

Sentek Probe Utility App User Guide (for Android Phones)

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The Sentek **ALL IN ONE** SOLUTION

and **Sentek Compact DTU**

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Sentek Probe Utility App Version 1.2

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Probe Utility Bluetooth App Overview

The Probe Utility App streamlines the in-field commissioning of a Sentek PLUS **All-in-one** or a Sentek PLUS **Compact DTU** probe, which has a self-contained Bluetooth communication module.

The Sentek App is a subset of the capabilities of the PC version of the Probe Configuration Utility. This utility is an Android Phone/Tablet application, which allows you to Query the sensors, Send test data, Upload readings to the Internet or Synchronise time in the probe.

What can the App Do?

After the probe is installed in the field the configuration needs to be checked for successful operation of every sensor and successful upload of readings to the Internet. This can be achieved by accessing the probe with the Probe Utility App on an Android phone. After the App has been installed, the validation steps are:

1. Connect to the probe and inspect the values on the summary Information screen
2. Synchronise the probe date and time with the Android date and time (if needed)
3. Sensor check to ensure all sensors are configured to the current depths
4. Query all sensors to ensure valid calibrated reading are obtained for every sensor
5. Modem Send Test data or Upload readings to ensure data is successfully uploaded to the Internet (App Version 1 only supports deferred upload)

Caution:

While the App is connected to the probe no reading samples are taken, which will result in graph gaps if connected when Next Sample Time occurs.

Restrictions

Only Android phones (or tablets) running Android version 2.3.5 (also known as Gingerbread, API Level 10) or later can use the Sentek Probe Utility App (the App).

Check using See Android Phone Apps menu: Settings > About Phone > Android version

The android phone communicates with the probe via a Bluetooth module that is incorporated in the **All-in-one** or **Compact DTU** top cap. Communication is established by swiping the activation magnet against the edge of the top cap, to turn on the Bluetooth module, then within a few meters, operating the phone to connect to the probe.

Only **All-in-one** probes and **Compact DTU** Drill & Drop probes are supported. They upload readings to the Internet to an Internet address accessible to IrriMAX Live (or customer specified Destination URL). They are preconfigured by Sentek using the Probe Configuration Utility (PConfig). This includes the Internet Destination URL to where readings are uploaded.

Version 1.x of the App cannot be installed from Google "Play Store" library in the Internet. At present the app must be manually installed from downloads on

the Sentek Web site. See section: *Installing the App on an Android Phone*.

See the Sentek All-in-one manual for further information on probe features.

The probes operate with an incorporated 13 volt battery and an EnviroSCAN RS232 interface.

All-in-one probes and Drill & Drop probes have a predefined set of sensor configuration and depths.

Caution:

The probe firmware does not support concurrent communication through the interface TTL port and Bluetooth device. Invalid data may be delivered.

If the probe is not located in the ground, it is recommended to remove power from the probe after disconnecting, to avoid sampling the sensors when they are not in the ground.

References

The following Sentek manuals describe the characteristics and installation of the various probe types:

- Sentek PLUS All-in-One and Sentek Compact DTU Hardware Manual
- Irrimax User Guide
- Irrimax Live, web based graphing
- Probe Configuration Utility User guide

A glossary of agronomic terms is available in the Irrimax User Guide.

Screens in Probe Utility App

Once the App is installed the following screens are available:

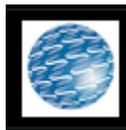
- Start Sentek App
- Scan for Devices
- Information summary
- Sensor Test (retrieve sensor configuration and Query All Sensors)
- Clock
- Modem Upload and Test

You can navigate between screens using the App function buttons and the **Back** button.

The **Home** button can also be used to suspend viewing the App. You then reenter the app by tapping the App icon.

Start Sentek App Screen

After installing the App, your list of All Apps will have the icon for the Sentek App.



Tap this App and the Start screen will appear.

Note: If you press **Home** while the App is running, you can reenter the app by tapping this icon again.



Tap **Start** and the Scan for device screen appears. You may need to tap **Yes** to turn on Bluetooth.

Caution:
Enabling Bluetooth may shorten the time before a phone battery recharge is necessary.

Note:

These screen shots are with a specific brand Android phone, but will be similar on other Windows versions and other brands of Android phone. Please consult your specific device manual for layout and navigation to specific Settings pages.



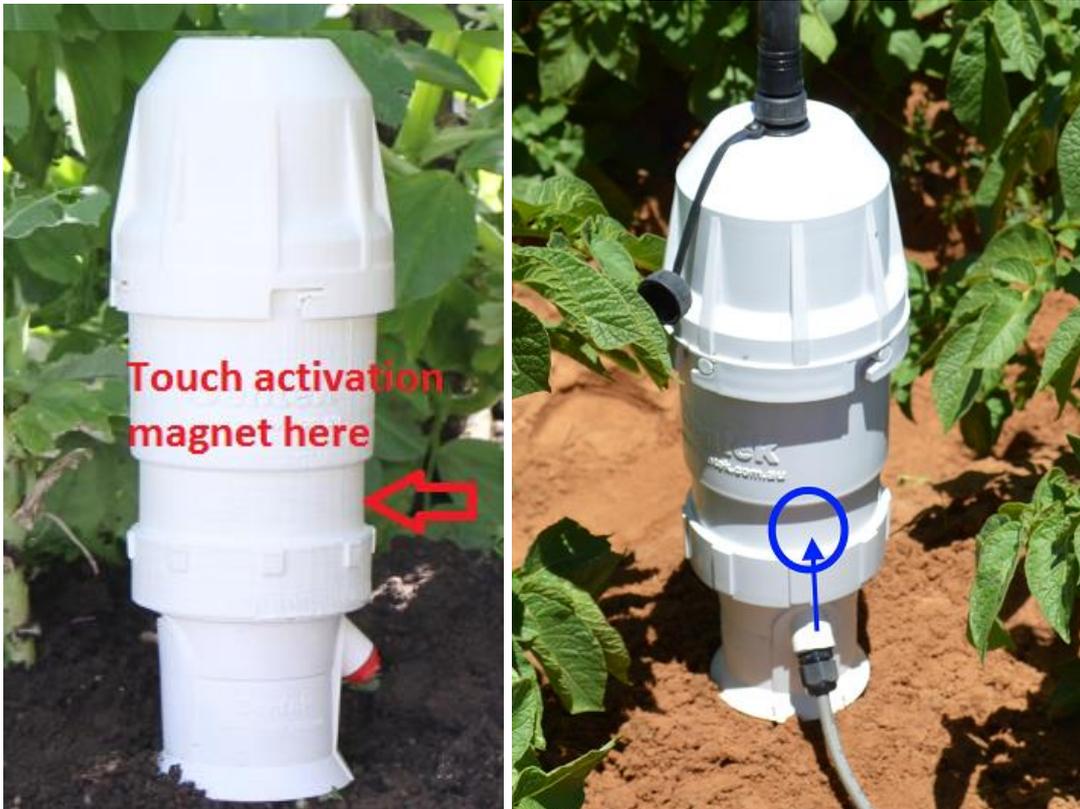
Later you can disable Bluetooth from the Settings App by untick/disable Bluetooth.



Scan for Devices Screen

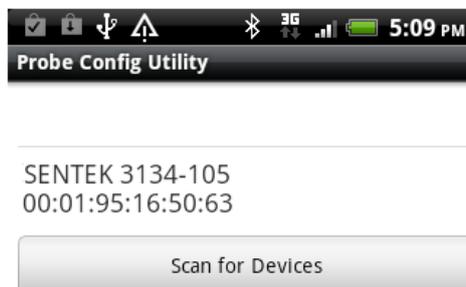
Touch the activation magnet (e.g. Sentek torch) at the activation point above the top cap plug on the All-in-one/Compact DTU probe. You have two minutes to successfully connect to the Bluetooth device in the probe.

An internal beeper sounds to indicate the Bluetooth module is active. The sound stops once the probe is connected.



The following screen appears after you tap **Start**. The app does not require pairing of devices and only displays Sentek devices. You can setup a paired device for all of your probes but only detected devices will appear in the list.

Tap **Scan for Devices** and all Sentek probes (within range) will appear on the screen.



Tap the desired probe name. The Information screen will appear, with a quick message similar to this: 

Note: If the Connected message does not appear, tap **Back** and again tap **Scan for Devices**.

Information screen

This screen displays information held in the probe. It also has three buttons to navigate to the other functions of the App.



The information displayed is preconfigured by Sentek and cannot be changed without PConfig. It is important in trouble shooting problems.

- Type
 - **All-in-one** probes have the same type (XEPI-232)
- Serial Number
 - Unique serial number of probe, may be different to Warranty Serial number label on the Interface
- Version
 - Version of the firmware in the probe
- Logger ID
 - This name is used to supply the IrriMAX database Logger ID. The default is the probe's serial number.
- Sample Interval
 - Time between readings taken by probe (typically 15 minutes)
- Upload Interval
 - Time between uploads to the internet (typically 1 to 3 hours)
- Next Sample Time
 - Time of the next reading.
 - **Caution:** Automatic scheduled samples and uploads do not occur while the App is connected to the probe. If a scheduled sample interval occurs while the App is connected the sample will not be taken and an invalid reading (gap in the graph) will be recorded. Sampling will not reoccur until at least 60 seconds after the App is disconnected.
- Next Upload Time

- If the App is still connected at this time the upload will not occur and the upload will not occur until the next sample time

Note: This value may be offset (sample origin) by a few minutes from other local probes, to prevent congestion caused by multiple probes uploading to the Internet at the same time.

Tapping the **Sensor Test**, **Clock** or **Modem** buttons take you to those appropriate screens.

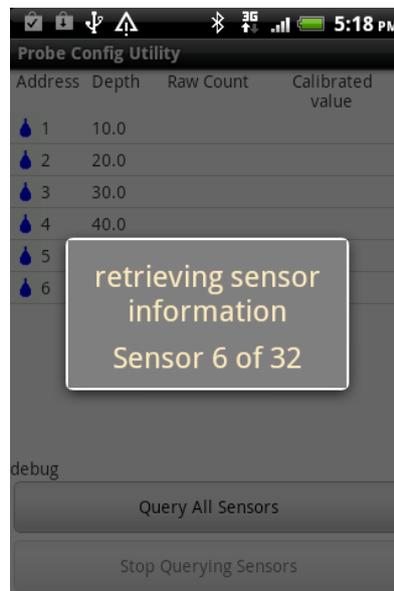
Pressing **Back** button from this screen closes the connection, with the

message: 

Sensor Test Screen

Note: If the probe is not configured correctly with PConfig the **Sensor Test** button will remain dimmed. The raw and calibrated values are meaningless if the probe is not installed in the ground.

This screen initiates the retrieving of sensors in the probe then allows querying of all sensors. It is similar to the Sensor test tab in PConfig.



The table contains four columns of information for all sensors in the probe. Sensors are displayed in the order of each sensor type then depth within each type.

- Sensors symbol and address
 -  Moisture sensors addresses start at 1
 -  TriSCAN Salinity sensors addresses start at 65, they are linked to corresponding moisture sensor at same depth
 -  Temperature sensors start at 161
 -  Humidity Sensors start at 193
- Sensor Depth
 - Multiples of 10cm
 - Depth of zero for moisture or salinity mean sensor that the sensor was incorrectly configured by PConfig.
- Raw count

- Updated about once per second while Query All Sensors is active
- Correctly operating when value is not zero and not 65534 or 65535)
- Calibrated Value
 - Updated about once per second while Query All Sensors is active
 - Correctly operating when the value is not zero and not "invalid"
 - Value of "invalid" when in soil indicates the sensor is not operating correctly, or sensor was incorrectly configured by PConfig.

Note: you can flick to scroll the sensor list if there are more sensors than will fit on one screen.

The two buttons **Query All Sensors** and **Stop Querying Sensors**, start and stop sensor querying respectively. During sensor querying the raw count values and moisture values are continuously retrieved from the probe and displayed in the list.

Address	Depth	Raw Count	Calibrated value
1	10.0	27231	16.67258
2	20.0	27215	16.72676
3	30.0	58392	invalid
65	10.0	19677	554.74194
66	20.0	19624	561.25903

Query All Sensors

Stop Querying Sensors

Press the **Back** button to return to the Information screen.

Clock Screen

The clock screen shows the probe's date and time.



The probe's time/date and the Android time/date should be within a few minutes of the current local time. The Android time is shown at the top of the Android screen in the indicator items area.

If the times do not closely match, tap the **Synchronise with Device** and the probe time will be within a few seconds of the Android's.

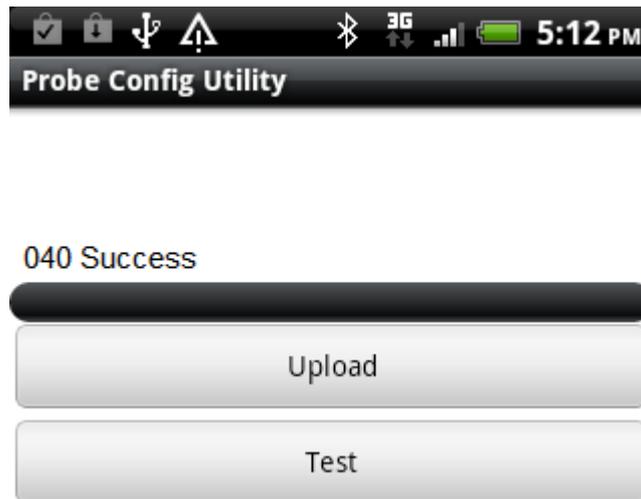
Caution:
The probe's time may be wrong if it has been unpowered for an extended time (about 1 week).
You may need to change the Android time as it may be inaccurate.

Press the **Back** button to return to the Information screen.

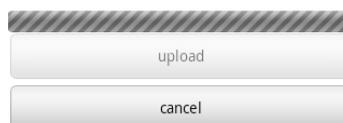
Modem Test and Upload Screen

Warning:
In the App version 1.x **Upload** and **Test** buttons cannot upload while the App is connected. They only tell the probe to schedule the test or upload, 1 minute after the App has been exited. The upload takes about 2 minutes or longer if a lot of data must be uploaded.

This screen appears when the **Modem** button is tapped on the Information screen.



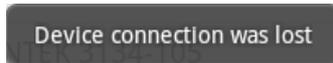
1. The result of any previous operation (App, PConfig or periodic upload) will appear above the progress bar.
2. Tap the **Test** button to schedule an upload of a test file. Usually the **Test** button is sufficient to confirm the Internet is accessible. Tap the **Upload** button to schedule an upload of all readings currently in the probe. While the **Test** or **Upload** button is in operation an animated progress bar shows the operation is still running.



When the operation is above the progress bar is the probe's last response:

- 041 Success (No Data)
There is no data in the probe, so no upload of readings will occur (upload is not exercised, so use the **Test** button)

- **081 Deferred Upload [190s after disconnect]**
The test or upload has been scheduled and will occur 1 minute after you exit the App. The upload will not be completed until at least 190 seconds (3 minutes 10 seconds) have passed.
 - **No server in probe**
The probe has been mis-configured because the Destination URL field is blank. Use PConfig to correct the probe's URL
3. You must then press the **Back** button until the App exits and you get the message:



4. Wait for the 190 seconds after you get the Device connection was lost.
5. Reenter the App and tap the **Modem** button.



Above the progress bar is the probe's last response:

- **081 Deferred Upload [190s after disconnect]**
You reconnected before the upload commenced - go back to *step 3*
- **040 Success**
The Test or Upload showed the probe successfully uploaded to the Internet.
- **053 Connection Failure(...)** or Other numeric codes
The modem could not successfully upload to the Internet.

Consult the Sentek All-in-one and Compact DTU Hardware Manual if you find the probe is unsuccessful in uploading. You may need to contact the dealer who configured the probe or use PConfig to connect to the probe. The last response indicates the failure point in the communication process.

Press the **Back** button to return to the Information screen.

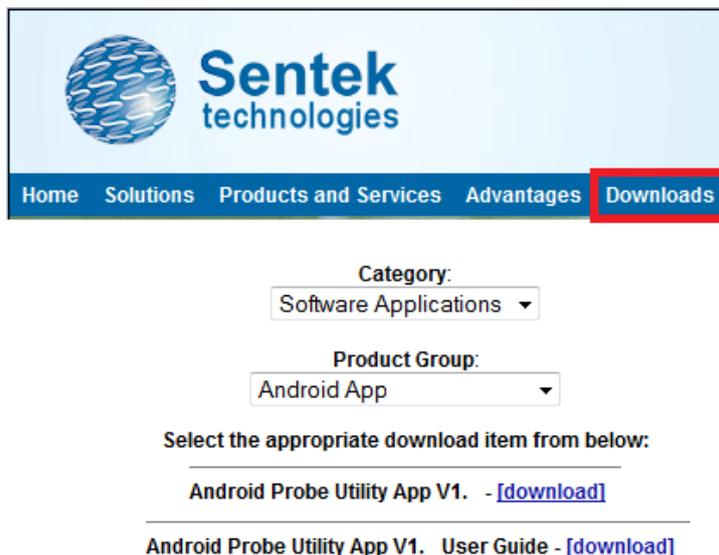
Installing the App on an Android Phone

The Sentek App becomes an application on the Android Phone when it is copied from a PC and then Installed.

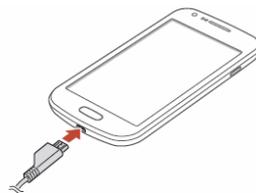
Caution:

These screen shots are for Windows 7 with a specific brand Android phone, but will be similar on other Windows versions and other brands of Android phone. Please consult your specific device manual for layout and navigation to specific Settings pages.

1. Download the App from the Sentek Download Web site to you PC
 - a) Select Downloads > category: Software Applications > Product Group: Android App > Appropriate download: Android Probe Utility App

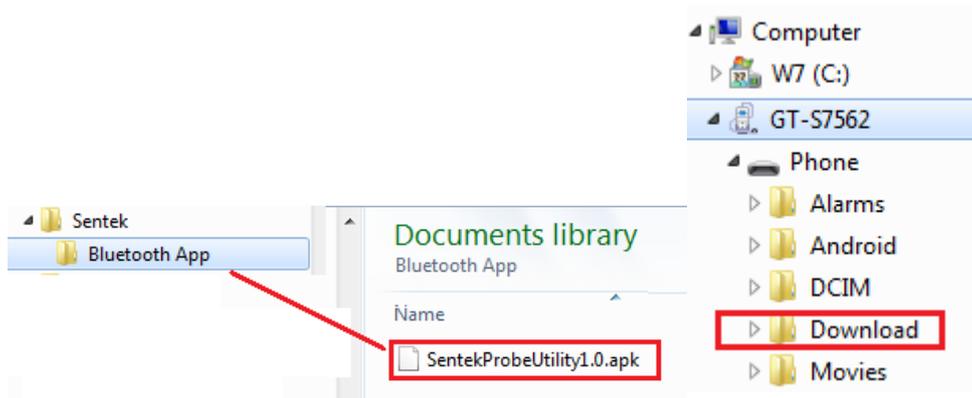


- b) Click Download and follow the prompts to save the file "Sentek Android Probe UtilityApp V1.x.apk" in an obvious folder on your PC e.g. My Documents
2. Copy the App from the PC to the phone using the following steps:
 - a) Confirm the phone supports Android 2.3.5 or later.
Settings > About Phone > Android version
Note: If version is earlier, use another phone.
 - b) Connect the Phone to PC USB cable (it is supplied with your phone) This will also charge the phone battery.

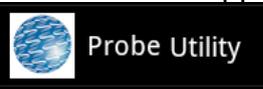


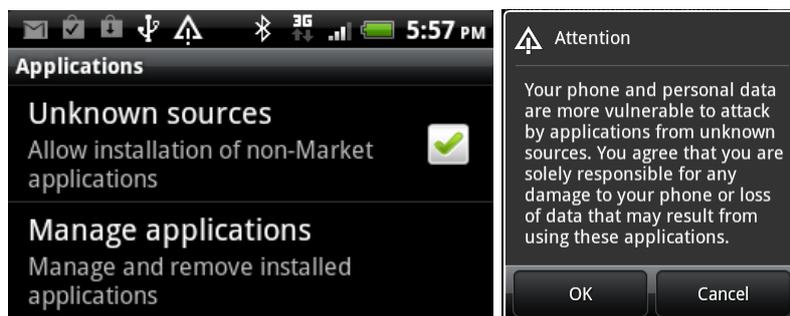
- c) Select the option: USB connected, Respond "Turn on USB storage" and Answer OK to "If you turn on USB storage, some applications you are using will stop and may be unavailable until you turn off USB storage."
 - d) On the PC a removable disk drive (the phone) will appear in list of devices

with removable storage. Open the phone folder where you want to store the .apk file (suggested folder: Download) and drag the .apk file from your PC to the phone.



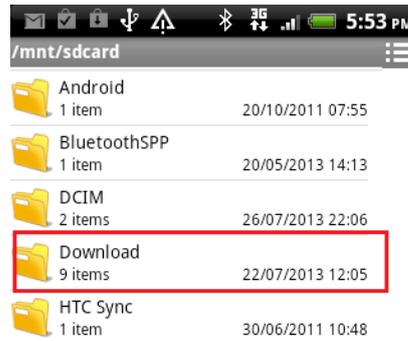
Alternatively, if the windows auto play window appears, select the option "Open folder to view files"

- a) Select Safely remove devices from the PC task bar and select Eject the removable device.
- b) Power Off/On the phone (may not be necessary)
3. Uninstall the Existing Sentek Probe Utility App (if already installed)
Caution: If you skip this step you may get the Installer message "Application not Installed"
 - a) Choose Settings > Applications > Manage Applications
 - b) Flick the list of applications, looking for

 - c) Tap The Probe utility and tap **Uninstall**
 - d) Tap Ok to the message "Uninstall Application?"
4. Install the App on the phone
 - a) Turn the phone on, and choose the Settings > Applications, and tick **Unknown sources**. Tap **OK** to the attention warning.



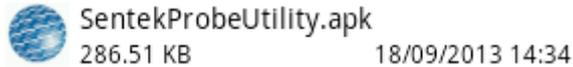
- b) Press **Home** button. On Home window, Tap **Apps** icon and look for the File Manager icon (**Filer, My files** or similar). Tap the Manager Icon

- c) Browse to the phone directory where you placed the



AndroidProbeUtilityApp.apk e.g.

d) tap this **file name**

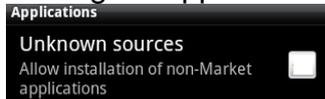


e) Tap **OK** to "The application you are installing will install (or replace another) application. All previous user data will be saved". Tap **Install** to the message "Do you want to install this application"

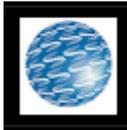
f) Answer **Done** to the message "Application installed"

g) Turn off/un-tick Unknown sources

Settings > Application > Unknown sources



The Sentek App is now available in the list of All Apps. The icon looks like:



You may want to hold and drag this icon to your home screen.

Quick Start

Note: The Android screen shots are from specific brand of Android phones but will be similar on other brands of Android phone

INSTALL THE APP

Download and install the App from Sentek website

Perform once only, or to update to a new version of the App.

See section *Installing the App on an Android Phone*

CONNECT TO THE PROBE

In your list of Apps, tap the Sentek app icon



Tap the **Start** button.



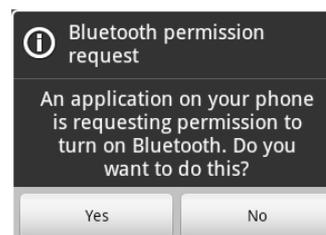
After touching the **Start** button if Bluetooth communications have not been enabled the phone will request that Bluetooth communication be enabled by displaying a Bluetooth permission request.

OR

Enable: Setting > wireless & Networks > Bluetooth

Answer **Yes** to allow Bluetooth

Caution: While Bluetooth is enabled the phone will consume power more quickly.



Activate the Probe's Bluetooth module by Waving the Sentek App activation magnet in close proximity to the **All-in-one** top cap.

This activates the **All-in-one** Bluetooth module for two minutes.

A beeper will sound until you have successfully connected to the probe.

If no connect is made within the two minutes it is necessary to wave the magnet again.

Once connected the connection remains active until you disconnect the Sentek App.

Tap **Scan for Devices**.

All Sentek devices (in range) will be displayed.

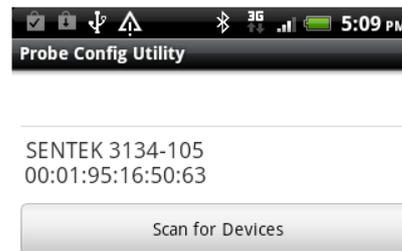
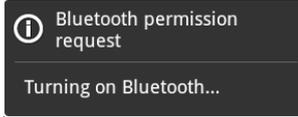
Generally there is only one device in close proximity.

Tap the desired device name.

The main information screen is displayed, after a connected to message appears.

For a description of the fields displayed see section *Information screen*.

Note: If the fields do not get populated within a few seconds press the **Back** button and try again.



To close the connection press the **Back** button, to return to the Start screen. The probe will be disconnected with the message "Device Connection was lost".

Press the **Back** button from the Start Screen and the App will close down.



CLOCK FUNCTIONS

On the main information screen tap the **Clock** button.

The probe's current time and date is displayed.

If the probe's time and phone time are different, tap **Synchronise with Device**.

Caution: The probe's time and date may be wrong if the probe has been unpowered for more than a few days.

Also, the Android device's clock may be inaccurate. You may need to manually change the Android clock.



MODEM FUNCTIONS

On the main information screen, tap **Modem** button. The Upload and test buttons appear.

When you tap the **Test** button a block of messages is sent to the specified URL.

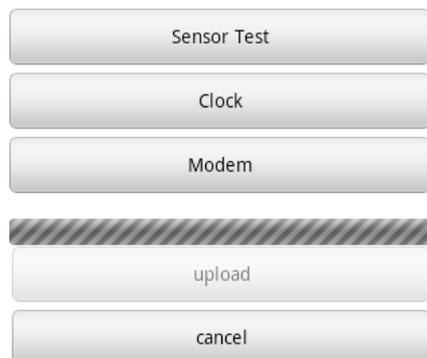
The progress bar shows the operation is in progress.

You can abort the command by tapping the **Cancel** button.

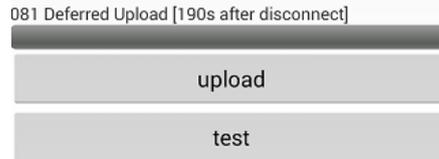
When you tap the **Upload** button all readings that are yet to be uploaded are sent to the specified URL.

The progress bar animates to show the operation is in progress.

You can abort the command by tapping the **Cancel** button.



When the operation is completed the progress bar stops animation and a completion message is displayed.



The expected response is

081 Deferred Upload [190s after disconnect]



3 minutes 10 seconds

1. Then press the **Back** button until the App exits and you get the message:

Wait until the 190 seconds have elapsed

Start the App again, Scan for devices, **Connect** then select the **Modem** button.



The result of the upload is displayed above the progress bar.



Expected result:

040 success

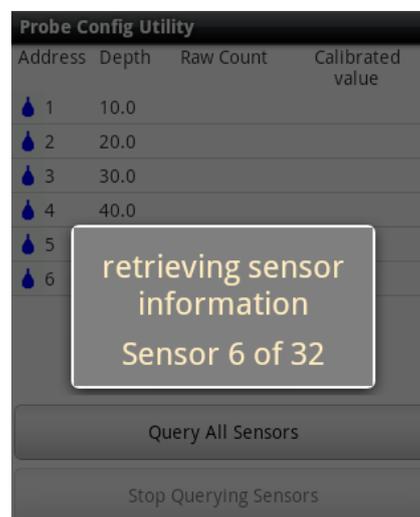
SENSOR TEST FUNCTION

Note: if the **Sensor Test** button remains dimmed, the probe has not been configured correctly.

On the main information screen, Tap the **Sensor Test** button.

Information for every sensor on the **All-in-one** probe will be retrieved. Please wait for the retrieving message to disappear.

If you press **Home** button



during this operation, the operation continues to run in the background. Tap the App icon to return to this screen.

The type and depth of each sensor will now be shown.

If many sensors are configured, you can flick the screen to display other sensors.

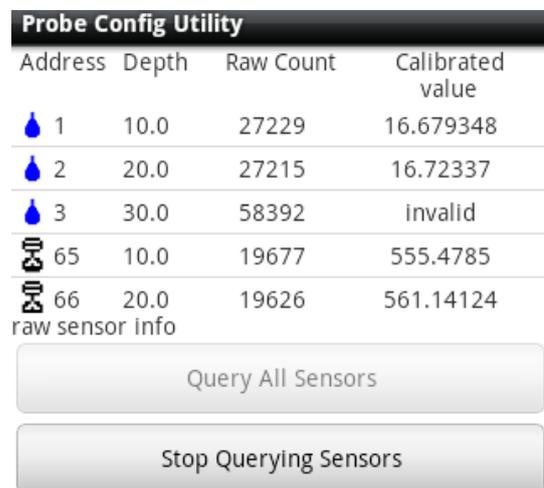
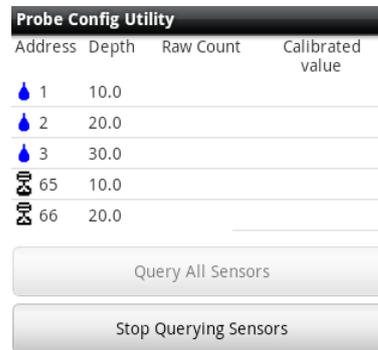
Tap **Query All Sensors** to read all the raw values and then the calibrated values.

These values will be continually refreshed until you tap **Stop Querying Sensors**

OR

Press the **Back** button.

Raw counts of zero indicate the sensor is not responding. Invalid values may indicate the sensor is not configured correctly or is not in the ground.



UNEXPECTED CONDITIONS

In the unexpected situation the App may crash with a message like
Tap the Force Close then restart the App from the list of Apps.



REMOVAL OF THE APP

Settings > Applications > Manage Applications
Tap the Sentek **Probe Utility**. Tap the **Uninstall** button.
Tap **Ok** to "Uninstall Application?"



Glossary

Android App	A mobile software application developed for use on devices powered by the Android software system. Android Apps are available in the Google Play Store and on Android-App focused sites. Apps can run on Android smartphones, tablets, Google TV and other devices.
Android Smart Phone/Tablet	Android (Smart Phone or tablet) is a mobile operating system developed by Google and is based upon the Linux kernel and GNU software. It is supported by many phone manufacturers.
Bluetooth	Bluetooth is an open wireless technology standard for exchanging data over short distances (using short wavelength radio transmissions).
Phone notification panel	To open the notifications panel, tap the indicator icons area and drag it downwards. To hide the panel, drag the bottom of the panel upwards
The App	The Sentek Probe Utility App
Touch screen terminology (see your phone user manual for further information)	<p>Control your touch screen with the following actions:</p> <p>Tap: Touch once to select or launch a menu, option, or application.</p> <p>Tap and hold: Tap an item and hold it for more than 2 seconds.</p> <p>Drag: Tap an item and move it to a new location</p> <p>Double-tap: Tap an item twice quickly.</p> <p>Flick: Briskly scroll up, down, left, or right to move through lists or screens.</p> <p>Pinch: Place two of your fingers far apart, and then pinch them together (not used in the App)</p> <p>Home: The button in the middle at the bottom of the screen. On some phones it is on the screen on others it below the screen. It takes you to the top level navigation screen.</p> <p>Back: The button to the right of the Home button. On some phones it is on the screen on others it below the screen. It generally takes you to the previous screen/</p>