PoKeys

+

xively™
by LogMeIn

Xively + PoKeys56E tutorial

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PoKeys: Xively + PoKeys56E tutorial

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Xively + PoKeys56E tutorial

Set up your PoKeys56E device

In order to use PoKeys56E device with Xively service (www.xively.com), your PoKeys56E device must be connected to a network with the internet connection. The PoKeys56E device must then also be properly configured with the network parameters - either with the use of the DHCP server of the network or with the use of the manual configuration parameters.

In order to proceed, make sure that you have connected 5 V power supply and ethernet cable to PoKeys56E device.

In order to configure the device for the operation on your network, follow one of the options below:

1. DHCP configuration (automatic IP assignment) is activated by default. To change the settings, open PoKeys configuration software and connect to your PoKeys56E device by selecting the device in the list and clicking on 'Connect'. Navigate to menu 'Device' and 'Network device settings'. In the dialog that appears, select 'Retrieve IP address automatically' and click 'OK' button.
2. Manual configuration - to change the settings, open PoKeys56E configuration software and connect to your PoKeys56E device by selecting the device in the list and clicking on 'Connect'. Navigate to menu 'Device' and 'Network device settings'. In the dialog that appears, select 'Use fixed IP address' and enter the device's IP address, the subnet address and the gateway IP.

Create a device and feed on Xively

1. Open a web browser on your computer and navigate to xively.com. Create a new account or login to an existing one.
2. Navigate to Develop and add a new device. Enter a name for your device and set its privacy to 'private' (if you wish to keep the data to yourself) or 'public' (if you wish to share your data with other users). Changing the device's privacy is not possible after the device gets created.
3. Under the created device information, you can find 'Feed ID' and 'API key' for your newly created device, as shown in the figure below.
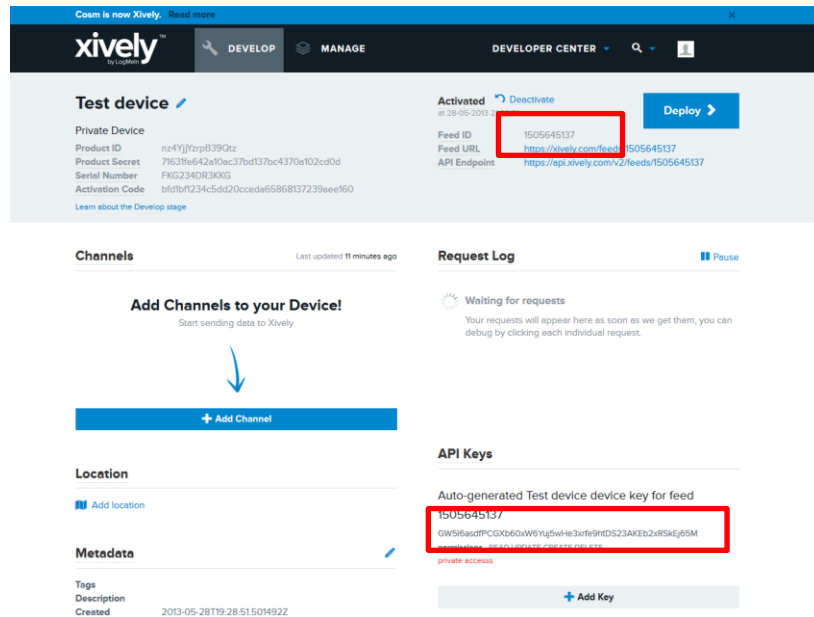
Configure your PoKeys device for Xively

1. Open PoKeys application, connect to your PoKeys device and go to Device > Web interface settings dialog and switch to 'Reports server' tab. Check 'Xively web service' option.

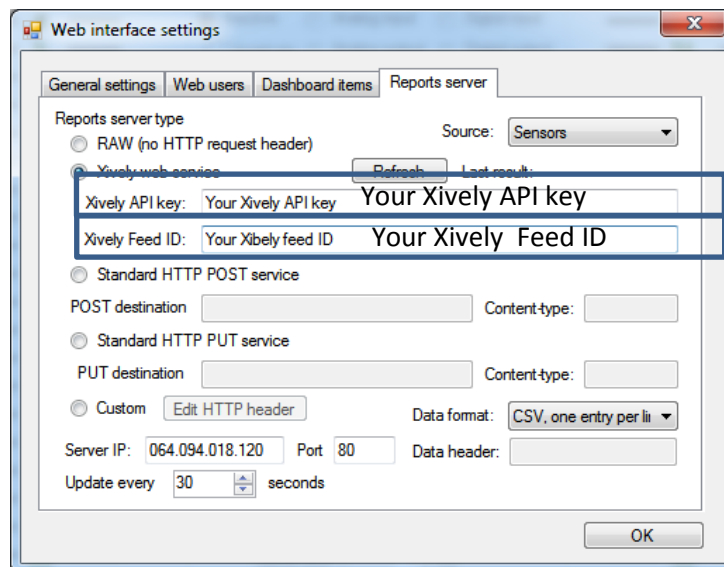2. Enter your Xively API key and Feed ID, created in step 3, leave other fields with default values

Figure 1: Xively settings page

3. Select the update rate at the bottom.

4. Click OK and click Send to device button

5. Go back to Device > Web interface settings to page 'Dashboard items'. Define entries as described in the 'Web interface' chapter of this manual. To enable uploading of the dashboard item to the Xively service, select 'Web report' as the user. The 'Item caption' field is used to identify the datastream in the selected Xively feed.

Make sure that item caption does not contain any invalid characters for Xively channel name (+, -, _, letters and numbers are allowed)
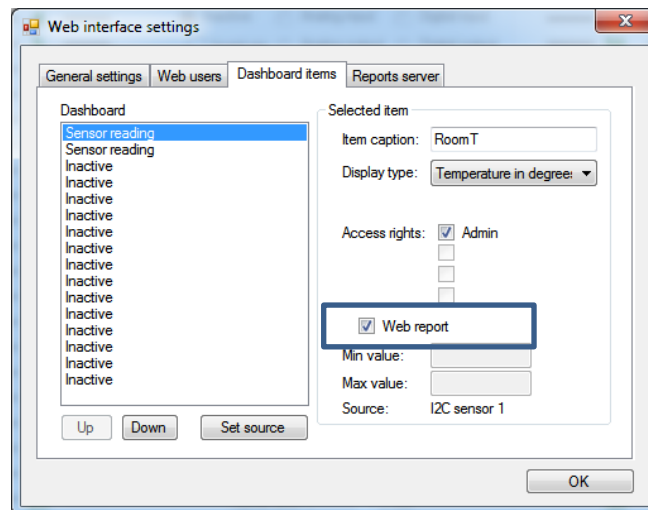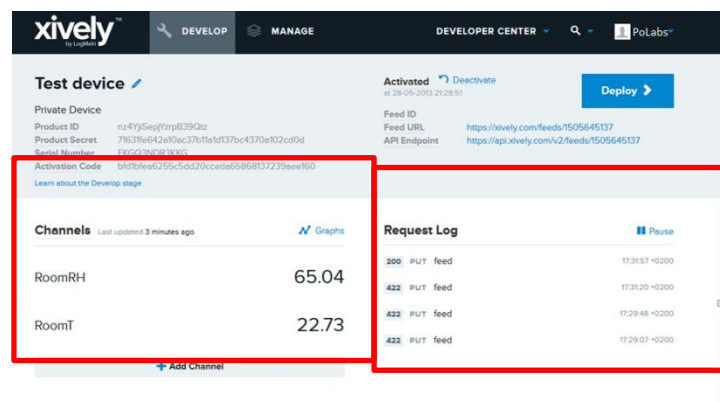

Figure 2: Item configuration for the Xively service

6. Save the settings again by clicking 'Send to device' button.
7. Make sure the PoKeys device has properly configured network settings and that it is connected to the internet
8. After a update interval, check the status of the Xively updates in the Xively 'Develop' page

9. Open your Xively feed by clicking the Feed URL – you should see the recorded data

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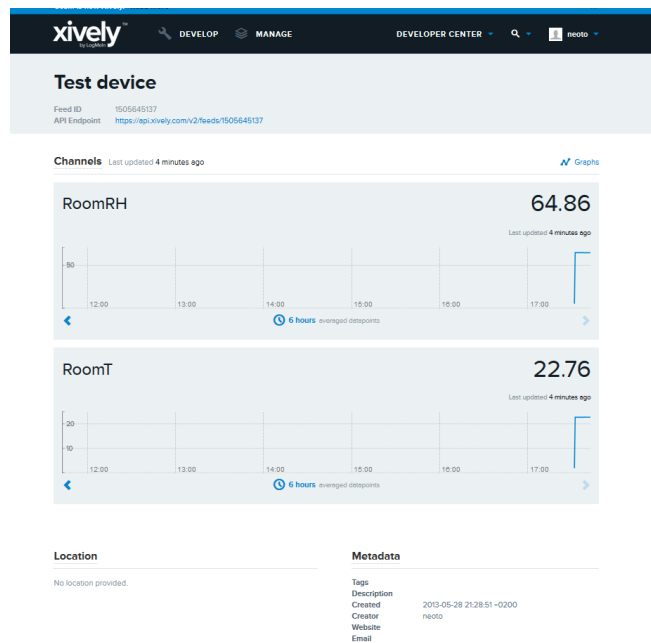

Figure 3: Xively feed overview page

Example: Configure a DS1820 1-wire temperature sensor for PoKeys56E and Xively

Connect DS1820 1-wire temperature sensor to PoKeys56E device as illustrated below.
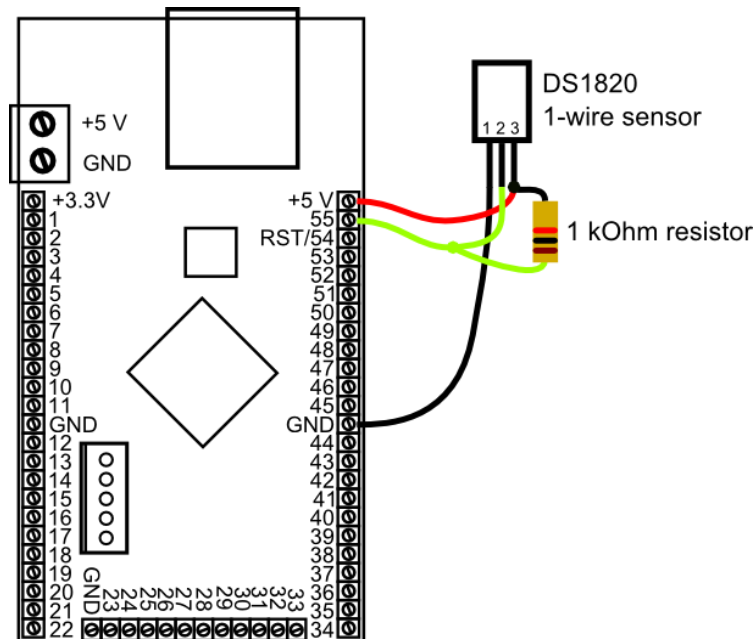

Configuring DS1820 sensor in PoKeys

1. Open PoKeys application and connect to your PoKeys56E device. Open Perihperals > Sensors and switch to 1-wire sensors tab. The following dialog appears
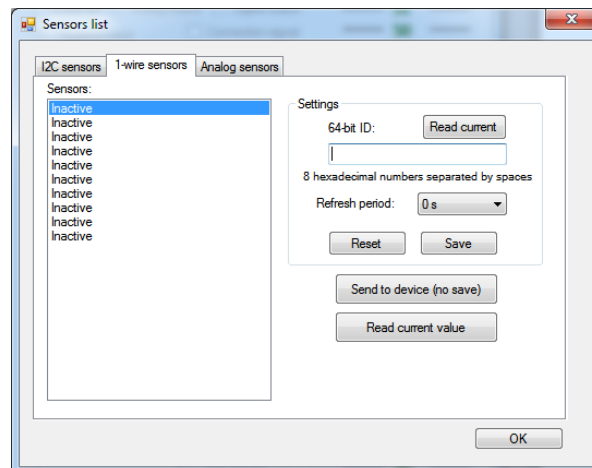
2. Select first inactive sensor slot on the left and click 'Read current' button on the right. This action reads the ID of the currently connected sensor and displays it in the text field below. Select the required refresh period (minimum value for DS1820 is '1,0 s').

3. Click 'Save' button first, then 'Send to device' button. To test the sensor, click on 'Read current value'. Measured temperature should appear as illustrated below.
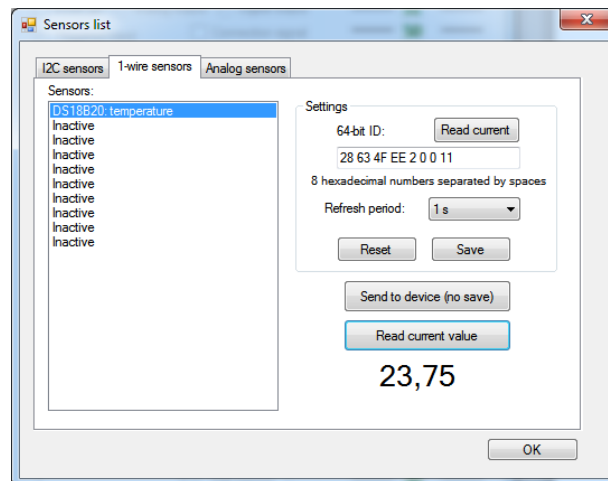
4. Close the Sensors list dialog by clicking 'OK' button and click 'Send to device' button to save the settings in the device.

Multiple 1-wire sensors

PoKeys device can read sensor ID of one sensor at a time. Because this is a crucial step in sensor setup, only one 1-wire sensor can be connected during setup. In order to configure multiple sensors, connect one of the sensors to configure to PoKeys device and follow the steps above. Then disconnect the sensor, connect another one and repeat the steps again.

When all sensors are configured, wire them all in parallel.
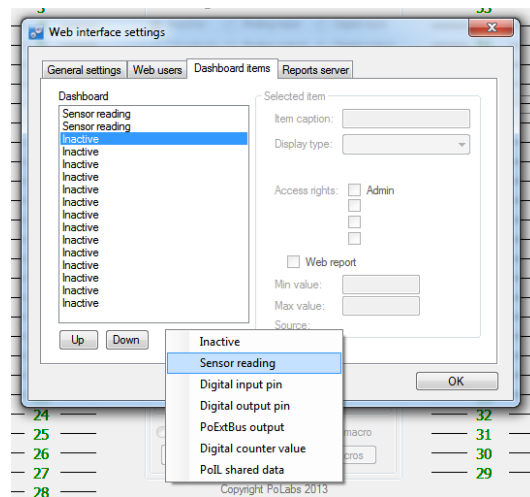
Configuration for Xively service

1. Follow the steps in this tutorial on how to open a Xively account, copy the API key and Feed ID to PoKeys configuration.
2. Open Device > Web interface settings and switch to 'Dashboard items' page
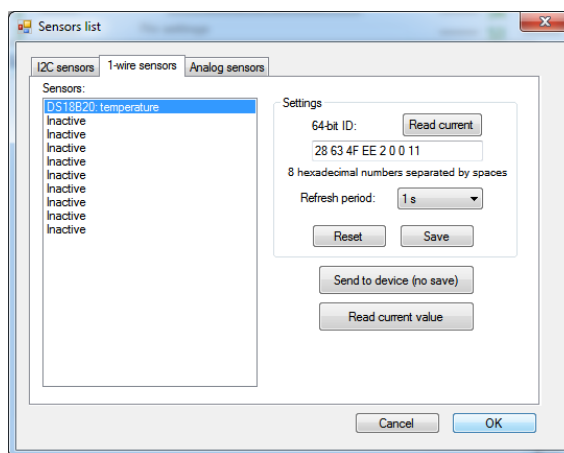3. Select and empty (inactive) dashboard item in the list on the left
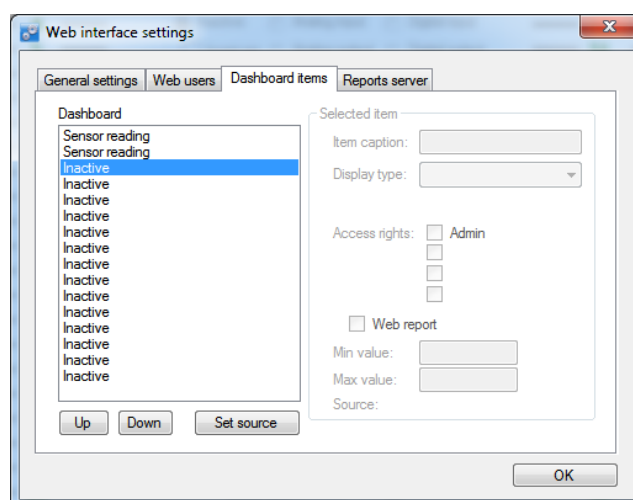
4. Click 'Set source' button and select 'Sensor reading'

5. In the dialog that appears, switch to '1-wire sensors' tab and select the sensor you configured. Click 'OK'

6. Enter the Channel name (in the Item caption text field) and select 'Web report' in Access rights section. *Make sure that item caption does not contain any invalid characters for Xively channel name (+, -, _, letters and numbers are allowed)*
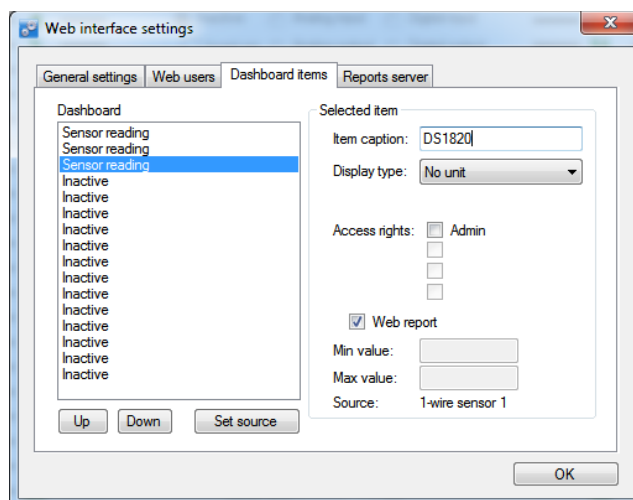
7. Click 'OK' and 'Send to device' on the main screen of PoKeys application.

Wait for a selected Xively refresh period (set in the first steps of this tutorial) and check your Xively feed page.

Example: Use PoBlocks for basic analog signal capture, processing and upload to Xively

In this example, a more advanced usage example will be presented.

Most of modern electric power consumption meters output the currently measured power using built-in blinking LED. The frequency of blinks corresponds to power. Current power and cumulative power consumption can therefore be approximated by counting the number of blinks per minute, hour, month, etc.

Using a simple circuit below we can detect flashes of the meter LED light. Tape the LDR resistor to the front panel of your energy meter using a black masking tape in order to shield the sensor from the ambient light (do not try to open the energy meter and be careful not to damage it).
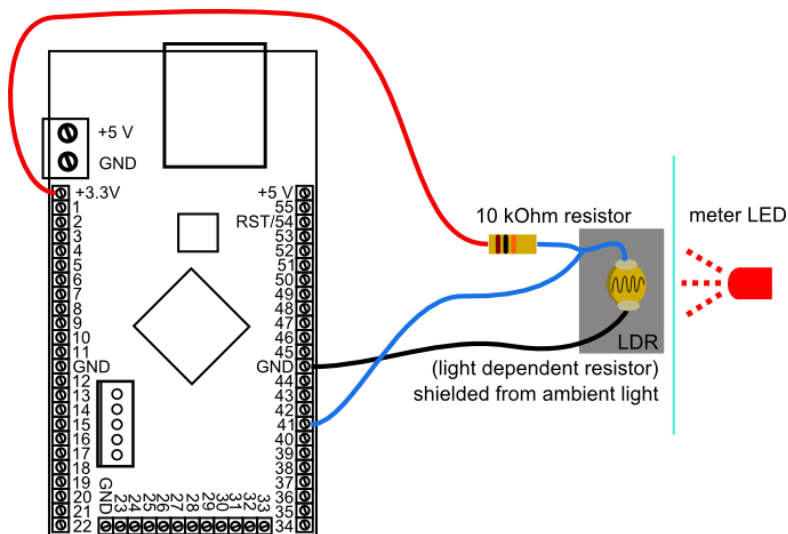

Using PoBlocks software, let design a simple diagram that counts number of pulses and displays the pulse count as total power consumption in kWh. Additionally, use 1-minute timer and separate counter to count number of pulses per minute and output this number as current power usage (averaged per 1 minute) in W. The values in the example are defined for 1000 blinks/kWh power meter.

First, we begin with LED detection logics. Upper part of the diagram takes care of filtering the analog value from the resistor divider with LDR. Left-upper part produces an average value of the analog input, while the upper-right side produces a reference signal for the comparator that is set to 3/4 of the average value. When the LED lights, the LDR resistance drops and as consequence, detected analog value drops. When the circuit detects a drop to 3/4 of the average using a comparator 'Compare (LE)' a signal is generated and fed to counters. On each blink, both counters (Cumulative cons. and Current power) are incremented. Total power usage is divided by 10 to produce 0.01 kWh unit. The output of this divide block has a 'Shared data slot' output defined with index 1 (displayed as yellow S1).

On the bottom, we have a one pulse per minute generator that triggers 'Reset' of the 'Current power' counter and the 'Data latch' clock, which stores the previous value of the counter. The stored value is then multiplied by 6 to produce average power consumption in one minute period in 0.01 kWatts. The output of this value is again defined as 'Shared data slot' (this time with index 0).

The diagram is shown below.
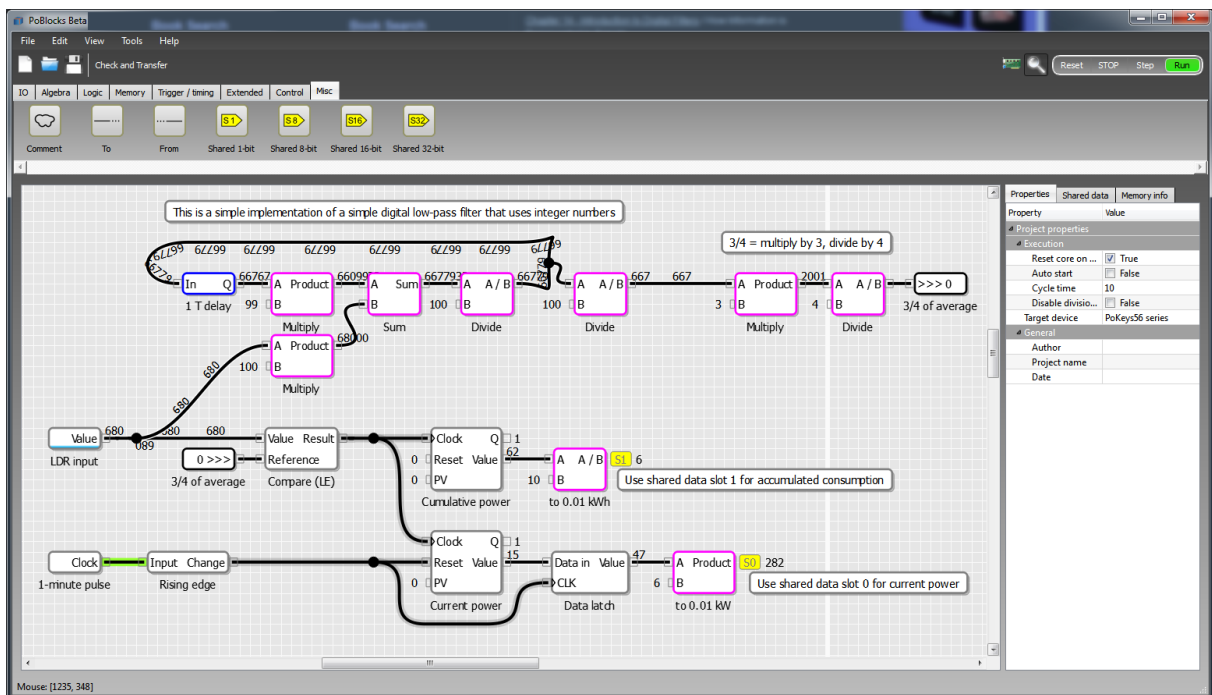

Configuration for Xively service

1. To output total power consumption and averaged current power to Xively web service, first configure PoKeys with Xively account as described in the beginning of this tutorial then open Device > Web interface settings and switch to 'Dashboard items' page
2. Select and empty (inactive) dashboard item in the list on the left
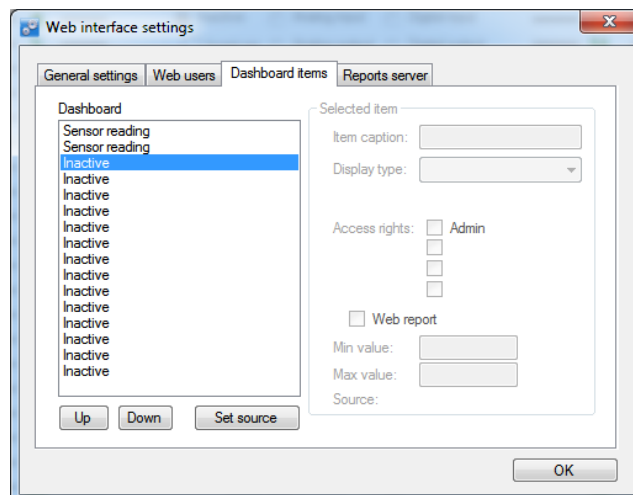
3. Click 'Set source' button and select 'PoIL shared data'
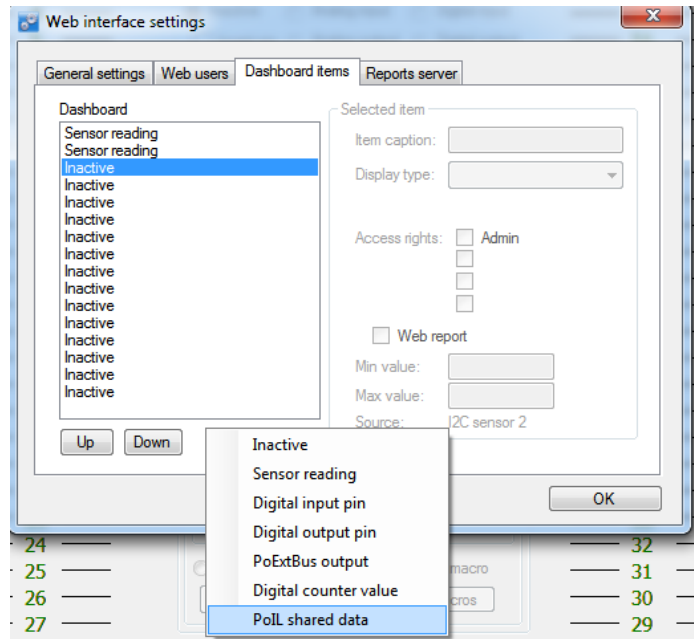
4. In the dialog that appears, enter the shared slot index - put 1 for accumulated power consumption
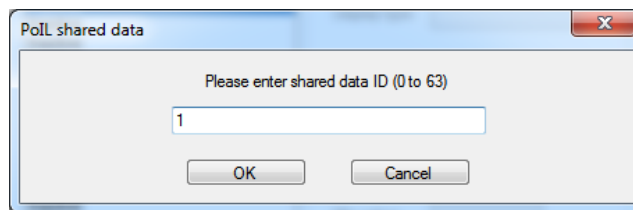
5. Click OK, enter 'Total' in Item caption field and check 'Web report' under Access rights
6. Repeat the steps 2-5 for current power consumption by entering 0 for the shared slot index and entering 'Current' for the Item caption.
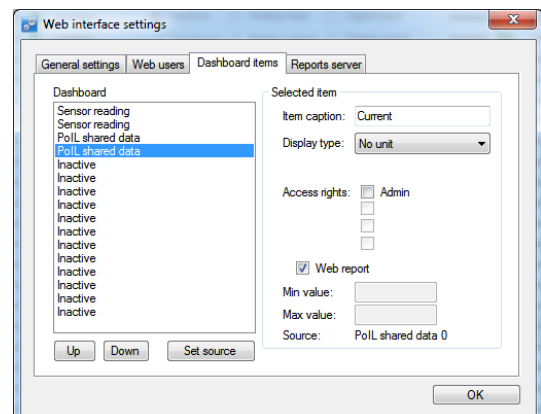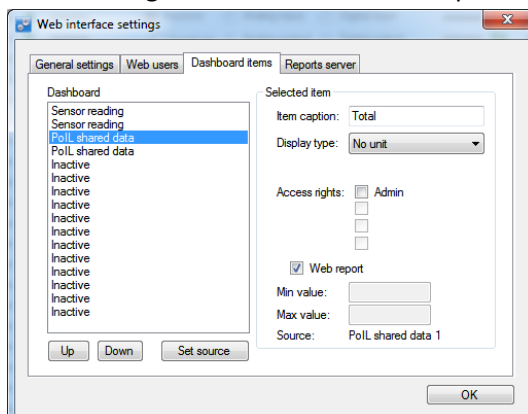
7. Click OK and 'Send to device' on main window.

If all went well, two channels will be added to your Xively feed will with the current and total power consumption data. You can edit the channel information to add 'kW' and 'kWh' units and symbols for the newly created channels.

Test device

Feed ID   1505645137
API Endpoint   https://api.xively.com/v2/feeds/1505645137

Channels Last updated in a few seconds   ⚡ Graphs

Current   **3.54**
                                                             kW

RoomRH   **65.96**
                                                             % RH

RoomT   **23.46**
                                                             °C

Total   **0.24**
                                                             kWh

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