

This tutorial explains on a step by step base how to setup a basic implementation of OMC-DOL in combination with the low-power OMC-040-loggers. The OMC-040 logger is designed for outdoor situations omitting access to power grids and therefore perfectly suitable for rainfall monitoring and that's why we use a logger configured for rainfall recording as example in this tutorial. (How to configure the logger itself is not part of this tutorial)

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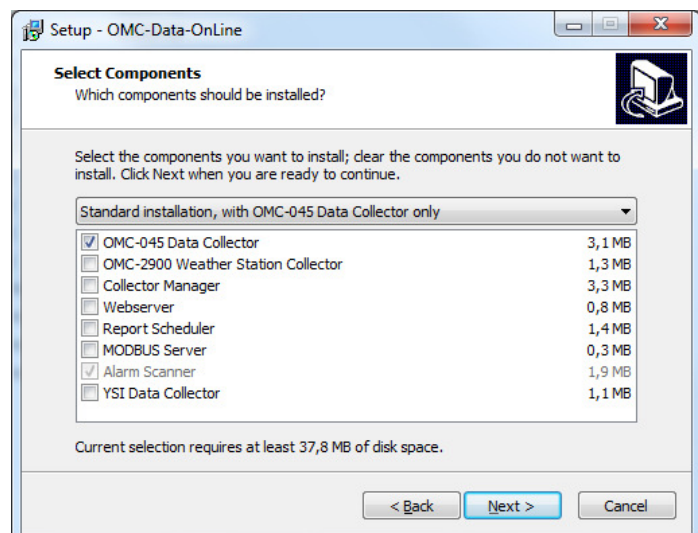
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## 1. Install OMC-DOL

If you did not already install OMC-DOL, please download and run <http://www.omc-data-online.com/download/omcdataonlinesetup.exe>.

Follow the obvious steps of the setup procedure and choose 'Standard installation' if you want to use OMC-DOL without additional components (e.g. Web Server).

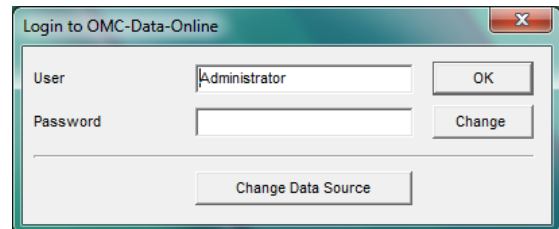
- Its required that you have administrator rights to be able to run setup.



## 2. Start OMC-DOL

The setup procedure has installed a desktop shortcut to start OMC-DOL. When you start OMC-DOL for the first time or with the intention to configure collectors/components it is: **a)** required that you have administrator rights and **b)** you should start OMC-DOL in administrator mode (right mouse click the shortcut and choose 'Run as Administrator').

- After an initial installation with an empty database the OMC-DOL user name to login with is 'Administrator' and having a blank password.

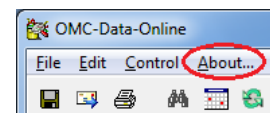


## 3. Unlock OMC-DOL

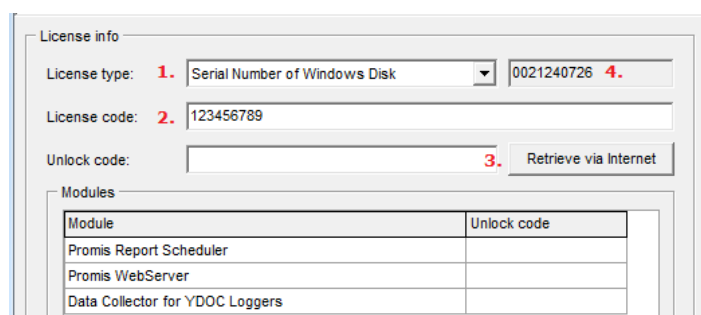
OMC-DOL is a suite of scalable components and depending on your license you are permitted to use additional components, define a certain number of users and collect data from a licensed number of loggers/sources.

After buying a license you are receiving a unique license code and you can use this license code to unlock OMC-DOL on one PC of your choosing. Please choose the PC with care as this is a onetime operation. If you want to change to another PC afterwards, you have to renew your license involving additional costs.

To unlock OMC-DOL select the 'About'-option from the 'Menu'-bar:



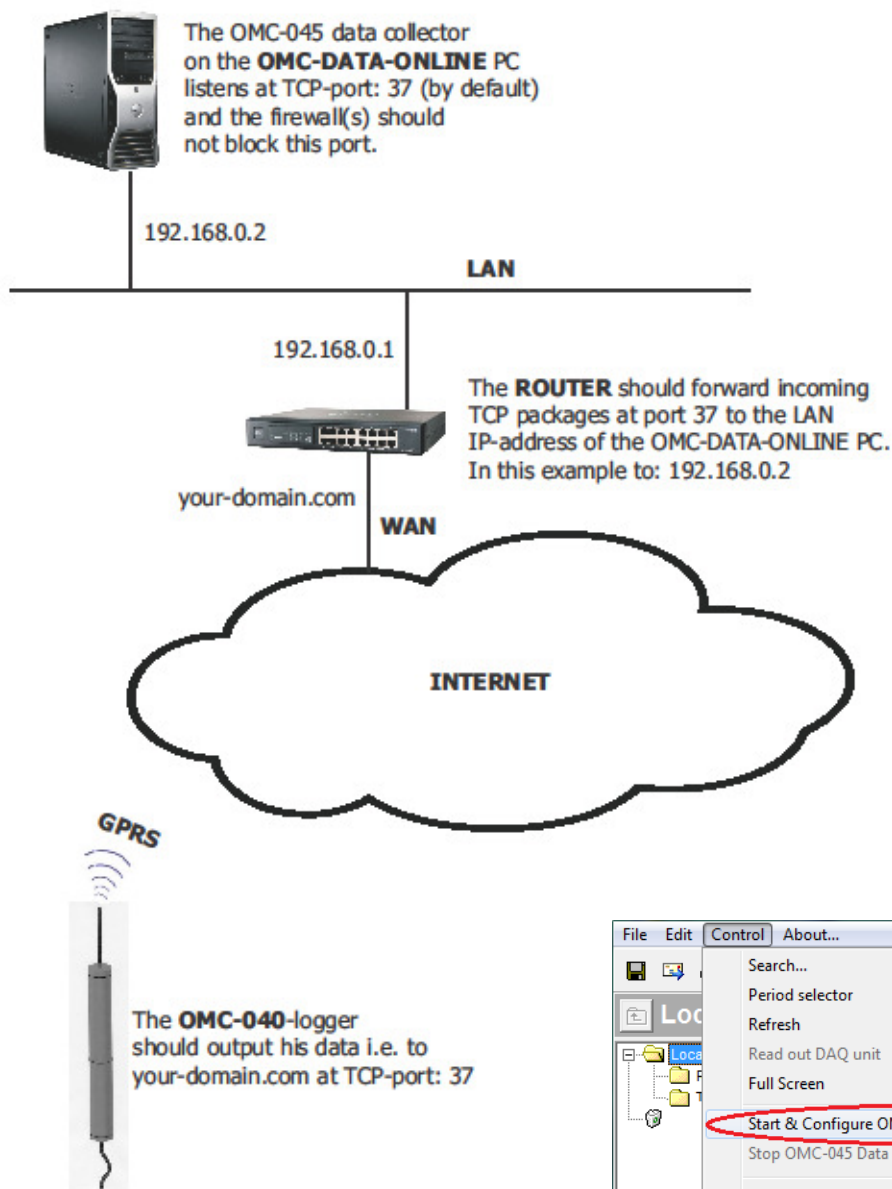
In the 'About'-box choose (1.) 'Serial number of Windows Disk' as license type, (2.) enter your license code and (3.) click the 'Retrieve'-button to get access to our licensing-server and to bind your license to this PC.



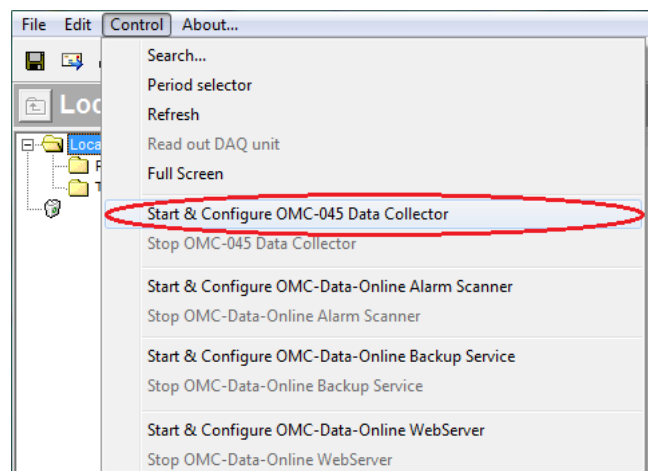
If you can't get access to the licensing-server, please handover (4.) the SN# of your hard disk to your distributor, so he can provide you with the necessary unlock codes to be entered manually.

## 4. Configure the OMC-045-collector

The function of the OMC-045-collector (used for OMC-040 as well) is to wait for log data transmitted by the loggers and to import this data into the OMC-DOL database automatically. If data from a new logger is received, the collector will automatically create a new location and according tags in the database. The collector can accept data thru various communication channels like E-mail, FTP and TCP. It's recommended to use TCP as this does not require an additional FTP- or E-mail server and is requiring less handshaking and therefore consuming less GPRS time and as a result drawing less power from the battery.



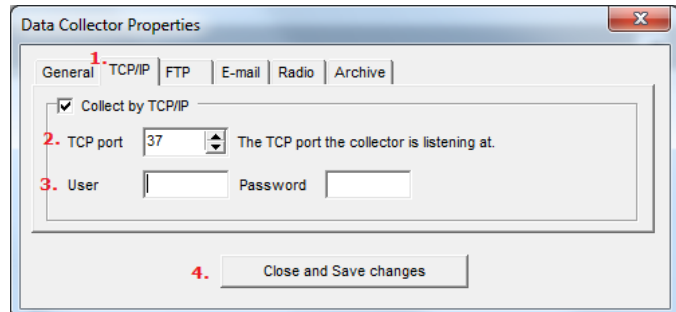
To configure the collector select the 'Start OMC-045-collector' from the 'Control'-menu:



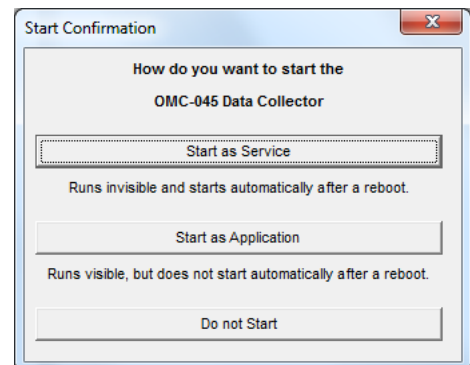
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In the 'Properties'-screen select (1.) the 'TCP/IP'-page and check the 'Collect by TCP/IP'-box. The collector acts as a TCP-server and listens (2.) at a TCP-port for incoming connections from loggers. The default port# is 37. It is recommended to specify (3.) a user name and password to prevent importation of log data transmitted from unauthorized sources.

- Make sure that your firewall(s) doesn't block incoming TCP-traffic on the specified port#
- If your PC is sitting behind a router, make sure that the router forwards incoming TCP traffic on the specified port# to the local IP-address of this PC.

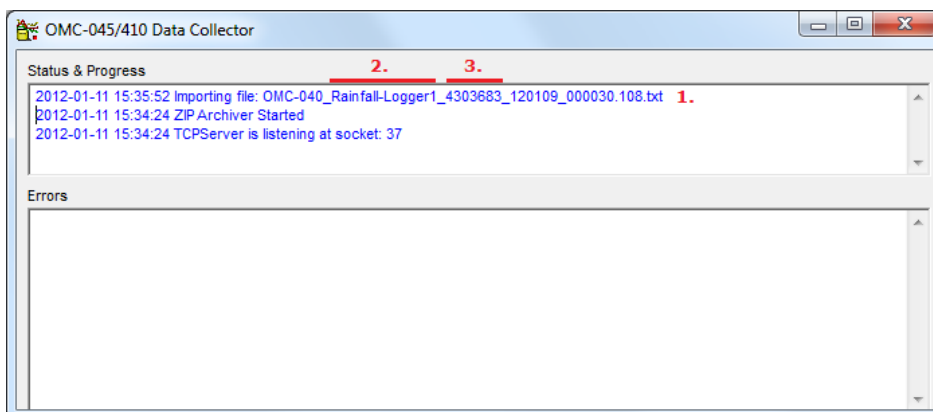


After (4.) saving your changes and closing the 'Properties'-screen, OMC-DOL asks you how to start the collector. For testing purpose you could start it as a visible application, but for operational purpose it is recommended to start the collector as a service. A service runs invisible in the background independent of the logged on user (very handy incase OMC-DOL is installed on a server used by several remote desktop users) and will automatically restart when the PC powers up (e.g. after a power outage).



## 5. Run the OMC-045-collector

When running the collector as a visible application the 'Status & Progress'-window will show (1.) a line for each log file received from a logger, saying importing file: *OMC-040\_<station name>\_<station SN#>\_<log file date>\_<log file time>.txt*



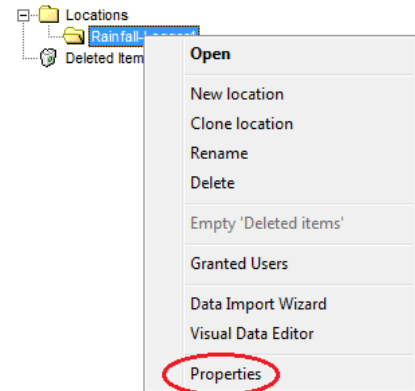
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When log data from a logger is received for the first time, a location with a name equal to the station name (2.) will be created in the OMC-DOL database.

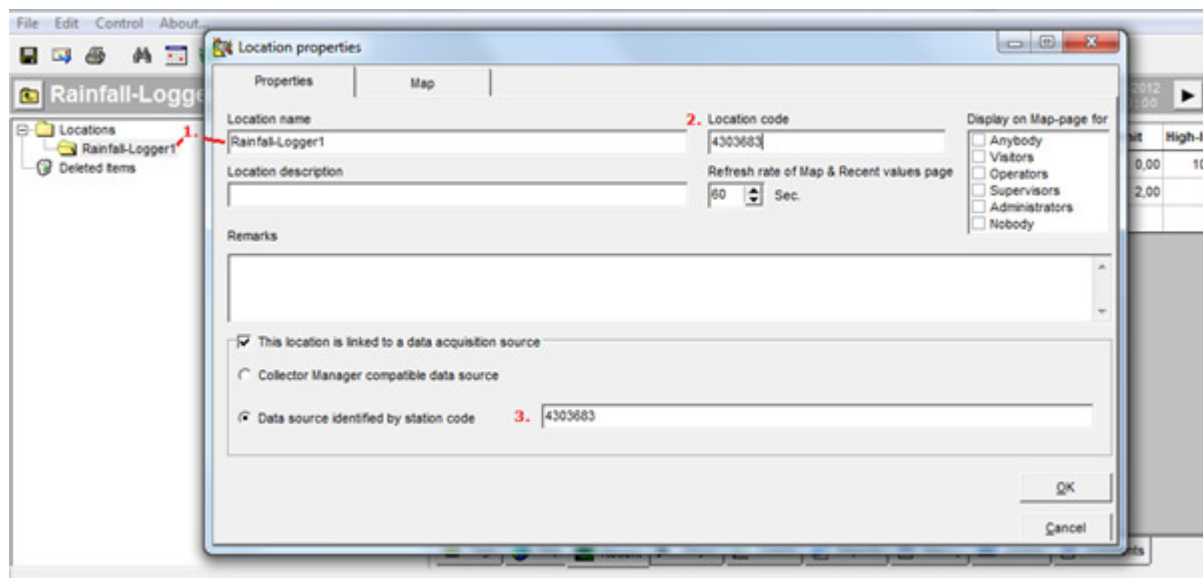
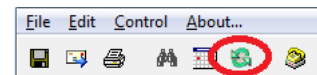
Each logger is uniquely identified by its (3.) serial number. This SN# is used as a reference to link a logger to a OMC-DOL location, so consecutive transmitted log files from the same logger will be imported to the same OMC-DOL location.

### 6. Configure the OMC-040-location

To (re)configure the location properties of an OMC-040 location, right click the corresponding name in the 'locations'-pane and select the 'Properties'-option.



- If the concerned location is not displayed in the location tree, you might need to click the 'Refresh'-button to re-load the location tree from the database.



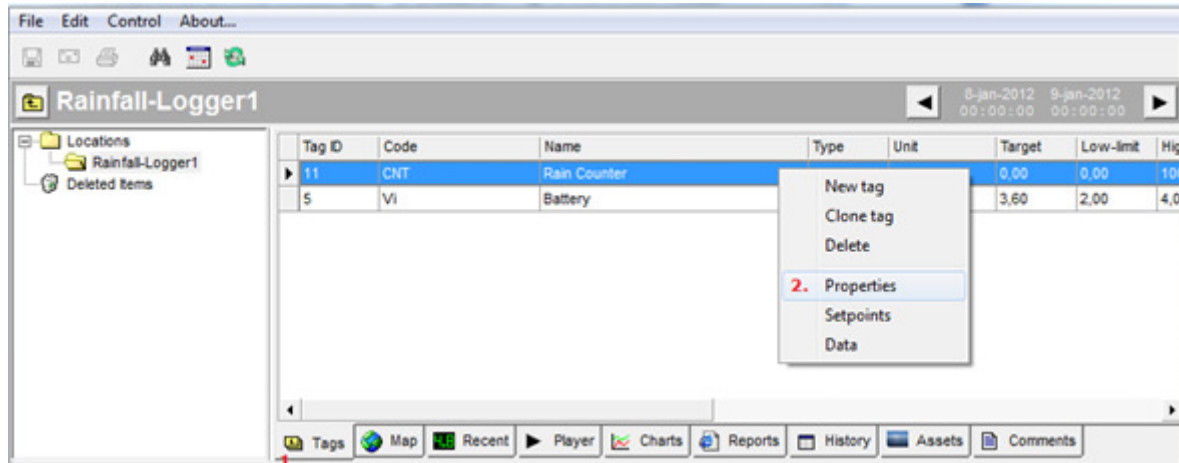
As said before, when log data from a logger is received for the first time, a location with a name (1.) equal to the station name will be created in the OMC-DOL database. However you may change the name displayed in OMC-DOL to whatever you like afterwards.

Each logger is uniquely identified by its serial number. This SN# is initially taken as code (2.) to uniquely identify the location, but you are allowed to change this code to whatever seems convenient to you (e.g. RL1).

**\*\*\*** The SN# is mandatory meant as a reference code (3.) to link a OMC-DOL location to a particular logger. If you change this code afterwards, new incoming log data will not be imported to this location anymore, but to an alternatively created new location.

## 7. Configure tags

When log data from a logger is received and one or more tags recorded in the log data are not having a corresponding tag in the OMC-DOL database, the collector will automatically create the necessary tags in the database. It could however that you want to make some changes to the default appearance of the tag like naming and limits.

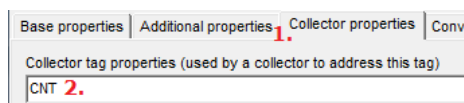
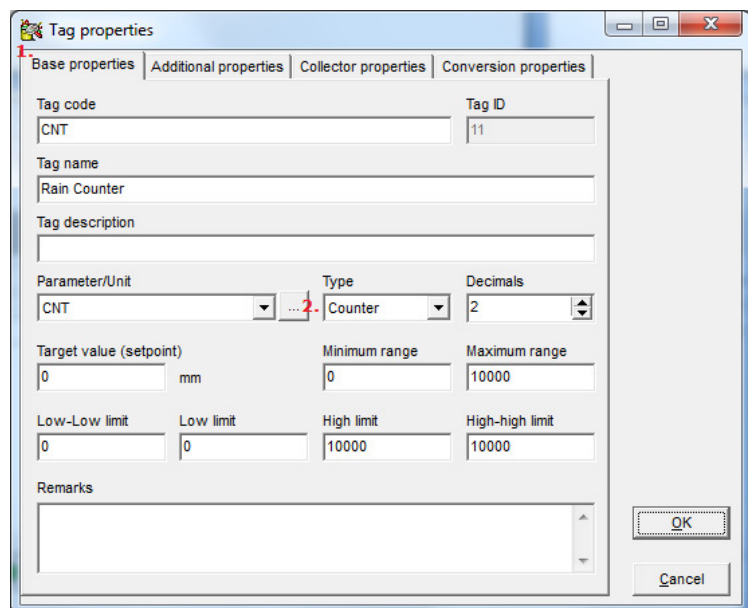


To (re)configure a tag select (1.) the 'Tags'-page of a particular location and right click the Tag you want to (re)configure and select (2.) the 'Properties'-option.

You may change anything on (1.) the 'Base properties'-page to your convenience.

- It's wise to use a proper codification philosophy for your tags. E.g. that your 'Rain counter' tags over all your locations are having the same 'Tag code'.

In case of a cumulative counter like a rain or electricity counter it is recommended that you set (2.) the Type of the tag to '**Counter**' as this will affect the default appearance of the tag. But it is even more important in case this tag is used in a 'calculated' tag, as the calculation engine treats counters a bit different than regular tags.



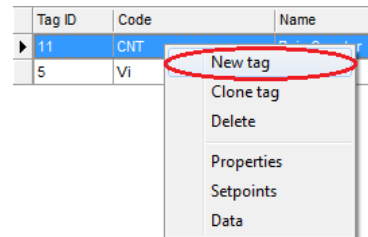
The link between a OMC-DOL and a logger tag is defined on (1.) the 'Collector properties'-page by (2.) the text in the 'Collector tag properties'-box. If you change this text, new log data will no longer be recorded under this tag, but under a new alternatively created tag.

## 8. Define calculated tags

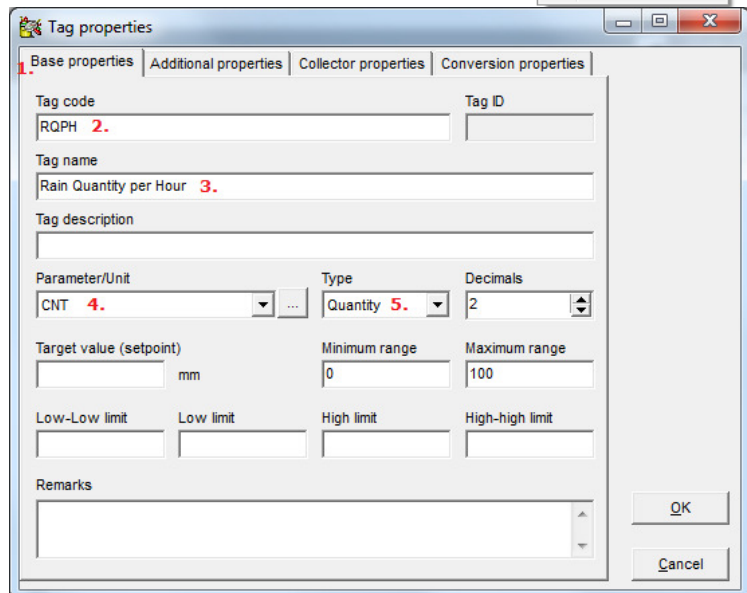
Counter tags are ideal for recording purpose, but of little use for analysis. The value of a counter itself is not really interesting, what you really want to know is the difference or rate over a certain period of time (e.g. the rain fallen per day or the intensity of rainfall in mm/h).

### 8.1 Define a calculated rain quantity tag

To define a tag to calculate the rain fallen per particular hour you have to create a new tag manually first, by right clicking your mouse on the 'Tags'-page and select the 'New tag'-option from the popup-menu.

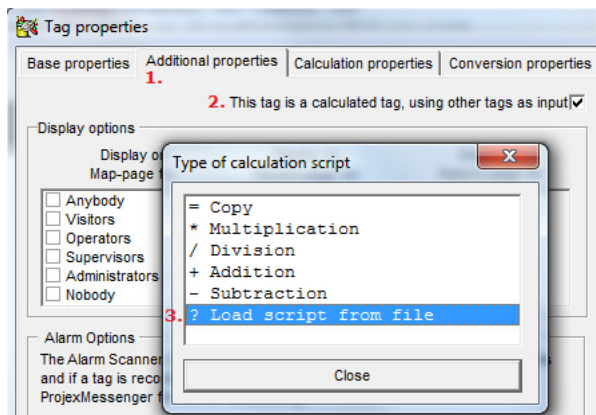


On (1.) the 'Base properties'-page its obligatory to define (2.) a code for the tag, in this case 'RQPH' and we name (3.) the tag 'Rain Quantity per Hour'. Rain is measured in mm and therefore we should select (4.) a parameter with mm as unit. If such a parameter is not in the list you can add one manually by clicking the '...'-button.



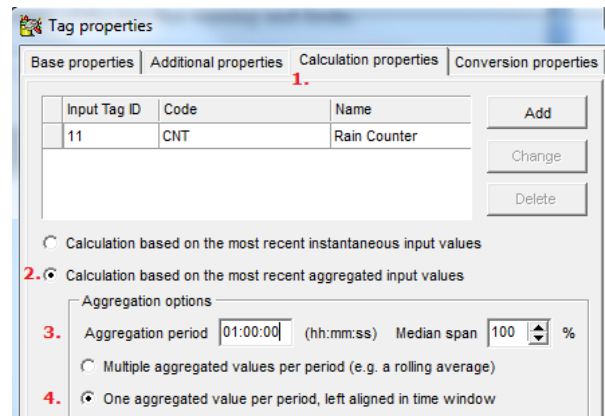
It is recommended that you set (5.) the Type of the tag to 'Quantity' as this will affect the default appearance of the tag. E.g. on the 'History'-page all recorded quantities will be summarized to display the total rain fallen during the selected period.

To indicate that this tag is a calculated tag, you have to check (2.) this on (1.) the 'Additional properties'-page. The first time you check (2.) it, a screen will popup to let you choose the Type of calculation script to use. Please choose (3.) 'Load script from file' and load the file 'Counter to Quantity.pcs' from the templates directory and choose the 'Rain counter' tag as input for this calculation.

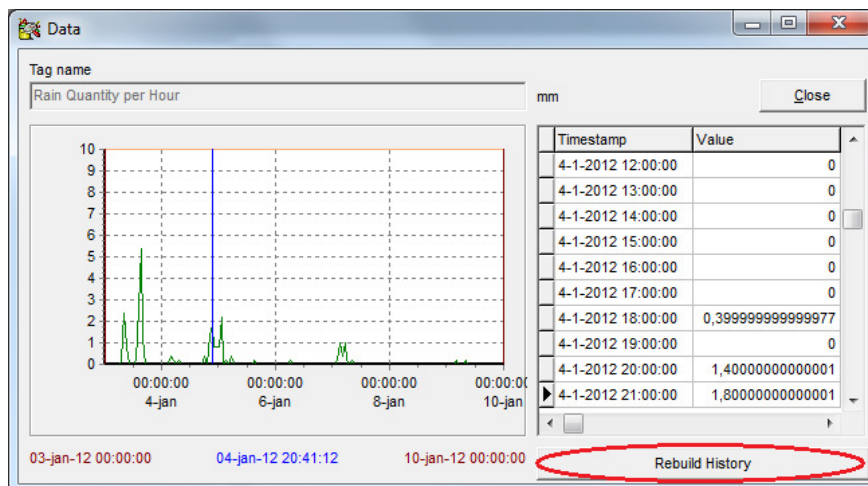
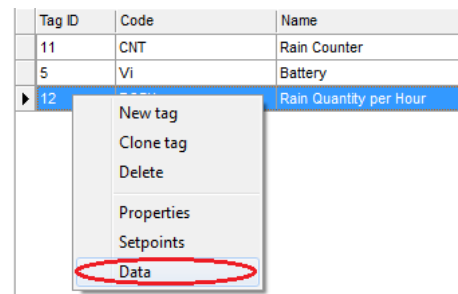


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After loading the script the software jumps to (1.) the 'Calculation properties'-page. On this page specify that your calculation should be aggregated over (2.) a series of recordings and specify (3.) an aggregation period of 01:00:00 to aggregate over one hour or 24:00:00 to aggregate over 1 day. It is recommend that you (4.) record one quantity value per aggregation period, otherwise the summaries on 'History'-pages or in reports will show more rain than actually fallen.



As soon as new log data is received, this calculated tag will be calculated and recorded to the database. It could however that you want this calculation to be done on previous recorded counter values. You can do this by right clicking this Tag in the 'Tags'-page and selecting the 'Data'-option from the popup-menu.

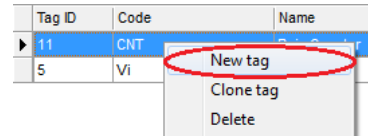


Click to the 'Rebuild History'-button to recalculate the recorded values of the calculated tag. Recalculation is performed over the currently selected period.

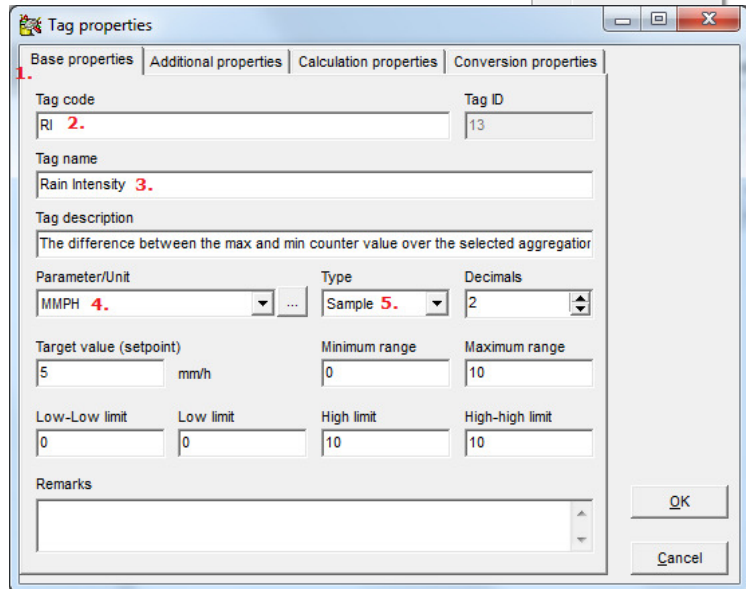


## 8.2 Define a calculated rain intensity tag

To define a tag to calculate the rain intensity you have to create a new tag manually first, by right clicking your mouse on the 'Tags'-page and select the 'New tag'-option from the popup-menu.



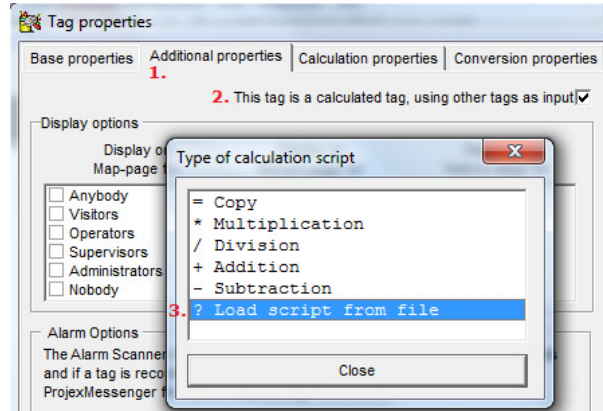
On (1.) the 'Base properties'-page its obligatory to define (2.) a code for the tag, in this case 'RI' and we name (3.) the tag 'Rain Intensity'. Intensity is measured in mm/h and therefore we should select (4.) a parameter with mm/h as unit. If such a parameter is not in the list you can add one manually by clicking the '...' -button.



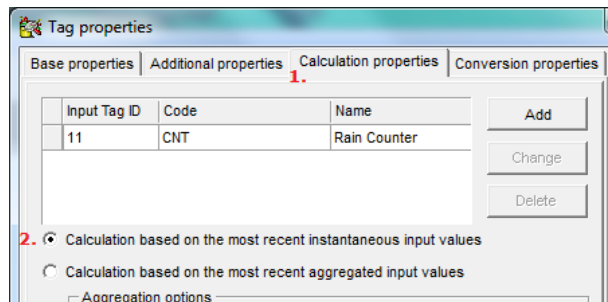
It is recommended that you set (5.) the Type of the tag to 'Sample' as this will affect the default appearance of the tag.

E.g. on the 'History'-page all recorded intensities will be averaged to display the average intensity during the selected period.

To indicate that this tag is a calculated tag, you have to check (2.) this on (1.) the 'Additional properties'-page. The first time you check (2.) it, a screen will popup to let you choose the Type of calculation script to use. Please choose (3.) 'Load script from file' and load the file 'Counter to Rate.pcs' from the templates directory and choose again the 'Rain counter' tag as input for this calculation.

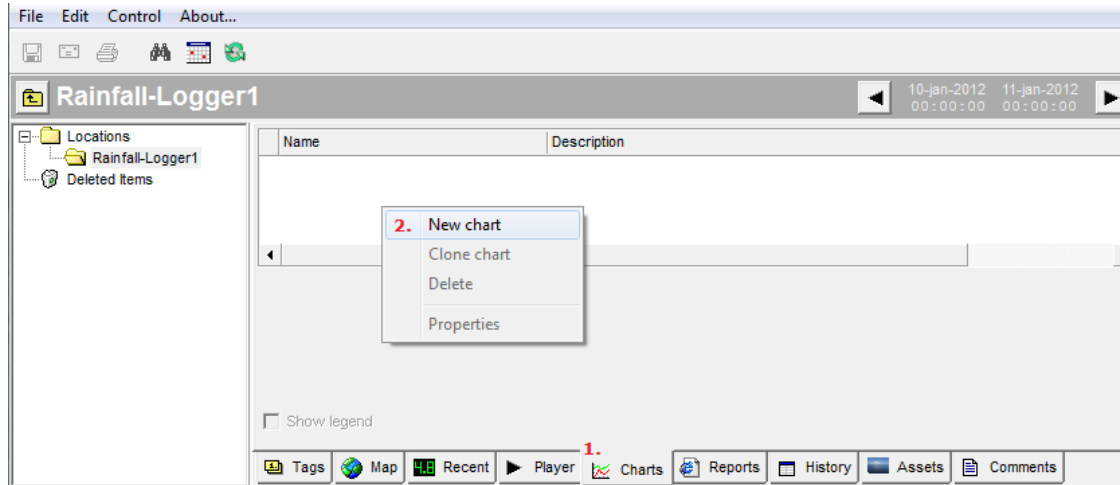


After loading the script the software jumps to (1.) the 'Calculation properties'-page. On this page specify that your calculation should be based on (2.) instantaneous input values, this will cause an intensity calculation between every two adjacent rain counter recordings.



## 9. Define a basic chart

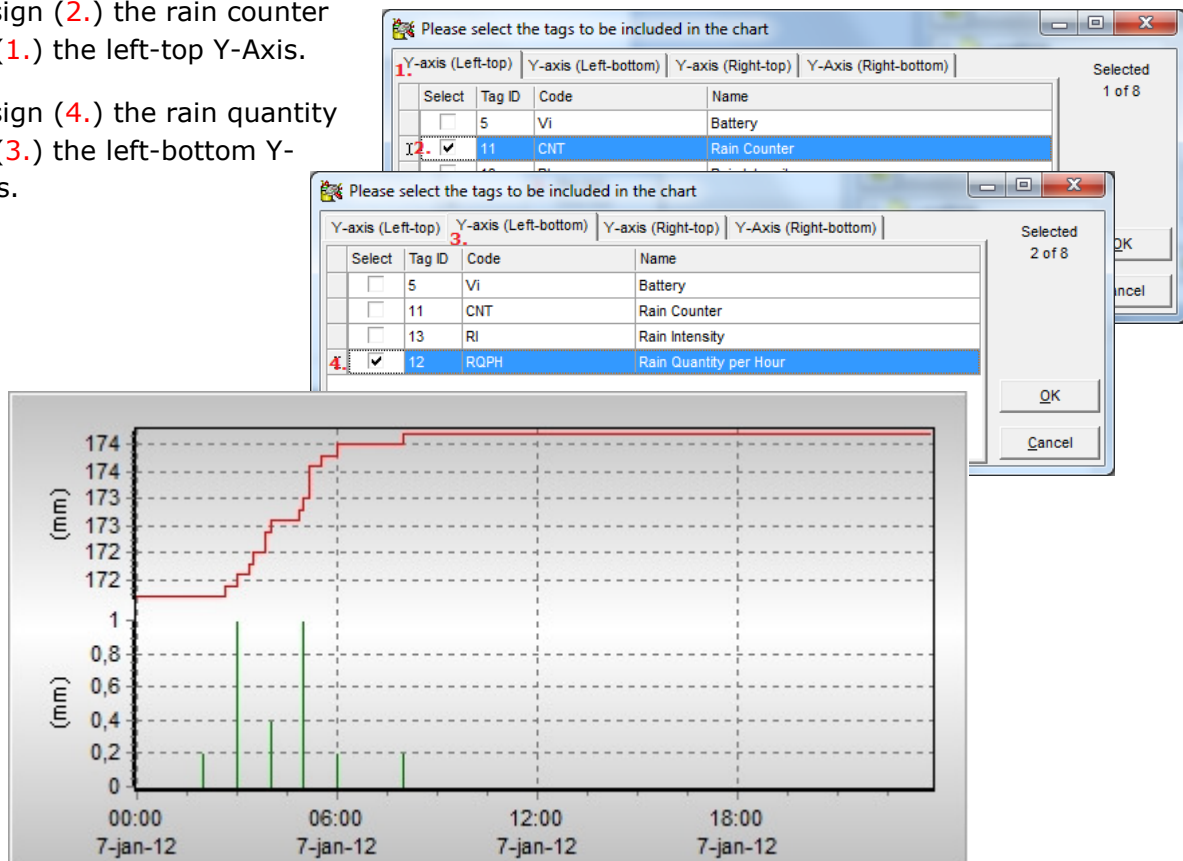
OMC-DOL has a very power full chart engine with a lot of features and possibilities, to be able to deploy all the features you need to get familiar with it and take your time by just trying things out. However defining a basic chart is as simple as a few mouse clicks.



To define an new chart select (1.) the 'Charts'-page of a particular location and right click with your mouse in the (empty) chart list, followed by selecting (2.) the 'New chart'-option from the popup-menu. A window will pop-up that let you select the tags you want to visualize in the chart. If you select multiple tags per chart with values in non matching ranges (e.g. a continuously increasing counter and a rate per hour) one or more of the tags will not be scaled optimal when using one Y-axis. A basic chart can have 4 Y-axes: Two stacked Y-axes at the left and two at the right.

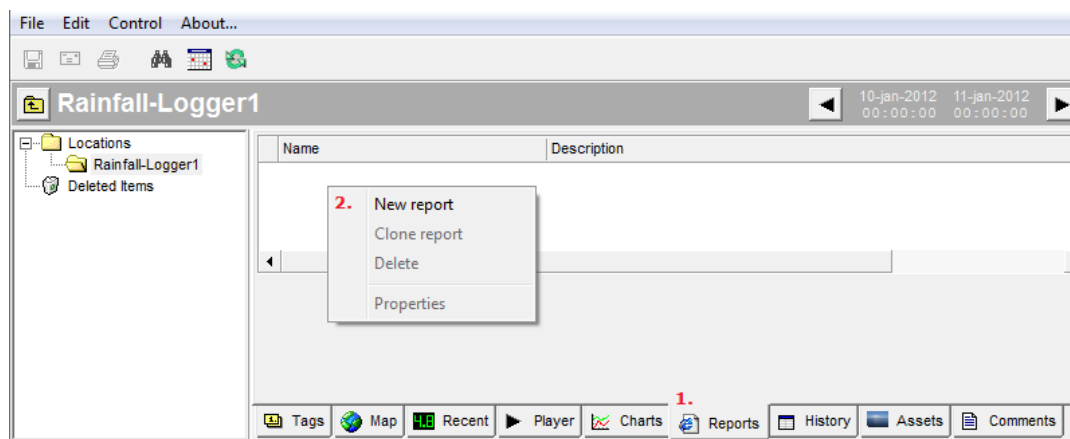
Assign (2.) the rain counter to (1.) the left-top Y-Axis.

Assign (4.) the rain quantity to (3.) the left-bottom Y-axis.



## 10. Define a standard report

OMC-DOL has a very power full report engine as well, but It requires some advanced IT skills to be able to create your own custom reports. Fortunately the software comes standard with several predefined report templates. Defining a report from a template is as simple as a few mouse clicks.



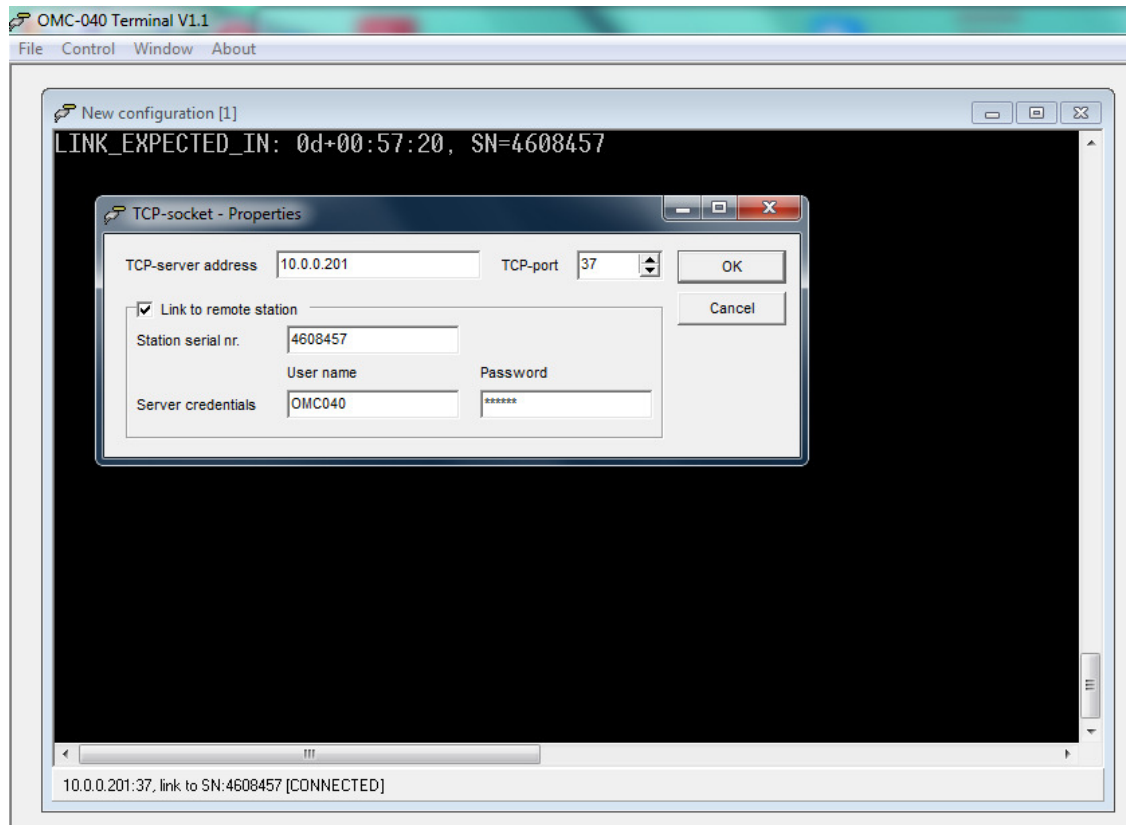
To define an new report select (1.) the 'Reports'-page of a particular location and right click with your mouse in the (empty) report list, followed by selecting (2.) the 'New report'-option from the popup-menu. A window will pop-up that let you select a report template from the templates directory, in this case we choose the file 'Standard Report.prd' and after loading, another window will pop-up that let you select the tags you want to be included in the report. I this case we choose rain quantity and rain intensity.

### Rain fall report

| Timestamp            | Rain Intensity mm/h | Rain Quantity per Hour mm |
|----------------------|---------------------|---------------------------|
| 03-Jan-2012 14:00:00 | 0.00                | 2.60                      |
| 03-Jan-2012 14:10:00 | 1.20                |                           |
| 03-Jan-2012 14:20:00 | 2.40                |                           |
| 03-Jan-2012 14:30:00 | 3.60                |                           |
| 03-Jan-2012 14:40:00 | 3.60                |                           |
| 03-Jan-2012 14:50:00 | 4.80                |                           |
| 03-Jan-2012 15:00:00 | 2.40                | 5.40                      |
| 03-Jan-2012 15:10:00 | 4.80                |                           |
| 03-Jan-2012 15:20:00 | 4.80                |                           |
| 03-Jan-2012 15:30:00 | 4.80                |                           |
| 03-Jan-2012 15:40:00 | 4.80                |                           |
| 03-Jan-2012 15:50:00 | 10.80               |                           |
| 03-Jan-2012 16:00:00 | 1.20                | 1.20                      |
| 03-Jan-2012 16:10:00 | 2.40                |                           |
| 03-Jan-2012 16:20:00 | 1.20                |                           |
| 03-Jan-2012 16:30:00 | 1.20                |                           |
| 03-Jan-2012 16:40:00 | 1.20                |                           |
| 03-Jan-2012 16:50:00 | 0.00                |                           |
| 03-Jan-2012 17:00:00 | 0.00                | 0.00                      |
| Summary              | Rain Intensity mm/h | Rain Quantity per Hour mm |
| Count                | 19                  | 4                         |
| Minimum              | 0.00                | 0.00                      |
| Maximum              | 10.80               | 5.40                      |
| Average              | 2.91                |                           |
| Quantity             |                     | 9.20                      |

### 11. Remote configuration

To save power the logger is switched off most of the time and can't be reached. However the logger wakes-up at regular intervals to output its logged data and we have implemented a mechanism to get access to the logger at such moments. The loggers must be configured for TCP data output.



#### 11.1 By terminal emulator

- Start our free terminal emulator software OMC040Terminal.exe
- Create or open a new TCP-socket to the data collector.
- Specify the SN# of the logger you want to configure.
- Make the connection and wait until the logger wakes up, depending on your configuration the time to wait for wake-up can be several minutes to several hours.
- When the logger wakes up and has transferred its log data, it will jump to the configuration menu and the collector will transparently pass all data to your OMC040Terminal window and vice versa. It's like you are cable connected to the logger itself. You can even do a firmware upgrade if necessary thru this link.

#### 11.2 By browser

If you have a WebServer license and did install it (see: step 1.), then you can configure the OMC-040 with all major browsers as well, all you have to do is add the 'OMC-040 Terminal' report from the templates directory to the concerned location.

- Although that you have added the report in OMC-DOL itself, it will only function when accessed from a browser.