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WHEN MEASUREMENTS MATTER

# HydroSense II

## Software User Guide

7/12

# HydroSense II
# Software User Guide

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# 1 Installation Guide

## 1.1 System Requirements

The HydroSense II software is built on the .NET Framework Version 3.5, the framework has the following minimum system requirements:

| .NET Framework 3.5 Minimum Requirements | |
|---|---|
| **Operating System** | Windows XP SP2, Windows Vista, Windows 7, Windows Server 2003<br>Windows Server 2008 |
| **Processor** | 400MHz Pentium processor or equivalent |
| **RAM** | 96MB |
| **Hard Disk** | Up to 500MB of available space may be required |
| **Display** | 800x600, 256 colours |

These are the minimum requirements in order to run the software; however the software makes use of resource intensive drawing libraries to display charts and 2D plots. The recommended requirements to use these features are:

| HydroSense II Software Recommended Requirements | |
|---|---|
| **Operating System** | Windows XP SP3, Windows Vista SP2, Windows 7 SP1<br>Windows Server 2003 SP2, Windows Server 2008 SP2 |
| **Processor** | 1.6GHz Pentium 4 processor or equivalent |
| **RAM** | 512MB |
| **Hard Disk** | 500MB for the .NET framework<br>an additional 10MB for the HydroSense II software |
| **Display** | 800x600, 32bit colour |

The recommended requirements above list the latest service packs at the time of writing for all supported operating systems as these service packs generally include updates to the .NET framework.

The PC software uses Bluetooth to communicate with the HydroSense II, a Bluetooth stack is required on the local PC to handle traffic between the HydroSense II software and the Bluetooth hardware (USB dongle or built in chip). The following Bluetooth stacks are supported, a description of where the stack is most commonly used is given for each.

**Supported Bluetooth Stacks**

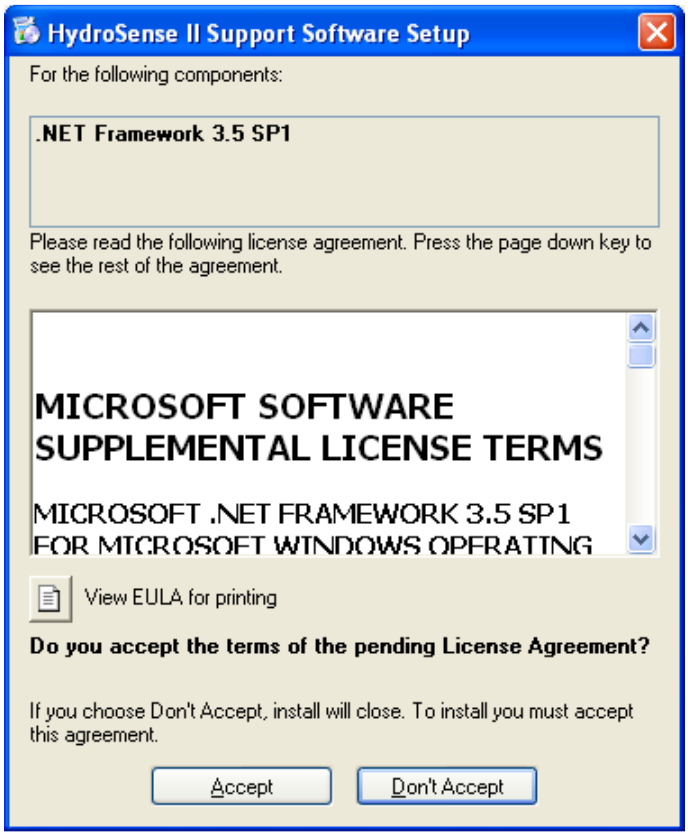
***Microsoft*** (included with Windows XP SP2, Windows Vista and Windows 7)
***BlueSoleil*** (bundled in the form of BlueSoleil software with Bluetooth USB dongles)
***Toshiba*** (used by third parties, such as Dell and Sony, in Laptops and USB dongles)
***Broadcom / Widcomm*** (one of the older stacks, also licensed to third parties)

## 1.2 Installation CD

An installation CD will be included with every HydroSense II unit purchased. This CD contains the HydroSense II software as well as the .NET Framework 3.5 for systems which do not have this installed already.

To install the software, insert the CD into the PC CD-ROM drive, the setup wizard should start automatically. If it does not, browse to the CD-ROM drive in windows explorer and run ***setup.exe***:


If the .NET Framework 3.5 SP1 is not already installed, the wizard will prompt to install it from the CD. Click Accept to continue:

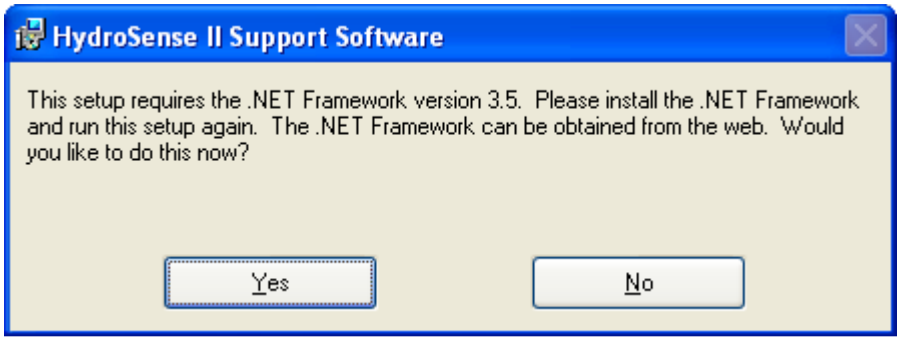



The installation of the .NET Framework will take a couple of minutes to install. Once the install has completed, the install wizard will continue as per the Install Wizard section below.

## 1.3 Web Setup File

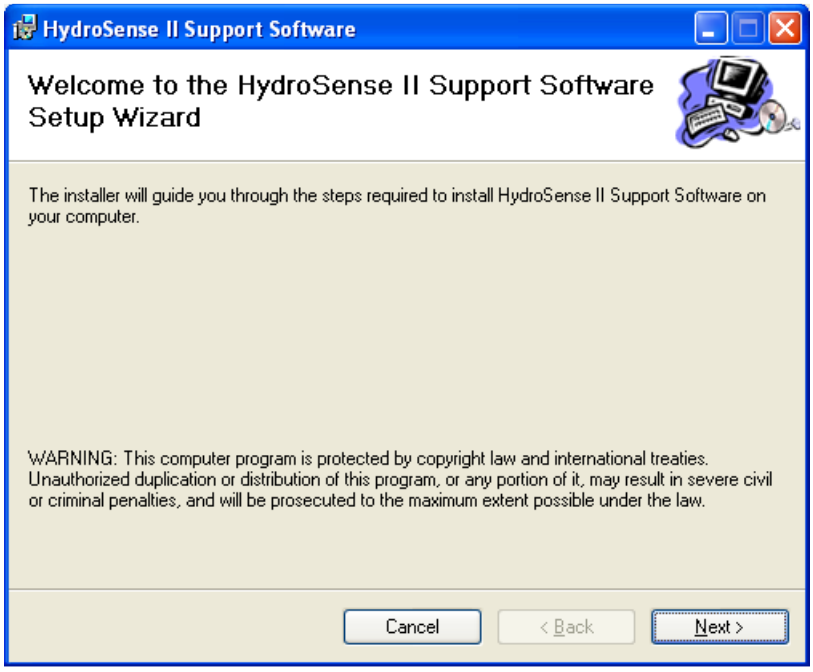
The HydroSense II software can be downloaded from the Campbell Scientific website, to reduce the size of the setup file this download does not include the .NET Framework. To start the installation, double click on HydroSoft.exe.

If the .NET Framework 3.5 is not installed, the wizard will prompt to download the framework from Microsoft's website:

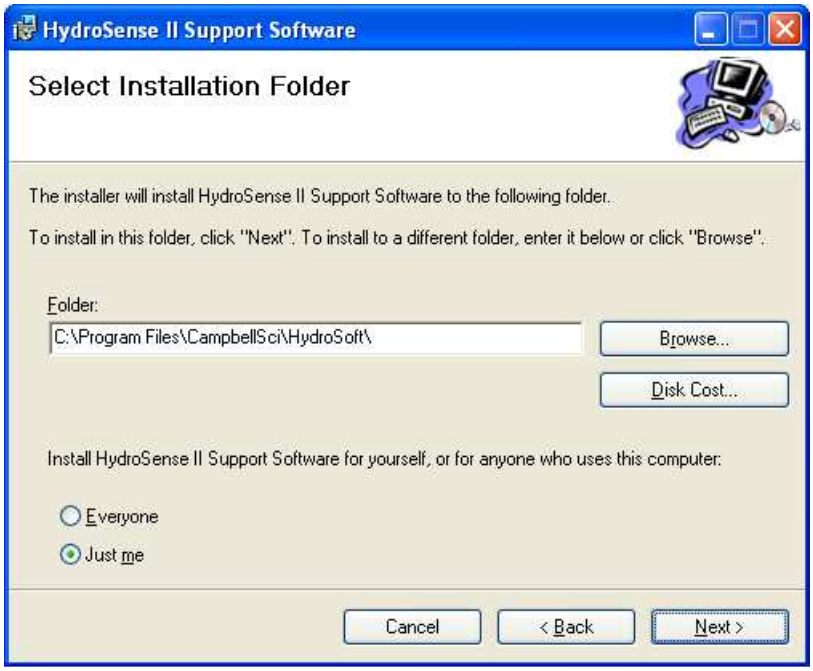



Click Yes to open a browser to download and install the .NET Framework, and then run HydroSoft.exe again once the install has completed.

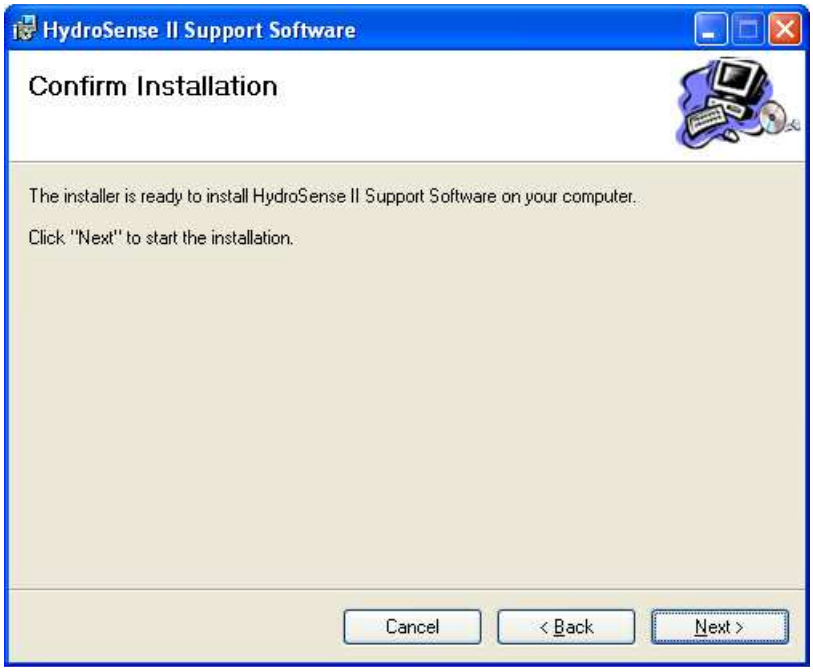
## 1.4 Install Wizard



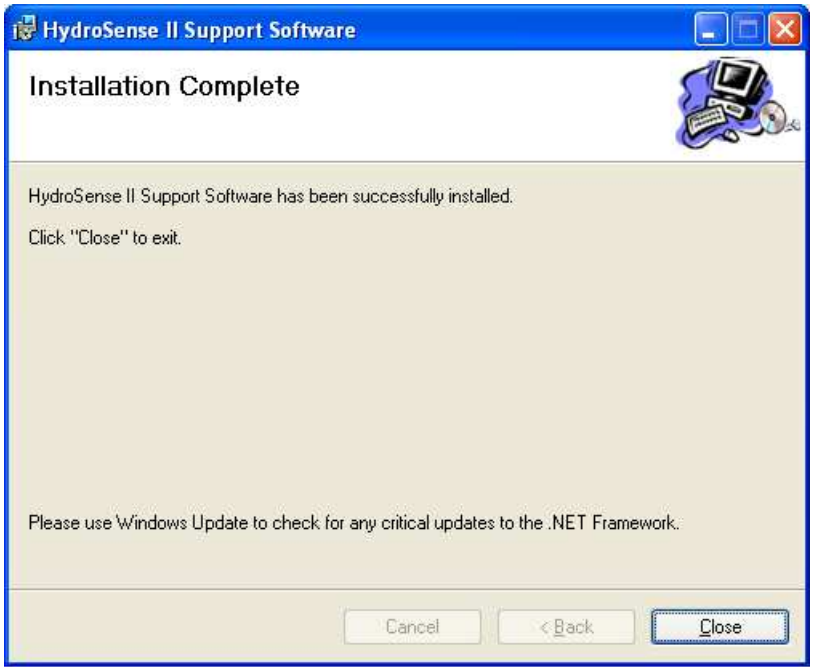

The installation wizard begins with a welcome page, click Next to continue.




The next page asks for the installation directory for the software. This is the directory that the HydroSense II Software application files will be installed to. In most cases this can be left as the default installation directory in Program Files.
This page also asks whether to install the software for the current user or for all users on this PC. This decides whether the desktop shortcut and Start Menu shortcut will be visible to just the current user or to all users. Click Next to continue.




Click Next on the next page to begin installing the software.




Once the install has completed, click Close to close the install wizard.
A shortcut to the software will be placed on the desktop and in the Start Menu under ***Programs > Campbell Scientific > HydroSense II***. This start menu group contains two shortcuts:

***HydroSense II Support Software***

This will run the support software used to download and display data from the HydroSense II. See the Getting Started Guide in this manual for more information on this software.

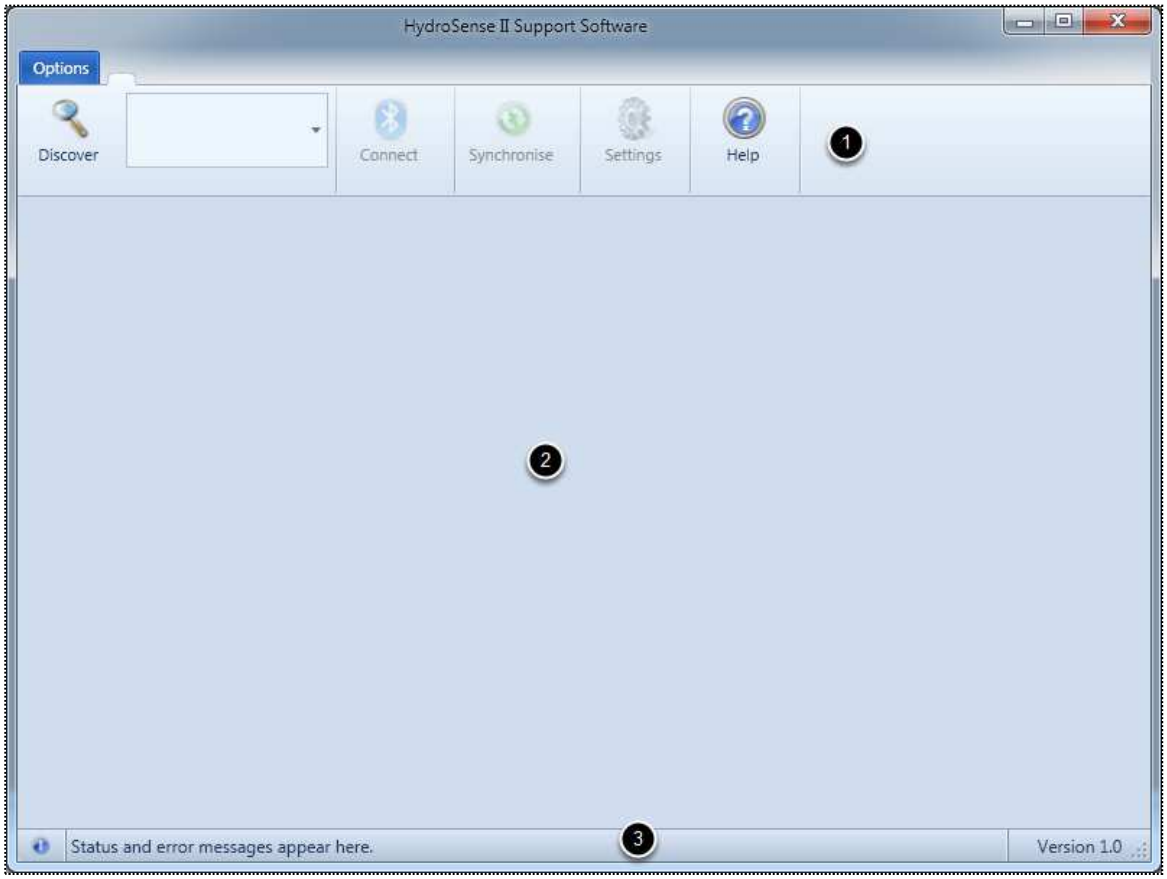
***Operating System Updater***

This will run the firmware update facility for the HydroSense II. This is used to send an updated operating system to the unit, it is only required if a new operating system has been released to add features or fix existing issues. See the Operating System Updater section in this manual for more information.

# 2 Getting Started Guide

## 2.1 The Main Window

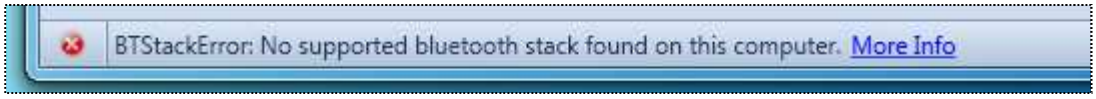
This is the HydroSense II software main window; it is split into three main areas:




1. The toolbar at the top of the window is used to connect to devices and download data.

2. The central area of the window will contain the Data, Chart and Map tabs. These tabs will become visible once data has been downloaded from the HydroSense II, more information on these can be found in the Viewing Data section.

3. The status bar at the bottom of the window displays any errors that may have occurred while connecting to a device. On start up the status bar at the bottom of the window should not show any errors, it should show an information icon as in the screen shot above. If the software did not detect any Bluetooth hardware on the local PC the error below will be shown, see the BTStackError section for more information.



## 2.2 Discover Devices

Press the Discover button in the toolbar to start searching for devices. Depending on your Bluetooth hardware this search could take up to 30 seconds to complete and cannot be cancelled.


Once the discovery is completed the first discovered device will be displayed in the Device List to the right of the Discover button. To view all devices which were discovered, press the down arrow to the right of the device name.


## 2.3 Connect to a Device

Select one of the discovered devices in the device list; this will enable the Connect button to the right. Press this button to connect to the HydroSense II.

The first time the software connects to a new HydroSense II device, the user is required to enter a pairing code for the device. For all HydroSense II devices the pairing code is:

**1234**

For more information on how to enter the pairing code, see the Pairing with a Device topic.

Once the connect process is completed the remote battery voltage and clock will be displayed in the toolbar.


If the device time needs updating, see the Setting the Device Time section for instructions. The HydroSense II should have its battery replaced at 4.00 V; it will not be able to power up once the battery voltage reaches 3.60 V.
More information on connecting to a device and possible connection errors can be found in the Connecting to a Device section.

## 2.4 Download Data

If the remote device has new data to download (new measurements or new zones created since the last time data was downloaded) the Synchronise area of the toolbar will indicate this.


To download the new data, press the Synchronise button.


After the download has completed, the toolbar will indicate that the measurements and zones are now synchronised.


For more information on downloading data see the Synchronising with a Device section.
Downloading new data from the HydroSense II will enable the three 'View' tabs in the main window (see below).

## 2.5 View Data

There are three 'Views' which can be used to display the data downloaded from the HydroSense II:

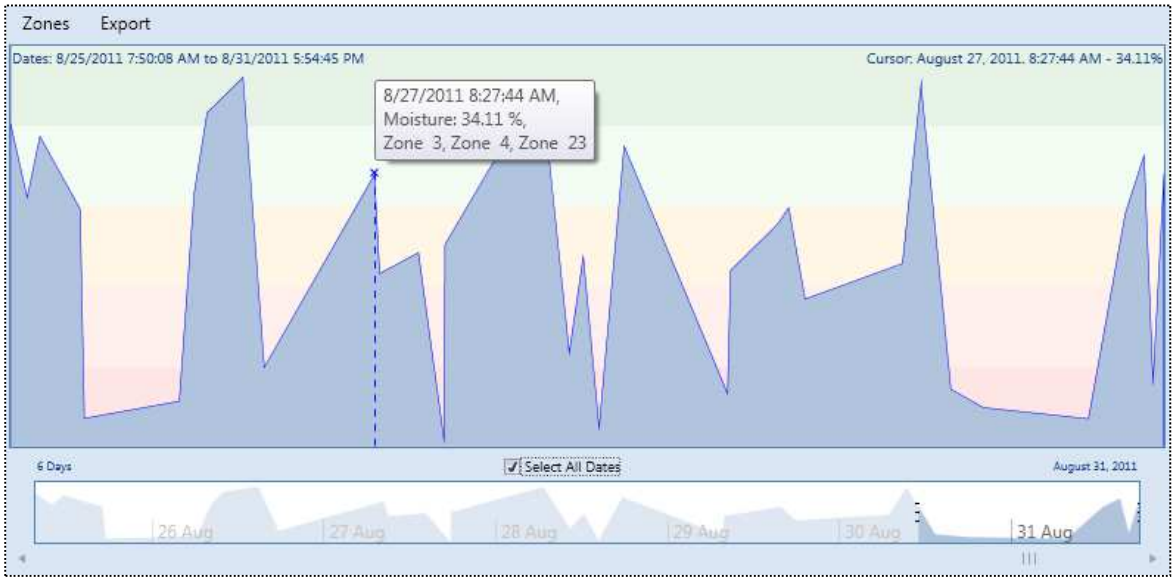
### 2.5.1 Data View

The data view displays a list of all measurements sorted by the time the measurement was taken. Each row represents a single measurement and lists the zone(s) the measurement is located within, the latitude and longitude of the measurement and the details of the parameters measured.


The timeline at the bottom of the table can be used to filter the points by measurement time, and the sliders on either side of the table can be used to scroll through the measurements.
For more information on the how to use the Data View and a full list of columns, see the Data View section later in this manual.

### 2.5.2 Chart View

The chart view plots measurements for a given zone (or group of zones) over time. Moving the mouse over the chart displays a cursor at the mouse position. The time and soil moisture value at the present cursor position is shown at the top right hand side of the chart. If the cursor is moved close to a measurement, a tooltip will display the measurement details as shown below.

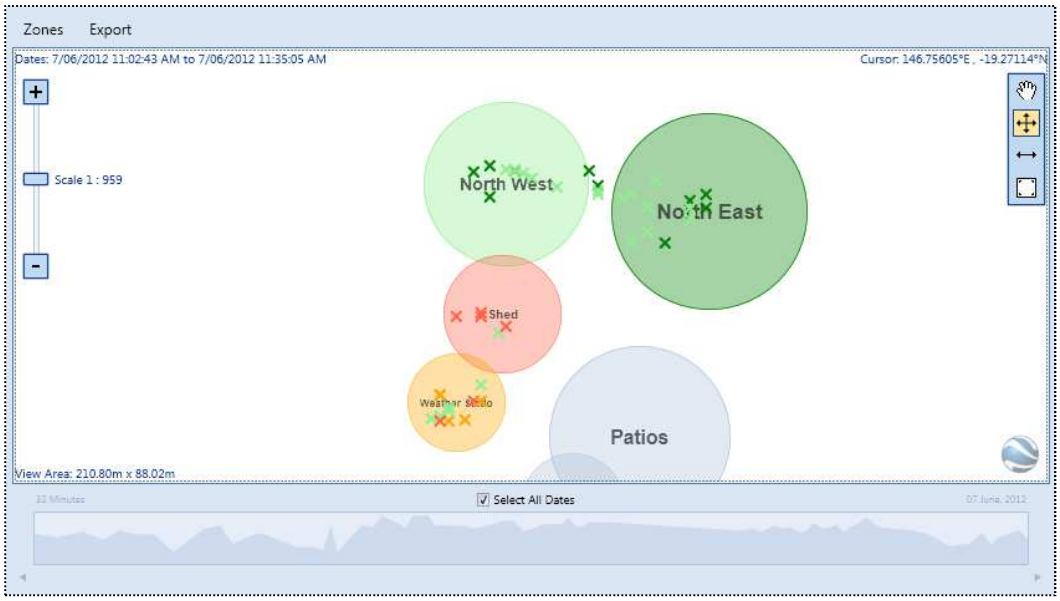



By default the chart will display all measurements taken by the HydroSense II, to view a chart for a specific date range, uncheck the Select All Dates checkbox below the main chart and use the timeline below to highlight the range of dates to display in the main chart.

For more information on how to use the timeline and the main chart, see the Chart View section.

### 2.5.3 Map View

The map view displays measurements and zones on a two dimensional plot. Average moisture is calculated for each zone from the measurements which it contains and the zone is coloured accordingly. Moving the mouse over any point or zone will display a tooltip with more detailed information.




By default, all points measured by the HydroSense II are displayed in the map chart, the timeline chart at the bottom of the map chart can be used to filter the displayed points by a given date range as for the Chart View.

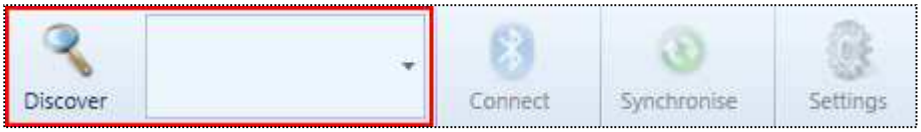
The toolbox on the right hand side of the window can be used to move and resize zones. Double click on a zone to explicitly set the zone radius or change the zone name.

For more information on how to use the map view, see Map View section of this manual. For more information on moving and resizing zones, see Zone Editing Tools section.

# 3 Downloading Data

## 3.1 Discovering a Device

The left hand section of the main toolbar contains the Discover button and the list of known devices.




Press the Discover button in the toolbar to start searching for devices. The HydroSense II should be in range of the PC, and should be turned on.

Depending on your Bluetooth hardware this search could take up to 20 seconds and cannot be cancelled. During the discovery process, the status bar will flash a discovery symbol to indicate that discovery is still in progress.


Once the discovery is completed the first discovered device will be displayed in the device list to the right of the discover button.

### 3.1.1 The Device List

The device list contains all devices which have been discovered in this session, along with those devices which had previously been discovered by the software.

Each device is listed with its device name (HYD followed by the serial number) in bold and its Bluetooth address in smaller font beneath. Devices which have been discovered since the software was started are shown next to a Bluetooth icon.


The software saves a list of previously discovered devices so that these devices do not need to be discovered again in order to connect to them. They can be selected directly from the list without a discovery step; these devices are shown next to a folder icon.

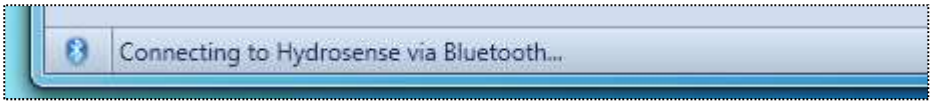
If data had been downloaded for a particular device, selecting the device in the list will update the display area below to show the data for that device, the device list controls which device has its data displayed in the software.

## 3.2 Connecting to a Device

### 3.2.1 Connecting

The second section in the main toolbar is used to control connection to devices. If a device is selected in the device list, the connect button will be enabled and appear as below.


Press the connect button to start connecting to the device. This process should only take a few seconds, the status bar will flash a connect icon to indicate that the connection is in progress.




If this is the first time the software has connected to this particular device, a pairing step will be required, see the Pairing with a Device section below.

If the connect succeeds, the connect section in the main toolbar will expand to show the device time and battery voltage.


The time icon may be pressed to set the device time. This will open a new window, for more information see the Setting the Device Time section below.

If the battery voltage is below 4.00V, it will need replacing. The HydroSense II will turn off if the battery voltage drops to 3.6V.

During the connect process, the software asks the device if it has any new data or zones to download. If the connect process is successful this information is used to update the Synchronise section of the toolbar.


Synchronising data with the device is covered in the Synchronising with a Device section.

### 3.2.2 Pairing with a Device

The first time the software connects to a new HydroSense II device, the user is required to enter a pairing code for the device. For all HydroSense II devices the pairing code is:

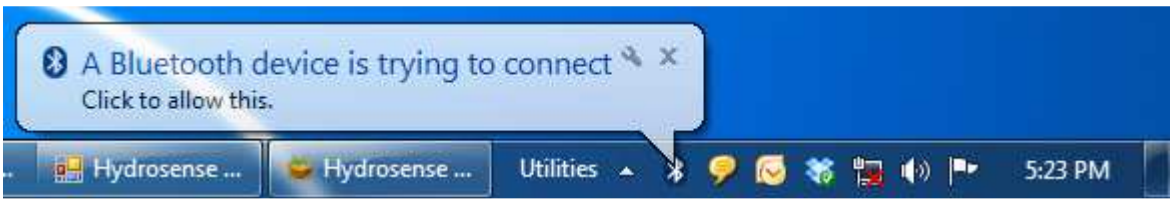
---

# 1234

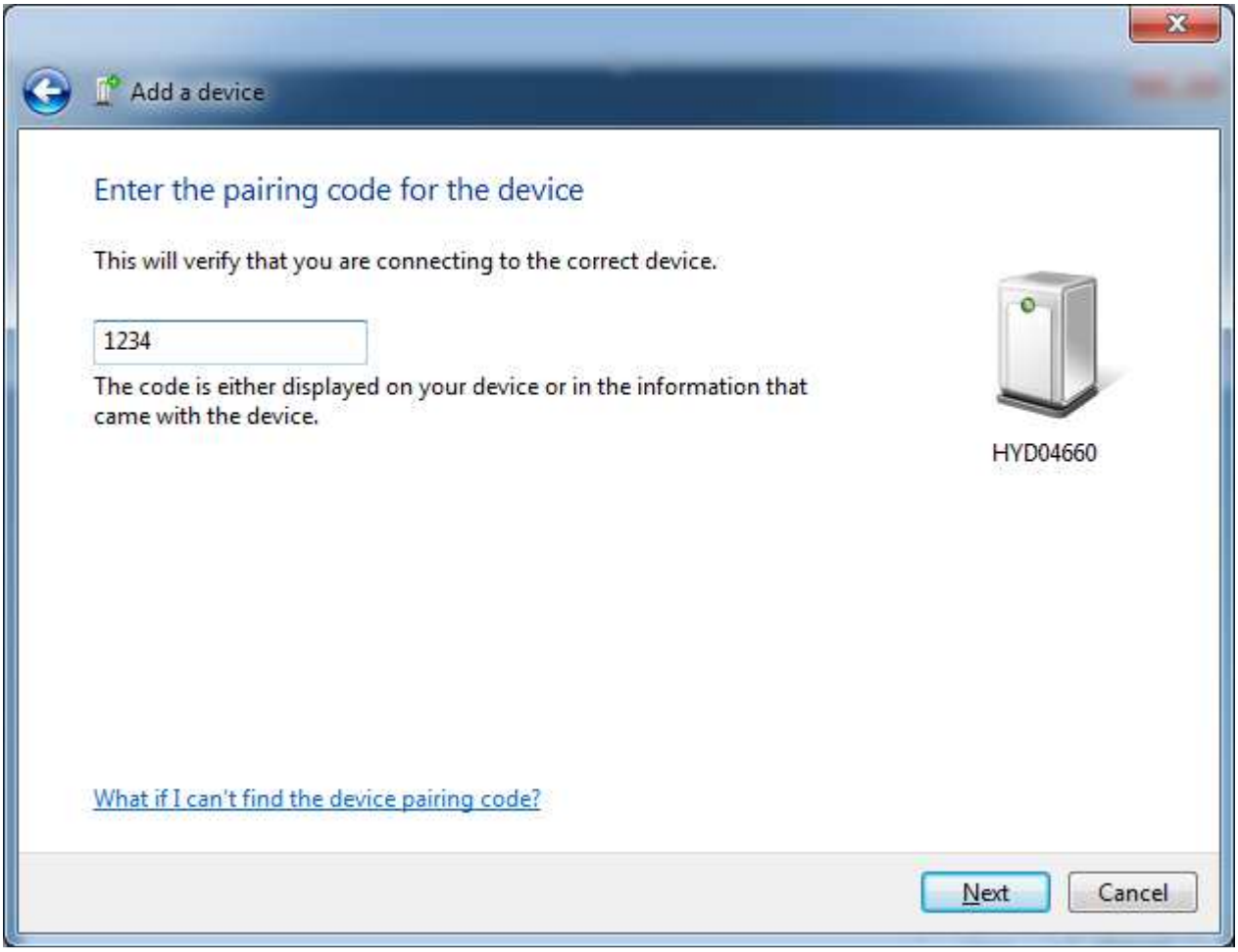
---

After pressing the connect button the Bluetooth Stack on the local PC will ask for the pairing code. The method used to ask for this code varies between Bluetooth stacks, this page shows the procedure for the Microsoft stack running on Windows 7.

A notification will appear at the bottom right hand side of the Windows display:

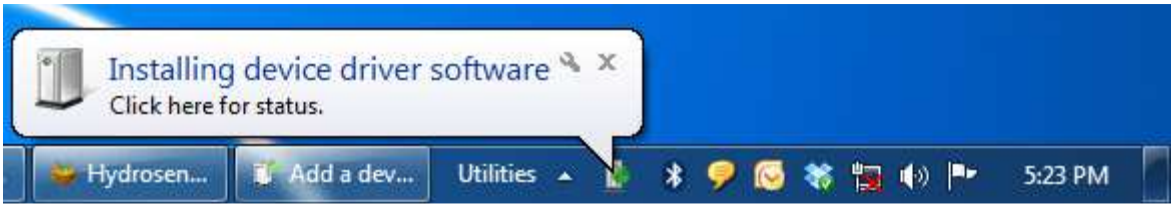



Click the notification to open the "Add a device" window.




Enter the pairing code 1234, and then press next.

Close the "Add a device" window by pressing the close button. Windows will install the necessary drivers to communicate with the HydroSense II; the progress will be shown above the Windows task bar.




Once the installation is complete, the software will connect to the HydroSense II.

### 3.2.3 Disconnecting

The software does not need to be connected to a device to view downloaded data.

The software needs to be connected to the device to perform the following:

- Download new measurements from the device.
- Download new zones from the device.
- Upload new or modified zones to the device.
- Change device settings.
- Change the device time.

Maintaining a Bluetooth connection with a PC consumes battery power on the HydroSense II, so it is recommended to disconnect and power down after a data download. All other software functions will be available while disconnected.

### 3.2.4 Connect Errors

The following errors may occur when connecting to a device. Detailed information on each error can be found in the Error Codes section of this manual.

- `BTUnkownError` - An error has occurred during the connection and the local Bluetooth stack did not specify the reason.
- `BTSocketError` - There was an error creating a Bluetooth connection to the device.
- `HydrocolNoResponse` - A Bluetooth connection was created to the device, but the device is not responding to commands from the software.

## 3.3 Setting the Device Time

### 3.3.1 The Set Device Time Window

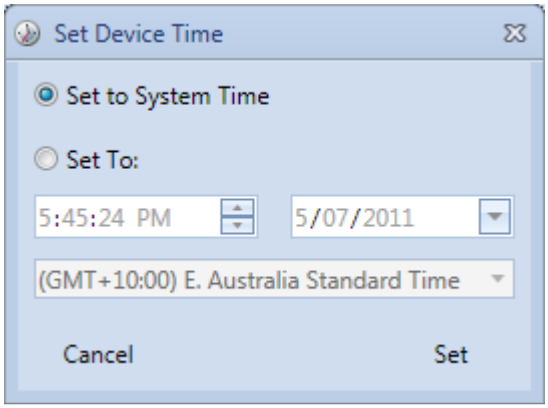
To set the time on the device, first connect to the device (See the Connecting section above).

Once connected, the current device time appears in the connect section of the main toolbar.


Press the clock icon next to the device time to open the Set Device Time window.

#### *3.3.1.1 Set to System Time*

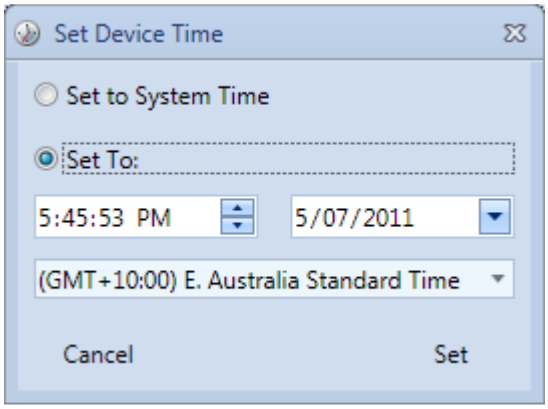
By default, the window is configured to set the device time to the same time and time zone as the local PC (Set to System Time is checked).




With this option selected, the time and time zone edit boxes are disabled, but will update once per second to the current system time.
Press the Set button to update the device with the current system time.

#### *3.3.1.2 Set to Custom Time*

To set the device time to a custom time or time zone, select the Set To: radio button.




This enables the time and time zone edit boxes. Type the desired date and time into the edit boxes, or to set the date using a calendar, press the drop down arrow on the date edit box.

Select the desired time zone by clicking the drop down arrow on the time zone edit box.

Press the Set button to update the device with the custom entered time.

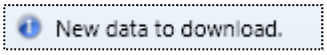
## 3.4 Synchronising with a Device

### 3.4.1 Synchronise Toolbar

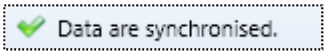
The Synchronise section of the main toolbar is disabled until a connection is made to a device.


After connection, the Synchronise section updates to show whether data or zones need to be downloaded from the device, or if zones need to be uploaded to the device.

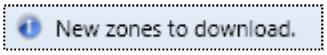
The table below shows the possible synchronise statuses shown in the Synchronise section. The table lists what action will be performed for each status.



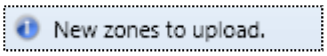

The latest record stored on the device is newer than the latest record stored on the PC.
*The PC will download the new records from the device.*



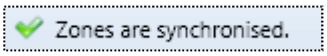

The latest record stored on the device is the same as the latest record stored on the PC.
*No action is needed.*




The zones stored on the device have changed since the last Synchronise. If the zones stored on the PC have also changed since the last Synchronise, device zone changes take precedence and will overwrite the zones stored on the PC.
*The PC will overwrite its zones with those from the device.*




The zones stored on the PC have changed since the last synchronise, and the zones stored on the device have not changed.
*The device will overwrite its zones with those from the PC.*




The zones on the device match those stored on the PC.
*No action is needed.*

### 3.4.2 Synchronising

Press the synchronise button to perform the download / upload actions shown in the status fields. The Synchronise section will change to show the download / upload progress for each file on the device.


After the Synchronise has completed, the toolbar will show that both data and zones are now synchronised.

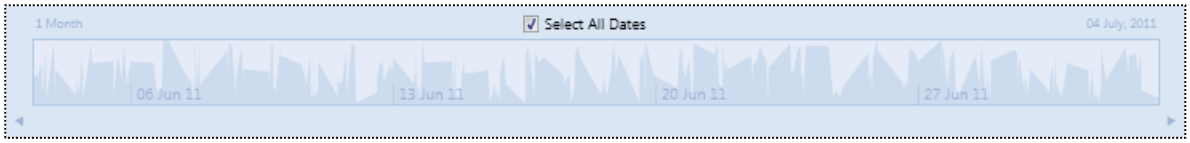
The connection with the HydroSense II can now be disconnected using the Disconnect button, the newly downloaded data can be viewed without an active connection.

# 4 Viewing Data

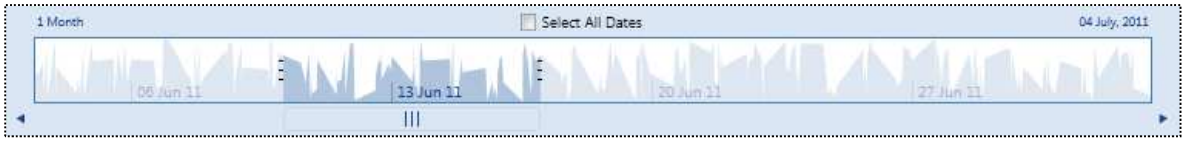
## 4.1 Using the Timeline

The Data View, Chart View and Map View use a timeline to filter measurements based on the time they were taken. All three timelines are linked together; changes made to the Data View timeline will be applied to the Chart View and Map View timelines and so on.

By default, all three timelines have their Select All Dates checkbox checked, this means that all measurements will be displayed in the associated View (Data View, Chart View or Map View).




To start filtering measurements by their timestamp, uncheck the Select All Dates checkbox, this will enable the rest of the timeline control.




The timeline shows an overview of water content over time, the screenshot above shows the water content for the month before 4 July, 2011. The length of time shown in the timeline is displayed in the top left corner (1 Month), and the ending date shown in the timeline is displayed in the top right corner (04 July, 2011).
Part of the timeline around the 13 June 2011 is highlighted to indicate that these are the points which are currently being shown in the main view. This highlighted area can be moved to the left and right by clicking and dragging the scrollbar beneath the timeline.


Dragging the scrollbar all the way to one edge of the timeline will scroll the timeline background to bring earlier (or later) points into view.

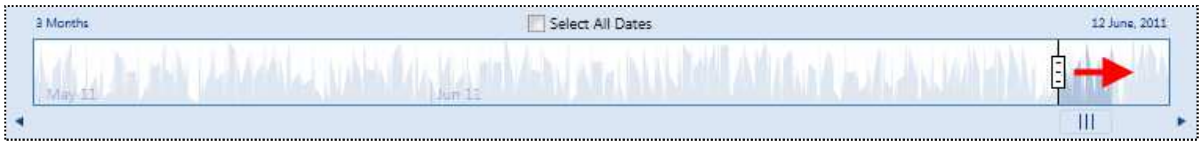

Notice above that the timeline is only showing a month of data at a time, dragging the scrollbar to the left edge of the screen has made the timeline show water content for a month ending at the 13 June, rather than 04 July as in the first screenshot.
The length of the highlighted area can be changed by clicking and dragging the sliders on either side of the selection.

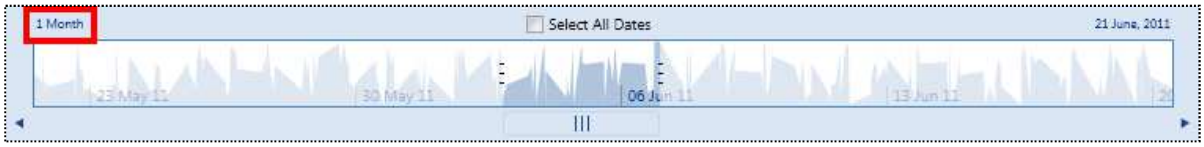

Extending the highlighted area so that it covers more than 80% of the timeline width will cause the timeline to zoom out to display a longer range of dates.



Notice that the timeline is now showing 3 months of data, instead of the 1 month of data from the previous example.

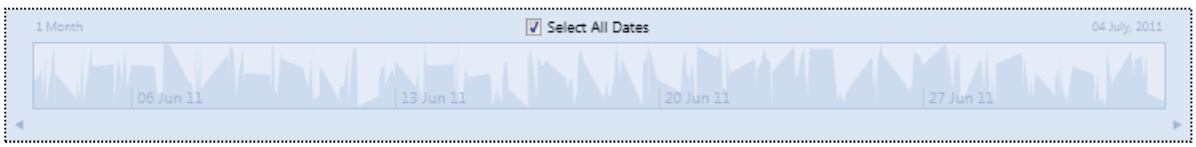
Likewise, reducing the length of the highlighted area so that it covers less than 20% of the width of the timeline will cause the timeline to zoom in to show a smaller range of dates.



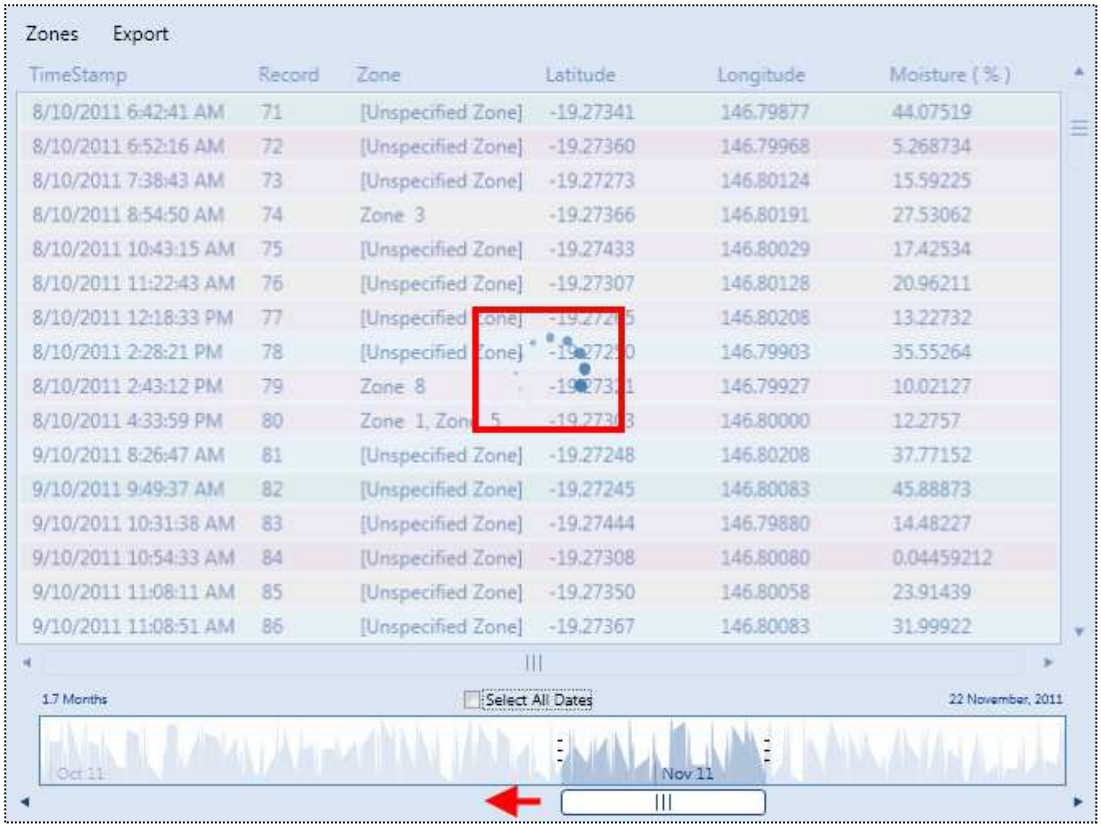




Notice that the timeline is now showing 1 month of data, instead of the 3 months of data from the previous example.

To stop filtering by date, check the Select All Dates checkbox to disable the timeline control and display all points in the associated view.

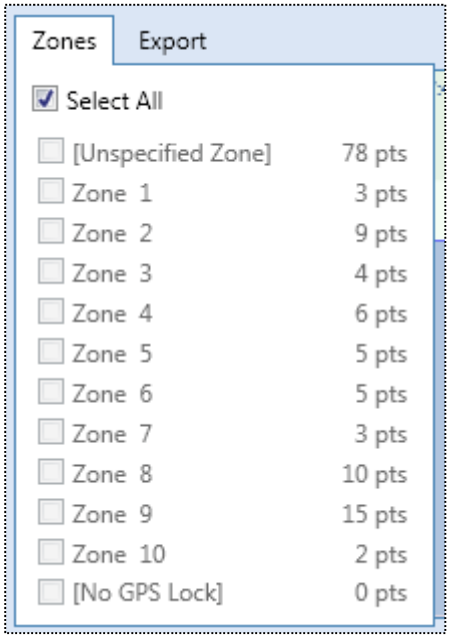


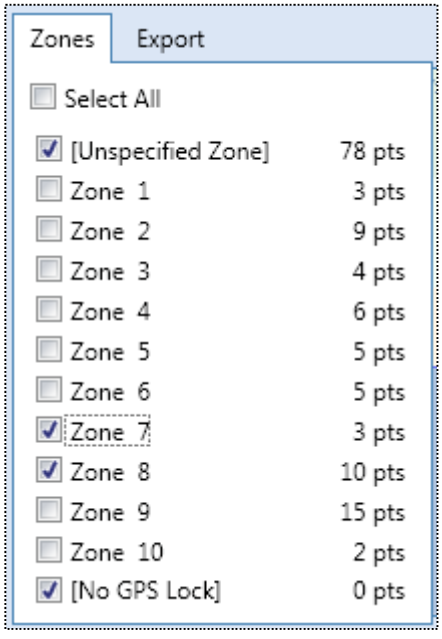

Using these methods to change the highlighted area in the timeline will update the main view which the timeline is associated with (Data View, Chart View or Map View). When large numbers of measurements need to be updated, this process may take a few seconds, a loading icon will be displayed while the view is being refreshed.




## 4.2 Showing / Hiding Zones

Both the Data View and the Chart View have the option of showing or hiding measurements which belong to a certain zone. The Zones menu in either of these views lists all available zones along with the number of measurements contained in each zone.




By default, all zones are shown in both views and will be listed in alphabetical order. Uncheck the Select All checkbox to enable the individual zone checkboxes.

Un-checking individual zones will remove measurements contained in these zones from display in the Data and Chart Views. If the Select All checkbox is unchecked and no individual zones are selected, both the Data View and Chart View will be empty.

The [Unspecified Zone] is a special zone which contains all the points which are not located in any of the other zones. The [No GPS Lock] zone is a special zone which contains all the points which were collected without any position information.

## 4.3 Data View

### 4.3.1 Records Display

The Data View displays all the records downloaded for the current device in detail. The view is split into three main sections.


**1. Menu Bar**
Two menus are located above the main data list.

The Zones Menu allows the user to hide measurements from the data list based on which zones the measurements are contained in, see the Showing / Hiding Zones section for more information.

The Export Menu allows the user to output a CSV file containing the measurements currently in view; see the Export Menu section below for more information.

**2. Main Data List**
The main data list contains all the measurements downloaded from the HydroSense II; the measurements shown in the list can be filtered using the Zones menu above or the timeline below.

Each row is coloured based on the volumetric water content measured. These colours default to red for low, yellow for midrange and green for high moisture. For information on how to customise these colours, see the Measurement Colours section in this manual.

The following columns are shown in the data list:

| TimeStamp | The device time when the measurement was made. |
|---|---|
| **Record** | The record number starting at 1 and continuously incrementing. |
| **Zone** | A comma separated list of the zones in which this measurement is located. |
| **Latitude** | The latitude of the measurement in degrees (North is positive). |
| **Longitude** | The longitude of the measurement in degrees (East is positive). |
| **Moisture ( % )** | The Volumetric Water Content (VWC) measured in %. |
| **Period ( us )** | The raw probe measurement which is the amount of time (in micro-seconds) between a transmitted pulse and its reflection from the end of the probe rods. |
| **Attenuation** | This value is used internally to compensate the VWC reading. It represents the affect of electrical conductivity on the probe measurement. |
| **Permittivity** | The dielectric permittivity of the soil. |
| **Probe Model** | The part number and rod length of the probe used for this measurement. |

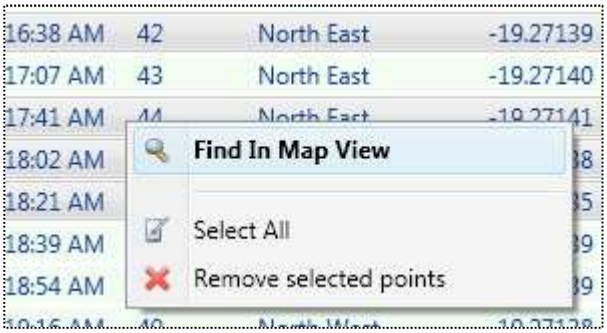
**3. Timeline**

The timeline allows the user to filter the points in the main data list based on when the measurements were taken. By default, the Select All Dates checkbox is selected and all measurements are displayed. For more information on how to use the timeline, see the Using the Timeline section in this manual.

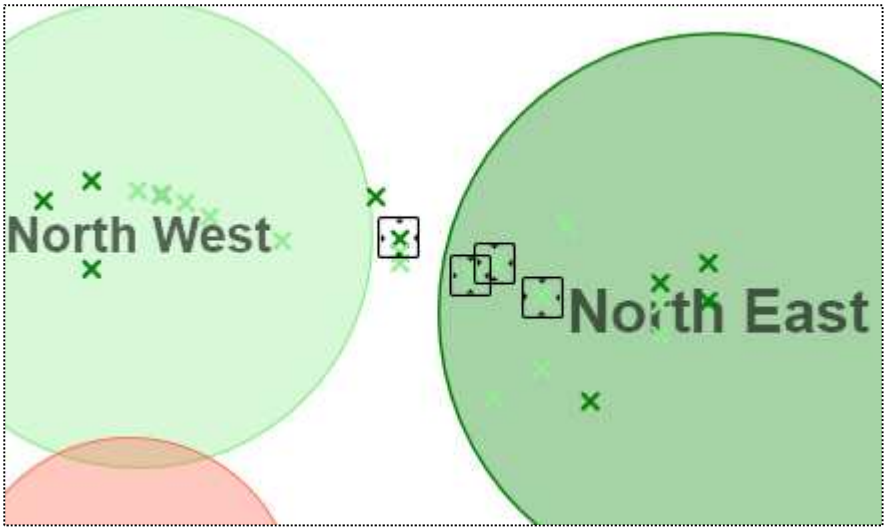
### 4.3.2 Point Options

#### *4.3.2.1 Find In Map View*

To locate a given point in the Map View, right click on the desired row (multiple rows can also be selected) in the Data View and choose Find In Map View. Alternatively, double clicking on the row will perform the same function.



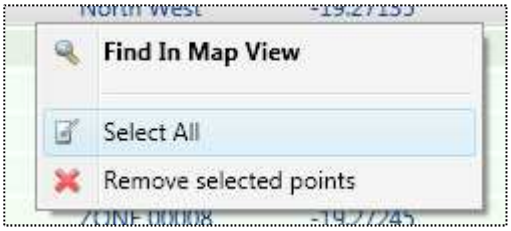

The Map View will appear and the selected points will be highlighted with cross hairs for 3 seconds.




The map will automatically pan to ensure all of the selected points are visible.

#### *4.3.2.2 Select All Rows*

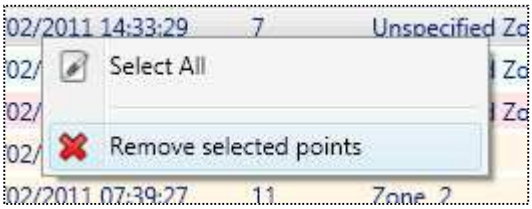
All rows in the Data View can be selected by right clicking anywhere in the data list and choosing Select All.




This will select all rows in the current view (it will not select rows which are currently hidden by the choice of visible zones or the date range).

#### *4.3.2.3 Removing Records*

Unwanted measurements can be removed by right clicking on the measurement row and selecting the "Remove selected points" menu option.

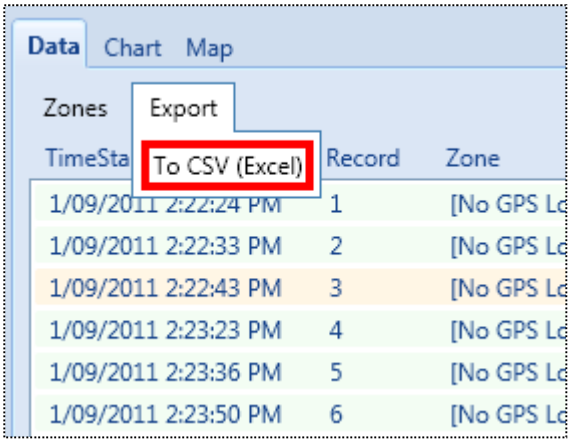



The software will show a prompt to confirm the removal. Once a measurement is removed from the list it cannot be recovered.

Multiple measurements can be removed by holding Ctrl and selecting the desired rows, then right clicking and choosing the “Remove selected points” menu option.

### 4.3.3 Export Menu

The Export menu can be found at the top left hand side of the Data View:



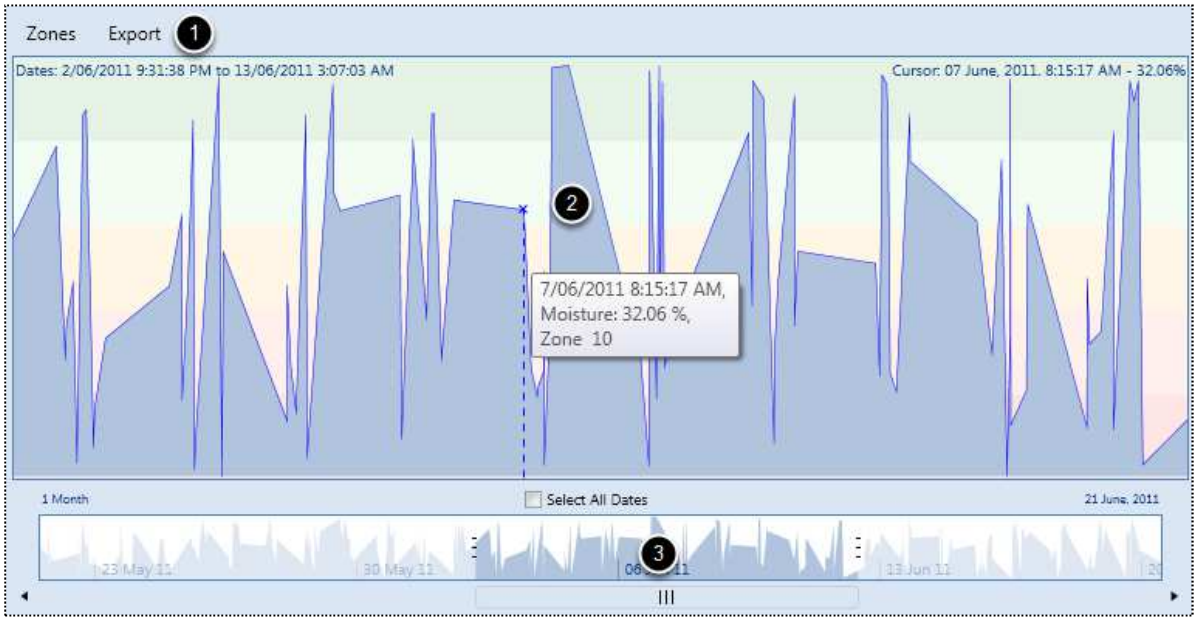

The menu contains an option to export the measurements listed in the Data View to a CSV file which can then be opened in Excel or any similar spreadsheet application. First select the appropriate range of dates from the timeline below the Data View, and then click the To CSV (Excel) menu option from the Export Menu. A Save As dialog will ask where to save the .csv file. Choose a location on the local computer and press Save. All columns shown in the Data View will be exported to the CSV file as shown in the example below:

| | A | B | C | D | E | F | G | H | I | J | K |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | TimeStamp | Record | Zone | Latitude | Longitude | Moisture ( % ) | Period ( us ) | Attenuation | Permittivity | Probe Model | |
| 2 | 19/11/2011 17:58 | 1 | ZONE 00001 | -19.2612 | 146.78551 | 18.44 | 1.4061 | 1.167 | 9.7999 | CD659 12cm rods | |
| 3 | 19/11/2011 17:58 | 2 | ZONE 00001 | -19.2612 | 146.78551 | 20.53 | 1.4411 | 1.3004 | 10.889 | CD659 12cm rods | |
| 4 | 19/11/2011 17:59 | 3 | ZONE 00001 | -19.2611 | 146.78552 | 24.22 | 1.4942 | 1.3409 | 12.9446 | CD659 12cm rods | |
| 5 | 19/11/2011 18:00 | 4 | ZONE 00001 | -19.2612 | 146.78546 | 20.05 | 1.4388 | 1.3915 | 10.6355 | CD659 12cm rods | |
| 6 | 19/11/2011 18:00 | 5 | ZONE 00001 | -19.2612 | 146.78545 | 20.13 | 1.44 | 1.3918 | 10.679 | CD659 12cm rods | |
| 7 | 19/11/2011 18:00 | 6 | ZONE 00001 | -19.2612 | 146.78545 | 16.03 | 1.3778 | 1.2892 | 8.603701 | CD659 12cm rods | |

## 4.4 Chart View

### 4.4.1 Chart View Sections

The Chart View plots the volumetric water content (VWC) from each measurement against time. The view is split into three main sections.



**1. Menu Bar**
Two menus are located above the main plot.

The Zones Menu allows the user to hide measurements from the chart based on which zones the measurements are contained in, see the Showing / Hiding Zones section for more information.

The Export Menu allows the user to save the current plot as an image file; see the Export Menu section below for more information.

**2. Main Chart**
The main chart plots the volumetric water content of downloaded measurements versus time. The plot can be scrolled using the timeline below, and the measurements included in the plot can be filtered using the Zone menu above.

Moving the mouse over the main plot displays a vertical line which will follow the mouse cursor to indicate the volumetric water content at the mouse position. The text in the top right corner of the plot shows the time the cursor is currently over along with the interpolated water content at this point (this is expected water content given the measurements directly before and after the cursor position). The text in the top left corner of the plot shows the range of dates currently shown in the plot.

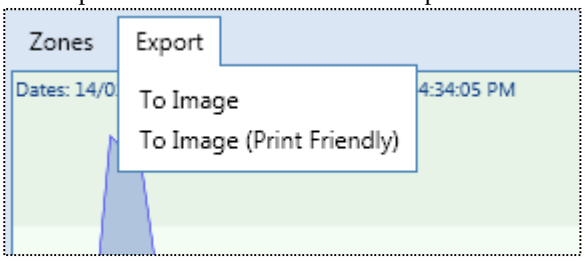
If the mouse moves close to a measurement, the cursor changes colour to a dark blue and shows a pop up with detailed information about the selected measurement. This popup shows the time the measurement was made, its VWC in % and the zones which this measurement belongs to.

The background of the main chart is a gradient made up of the default colouring scheme used in the HydroSense II software. This is the colouring scheme used as the background for rows in the Data View and used to colour measurements and zones in the Map View. To change these colours, see the Measurement Colours section later in this manual.

**3. Timeline**
The timeline below the main chart can be used to scroll the chart as well as zoom in and zoom out. For more information on how to use the timeline, see the Using the Timeline section above.

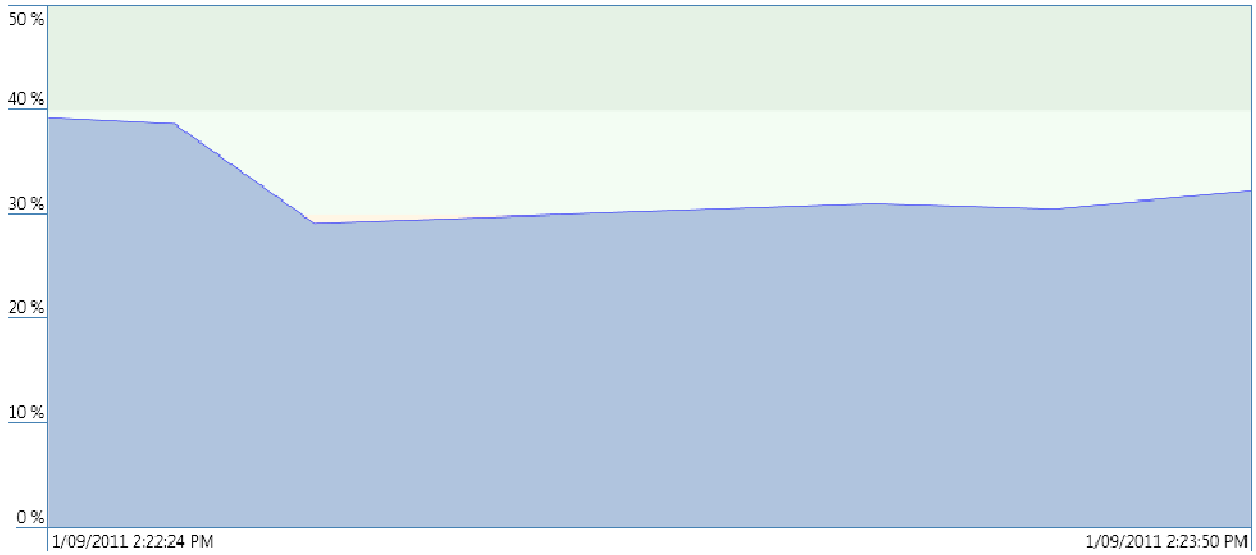
### 4.4.2 Export Menu

The Export menu can be found at the top left hand side of the Chart View:

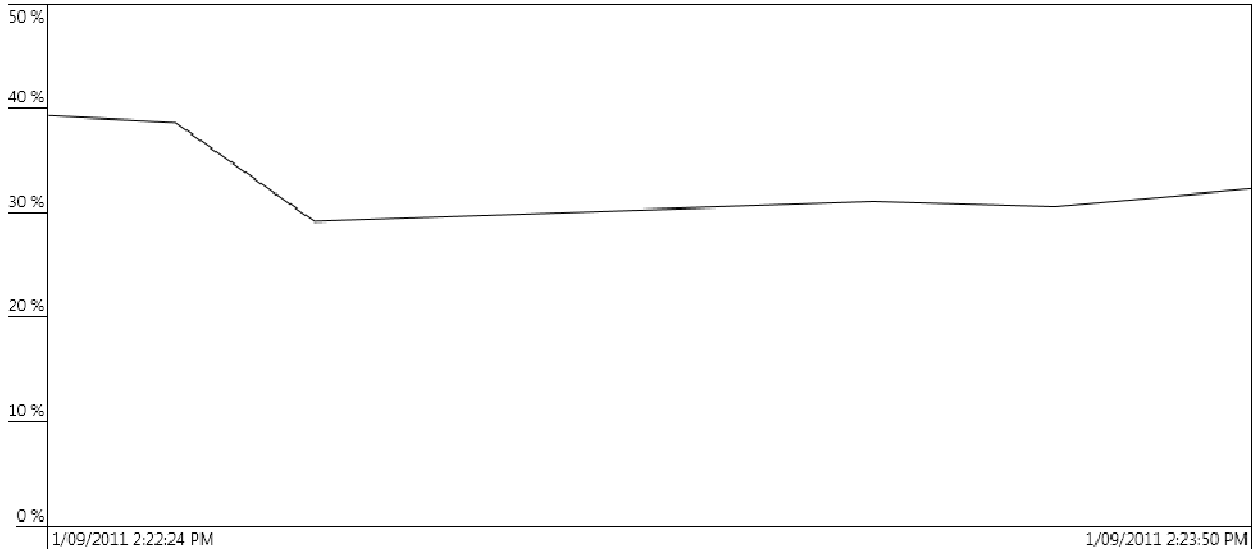



The menu allows exporting of the current chart to an image file, either as shown on screen in full colour, or in a print friendly format using only black and white. Clicking on either of the menu options will open a Save As dialog box to choose the location of the exported file, the file can be saved as a PNG, JPG or BMP file. Samples of the two image outputs are shown below.

### Sample Chart Export



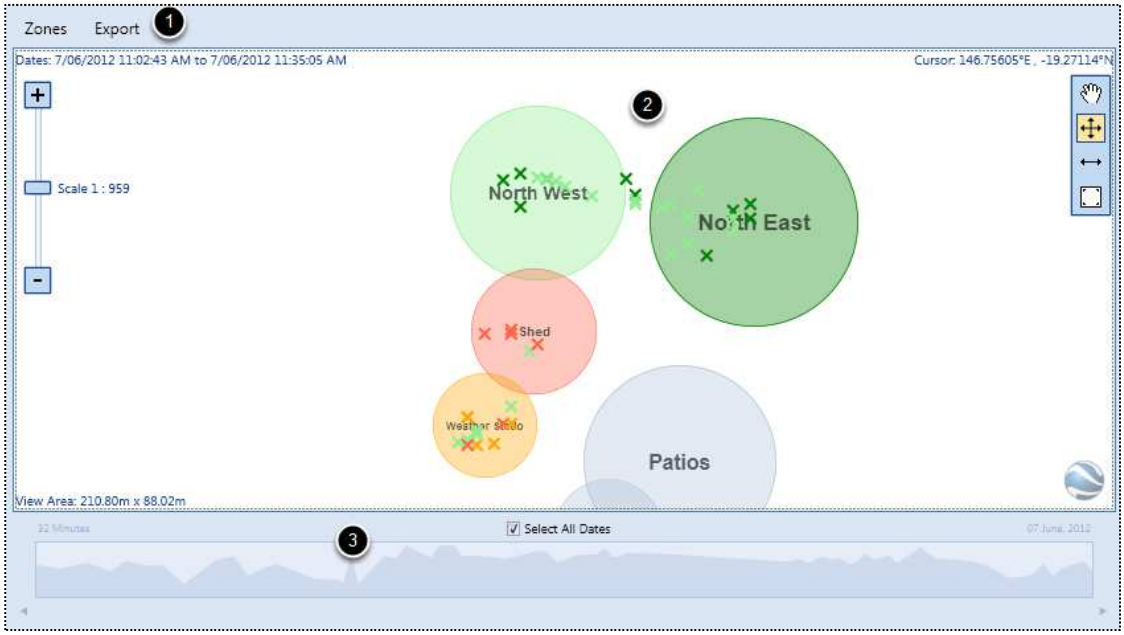

### Sample Chart Export (Print Friendly)



## 4.5 Map View

### 4.5.1 Map View Sections

The Map View displays measurements and zones on a 2D map plot, colouring the measurements and zones by their respective measurement values. The Map View does not have the ability to plot on top of satellite imagery, but can export the current map view to Google Earth for viewing against satellite imagery. The view is split into three main sections.




**1. Menu Bar**

The Zones Menu lists all zones plotted in the main map and allows the user to zoom to a particular zone by double clicking on its entry in the list. See the Zones List section below for more information.

The Export Menu allows the user to export the current view to either KML format (to import into Google Earth) or GPX format (GPS Exchange Format, this can be imported into many mapping applications). See the Export Menu section below for more information.

**2. Main Map**

The date range of the points displayed is shown at the top left hand corner of the main map, this is the date range which has been chosen by the timeline below the map.

The size of the current viewing area in meters is displayed at the bottom left hand side of the map. The size of the viewing area can be changed by zooming in and out or by resizing the main window. The area is expressed as width x height.

A toolbar is located on the right hand side of the main map containing tools to change zone sizes and positions. See the Zone Editing Tools section below for instructions on how to use this toolbar.

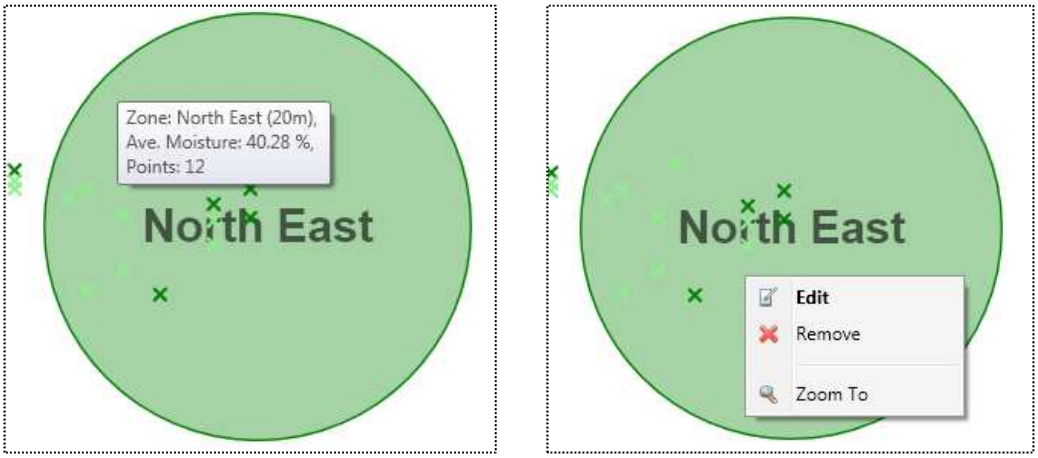
A zoom slider is located on the left hand side of the main map, this can be used to change the current zoom level in increments by clicking the + and - buttons or continuously zoom in using the slider. See the Changing Zoom topic for more information.

If Google Earth is installed on the local computer, clicking the button at the bottom right hand side of the main map will show the contents of the view in Google Earth. More information on this can be found in the Show in Google Earth section below.

**3. Timeline**

The timeline allows the user to filter the measurements shown in the main map based on when the measurements were taken. By default, the Select All Dates checkbox is selected and all measurements are displayed. For more information on how to use the timeline, see the Using the Timeline section of this manual.

**Zones**



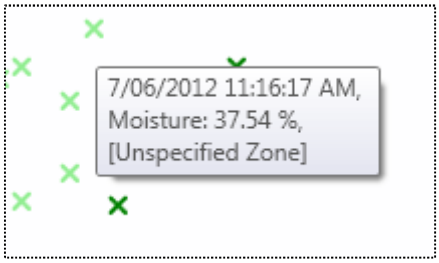

Zones are shown on the map to scale, the relative sizes of the zones on the map will match the relative diameters chosen on the HydroSense II. Each zone is coloured according to the average VWC of all the points contained in the zone, the colours used to represent different levels of VWC can be changed in the Reading Colours Window.

Hovering the mouse over a zone will show a tooltip listing the average VWC of this zone, its diameter and number of contained points. The diameter of the zone is shown in brackets next to the zone name in this tooltip.

Right clicking on the zone shows the zone context menu, with the following options:

- The Edit menu option will open the Edit Zone Window where the zone name and diameter can be changed; this window is described in its own section below. This is the default action for a zone and double clicking the zone will perform the same function.
- The Zoom To menu option will zoom in the current map view to only show the selected zone.
- The Remove menu option will remove this zone from the software, and from the HydroSense II device on the next Synchronise. A dialog box will ask the user to confirm this action.

**Points**





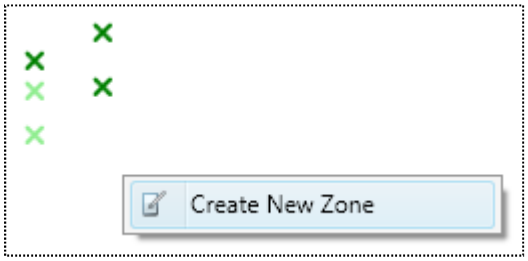
Measurements are shown on the map as small cross marks, these cross marks are not drawn to scale and do not change size during zooming. Each cross is coloured according to the VWC for the measurement, the colours used to represent different levels of VWC can be changed in the Reading Colours Window.
Hovering the mouse over a cross mark will show the timestamp, VWC and containing zone(s) for the measurement.

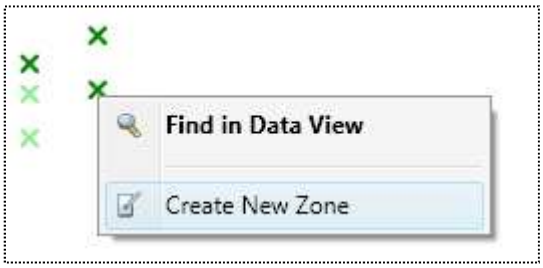
Right clicking on the zone shows the zone context menu, with the following options:

- The Find in Data View menu option will display the Data View and select the appropriate row for this measurement. This is the default action for a point and double clicking on the point will perform the same function.
- The Create New Zone menu option will create a new zone centred around the selected point. See the Creating a New Zone section below.

### 4.5.2 Creating a New Zone

New zones can be created from the Map View by right clicking on an empty area on the map or on an existing point, then choosing Create New Zone.



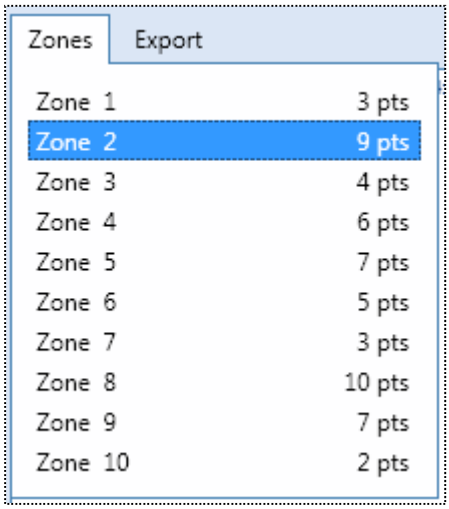

This will create a new zone centred on the cursor position or on the selected point.

The name of the zone will be automatically generated and the radius will be set to a quarter of the Map View height (with a minimum of 3 meters). Double click the new zone to change the name and size or use the Zone Editing Tools to resize or move the zone.

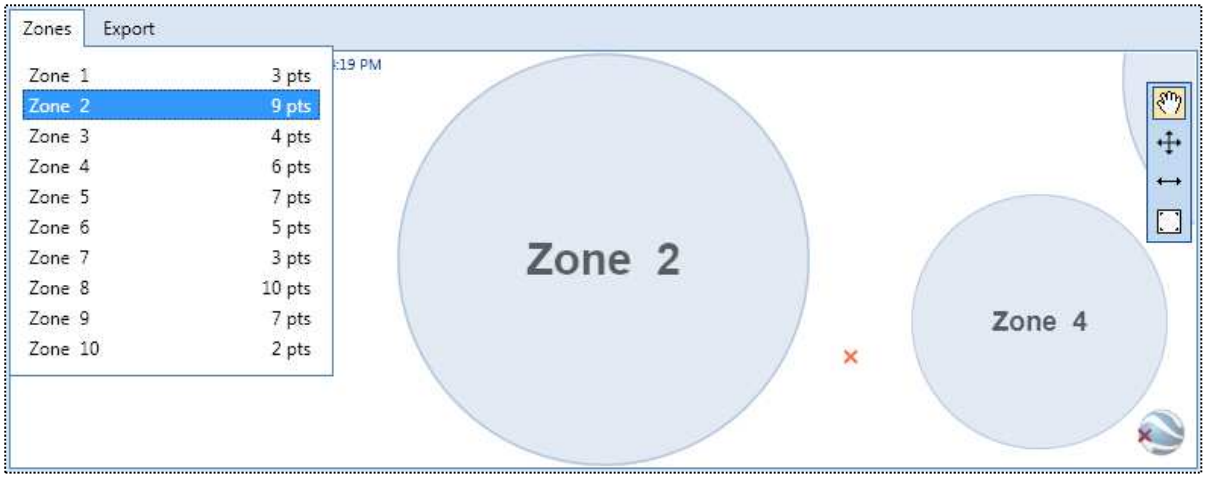
The new zone will not yet exist on the HydroSense II hand held unit; it will be uploaded to the unit on the next Synchronise.

### 4.5.3 Zones List

The zones list menu can be found at the top left hand side of the Map View:



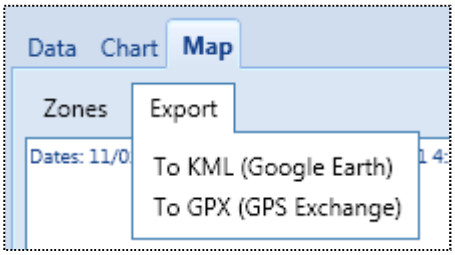

This menu lists all of the zones stored on the HydroSense II along with the number of points contained in each zone. The zones will be listed in alphabetical order. Double click on a zone to zoom to that zone in the Map View.




Zone editing options are available by right clicking on the zone in the map view. See the main Map View section above for more information.

### 4.5.4 Export Menu

The Export menu can be found at the top left hand side of the Map View:




The menu allows exporting of map data into one of two formats. Clicking on either of the menu options will open a Save As dialog box to choose the location of the exported file. Only the points currently visible on the map will be exported. To export all points, click the Select All Dates checkbox in the timeline below the main map.

#### KML

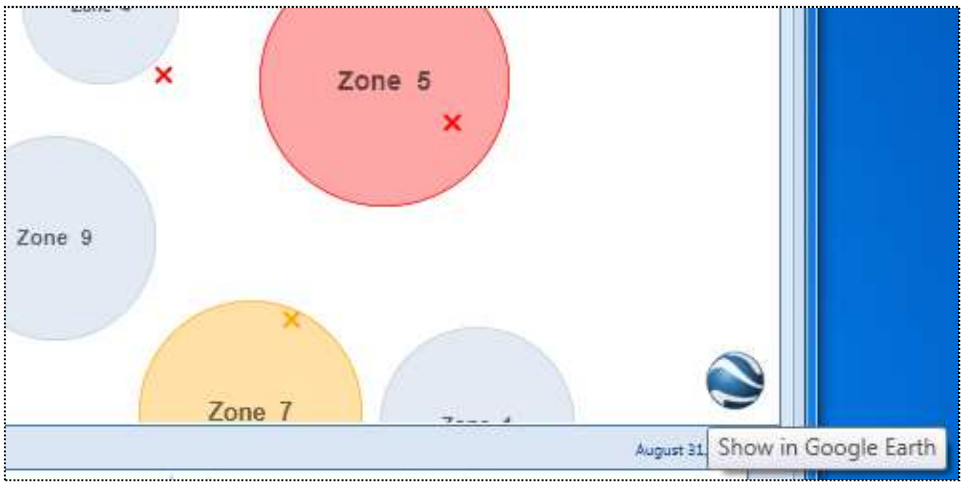
This is the Google Earth file format; the '.kml' file which is exported will contain both zone and measurement information. Zones will be displayed as coloured circles; measurements will be displayed as coloured drawing pins in Google Earth. The colour of the circles and drawing pins will be the same as the colours shown in the HydroSense II software.

#### GPX

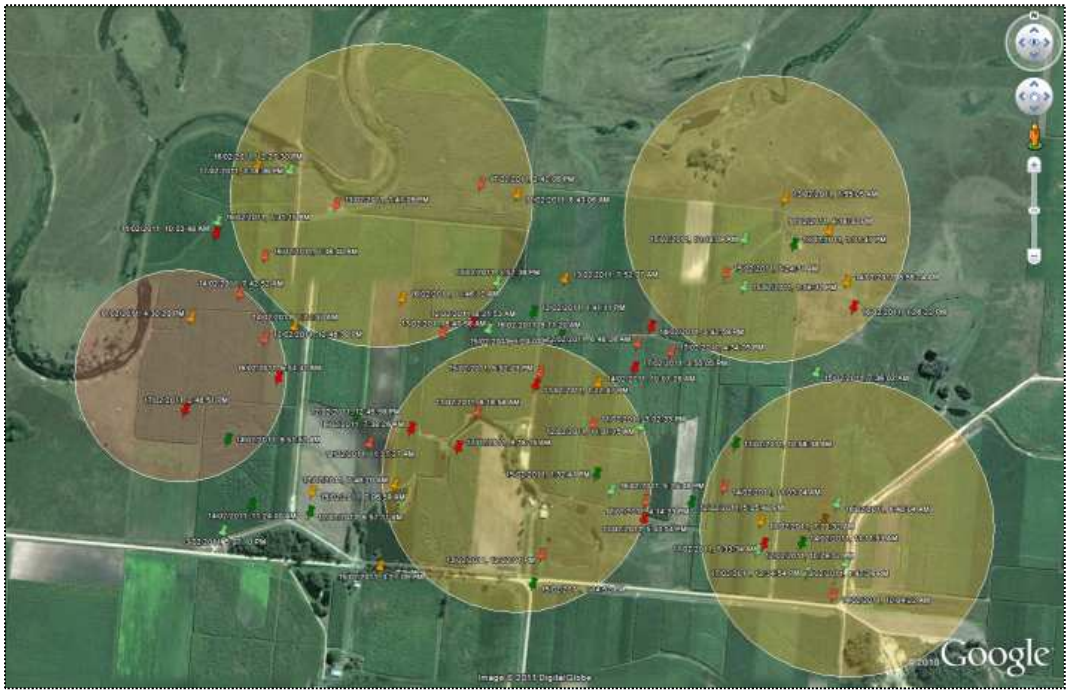
This is a standard GIS format used by many mapping packages. Google Earth supports GPX files, however the GPX format does not allow for drawing shapes, so only measurement information is stored in the exported GPX file. Each measurement is stored as a GPX waypoint with a timestamp. The VWC for the measurement is stored in the waypoint description.

### 4.5.5 Show in Google Earth

The Show in Google Earth button is located at the bottom right hand side of the Map View (This button will be visible but disabled if Google Earth is not installed).




Clicking this button will open Google Earth and display the currently visible zones and measurements.

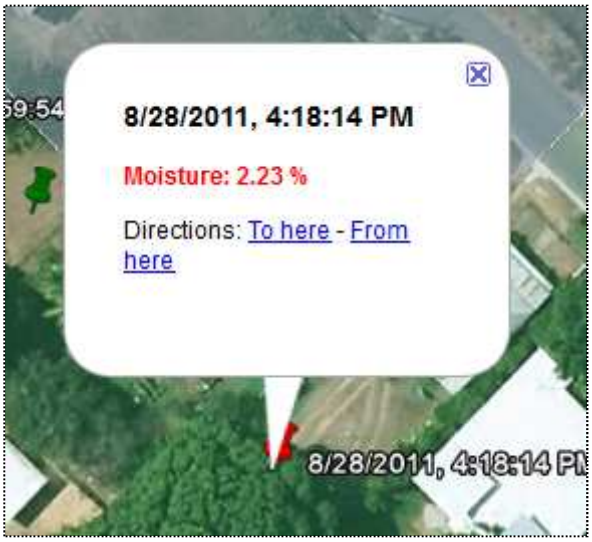



#### *4.5.5.1 Zones*

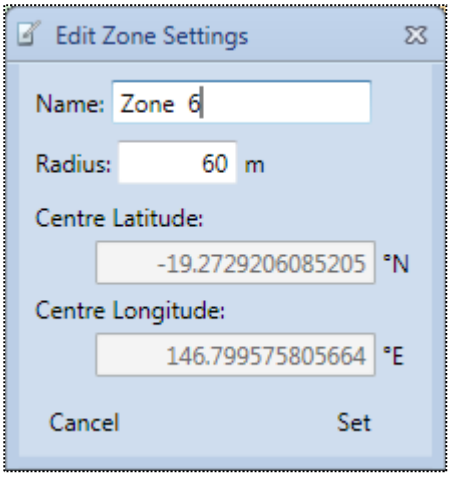
Zones are displayed to scale as coloured circles; the colour of the circle is determined by the average VWC of all points in this zone. Click the zone to view a tooltip with more information about the zone.

#### *4.5.5.2 Measurements*

Measurements are displayed as pin markers in Google Earth, each marker will be coloured according to the VWC measured at that point. Click on one of the markers to view a tooltip with more information about the measurement.

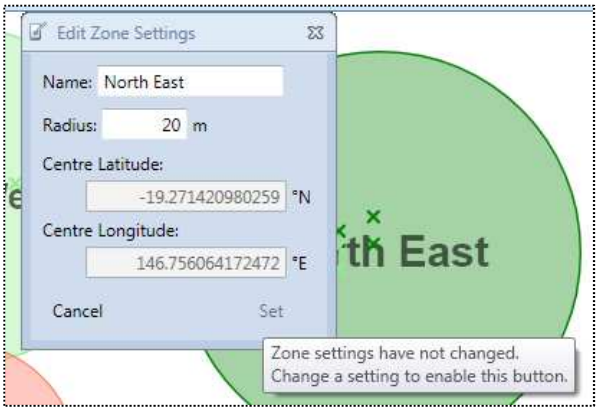



### 4.5.6 Edit Zone Window




The Edit Zone Window can be displayed by double clicking a zone in the main map or right clicking the zone and choosing 'Edit' menu option.

Note that the Set button will be disabled until a zone setting has been changed:



The following zone settings can be changed and saved by pressing the Set button. The Set button will be disabled until a change is made to the zone settings. Any changes made to zones on the local PC will be uploaded to the HydroSense II on the next Synchronise.

**Name**

This field is used to identify the zone in the software and on the HydroSense II hand held display. The maximum width of the zone name is 14 characters, there is no minimum width.

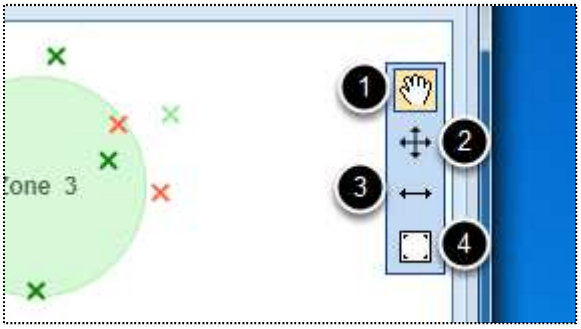
**Radius**

This field specifies the radius of the zone in meters. This field will only accept numeric characters (numbers and the period character '.'). The minimum allowable zone radius is 3m.

The **Centre Latitude** and **Centre Longitude** cannot be edited from the Edit Zone Settings window, to change the location of a zone, use the Move Zone tool in the main map (this is described in the Zone Editing Tools section below).

### 4.5.7 Zone Editing Tools

The toolbar at the top right side of the main map contains tools to control the map position and edit zones:

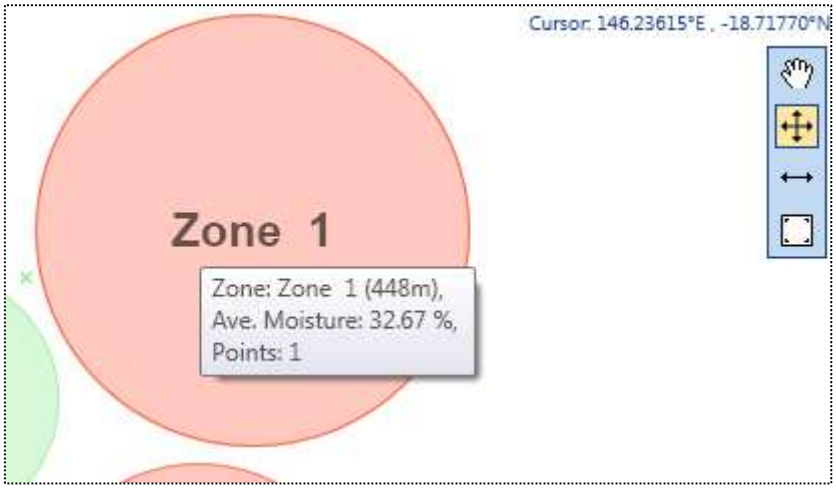



1. **Drag Mode**

By default, the hand icon in the toolbar is selected, this means that the main map is in drag mode.
Clicking and dragging anywhere on the map pans the view, moving the mouse wheel while over the main map zooms the view in and out.

2. **Move Mode**

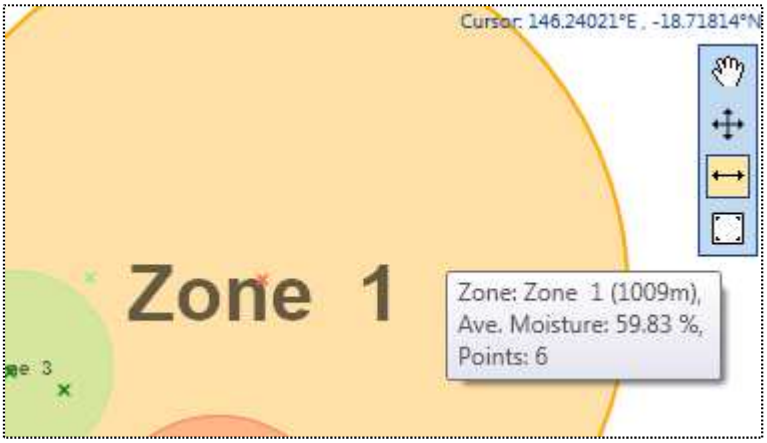
Clicking the move tool puts the main map in Move Mode. Clicking and dragging on any zone will make the zone move with the mouse cursor. This tool can be used to reposition zones on the map.




While dragging, the position of the cursor on the map is displayed in the top right hand corner of the main map. A popup is displayed to show the number of contained points and average moisture for the current zone position.
Right clicking anywhere on the main map or selecting the hand tool from the toolbox puts the map back into Drag Mode.

**3. Resize Mode**

Clicking the resize tool puts the map in Resize Mode. Click and dragging on any zone will make the zones radius increase and decrease with the position of the cursor. This tool can be used to resize zones on the map.



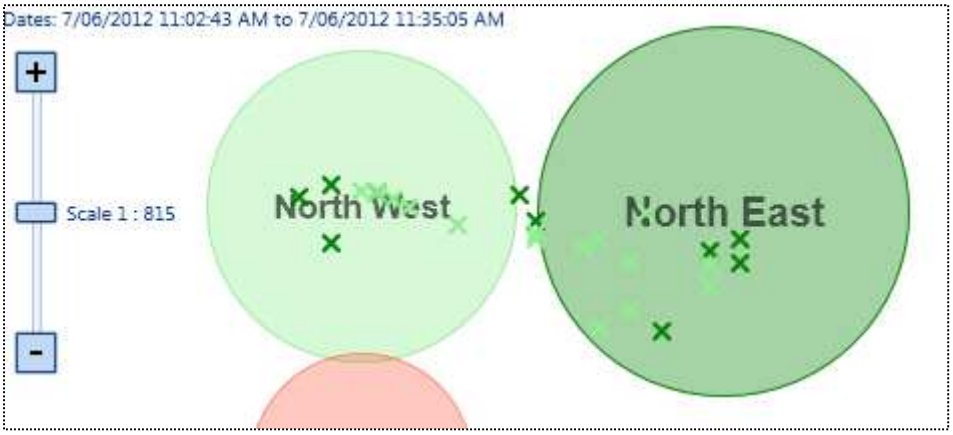

While dragging, a tooltip will show the current radius of the zone in meters, along with the number of contained zones and the average moisture at this zone size.
Right clicking anywhere on the main map or selecting the hand tool from the toolbox puts the map back into Drag Mode.

**4. Zoom to Extents**

Clicking the zoom to extents button will re-centre the view so that all points for the selected date range are visible.

### 4.5.8 Changing Zoom

A zoom slider is located on the left hand side of the Map View:




The current zoom level of the map is shown next to the slider thumb. It is expressed as a ratio of the plot size of objects on the screen to their actual size.

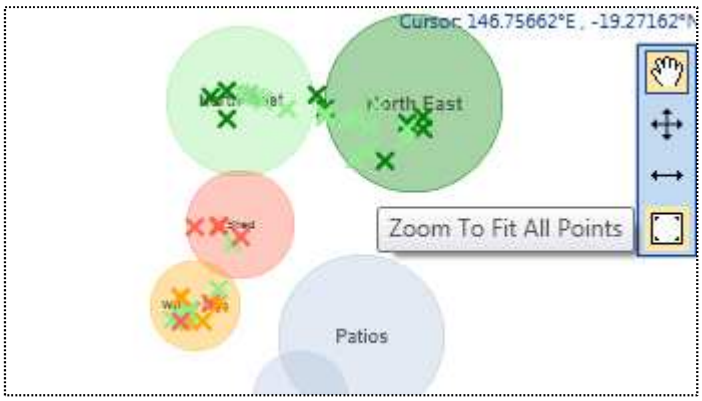
*Note: The zoom ratio is calculated based on the dots per inch setting reported by windows. If this setting is not correct for the current monitor, the zoom ratio will not represent the true ratio of object size on the screen to actual size.*

Click the + button to zoom in around the centre of the current view to make objects appear 10% larger. Click the - button to zoom out around the centre of the current view to make objects appear 10% smaller.

Drag the thumb slider towards the + button to continuously zoom in around the centre of the current view. Drag the thumb slider towards the - button to continuously zoom out around the centre of the current view. The zoom ratio will update as the slider is being dragged. After releasing the thumb it will return to the middle of the slider track and can be used again to zoom in and out from the new zoom level. There is no minimum or maximum zoom level.

In addition to the zoom slider, rolling the mouse wheel forward will zoom in around the current mouse position to make objects 10% larger on each wheel increment. Rolling the mouse wheel backward will zoom out around the current mouse position to make objects appear 10% smaller on each wheel increment.

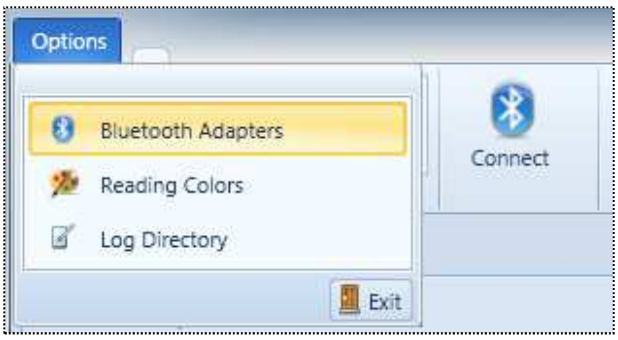
To reset the zoom to contain the currently visible points and zones, click the Zoom to Fit All Points button in the Zone Editing Toolbar:



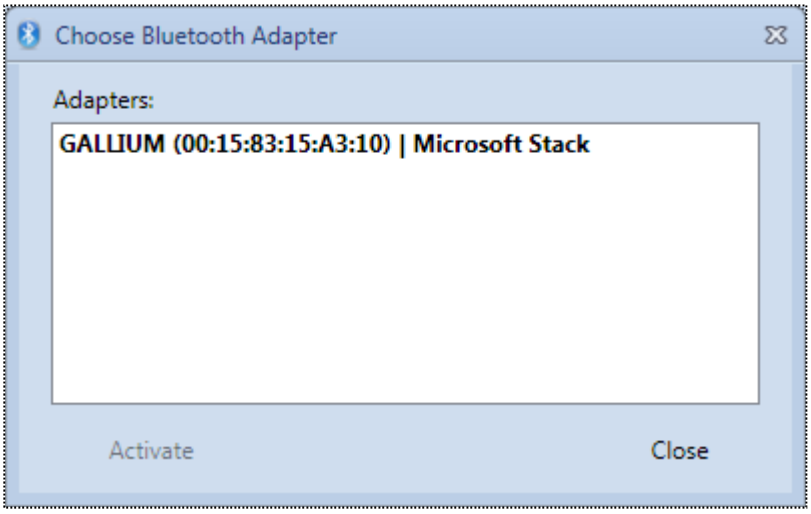
# 5 Settings and Configuration

## 5.1 Bluetooth Settings

The Bluetooth Adapters window can be accessed from the Options Menu in the HydroSense II software main window:




The window shows a list of all available Bluetooth Adapters on the local PC.

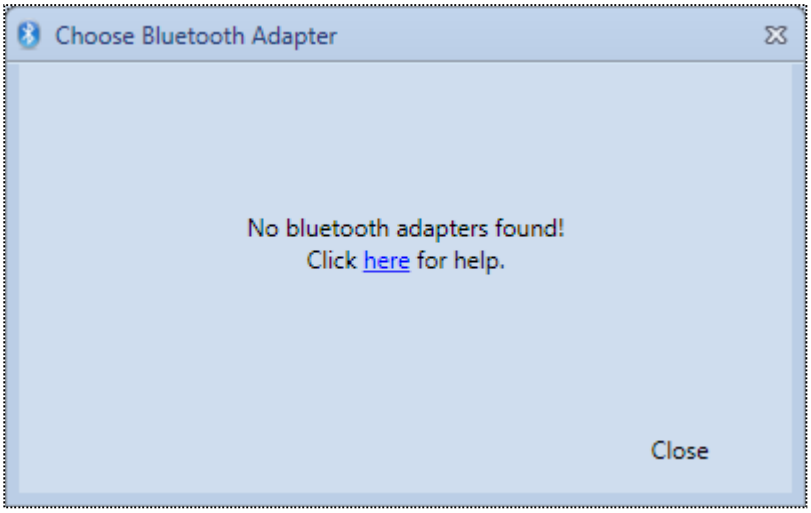



The Bluetooth Adapter currently being used by the HydroSense II software is shown in bold. If there is more than one Bluetooth Adapter on the local computer, the extra adapters will be shown in normal font in the list.

Each adapter is listed in the following format:
Adapter Name (Adapter Bluetooth Address) | Bluetooth Stack Used

To use a different adapter, select the adapter in the list, then press the Activate button. The new adapter will now be shown in bold and this setting will be saved to disk so that this adapter will be used the next time the HydroSense II software is run.

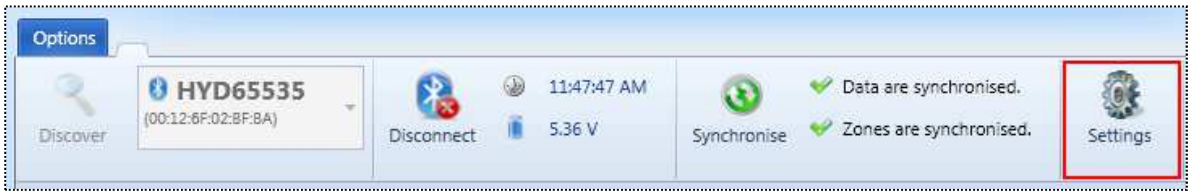
If the local PC does not have any Bluetooth Adapters connected, the following window will be displayed:



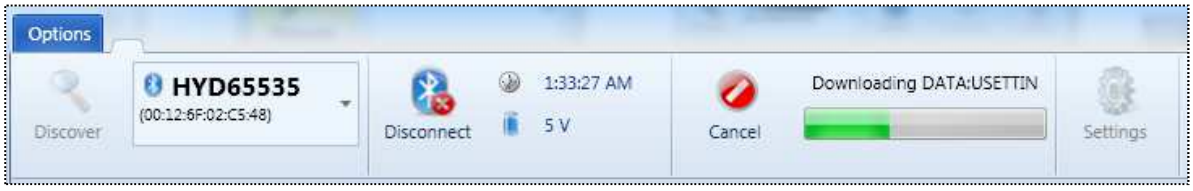

If a Bluetooth Adapter is connected and the window above is displayed, see the BTStackError error code for more help.

## 5.2 Device Settings

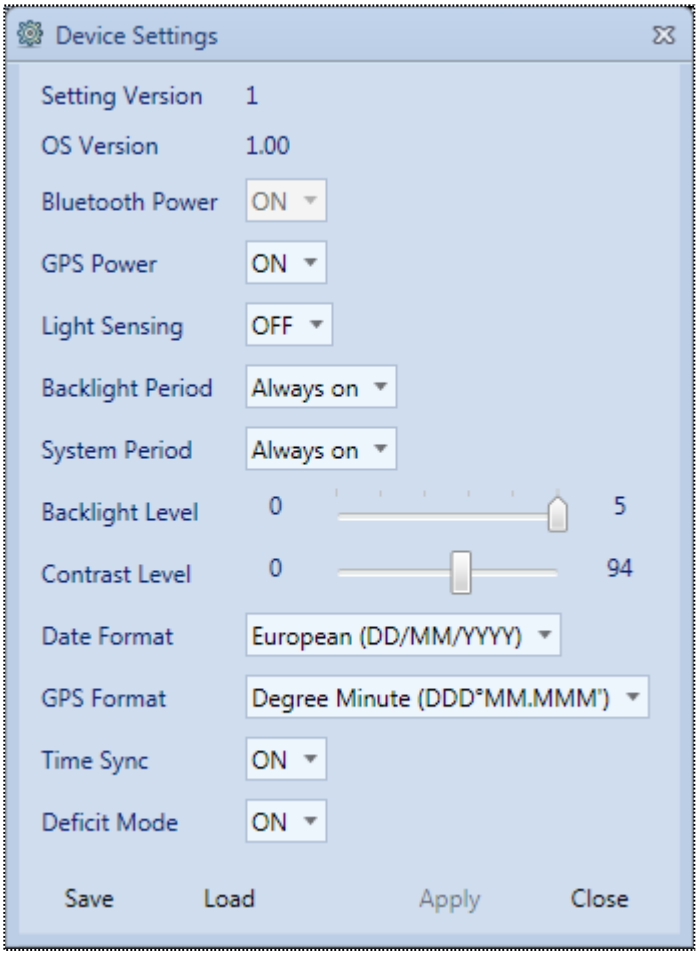
The settings for the HydroSense II can only be accessed once a Bluetooth connection has been established. Click the Settings button in the main toolbar:




The software will first download the settings from the device:

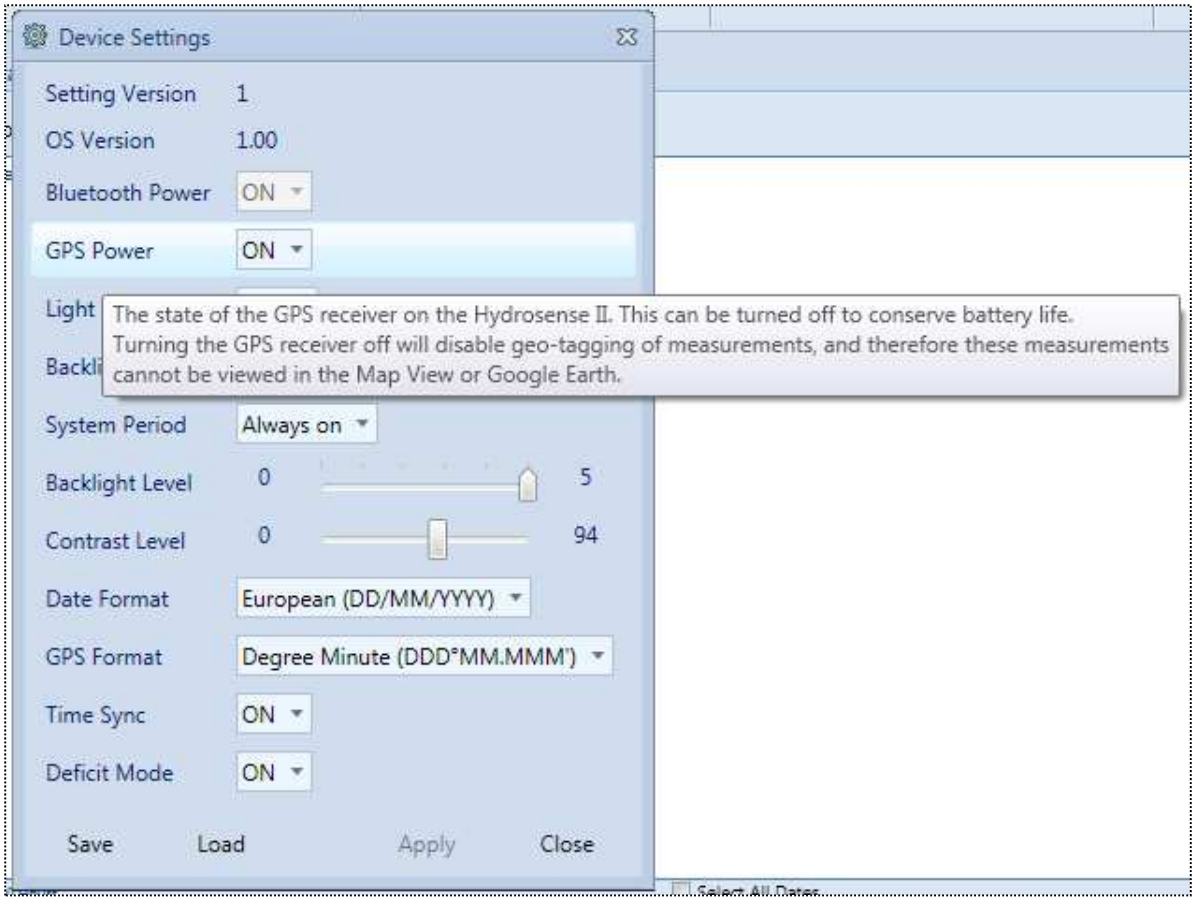


Then the Device Settings Window will be displayed:



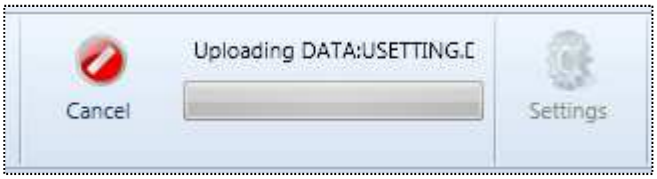

The device settings shown in the window will depend on the current version of the operating system, the settings above are for the first released version of the HydroSense II.

Move the mouse over the labels on the left hand side of the screen to find out more information about each setting.




Change settings using the drop down boxes and sliders. The Apply button will be disabled until a setting is changed, make sure to press the Apply button to save the settings to the HydroSense II.

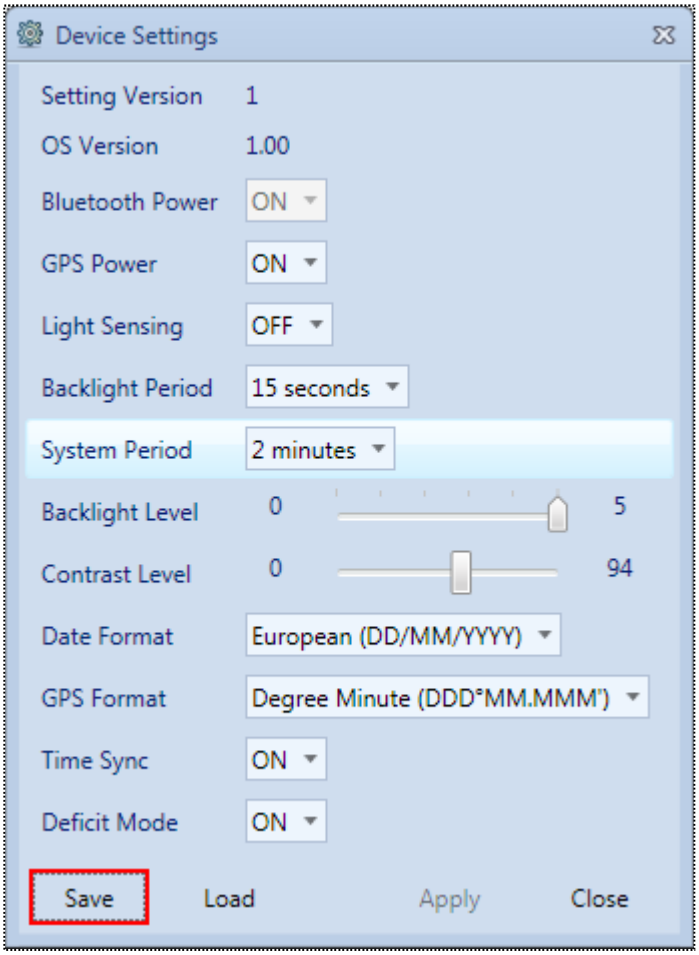
After pressing the Apply button, the main window will show the settings file being uploaded to the HydroSense II:



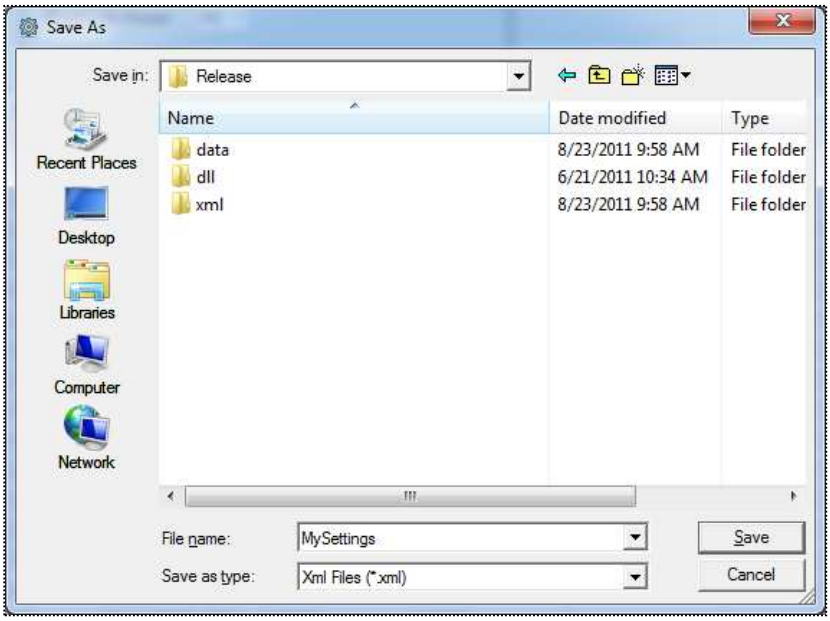

### 5.2.1 Saving Settings

During a firmware upgrade the device settings of the HydroSense II will be lost. The Device Settings Window can be used to save the settings before the upgrade.

Open the Device Settings Window, then click the Save button.

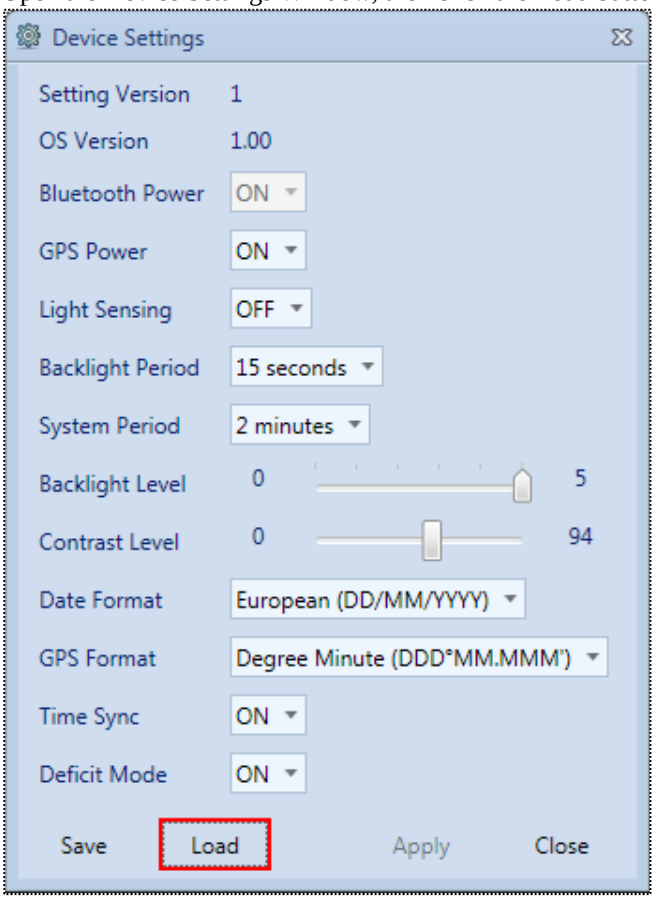



Choose a location on the local PC to save the settings in an xml file, then click Save.

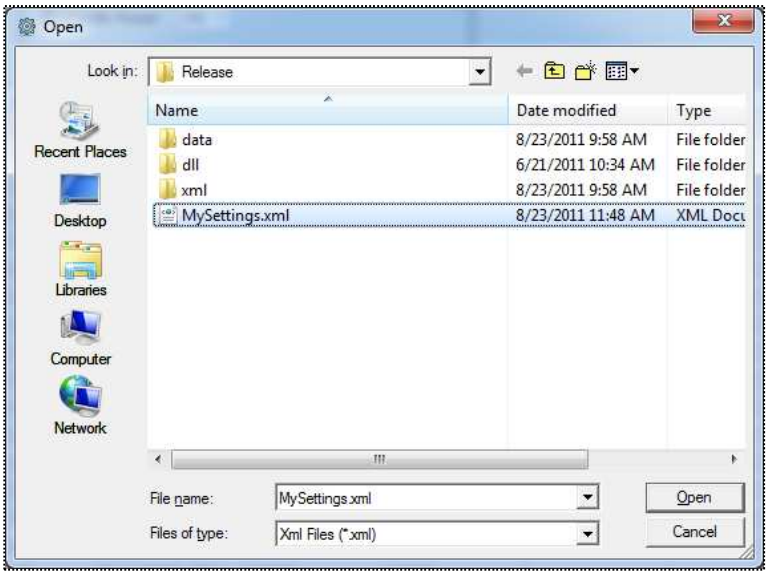


### 5.2.2 Loading Settings

Open the Device Settings Window, then click the Load button.




Browse to the location of the settings xml file on the local computer, the click Open:




The window will be filled with the saved settings, now press the Apply button to update the HydroSense II with these settings.

## 5.3 Measurement Colours

The HydroSense II software provides three different ways to visualise data, the Data View, Chart View and Map View. In each of these views, colours are used to represent the value of volumetric water content (VWC) from a measurement. The ways these colours are used are described below.

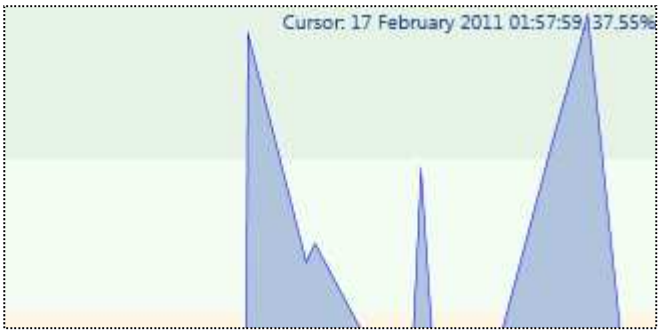
### 5.3.1 Data View

The background of each data record is coloured based on the VWC measured at that point.

| | | | | | |
|---|---|---|---|---|---|
| 11/02/2011 06:37:02 | 1 | Unspecified Zone | -19.27407 | 146.80171 | 36.58315 |
| 11/02/2011 07:36:20 | 2 | Zone 5 | -19.27285 | 146.80182 | 89.53485 |

### 5.3.2 Chart View

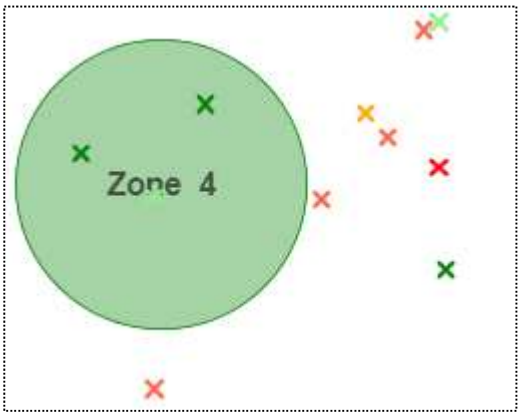
The background of the chart is coloured with bands to show which colours are used for each level of VWC.




### 5.3.3 Map View

Zones in the map view are coloured based on the average VWC of all the measurements located within that zone.

Measurements are coloured based on the VWC measured at that point.

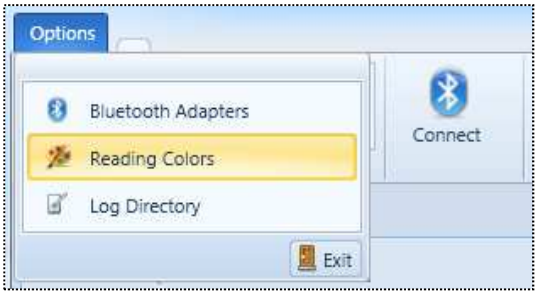


### 5.3.4 Changing Measurement Colours

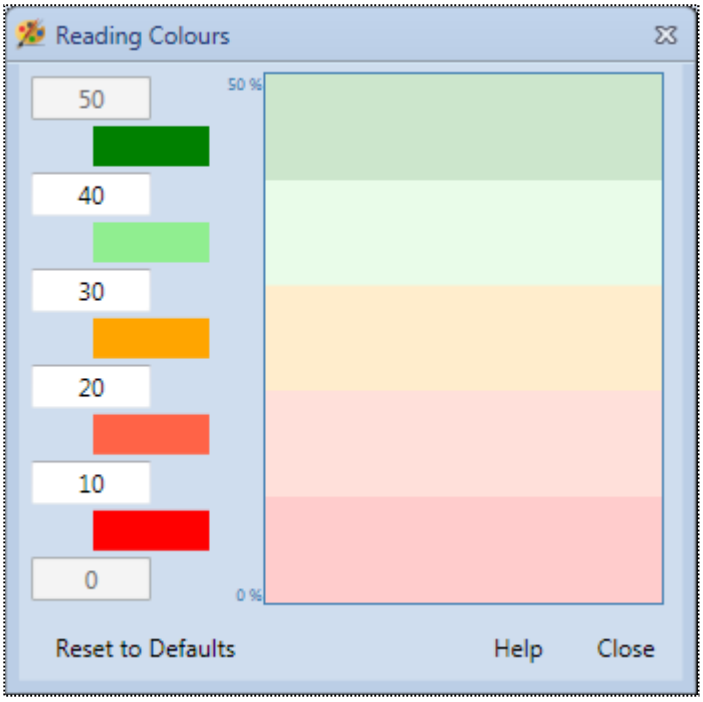
The default rules for deciding on the measurement colour are shown below.

| Moisture Range | Colour |
|---|---|
| 0% < Moisture < 10% | Red |
| 10% < Moisture < 20% | Light Red |
| 20% < Moisture < 30% | Orange |
| 30% < Moisture < 40% | Light Green |
| 40% < Moisture < 50% | Green |

These colour levels can be customised in the Reading Colours Window. Click the Options menu in the main window, and then choose Reading Colours.




The reading colours window contains 6 edit boxes and 5 coloured buttons.




Each coloured button is positioned between two edit boxes. The values in the edit boxes represent the upper and lower VWC limits for the reading colour shown on the coloured button between them.

In the default configuration above, the colour RED is positioned between the values 0 and 10. This means that measurements between 0% and 10% volumetric water content will be coloured RED.

To change the level at which colours begin and end, simply edit the values in the edit boxes. The preview on the right hand side of the window will update automatically.

The edit boxes will only accept numeric digits and will show a red outline when an invalid entry has been made.

The 0% and 50% edit boxes are disabled; these represent the minimum and maximum output from the soil moisture probe and cannot be edited.
To change the colours which are displayed, click the desired coloured button to open a selection dialog.


Click one of the colours in the selection dialog, the dialog will close and the selected coloured button will update its background to the selected colour.

To close the dialog without making a selection, click anywhere else in the Reading Colours window.

On the right hand side of the Reading Colours window is a sample chart background.


This sample background updates automatically when changes are made to the values and colours on the left, it shows the background which will be used for the Chart View given the current selections.

Press the Reset to Defaults button to revert the reading colours to the default selections shown in the images above.

Press the Close button to save changes and return to the main window.

# 6 Terms

## 6.1 Bluetooth Adapter

Bluetooth Adapter is the name given to the hardware connected to the local PC which transmits and receives the radio signals required for Bluetooth communications.
On desktop computers this is usually a USB device which connects to a USB port on the computer. If the HydroSense II software is reporting a `BTStackError`, make sure that the USB device is firmly inserted into a USB port on the PC. Make sure that the Bluetooth Stack on the computer recognises that the device is attached.

On laptop computers, a Bluetooth Adapter is often built in to the laptop hardware so that an extra USB adapter is not required. These laptop computers will have an option to enable/disable the internal Bluetooth Adapter; usually this function is performed by a special key on the laptop keyboard or an extra sliding switch on the side of the laptop. If the HydroSense II software is reporting a `BTStackError`, make sure that the internal Bluetooth adapter is enabled using the hotkey or switch.

## 6.2 Bluetooth Stack

The term Bluetooth Stack refers to the collection of code on a PC which handles Bluetooth traffic.

The software does not communicate with the HydroSense II directly, it asks the Bluetooth stack on the PC to communicate with the HydroSense II and return the results.

The software supports the four major Bluetooth Stacks currently on the market, those produced by Microsoft, BlueSoleil, Toshiba and Broadcom.

## 6.3 VWC

VWC is an acronym for Volumetric Water Content. This is a measure of the amount water present in soil expressed as a percentage of the total volume measured by the sensor. A VWC of 50% indicates that water takes up 50% of the volume of soil measured.

# 7 Error Codes

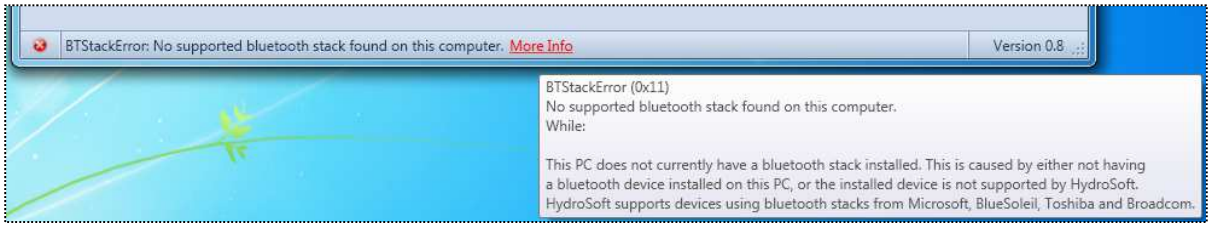
## 7.1 Reporting an Error

The following subsections discuss the information that will be required when reporting an error code to your supplier; this will be the company which you originally purchased the HydroSense II from.

**The Error Code**

For example: BTStackError (0x11).

To find out more information on a particular error code, hover the mouse over the error in the status bar as shown below:




**The Steps to Reproduce the Error**

For example:

1. Pressed the Discover button to discover the HydroSense II.
2. Selected the HydroSense II device from the list.
3. Pressed Connect.
4. Connection failed with the error BTUnkownError.

Also indicate whether these steps had worked as expected previously.

**Bluetooth Adapter Make and Model**

If you are using a Bluetooth Adapter on a desktop machine, please supply the make and model number (if available) for the Bluetooth Adapter.

If you are using a laptop with built in Bluetooth, please supply the laptop make and model number instead.

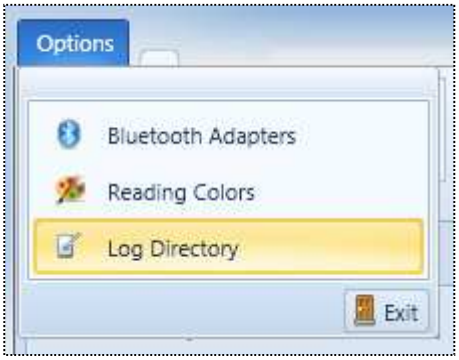
**Log Files**

See the Log Files topic below for information on how to locate the Bluetooth and application log files.

## 7.2 Software Log Files

In the event of an error with the HydroSense II support software, please follow the instructions in Reporting an Error to notify the local HydroSense II distributor of the issue. To make identifying the cause of the error easier, please attach the communication and application logs to your correspondence.

These logs are located in the working directory of the software which can be opened from the options menu in the main window.




The working directory contains three folders; data, logs and xml.


The data folder contains records and zones downloaded from each HydroSense II stored in a raw binary format. These files can only be opened by the HydroSense II software, please use the Export to CSV option in the Data View to view records in Excel.

The xml folder contains configuration information for the HydroSense II software.

The logs folder contains two log files; bluetooth.log and application.log.

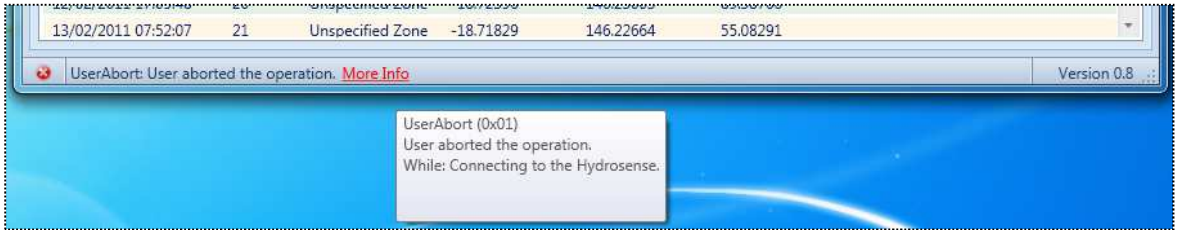

The Bluetooth log file records the details of the last communication attempt with a HydroSense II device.

The application log file contains start-up information and any program errors since the last time the software was started.

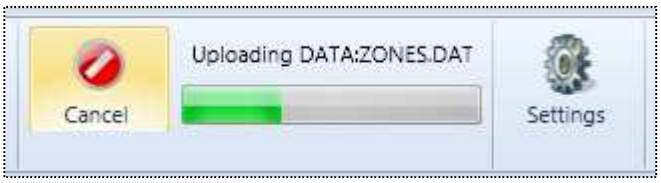
When reporting an error, please email blueooth.log and application.log to your HydroSense II distributor.

## 7.3 (0x01) UserAbort

**User aborted the operation.**



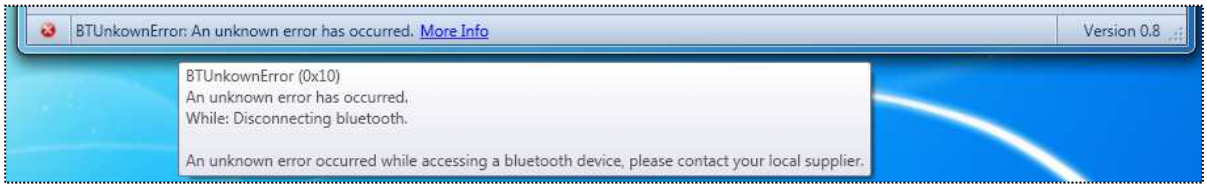

This error is shown when a connect attempt or a Synchronise attempt is cancelled by clicking the cancel button.


This does not indicate any problems with communication, however if it is displayed without a cancel button being pressed and preventing normal operation of the software, please contact your HydroSense II supplier.

## 7.4 (0x10) BTUnknownError

**An unknown error has occurred during Bluetooth communications.**



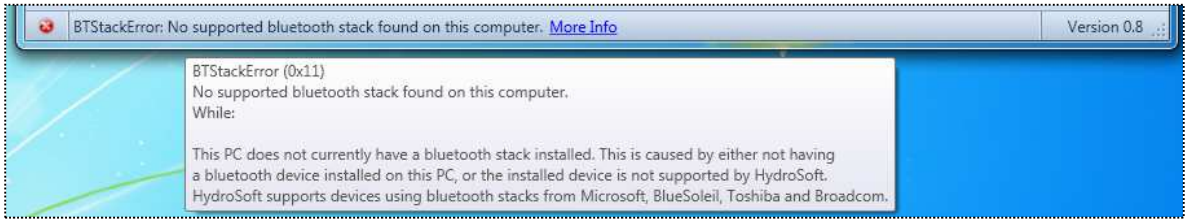

This error is shown when communications with the HydroSense II failed and the Bluetooth driver on the local computer did not specify the cause of the failure.

If this error has occurred, attempt to reproduce the error a second time by following the same steps that resulted in the first error.

If the error is confirmed, please report the error to your HydroSense II supplier along with the steps to follow to produce the error.

## 7.5 (0x11) BTStackError

**No supported Bluetooth stack found on this computer.**




The software did not find a compatible Bluetooth Stack on the local PC. This will usually occur on a desktop machine where the Bluetooth Adapter has not been connected or on a laptop where Bluetooth has been disabled.

First check to make sure that the Bluetooth Adapter is connected via a USB port, or that Bluetooth has been enabled if using a laptop. Most new laptops have an external button or a keyboard key which can be used to turn Bluetooth on or off.

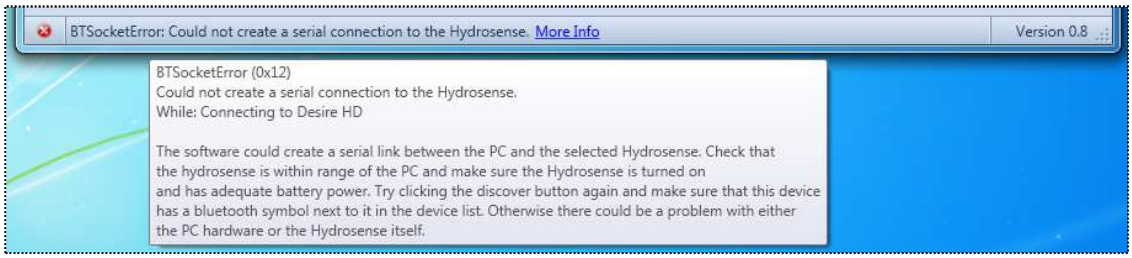
If the Bluetooth Adapter is connected and Bluetooth is turned on, check whether Windows has recognised the Bluetooth Adapter. If Windows has recognised the Bluetooth Adapter, a Bluetooth icon should be displayed in the Windows Taskbar.


The icon should be shaded blue, if it is shaded grey or is missing; then Windows has not recognised the Bluetooth hardware. Please contact the supplier of your Bluetooth hardware.

If this icon is present, then Windows has recognised the Bluetooth hardware, but the HydroSense II software has not. Please report the issue to your local HydroSense II supplier.

## 7.6 (0x12) BTSocketError

**Could not establish a connection to the HydroSense II.**




This error occurs when the Bluetooth adapter on the local PC is not able to create a connection to the HydroSense II. This can be caused by the device being out of range, or not responding to Bluetooth requests.

Try the following steps to rectify the issue:

*Make sure the HydroSense II is powered on; check that the display is on and responsive.*

Make sure that the HydroSense II is within range of the PC, the maximum distance that the hand held can be situated away from the PC depends on the class of the Bluetooth adapter used by the PC:

| Bluetooth Class | Maximum Distance |
|---|---|
| Class 1 | 5m |
| Class 2 | 10m |
| Class 3 | 100m |

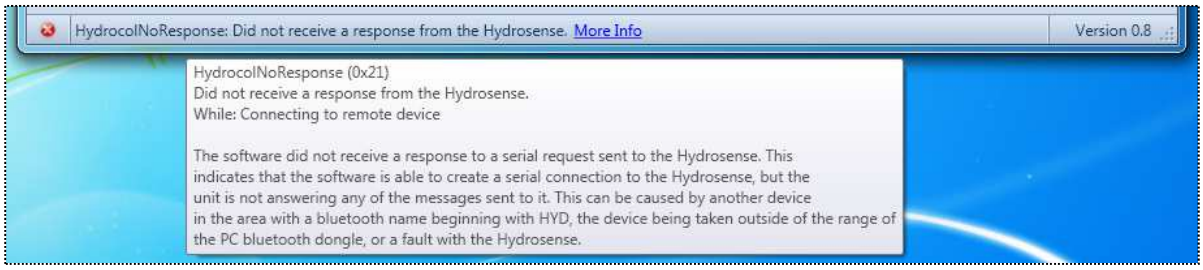
Press the discover button in the software again, and check that a Bluetooth symbol is shown next to the device serial number.


If a folder icon is shown instead, this means that the software did not detect the device during the discovery process. Restart the PC software and restart the HydroSense II, then try another discovery attempt.

If the device is still not discovered by the software, or if the device is being discovered but cannot establish a connection, please report the issue to your HydroSense II supplier.

## 7.7 (0x21) HydrocolNoResponse

**Did not receive a response from the HydroSense II.**



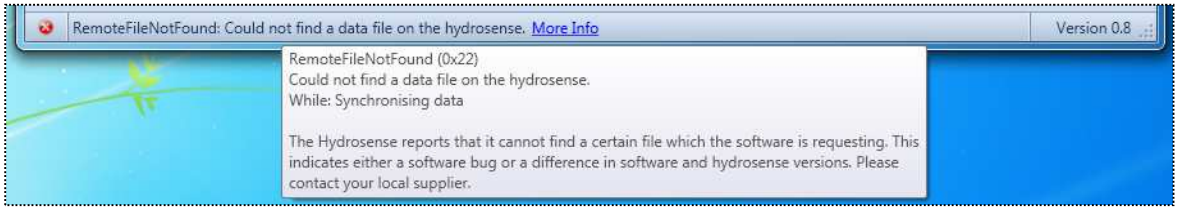

The software did not receive a response to a request which was sent via Bluetooth. This means that the Bluetooth connection was successfully connected, but communications after the initial connection have failed.

This can be caused by:

- Another device in the area is accepting Bluetooth connections under a name beginning with the letters "HYD". Check that the serial number of the currently selected device in the software (the 5 digits after HYD) matches the serial number printed on the HydroSense II.
- The HydroSense II has been taken out of Bluetooth range after the initial connection. Ensure that the HydroSense II is well within the Bluetooth range specified by the Bluetooth Adapter on the local PC.
- There is a fault with the HydroSense II or the PC Software. If the No Response error can be reproduced a second time and the steps above do not fix the issue, please report this to your HydroSense II supplier.

## 7.8 (0x22) RemoteFileNotFound

**Remote file not found.**



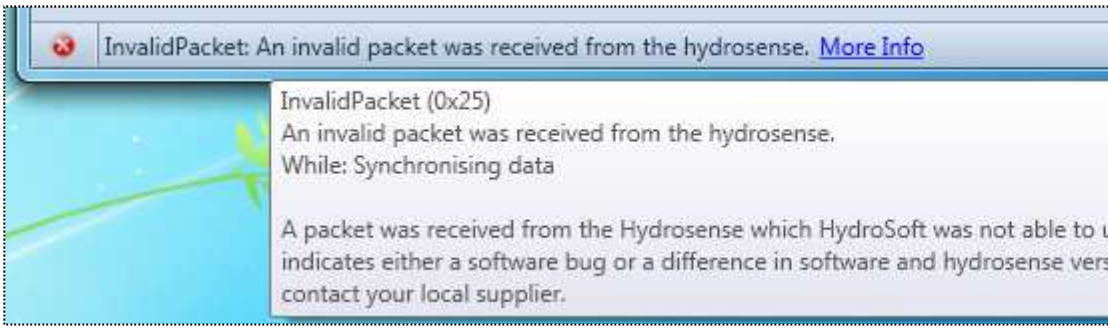

Data and Zone information is stored in files on the HydroSense II, during a Synchronise the software will download these files from the device. If this error occurs, it means that the remote device does not recognise the file which the software is asking for.

This can be caused by an older version of the software communicating with a device with new firmware. Please visit http://www.campbellsci.com.au to check whether an updated software version is available.

If the latest version of the software is being used, then please report the issue to your HydroSense II supplier.

## 7.9 (0x25) InvalidPacket

**Invalid packet received.**




The software has received a response from the remote which is either of the wrong length or has an incorrect format.

This can be caused by an older version of the software communicating with a device with new firmware. Please visit http://www.campbellsci.com.au to check whether an updated software version is available.

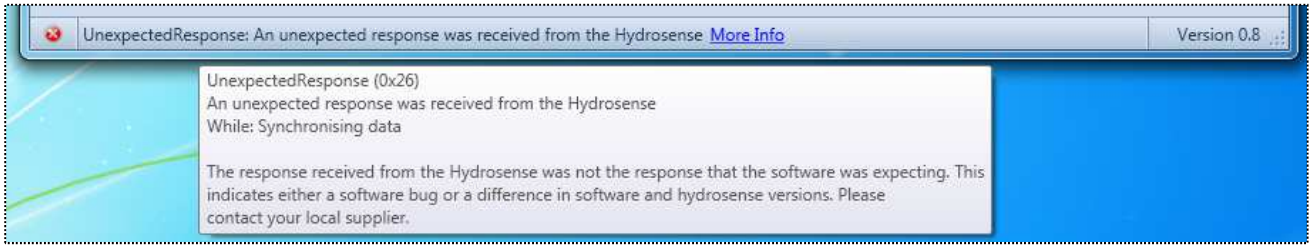
The error can also be caused by a weak Bluetooth connection with the remote device. Please ensure that the device is well within the maximum distance quoted by the Bluetooth Adapter on the local machine. The maximum communication distance for Bluetooth adapters is:

| Bluetooth Class | Maximum Distance |
|---|---|
| Class 1 | 5m |
| Class 2 | 10m |
| Class 3 | 100m |

If the error persists please report the issue to your HydroSense II supplier.

## 7.10 (0x26) UnexpectedResponse

**Unexpected response received from the device.**




The software has received a properly formatted response from the HydroSense II, but it is not the response that the software was expecting. This can be caused by an older version of the software communicating with a device with new firmware. Please visit http://www.campbellsci.com.au to check whether an updated software version is available.

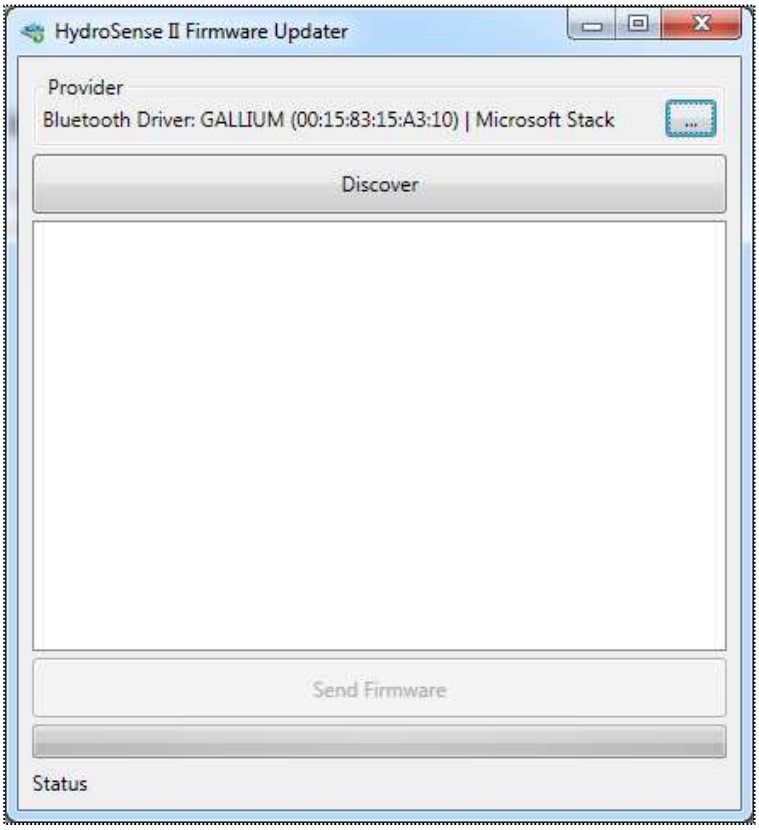
If the latest version of the software is being used, then please report the issue to your HydroSense II supplier.

# 8 Operating System Updater

**Warning**

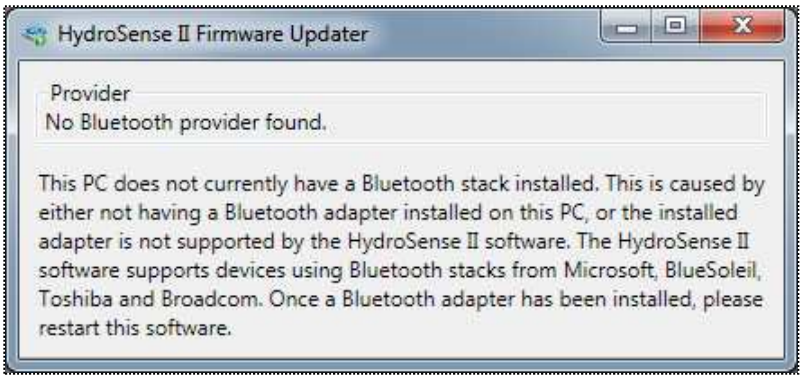
Sending an operating system to the HydroSense II will permanently delete all measurements and zones saved on the device. Please ensure that the HydroSense II is synchronised with the PC Software before sending a new operating system, this will save all data points and zones stored on the HydroSense II to the PC.

The software includes a facility to update the operating system on the HydroSense II; this can be run from the Operating System Updater shortcut under the HydroSense II group in the start menu.



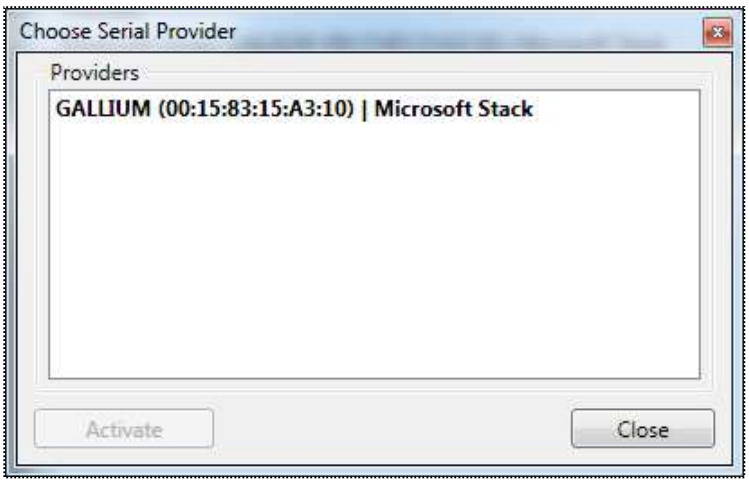
## 8.1 Bluetooth Provider

The facility uses Bluetooth to transfer the new operating system to the device; the current Bluetooth provider being used is shown at the top of the screen. A Bluetooth provider refers to either a USB dongle or a built in USB chip in a laptop. If no Bluetooth provider is found, the following screen will be displayed:




Make sure that Bluetooth is enabled on the local PC; this can be enabled or disabled using an external switch on a laptop or a special function key on the keyboard. Bluetooth can also be enabled or disabled using the Bluetooth icon in the Windows taskbar. If Bluetooth is enabled and working with other devices, and the above error is still displayed, please contact your HydroSense II supplier.

If multiple Bluetooth providers are available, click the browse button next to the current provider to select a different provider:




The currently selected provider will appear in bold in the list, to activate a different provider, double click on its name, or select the provider and press the Activate button. Then close the window using the Close button.

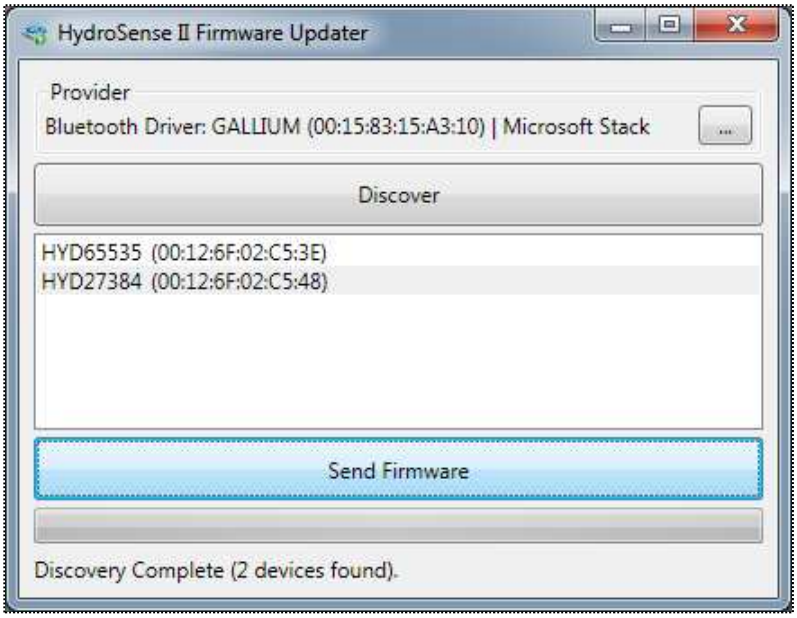
## 8.2 Discovering the Device

In order to send an operating system to the device, it must be powered on in “boot loader” mode. The procedure to do so is as follows:

- Make sure the HydroSense II is turned off
- Press and hold the up arrow button
- With the up arrow still depressed, press and hold the power button for 2 seconds

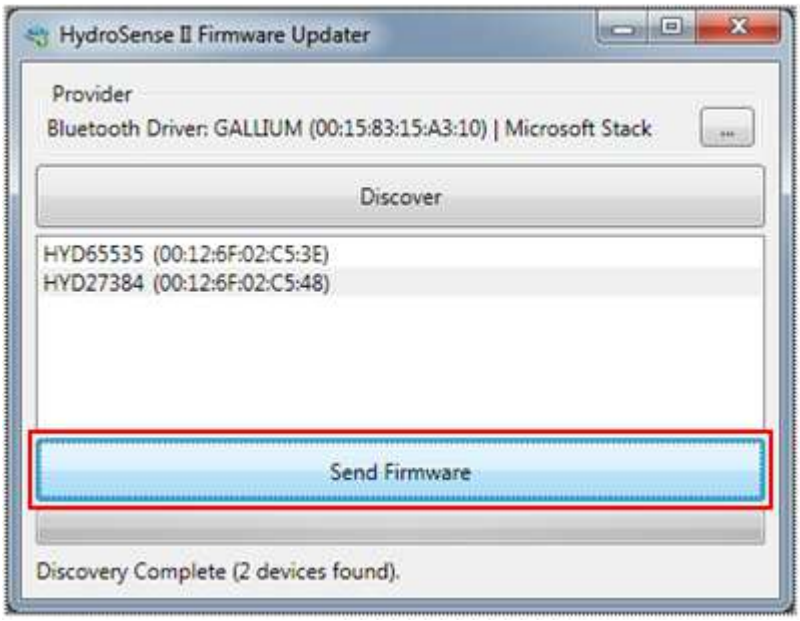
The HydroSense II will power on in “boot loader” mode and flash the LCD display.

The device will remain in this mode for 2 minutes, return to the software and press the Discover button. The device should be displayed with its serial number as below.

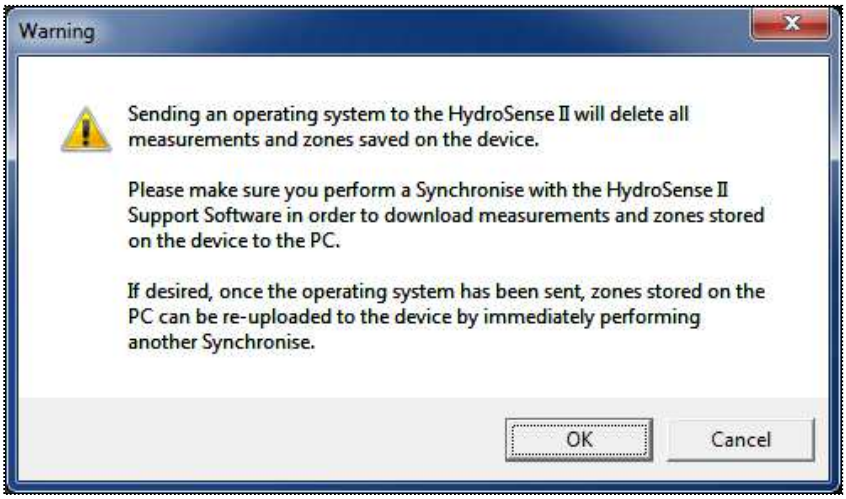



## 8.3 Sending an Operating System

Select the device, and then press the Send Firmware button.



Before choosing a firmware to send to the device, a warning dialog is shown as below:

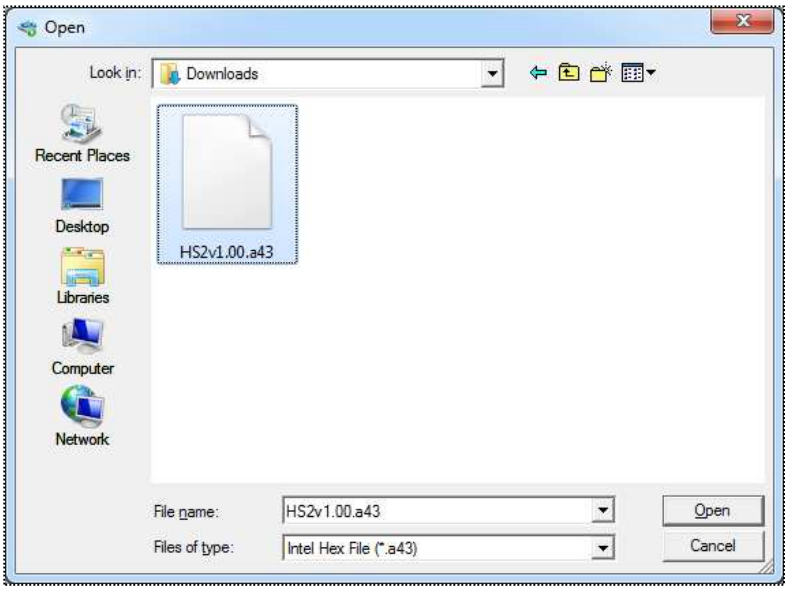



Ensure that all data points and zones on the device have been synchronised with the PC software before continuing.

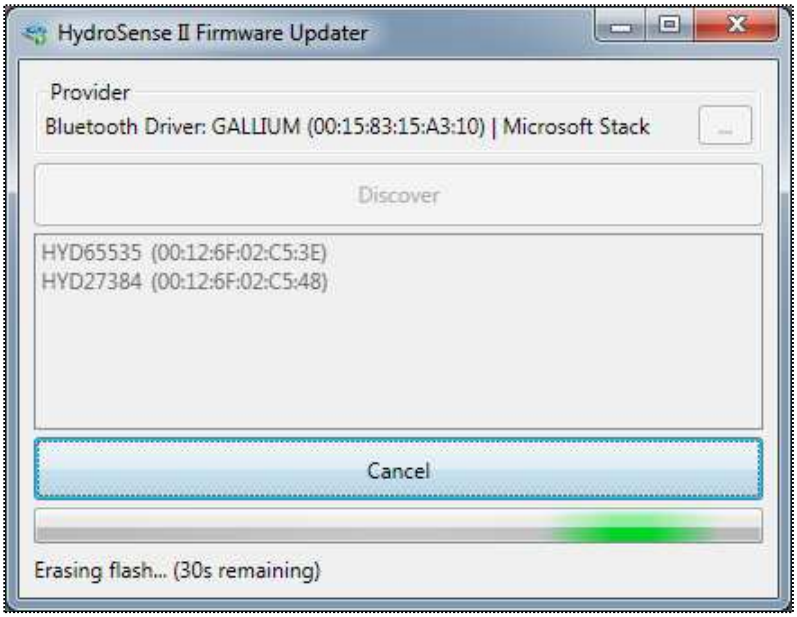
Press Cancel to return to the Operating System Updater and cancel the send operation.

Press OK to agree to remove all saved data points and zones from the device during the operating system update. Note that any previous zones stored by the PC software can be re-uploaded to the device by performing a Synchronise with the device immediately after the update is completed.

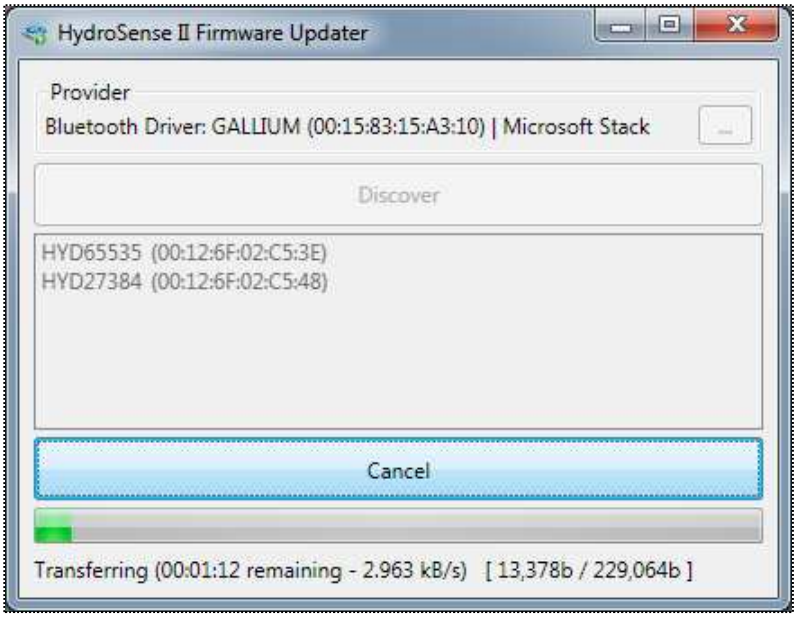
A file browser will open to select the .a43 file for the new operating system. When a new operating system becomes available, it will be listed in the Downloads section of the Campbell Scientific website as an .a43 file. It is this file that should be selected in the file browser.



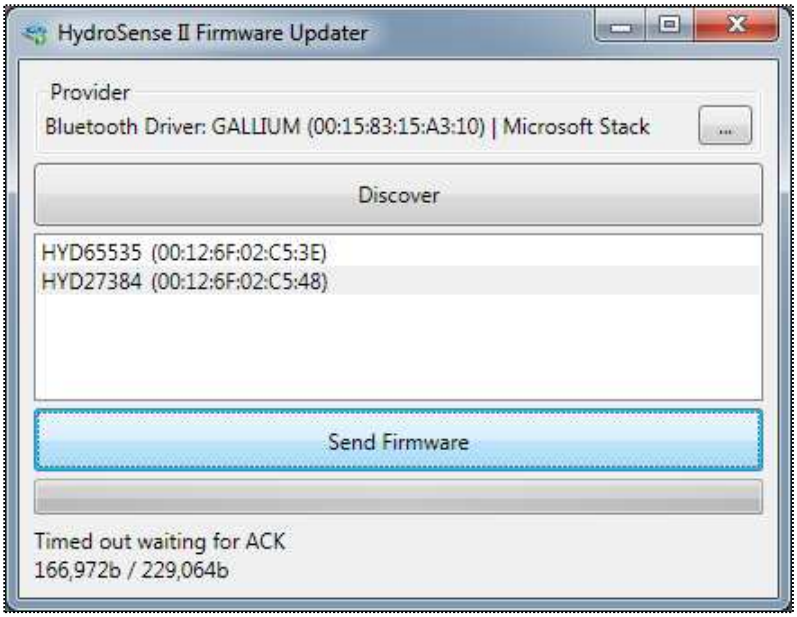

Click the Open button to begin the transfer, the HydroSense II will flash the LCD display rapidly to indicate a send is in progress.



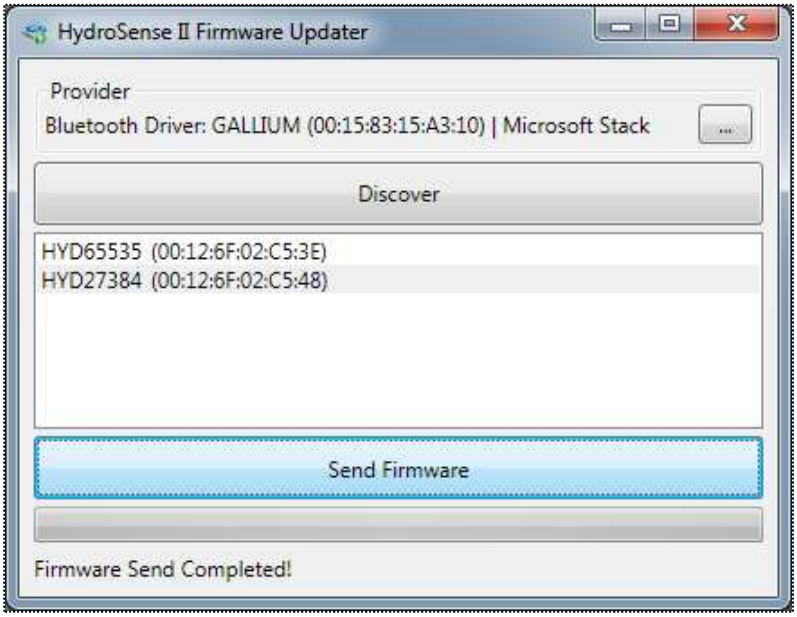

The device will first erase the old operating system, this process takes about 30 seconds to complete.




Once the old operating system has been erased, the facility will transfer the new operating system to the device. This process takes about 90 seconds to complete, a progress bar displays the transfer progress.




If there was a Bluetooth error while transferring the operating system, the error will be shown below the progress bar. The HydroSense II will turn off and the operating system transfer will have failed. At this point, the HydroSense II will not power on as it has an incomplete operating system. The device can still be powered on in “boot loader” mode, so in the event of an error, repeat the operating system send procedure. If the error continues, please contact your local HydroSense II supplier.




Once the transfer has successfully completed the HydroSense II will power off and the update facility will display a message to indicate that the send was successful. The device can now be powered on as normal.

Before storing data points on the device, perform a Synchronise with the HydroSense II Support Software. This will upload the zones stored on the PC to the HydroSense II, as the device zones will have been cleared during the upgrade process.

# Campbell Scientific Companies

**Campbell Scientific, Inc. (CSI)**
815 West 1800 North Logan, Utah 84321 UNITED STATES
www.campbellsci.com • info@campbellsci.com

**Campbell Scientific Africa Pty. Ltd. (CSAf)**
PO Box 2450 Somerset West 7129 SOUTH AFRICA
www.csafrica.co.za • cleroux@csafrica.co.za

**Campbell Scientific Australia Pty. Ltd. (CSA)**
PO Box 444 Thuringowa Central QLD 4812 AUSTRALIA
www.campbellsci.com.au • info@campbellsci.com.au

**Campbell Scientific do Brazil Ltda. (CSB)**
Rua Luisa Crapsi Orsi, 15 Butantã CEP: 005543-000 São Paulo SP BRAZIL www.campbellsci.com.br • suporte@campbellsci.com.br

**Campbell Scientific Canada Corp. (CSC)**
11564 - 149th Street NW Edmonton, Alberta T5M 1W7 CANADA www.campbellsci.ca • dataloggers@campbellsci.ca

**Campbell Scientific Centro Caribe S.A. (CSCC)**
300 N Cementerio, Edificio Breller Santo Domingo, Heredia 40305 COSTA RICA www.campbellsci.cc • info@campbellsci.cc

**Campbell Scientific Ltd. (CSL)**
Campbell Park 80 Hathern Road Shepshed, Loughborough LE12 9GX UNITED KINGDOM www.campbellsci.co.uk • sales@campbellsci.co.uk

**Campbell Scientific Ltd. (France)**
Miniparc du Verger - Bat. H 1, rue de Terre Neuve - Les Ulis 91967 COURTABOEUF CEDEX FRANCE
www.campbellsci.fr • info@campbellsci.fr

**Campbell Scientific Spain, S. L.**
Avda. Pompeu Fabra 7-9, local 1 08024 Barcelona SPAIN
www.campbellsci.es • info@campbellsci.es

*Please visit www.campbellsci.com to obtain contact information for your local or International representative*