cm.
- The *RTK* LED on the Survey Module will be lit continuously when in RTK Fix.

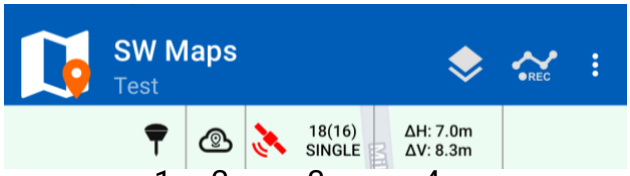

Figure 1
1. *GNSS Connection*
2. *NTRIP Client*
3. *Skyplot*
4. *GNSS Status*

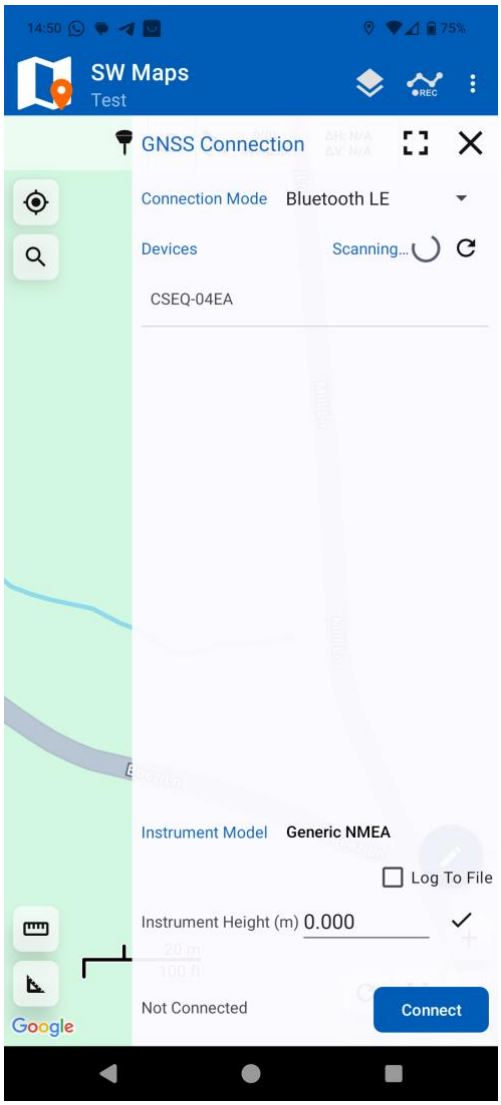

Figure 2

Figure 3

Recording points

SW Maps can be set to record points, lines or polygons as desired. First, create a new layer:

- Press the  icon in the top right:
  - Create a new layer with +.
  - Select *Drawn Feature*.
  - Name the layer.
  - *Geometry Type*: Can be *Point*, *Line* or *Polygon*.
  - Press *Add*.
- Press the  icon in the top right:
  - Select *Record Feature*.
  - Type in a name.
  - Make sure the pole is upright using the bubble level.
  - In the bottom right, press  to add a point.
  - Repeat for all the points in your field.

Exporting files

Once you have recorded the field, it is easy to export and share the files from SW Maps. The app supports various file formats: KMZ is useful for directly viewing in Google Earth and Shape files are most useful for precision farming or applications like QGis.

- Press the  icon in the top left.
- Select *Share Project*:
  - Choose an appropriate file format.
  - Choose a name and which layers to export.
  - You can share to email, Google Drive, WhatsApp, etc.

Miscellaneous

Opening the unit

Unscrew the front panel (the panel with connectors) and slide the main circuit board out.

The unit is waterproofed with a silicone gasket at both ends. If you open the device, ensure you clean the surfaces thoroughly before applying a thin layer of silicone-based adhesive, such as CT-1.

Thank you

..for purchasing a CSEQ Technologies product. We hope it serves you well for years to come. We always welcome feedback to improve our products so please let us know your comments at cseq.co.uk.

Source code and schematics for repair purposes are available upon request.