



1.1 Measured data module

The *Measured data module* is used to capture/archive time series data from flow measuring stations into the WAS database. There is no limitation on the number of measuring stations that can be captured. The time series record includes the station id, date & time, flow depth and flow rate.



Figure 1.1: Measuring station

The data sources can be from mechanical chart recorders, electronic data loggers and measuring plate readings. Measured water levels are automatically converted to flow rates by means of a discharge table for the specific measuring station. The module has the following functionality:

- Integrated discharge tables that are used to convert water levels to discharges and vice versa.
- Importing of data with various formats.
- Use flexible units for water levels and flow rates which include mm, m, m^3/s and m^3/hour .
- Export data to Microsoft Excel.

- Calculation of volumes between user-specified dates.
- Capture inflows and outflows for river systems.
- Generate daily, weekly, monthly and annually abstraction data.
- Generate discharges for stations that are linked to an indicator site.
- Generate recession curves.
- Tools to add/subtract time series data.
- Integrates with the *Reporting module* including the *Water Use Efficiency Accounting Reports (WUEAR)*.
- Display graphs for user-defined date and time ranges. The data of up to five measuring stations can be displayed on a single graph.
- Downloads and imports data from various loggers in the field.

Internet platform

This is a platform which hosts measured data in a database that is accessible through the Internet. To quantify water losses on an irrigation scheme, accurate and reliable inflow data into an irrigation scheme is non negotiable. Cello loggers that are linked to the internet has proven to be a good option because:

- The data is reliable.
- The data is easily accessible through the Internet.
- An automatic import procedure is available in the WAS which connects to the internet directly. This enables a WAS operator to import the data from an unlimited number of measuring stations automatically.
- This data can come from different sources on the internet. Depending on your installation
 - Zednet platform
 - WAS server

It is therefore virtually impossible to import data into a wrong measuring station.

This added functionality makes it very easy to import data from the Internet platform into the WAS database where after water loss reports can automatically be generated in the WAS.

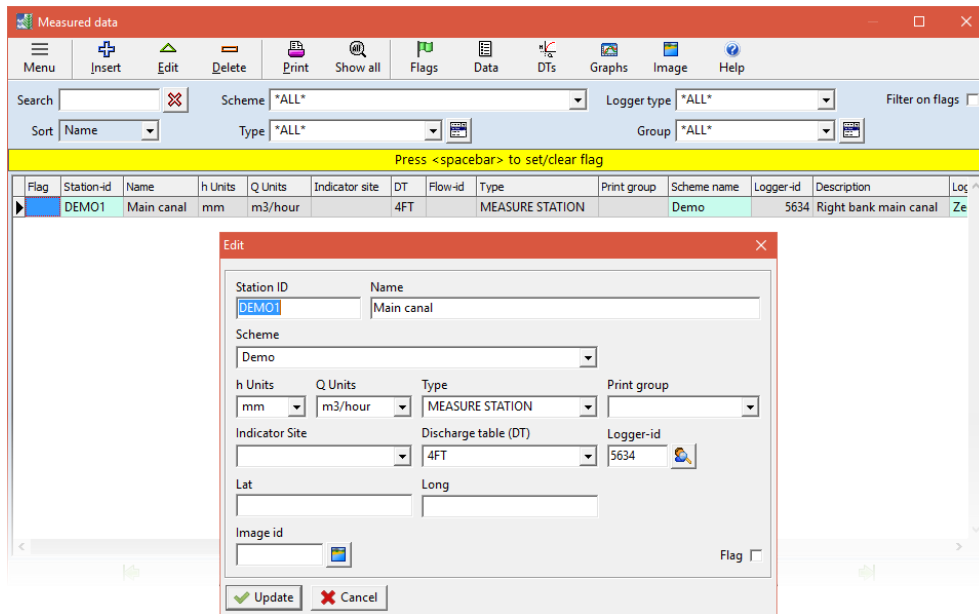


Figure 1.2: Measured data capturing form

The WAS program has a *Data copy toolbox* (Figure 1.4) which is used to manipulate measuring station (time series) data in the following ways:

- Copy data from one measuring station to another. Stations concerned must be specified as well as the date and time range for the data to be copied. A multiplier can be used to multiply the data by a constant value while copying. A constant can also be added or subtracted while copying.
- Add the discharges of one measuring station to another. In this case a third measuring station is used to save the result.
- Subtract the discharges of one measuring station from another. In this case a third measuring station is used to save the result.

This data copying utility is very useful when there is a need to split a hydrograph into two separate hydrographs at the confluence of two rivers.

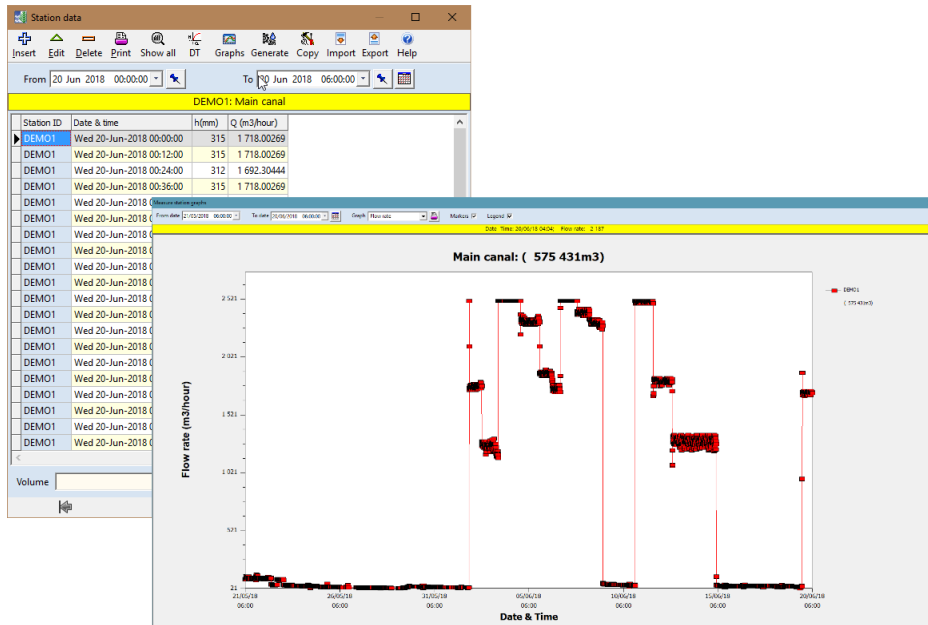


Figure 1.3: Measuring station data and graph forms

The release calculation in the WAS starts at the end of a canal network or river system and will migrate from reach to reach up to the source or confluence of two rivers or channels. The resulting hydrograph can then be divided with the copying utility. The resulting hydrographs can be used as input for the release calculation of the two upstream legs which is done separately.

The image shows a software dialog box titled "Data copy toolbox". It has a blue header bar with a close button (X) on the right. The dialog is organized into several sections:

- From station:** A dropdown menu with "DEMO1: Main canal" selected.
- To station:** An empty dropdown menu.
- None:** An empty dropdown menu.
- Q Conversion:** Contains three sub-sections:
 - Multiplier:** An empty text input field with a small icon to its right.
 - +/- Constant:** An empty text input field.
 - Add/subtract:** A dropdown menu with "None" selected.
- Range:** Contains two date/time selection fields:
 - From date/time:** Shows "21/05/2018 06:00:00".
 - To date/time:** Shows "20/06/2018 06:00:00".
- Date/time offset starting at:** A date/time selection field showing "20/06/2018 06:00:00".

At the bottom of the dialog, there are three buttons: "OK" (with a green checkmark icon), "Cancel" (with a red X icon), and "Help" (with a blue question mark icon).

Figure 1.4: Data copy toolbox form use to add/subtract time series data