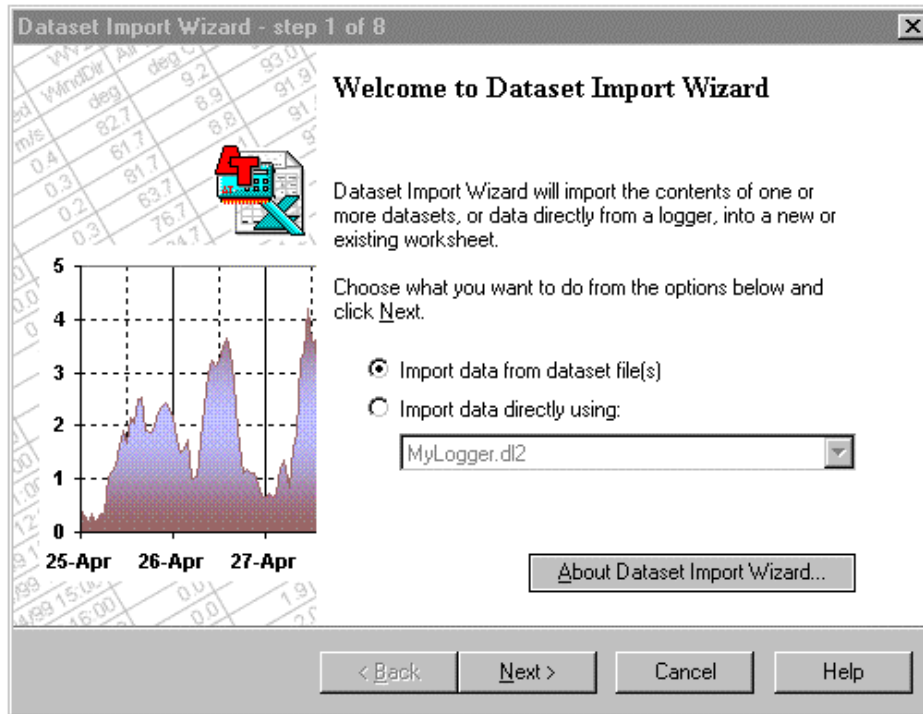




Dataset Import Wizard Notes for HH2 Users

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Introduction

This program is useful for importing data into Microsoft Excel™ spreadsheets.

If you have ever had to manage large numbers of large data logger files you will know what a chore it can be to combine a large number of datasets together. Inevitably some columns of data are not needed - their presence makes graphing cumbersome. Sometimes time-stamped data needs to be integrated together in different ways. The Dataset Import Wizard does these and other tasks rather well.

- It's a quick way of viewing the data, automatically generating time series graphs.
- It makes it much easier to combine data from different sensors or options, making it easier to draw graphs.
- If you create your own custom Excel graphs they can be automatically overwritten with new data, or extended with new data appended.
- It will import .CSV format files saved from the HH2 using HH2 Read. (It cannot directly download HH2 files).
- It can also import data files from Delta-T DL2e data loggers, both from saved data files and directly from the datalogger. This gives the potential for integrating weather data and soil moisture data, for example.
- You can choose which columns of readings or values to import.
- You can choose a range of dates and times to import
- The Wizard is smart in the way it combines data sets together. It interleaves timestamp readings in the correct time order. It automatically deals with a range of problems such as what to do when two datasets have the same timestamp.
- Closely similar times can be treated as the same time. Readings from different sensors at different times e.g. 3 hours apart, can be placed on the same row, so that they get graphed together. This is useful if you walk around a field and want all the days readings to be treated as if at one point in time.
- Readings from different sensors can be written to the same column making it much easier to combine data for graphing
- It is not an irrigation management program, but could be of use of those able to develop their own.

For the full set of functions see Functionality, below.

Installing the software

Set Macro security

Before installing on PCs using XP, 2003 or later, ensure macro security is set to medium or lower – as follows:-

Start Excel and select **Tools, Options**, select **Security Tab, Macro Security**, and select **medium** or **low** then **OK**. (Medium displays warning and option to disable macro before it runs).

To install the Wizard into Excel

Select **Start menu, Programs, HH2Read, Install Dataset Import Wizard**.

Dataset Import Wizard should report that it has installed itself. The Excel File menu should now contain an additional command, **Import Dataset(s)**. It will remain in the File menu, available each time you start Excel.

Before using the Wizard

Before running the Wizard, retrieve and save a dataset file to your PC - see “Upload Data to PC” on page 13 over the HH2 User Manual (version 3.0).

Dataset Import
Wizard

Using the Wizard

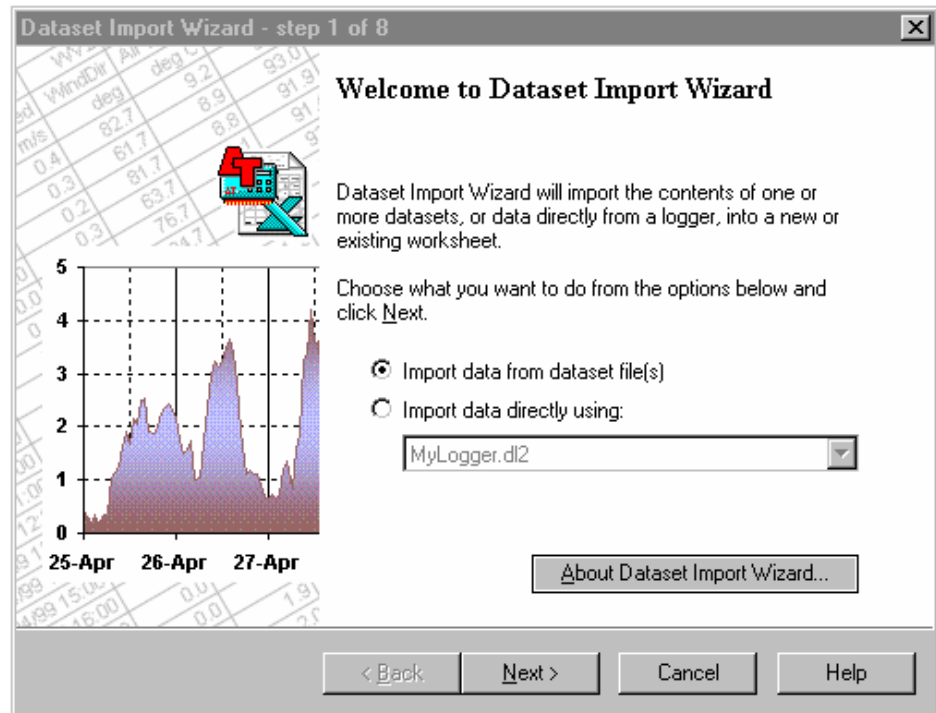
To run the Dataset Import Wizard either:

Select **File, Import Datasets** from Microsoft Excel or

Click on the **Dataset Import Wizard** on your desktop, or

Select **Start, Programs, HH2Read, Dataset Import Wizard** to display step 1.

Step 1: Welcome



In Step1 you can choose to import data from one or more dataset files. (Data logger users can also import data directly from a logger without creating intermediate dataset files.)

Step 1: Welcome provides the following options:

Import data from dataset file(s)

Choose this option and click **Next** to import data from dataset files.

Note: The wizard cannot import data direct from the HH2, only from the DL2e logger.

In the **Open** dialog, select the dataset files that you wish to import and click **OK** to proceed.

Note: you can select several dataset files to import in a single import operation – hold down Ctrl while selecting files to select individual files, or hold down Shift to select a contiguous block of files.

Step 2: **Timestamps**

Timestamps
You can adjust the dataset timestamps for Day/Month order, year number and elapsed leap years ...

To enable Dataset Import Wizard to construct complete timestamps and to correct for elapsed leap years, please enter the correct calendar year in the boxes below.
Also, if the Day/Month order in the dataset is ambiguous, please select the correct date from the available alternatives.

Logging Started: 7 January 2000

First Record in the Dataset: 7 January 2000

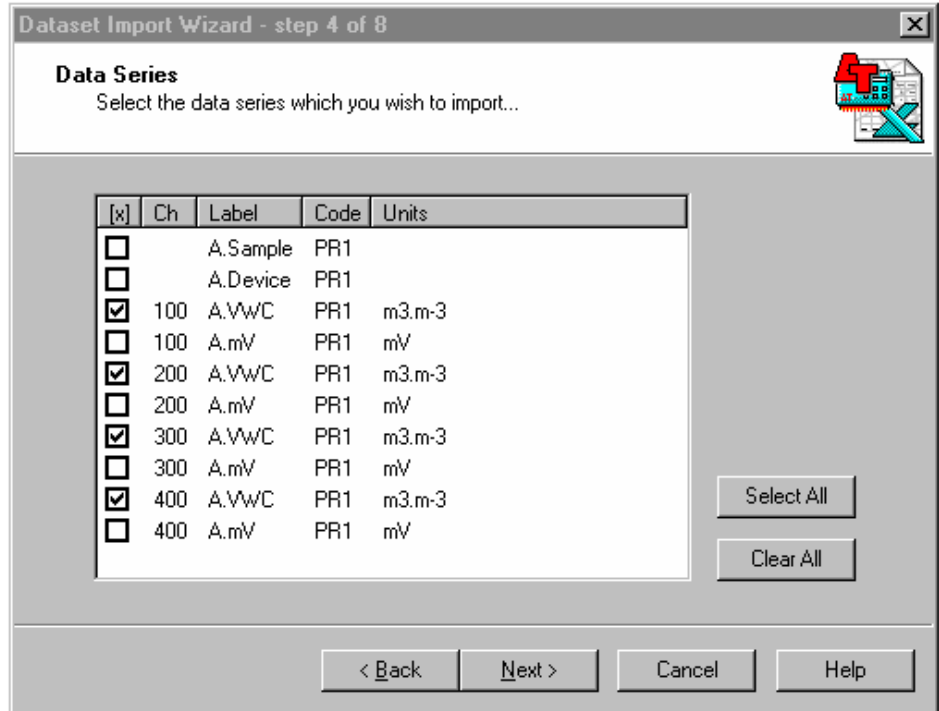
< Back Next > Cancel Help

Step 2 is mainly of use correcting year and leap year information in the DL2e logger.
We don't care so Click **Next**.

Step 3: Progress

Step 3: shows a progress bar as the data loads.

Step 4: **Data Series**



The rows in the dialog show the "columns" available for importing into the spreadsheet. Either click on **Next**, or, to simplify plotting, toggle the check boxes as shown above. To see the effects of these actions see "Examples" on page 8.

Step 4: Data Series provides the following options:

Data Series List

The list of data series provides information about each data series in the data(s) that you have chosen to import:

- [x] – Indicates whether the data series is selected
- Ch – channel number - used for sensor depth.
- Label – channel label. Note the Plot ID, in this example "A", is added to each label.
- Code – sensor type code
- Units – engineering units
- Dataset – if you are importing multiple datasets, the name of the dataset file

Click any of the column headings to sort the list according to the information in the column, and click on the same column heading again to reverse the sort order.

See also "Examples" - page 8.

Select All

Click to select all the listed data series.

Clear All

Click to deselect all the listed data series

Step 5: Records

Step 5 allows you to scan the timestamps contained in the dataset(s) which you are importing, and to select a range of records to import. If you are importing more than one dataset, Step 5 lists timestamps from all datasets in timestamp sequence.

1. Select the First Record which you wish to import. Use the slider control to move quickly to the section of the dataset that you are interested in, and the up-down control attached to the record number to step through the dataset one record at a time. You can also type directly into the record number control.
2. Select the Last Record which you wish to import. Use the slider and up-down controls in the same way as for First Record.
3. Alternatively, if you need to import a fixed number of records (e.g. 7 days of hourly data = $7 * 24 = 168$ records) you can type the number into the Selected control.
4. Or, if you want to import all records, select All available records.
5. Click Next to proceed.

Step 5: Records provides the following options:

First Record, Last Record

Sequence number and timestamp of the first and last records selected for importing. Use the sliders to quickly locate approximate positions in the dataset(s), and the up-down controls to step through the dataset(s) one record at a time. You can also type sequence numbers directly into the edit controls.

Selection Indicator

The selection indicator between the First Record and Last Record sliders shows the portion of the dataset(s) which is selected for importing, and the captions at either show the timestamps of first and last available records.

Selected

The number of records selected for importing. Enter a number in the edit box (or use the up-down control) as an alternative to the Last Record controls if you know exactly how many records to import.

All available records

Selects all the available records.

Step 6: Options

Step 6 allows you to make the following additional choices:

- which worksheet you want to import data into,
- whether you want to merge imported data with existing data in a worksheet, or whether any existing data in the worksheet is to be replaced,
- whether you want to import channel numbers and sensor type codes (Dataset Import Wizard always imports labels and units),
- or whether you want to create a sheet of charts.

Step 6: Options provides the following options:

Import into

Select which workbook and/or worksheet you want to import data into, or whether to create a new workbook and/or new sheet.

Note: To avoid confusion, the list of available sheets excludes sheets which already contain charts.

Importing into a sheet which contains existing dataset records

Select one of the available options:

Merge new and existing records – if you want to append or merge the imported data with the data already in the worksheet.

Replace existing data series – if you want to update a workbook by replacing existing with imported data

Note: If you are importing into a new or empty worksheet, these two options have no effect.

Import the following data series header items

Select which header items you want to import (Label and Units are always imported)

Channel – channel number. HH2 **Sensor Depth** values are displayed here as a header. (Sorry if this is confusing. The word "channel" makes sense when the wizard is used with data loggers)

Sensor Type – sensor type code.

Hint: If you have changed the channel number (i.e. sensor depth for HH2 data) or sensor type of a data series but have retained its label, you can choose to exclude channel number and/or sensor type.

Dataset Import Wizard will then ignore channel numbers and sensor types, and import data series into columns identified by label and units only.

Truncate timestamps to the nearest: Timestamps can be optionally truncated (e.g. to the nearest 3 hours), so that readings occurring within the same 3-hour slot occupy a single horizontal band in the worksheet. This can save space and may help simplify some graphs.

Create a new chart sheet from imported data

Select this option if you want to create a new chart sheet from the imported data.

Deselect this option if you are updating a workbook which already contains charts, and you don't want to create an additional sheet of charts.

Examples

Two examples workbooks are provided on the installation disc and installed to an Examples sub-folder to the directory folder where HH2Read is installed.

PR1 Example Book 1.xls

PR1 Example Book 1.xls shows a typical set of PR1 readings with time series graphs as automatically generated by the wizard. To get this just accept all the default settings as you step through the wizard. (You will of course need some HH2 readings saved as a .CSV file on your PC).

Label	A.Sample	A.Device	A.VWC	A.mV	A.VWC	A.mV	A.VWC	A.mV	A.VWC	A.mV
Channel			100	100	200	200	300	300	400	400
Sensor Type	PR1	PR1	PR1	PR1	PR1	PR1	PR1	PR1	PR1	PR1
Units			m3.m-3	mV	m3.m-3	mV	m3.m-3	mV	m3.m-3	mV
7-Jan-00 19:53:08	1	0	0.507	397	0.973	451	0.494	333	0.004	26
7-Jan-00 19:53:20	2	0	0.507	397	0.973	451	0.493	332	0.003	26
7-Jan-00 19:53:30	3	0	0.505	396	0.971	451	0.493	332	0.003	26
7-Jan-00 19:53:37	4	0	0.506	397	0.973	451	0.493	333	0.004	26
7-Jan-00 19:53:44	5	0	0.507	397	0.973	451	0.494	333	0.004	26
7-Jan-00 19:53:50	6	0	0.508	397	0.97	451	0.492	332	0.004	26
7-Jan-00 19:53:57	7	0	0.507	397	0.973	451	0.493	333	0.004	26
7-Jan-00 19:54:03	8	0	0.506	396	0.975	451	0.494	333	0.004	26

Data saved in PR1 Example Book 1.xls accepting defaults offered by Dataset Import Wizard

Note how the various HH2 Options have been displayed.

Row 1: Label

The Plot ID in this example was "A". It is added to every label.

VWC stand for volumetric water content.

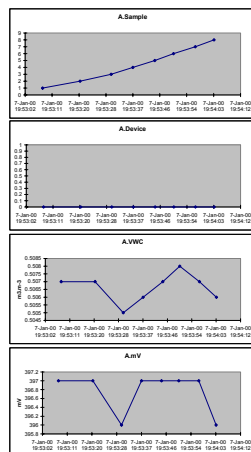
The Sample and Device labels have their own columns.

Row 2: Channel

The sensor depth is displayed in the row called "Channels". This name is somewhat contrived but it makes it easier to plot data and to combine HH2 and data logger data.

(The columns in the above table were manually reformatted to centre the contents.)

The values in each column were automatically plotted as a time series in Sheet 2.



Some of the Graphs saved in Sheet 2 of PR1 Example Book 1.xls using default Wizard options

Note that the wizard has plotted all the columns against time, including the Sample and Device label columns, the volumetric readings and the raw mV reading.

This clutter can be easily removed using the Dataset Import Wizard options - e.g. see PR2 Example Book 2.xls.

PR1 Example Book 2.xls

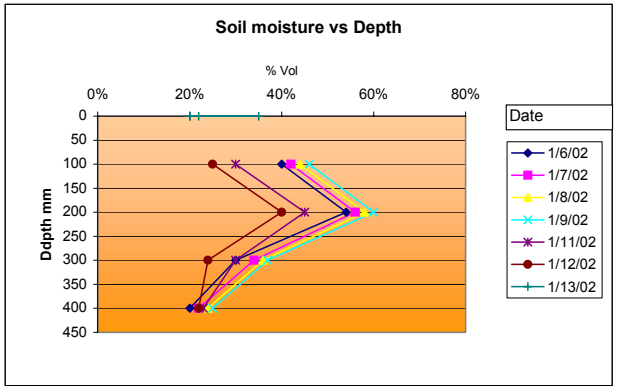
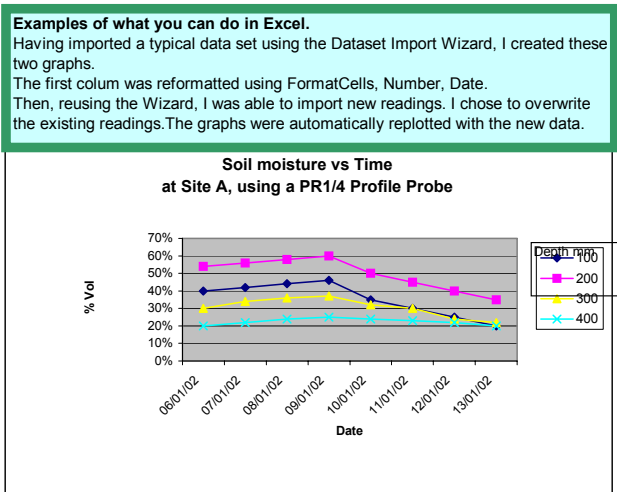
PR1 Example Book 2.xls shows an additional worksheet where two custom graphs were created within Excel in the normal way using the Excel graphing wizard. The Dataset Import Wizard was then run again, with new data, overwriting the first set and automatically being re-graphed. You could use this approach to create a template that, for instance, graphs weekly sets of data on separate worksheets.

Data saved in PR1 Example Book 2.xls

Notes:

- the wizard was used to exclude non essential columns.
- the columns have not been formatted "centred".

Label	A.VWC	A.VWC	A.VWC	A.VWC
Channel	100	200	300	400
Sensor Type	PR1	PR1	PR1	PR1
Units	m3.m-3	m3.m-3	m3.m-3	m3.m-3
1/6/02	40%	54%	30%	20%
1/7/02	42%	56%	34%	22%
1/8/02	44%	58%	36%	24%
1/9/02	46%	60%	37%	25%
1/10/02	35%	50%	32%	24%
1/11/02	30%	45%	30%	23%
1/12/02	25%	40%	24%	22%
1/13/02	20%	35%	22%	20%



The water content vs. depth graph may be helpful in finding what is called the Refill Point. See also "Finding the Refill Point" in the HH2 User Manual.

Weather Station Application Note and Example

Owners of Delta-T type DL2e data logger and Ls2Win software will have comprehensive documentation about using the Dataset Import Wizard with DL2e loggers. This includes a Weather Station Application Note, example spreadsheet with weather sensors graphed, and a tutorial in the DL2e Data Logger Getting Started Manual.

Functionality

Dataset Import Wizard provides the following functionality:

1. Start-up: once installed, the File, Import Dataset(s) command starts the wizard. DtImpWiz.exe also starts the wizard.
2. Supported file types: version 1.4 supports dataset files from both the HH2 Moisture Meter and the DL2e & DL6 loggers.
3. Directly importing datasets from a device: the wizard can only import datasets directly from the DL2, not from the HH2.
4. Multiple dataset files: the wizard can import multiple files of mixed types in a single operation, intelligently collating and interleaving records in timestamp order.
5. Choice of data series and timestamp range: the wizard allows the user to choose which data series and the range of timestamps that are to be imported.
6. Data series identifiers: each data series is uniquely identified by a combination of Label, Channel, Sensor Type and Units. The user can choose to ignore Sensor Type and/or Channel, thus combining readings with different Sensor Type and/or Channel into a single column.
7. Mapping of HH2 configuration data onto data series identifiers: the wizard maps HH2 configuration data onto data series identifiers as follows:

Device type	Sensor type, in data series header
Units	Units, in data series header
Plot Id, Measured Quantity	Concatenated to create the Label. For example volumetric water content (VWC) in plot F has the label F.VWC
Sensor Depth	Channel, in data series header, so a set of PR1 reading values appear in columns titled 100, 200, 300, 400, 600, 1000. Although somewhat contrived, this arrangement facilitates plotting of profile charts.
Sample Number, Device Id	Separate optional data series. For example, for plot F, these would have the labels F.Sample and F.Device, which would be offered alongside F.VWC as data series that the user can choose to import or leave out.
Other configuration data	Not imported

See also : Examples on page 8:

8. Choice of worksheet: the user can choose to import data into a new workbook, a new worksheet, or an existing worksheet.
9. If importing into an existing worksheet, the user can choose to overwrite existing data, or to augment any existing data series.
10. Either way, if importing into an existing worksheet, the wizard proceeds as follows:
 - a. identifies the rows that contain data series identifiers – by searching for ‘Label’, ‘Channel’, ‘Sensor Type’ and ‘Units’ in column A.
 - b. the search for identifier rows stops at the first numeric value encountered in column A, or at the last row in the worksheet – this row is assumed to contain a timestamp and is taken to be the first data row.
 - c. on failing to find a suitably labelled row, the wizard creates and suitably labels a new row for the identifier
 - d. the wizard omits searching for or creating identifier rows for any identifier that the user has chosen to ignore.
 - e. for each imported data series, the wizard searches for a column that contains a matching set of identifiers. On failing to find a matching column, it appends and labels a new column.
11. If importing into a new worksheet, the above operations equate to creating a new set of identifier rows, and a new column for each data series.

12. If the user has chosen to overwrite existing data, the wizard deletes all data in each data series column and in the timestamp column (A), from the first data row to the end of the worksheet. Values in other columns are unaffected.
13. The wizard then proceeds to write values from the dataset into the worksheet in timestamp order.
14. If two records have identical timestamps, their readings are written to the same row in the worksheet, if possible. This occurs if the records contain readings from completely distinct sets of data series, or if the values in overlapping data series are identical.
15. If two records have identical timestamps, and contain conflicting values for a particular data series, both values are written to the worksheet on distinct rows.
16. Timestamps can be optionally truncated (e.g. to the nearest 3 hours), so that readings occurring within the same 3-hour slot occupy a single horizontal band in the worksheet. This results in economical usage of space.
17. If the user has chosen to augment existing data, the wizard inserts records in the worksheet in timestamp order.
18. For HH2 datasets, each reading constitutes a record that contains one or more data series.

Help Files

On-line help is available from within the Dataset Import Wizard. Once it is running, click on Help to display context sensitive help.

Please note the online Help files have not been updated to support the HH2 meter. They refer exclusively to using the Wizard with the DL2e data logger.