

Smart Meter DSMR P1 Port Reader

This plugin is designed to read Smart Meters that comply with the Dutch DSMR standards 2/3.x and 4.x via a connection to the meters P1 port. All Dutch 'Slimmeters' installed after 2008/9 (or so) will have a P1 port.

Depending on your needs you can configure the meters you want shown on the Vera Dashboard. By default you only have one Power meter child device that shows the total usage of your house, Smart Meter House. Next to that you can select if you have multiple tariffs (hoog/laag) and thus see separate displays for those, and if you want to see the Export meter(s). Those latter you only need if you produce electricity yourself, for example using solar panels. Also the display of the gas meter is selectable. In short, you only need to see what is relevant for your house.

If you produce electricity and have a Power meter device that shows its energy production, you can link to that. The House Watts value will then show the actual usage of your house. See below for more details.

On the forum you can find the latest information on this plugin:

<http://forum.micasaverde.com/index.php/topic,32081.0.html>

There is another plugin to read a Dutch Slimmeter similar to this. You can find lots of information on connecting the Slimmeter : <http://forum.micasaverde.com/index.php/topic,10736.0.html>

I found two places where you can get the correct P1 to USB cable. The one from Robbshop is plug-and-play (<http://www.robshop.nl/smart-meter-cable>), not sure if the one from here (<http://www.smartmeterdashboard.nl/webshop>) has the RX signal reversed already. It should be possible to extend the cable on the P1 side up to 10 meters using a phone RJ11 cable (this is hear say, I have not done this myself).

Installation

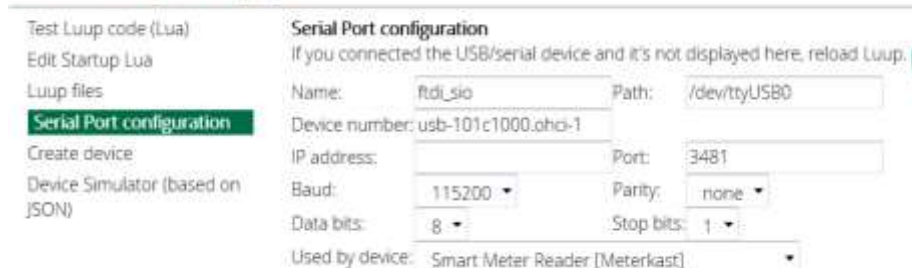
The simplest way to install this plugin is from the App Market. On your Vera in Apps > Install Apps, search for Smart Meter. Connect the cable to your Vera's USB port.

Next you will have to configure the Vera serial port. You should only change the Baud, Parity, Data bits, Stop bits. Make sure they match the DSMR meter type you have. The latest that are installed from 2014 are of the type DSMR 4, you should be able to see this in your meter manual.

For the DSMR 4 you have to use the serial port settings of 115200,N,8,1 as shown here. For the older types use 9600,E,7,1.

As Used by device select this plugins name: Smart Meter Reader []. The value in between the square brackets is to room you put the plugin in.

Develop apps



The screenshot shows the 'Serial Port configuration' window in the Vera firmware. On the left is a sidebar with options: 'Test Luup code (Lua)', 'Edit Startup Lua', 'Luup files', 'Serial Port configuration' (highlighted), 'Create device', and 'Device Simulator (based on JSON)'. The main area contains the following settings:

- Name: Path:
- Device number:
- IP address: Port:
- Baud: Parity:
- Data bits: Stop bits:
- Used by device:

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Setup

After the installation Reload Luup and refresh your browser. When the installation was successful you should start seeing the details on the Control panel to populate.

If these do not populate make sure the serial port configuration is correct for your meter type.

Note that the Control panel will always show all meter values, even if you select not to show them as separate child devices.

On the Vera dashboard you now should have the Smart Meter Reader and the Smart Meter House power meter.

This screen shot shows the import Gas meter as well, but that is not the installation default.

Once you know the data is shown on your Vera you can select the meters you want shown for your setup.

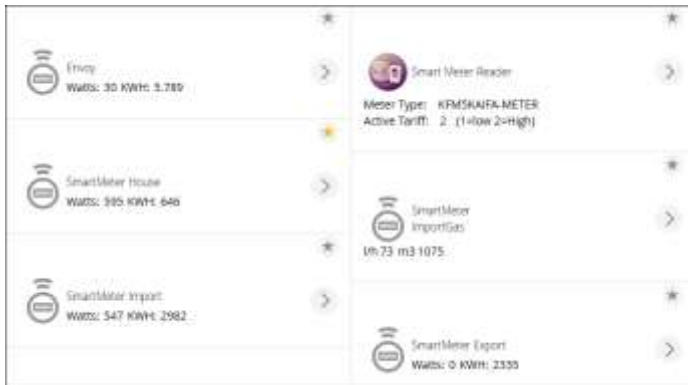
Open the Settings and make your selections.

When setting Show High and Low Tariff meters to Yes, separate power meter child devices for ImportT1 (low tariff) and ImportT2 (high tariff) will be created.

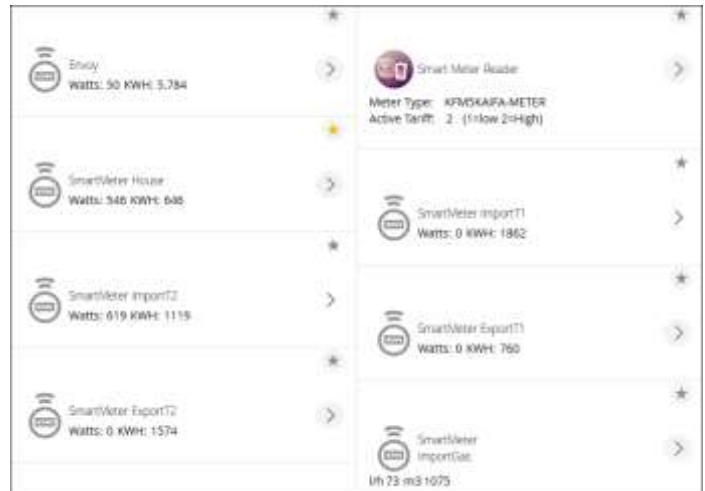
Likewise setting Show Export meter(s) will create extra child devices to show the Export value(s). When Show high and Low is No, you will get one Import and one Export child device that show the sum of the ImportT1 and ImportT2 combined on Smart Meter Import and the sum of the ExportT1 and ExportT2 combined on Smart Meter Export. If Show high and Low is Yes, you will see four child devices, one for each.

See the next page for the screenshots of what I mean.

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Show High and Low Tariff is No,
Show Export Meter(s) is Yes.



Both Show High and Low Tariff and Show Export are Yes

To add a child device that shows the Gas meter reading set Show Gas Meter to Yes. Sadly there is no standard Gas meter device for Vera so it uses a modified generic sensor. This implies that many remote apps will not display it correctly or even not at all. The ImportGas meter also calculates the actual Gas usage in liters per hour (a liter is one thousands of an m3). Note that the Gas value only updates ones per hour per the DSMR standard so after first install it can take over an hour before the flow value becomes meaningful.

Multiphase Reading

With version 1.5 it is possible to show the Watt usage per phase. This is only useful if you have a 3 phase connection. You can tell by looking at the Control panel. When there are no values showing for Line 2 and Line 3, you have a single phase connection.

When you set the option Show Line 1-3 meters to Yes, three child device are created to show the Wattage per phase. When you have Show Export Meter(s) set to Yes, three more are created to show the export value.

Energy Production Setup

The most difficult part to build on this plugin was the integration with an own energy generator. In my case, Enphase Envoy solar panels. When you set Show Export Meter(s) to Yes an additional setting is shown (well in UI7, in UI5 all questions always show). If you have an energy meter device that reports the Watts and KWH of your system, you set

A screenshot of the Smart Meter Reader settings page for Device #83. The page has a green header with 'Control', 'Settings', and 'Back' buttons. Below the header, there are several settings with dropdown menus: 'Show High and Low Tariff meters' (Yes), 'Show Line 1-3 meters' (Yes), 'Show Export meter(s)' (Yes), 'Include Power Generator' (Yes), 'Power Generator device' (Envoy), 'Power Generator Update interval' (5 minutes), 'Power Generator Update offset' (30 seconds), 'Show Gas meter' (Yes), 'Log level' (Error), and 'Syslog server IP Address:Port' (empty). A 'Save Changes' button is at the bottom right.

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Include Power Generator to Yes. Then select that power generator device. This must be a power meter (device type 21) or binary light (device type 3) and have variables Watts and KWH for service urn:micasaverde-com:serviceId:EnergyMetering1.

The Power Generator Update Interval must match how often a new KWH or Watts value is reported. For Envoy that is once every five minutes.

The Power Generator Update Offset is used to compensate any possible time lag between the Smart meter and your generator meter. For me 30 seconds worked best. Change this value if you see the House Watts value shoot up and down. However, it impossible to get the timing perfect it seems.

How is this Power Generator value handled?

I spend quite a bit of time on how the best handle the calculations for the Smart meter combined with a power generator. The challenge is that the Smart meter readings are reported every 10 seconds, but it is not that likely you get the same sample rate from your power source. In my case the Envoy updates its reported values once per five minutes, even if I ask for an update every 30 seconds.

So what I did is not to look at the Watts, but look at the KWH values over those five minutes and calculate the average Watts over those five minutes. The plugin looks at the values from the power source changing and calculates based on the last change. So the Update Interval setting does not have to be an exact match with the power source. The interval is used to determine if the power generator may have gone into an idle status, i.e. stopped generating power. When for 1.5 times the interval no new KWH value is reported the plugin assumes no power is generated.

The Interval Offset can be used to tweak the House Watts reading. It is used to compensate any delay in the KWH report of the power source as it is very unlikely that that is happening real time. In my setup, I poll the Envoy every 30 seconds for a possible change. This means the reading can be up to 30 seconds late. I found that not having this Interval Offset resulted in the House Watts jumping up and down quite significantly. For me the 30 seconds seems to work best to get a reasonable House Watts. It will never be spot on though.

When the Update Interval set to Real-time it works differently. Then the plugin simply subtracts the Watts of the power source from the Watts of the Smart meter at every ten second reading. I do not know if that would ever produce a reliable result as I cannot test it myself.

Reporting

For reporting I can only advice to install DataMine or DataYours. Both work with this plugin.