

# AquaCheck AcUtility Instruction Manual

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AcUtility V2.00 or later*

[www.aquacheck.co.za](http://www.aquacheck.co.za)



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# 1 Introduction

The “AcUtility” program is intended for functionality testing and commissioning of AquaCheck soil moisture probes.

Firmware upgrades for all probes, ROVER, Shuttle and Portable Upgrade Kit (PUK) can be done via this program. The “AcUtility” will also manage the firmware files for the PUK.

During commissioning of the probes, user settings can be managed. These include the SDI-12 and MODBUS communications, control of the radio, baud rate and logging interval.

Please check regularly that you have the latest version of software and firmware files.

## 2 Connecting to the device

Connecting to the device (probe) will require the suitable hardware between the device and the PC. Example of the PC upgrade kit (diagnostics kit) and how to connect to the probe is shown to the end of the document.



The Com Port selection is a drop-down menu at the top right. If there are any compatible USB devices attached to the USB port, AcUtility will detect these and the “USB” check box will appear. The com status will indicate “USB Detected(n)” where n is the number of compatible devices detected.

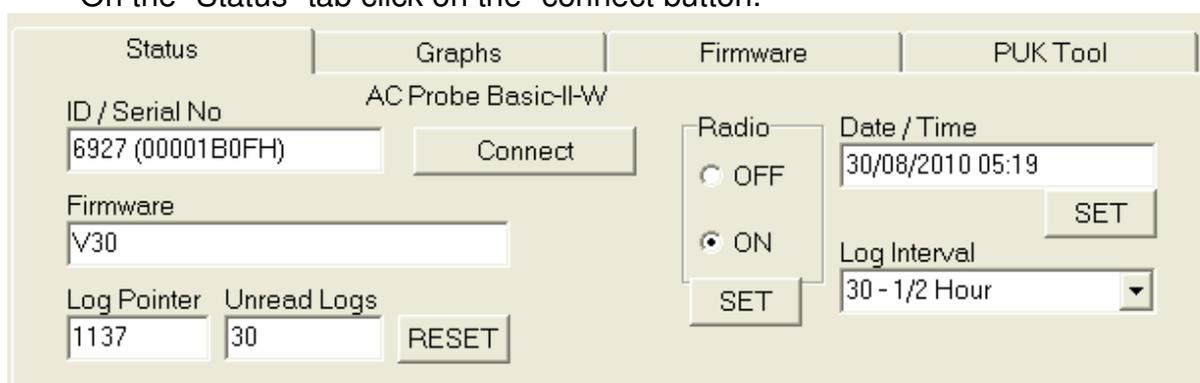
If you are using a compatible USB converter (or built-in USB like the shuttle) then check the USB box and select the device

If you are not using a compatible USB converter then un-check the USB box and select the correct com port from the list.



Select the Mode (MODBUS or SDI-12) and the baud rate (MODBUS mode only). Click on the “Open Port” button. If you wish to see more info about the USB device, select the device in the drop-down list, then double-click on the list box. A dialog will open with the available information. Click “OK” to close.

On the “Status” tab click on the “connect button.



The connected device will respond with its ID and status as shown. For wireless probes the Radio can be turned on or off, and the logging interval set. Logging devices show the status of the logs on the device.

If wireless probes are not used in a wireless system or with the wireless logger/shuttle, the radio can be turned off to conserve power. If the probe is used in conjunction with a wired controller, then the logging interval should be turned off.

SOLO and Scout units can have more than one probe attached.

The screenshot shows the AC SOLO-I control interface with the following fields and controls:

- Status** | **Graphs** | **Firmware** | **PUK Tool**
- AC SOLO-I
- ID / Serial No: 100(1&6758) [Connect]
- Firmware: V30
- Radio:  OFF,  ON [SET]
- Date / Time: 19/08/2010 13:32 [SET]
- Log Interval: 30 - 1/2 Hour [v]
- Log Pointer: 1 & 1025 | Unread Logs: 159 & 126 [RESET]

1	6.4514%	24.6°C
2	9.4025%	25°C
3	No DATA	0°C
4	No DATA	0°C
5	No DATA	0°C
6	No DATA	0°C

[Refresh]

The ID/Serial number show the ID of the master unit, and the ID of the last probe(s) attached in brackets. The status of the logs are shown for probes last logged by the unit.

The lower portion of the screen shows the values sensor readings of the probe. Active sensors (up to 6) will show. For more than 6 sensors a button will appear to cycle through additional sensors. These values are the last readings taken by the probe. To get fresh readings press the “Refresh” button. After 2 seconds (or 4 seconds for SOLO/Scout) the new values will appear. To get the readings from the second probe attached to the SOLO/Scout, put in the value “2” in the “Modbus Adr” at the top of the screen, and press “refresh”. Remember to return the Modbus Adr to 1 (the default value).

Currently the SOLO and Scout units only operate in MODBUS mode. It would be unlikely to use this unit in SDI-12 installations, as the probes themselves can be bussed on an SDI-12 multi-drop configuration.

The 2 blocks at the bottom of the window show the data sent to and received from the connected device. To show this press the “more” button.

NOTE: For probes with more than 6 sensors a button will appear just above the bar-graphs – click this button to scroll through the additional sensors

### 3 Changing the communication Mode and Baud rate

The communication mode and baud rates can be set. Once the probe is connected as described in chapter 1, change the Mode setting to the required “Modbus” or SDI-12, or ASCII. (Do not close the com port when doing this.) An “Update” button will appear in the box, click on it. Close the com port, and re-open – check that the probe will “connect” as required. (Note the mode can only be changed after the device has “connected”). It may be necessary to cycle the probe power if it will not connect after changing the mode.

Similarly the baud rate can be set to 9600, or 2400. This can only be done for the Modbus mode. It will be good practice to mark the probe if the baud rate or operating mode is changed.

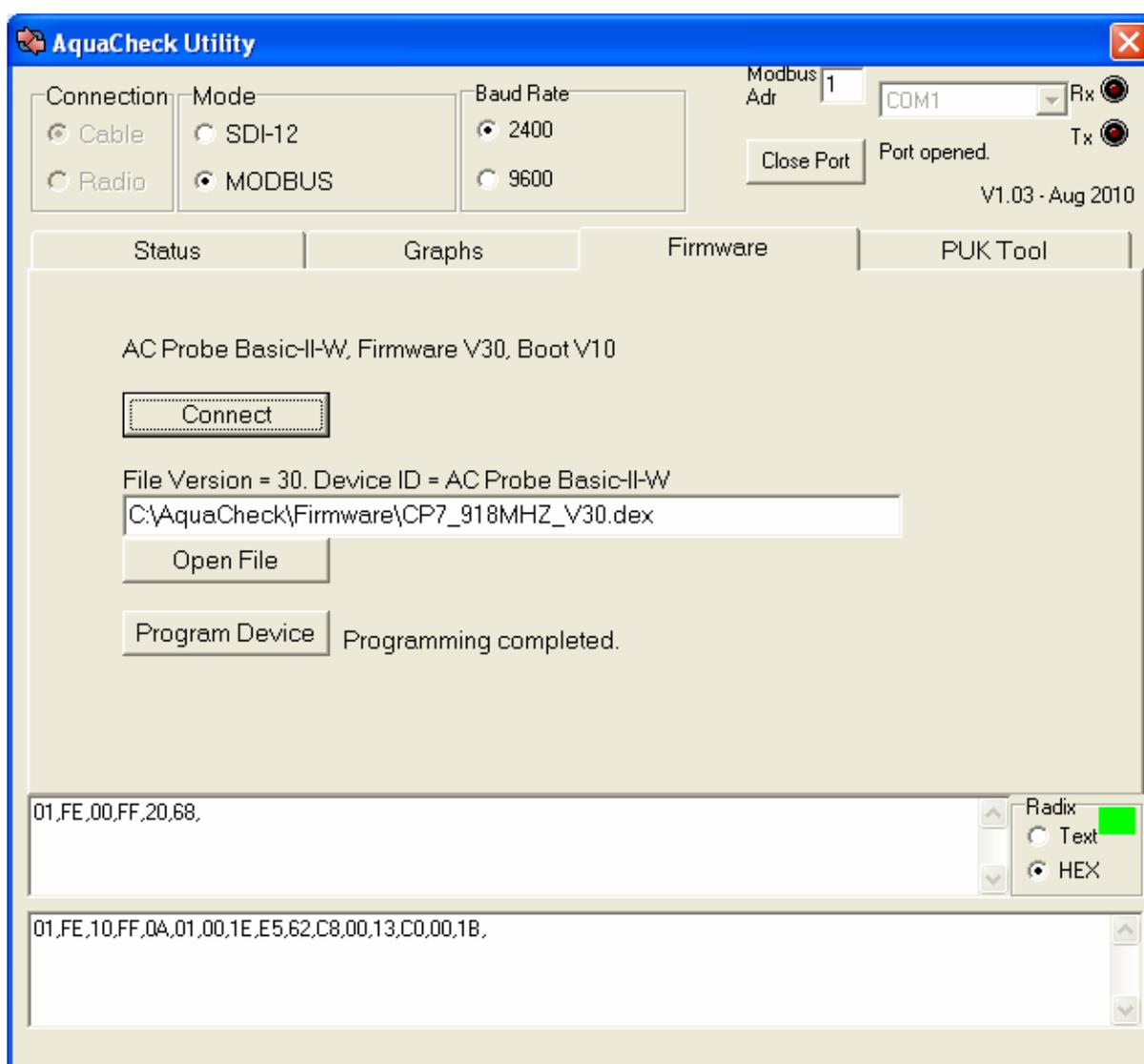
To change the address of the probe – double click on the address box (just to the left of the com port selection. A dialog box will open where you can enter the new address. MODBUS address range is 0 to 126 (default is 1), SDI-12 is 0-9, a-z and A-Z (default is 0). For ASCII the range is 00 to 98 (default is 11).

## 4 Firmware Upgrading

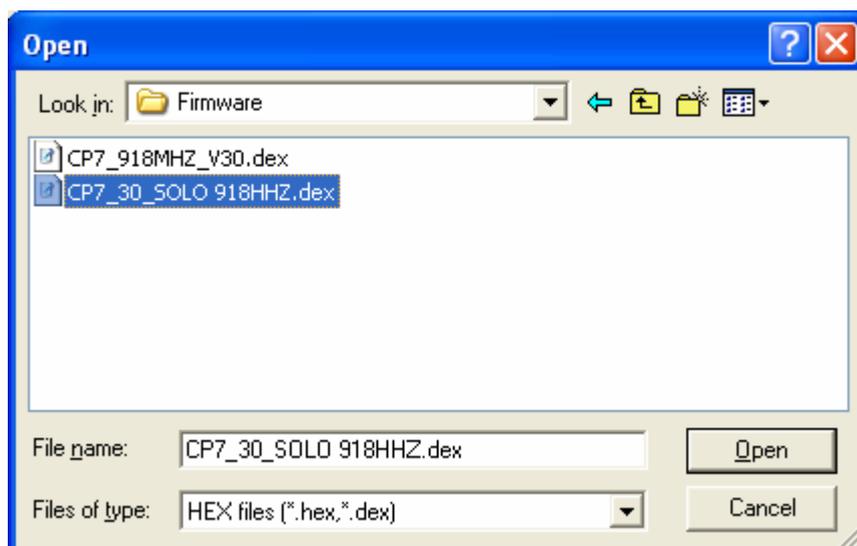
Firmware upgrading can be done for all probes, SOLO, Scout, Shuttle and PUK equipment

Start by making sure you can connect to the device as in the preceding procedure.

Click on the “Firmware” Tab. Click the “Connect” button. The description of the connected device, Firmware version and Boot version will show.



Click on the “Open File” button. After browsing to and selecting the file, the details of the contents of the file will show just above the file name.



Click “Program Device” – the process will begin, showing a progress bar indicating the progress of the programming.

Do not disturb the programming process.

#### **NOTE ON UPDATING SDI-12 and 9600 baud PROBES:**

If SDI-12 or ASCII probes (Classic and SubSurface) **prior to version 40** are to be programmed via this utility, then the probe **MUST FIRST BE PUT IN MODBUS 2400 baud mode**. After programming the probe can be returned to SDI-12 mode or the required baud rate. If the probe is in SDI mode, connect to the probe, then click the “MODBUS” button – then click the “Update” button that appears. Now program the probe/device. After the probe/device is programmed click on the SDI-12 button and “update” to put the probe/device back into SDI mode. See [section 3](#) for more details.

When using the PUK tool (below) to upgrade firmware, it is not required to change to operating mode, the PUK will program the firmware and leave the device in the correct mode, no need to change it.

## 5 PUK (Portable Upgrade Kit)

The PUK is a hand held field upgrade kit. One can upgrade AquaCheck field equipment without the need for a laptop. Follow the instructions in the “PUK-II Manual.pdf” guide. This guide will detail the use and programming of the PUK kit. The PUK kit is sold separately.

## 6 AC-Shuttle

This section specifically describes updating the language (menu messages), font and splash screen bitmaps.

Connect the Shuttle to the USB port as you would any device (press the “Connect” button on the “Status” tab to ensure the Shuttle connects with the AcUtility. Select the “Shuttle” tab to access the upgrade options. Select one or more of the files that require updating.



The screenshot shows a software window with four tabs: Status, Shuttle, Firmware, and PUK Tool. The 'Shuttle' tab is selected. Below the tabs, there are three rows of file selection options:

File Type	File Path	Action 1	Action 2
Bitmap File:	C:\AquaCheck128x64.bmp	Open File	Program
Fonts File:	C:\AC-Shuttle Font 8x5 Latin.clf	Open File	Program
Menu File:	C:\AC-Shuttle Menu.txt	Open File	Program

Note: These files should not be modified by users, please contact AquaCheck for latest versions and changes that are required for the Menu and fonts.

The “splash-screen” bitmap must be in a black and white (one bit per pixel) 128 dots by 64 dots. For custom bitmaps please correspond via AquaCheck agent.

## 7 PC Upgrade Kit (Diagnostics kit)

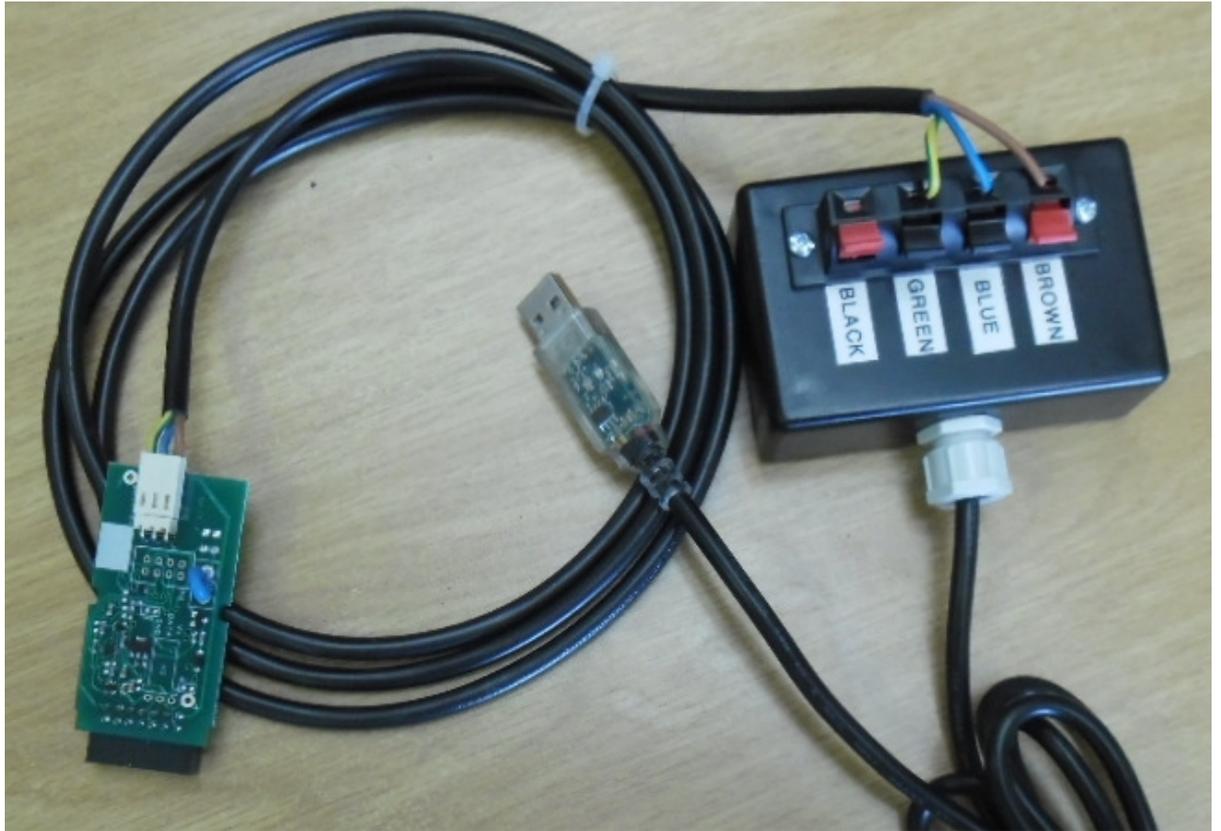


The PC Upgrade kit (diagnostics kit) is for upgrading firmware and for doing commissioning tests on AquaCheck probes. It works in conjunction with the AcUtility software.

The kit shown has 3 parts – USB to serial converter and 2 connection cables for SDI-12 (3-core) and RS485 (4-core) used for connecting to “Classic” model probes. Sub-Surface model probes connect direct to the converter terminals – colours as shown on the terminals.

The probe and converter is powered from the USB port. DO NOT inject power into the converter box.

To connect to the Basic-II Wireless probes (14-way connector), a SDI-12 converter board will also be required, and can be obtained separately.



The picture above shows the SDI-12 converter attached to the upgrade kit. DO NOT connect the upgrade kit directly to the BIW probe via the battery carrier board – this will damage the probe. Connect the converter shown to the 14-way terminal of the probe.

## 8 Installing the AcUtility Software

The AcUtility software is supplied in two ZIP files.

- ✓ Create a folder on your PC for AquaCheck files
  - ✓ Unzip the AcUtility.exe and the system32 (dll/bcp) files (all in the same folder).
  - ✓ Run the “AcUtility.exe”. You can make a shortcut on the desktop.
  - ✓ You must be using a windows account with administrator privileges.
- Unzip any associated firmware upgrade files