

PPC.04 P1 to pulse +USB converter



The PPC.04 module, or the 'P1 port to Pulse converter' is a standalone module that either converts the meter readings of the P1 port to consumption pulses, or transmits meter readings to a USB port.

A home automation system or a data logger can use this module to read import, export, gas consumption and switching high-low tariff pulses.

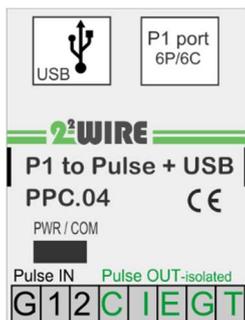
With the USB output you can make your own application for PC or Raspberry Pi. The serial protocol is easily prepared and is described at the bottom of this datasheet or you can also use our demo version of a Windows 10 application, the 'PPC04 visualizer' for configuration and/or read out of the P1 values via PC.

The meter supports both the Dutch digital meter (DSMR 2.x, DSMR 4.x, DSMR 5.x) and the Belgian digital meter (DSMR 5.x). By default, the module is set to the Belgian DSMR 5.x meter and the pulse divider at 1 (1pulse per Wh, 1 pulse per 1 liter gas) but via the Windows configuration software and a USB connection to the PC these settings can be changed or you could update the firmware.

The power supply for the PPC.04 module is provided by the digital meter via the included 'RJ11 6P/6C cross cable'. Only at the Dutch DSMR 2.x the module needs to be externally fed via a 5V/100mA USB power supply.

In addition to the 4 pulse OUTlets, the PPC.04 module also has 2 pulse iNputs for counting consumption pulses which can then be read out via USB.

1. Connect:



Power supply:

From the P1 port:
The digital meters from DSMR 4.x and more are getting power from the digital meter so only connect the included 'RJ12 6P/6C cross' cable.

Power supply via USB connection: The 'older' digital meters, version DSMR 2.x do not all give power out so here it may be that extra power has to come from the PC or from a USB power supply.

It is no issue when both power supplies (P1 and USB) are connected at the same time.

P1 port:

The PPC.04 module supports both the Dutch (DSMR 2.x,4.x,5.x) and the Belgian (DSMR 5.x) digital meters. The setting of the type of protocol is done via the software tool which you can download from the product page on our website. The module is default set to dsmr 5.x-of the Belgian digital meter protocol and the default divider at 1.

Binary OUTputs:

There are a total of 4 pulse outputs available on the clamps (pitch 2.54mm),

- Clamp C-I: Import electricity (standard 1Wh per pulse)
- Clamp C-E: Export electricity (standard 1Wh per pulse)
- Clamp C-G: Gas consumption (standard 1liter per pulse)
- Clamp C-T: Rate switching high/low (on/off)

Operation:

By default, data is requested from the P1 port every minute. Then the difference between present and previous meter-value is made to calculate the consumptions for import-export and gas. These calculate values then generate the output pulses.

The pulse outputs are galvanically separated via optocouplers.. Each pulse has a pulse width of 50ms, so the maximum number of pulses per second = 10

Per hour this would be 10x3600 = 36000 pulses, or up to 36kWh. If there is a greater consumption, the divider can be set to 1/2 to 1/10 (max 360kWh) via the 2-WIRE TOOL 'PPC04 visualizer'.

This Windows 10 application can be downloaded from our website

Energy rate output:

When the digital meter has dual tariff, this status is sent to the digital output. This on/off contact can be used to switch on/off appliances or to make the tariff status visible to the consumer.

Attention: for the 4 optically separated outputs, Max. 40Volt/50mA applies

Binary Inputs:

There are a total of 2 pulse inputs, via the connector (pitch 2.54mm) The purpose of these inputs is to read energy pulses from a water meter, gas meter, energy meter,.. The counted pulses are then passed serially through the USB port.

Please note:

- Connect between clip G(=Ground=-) and entrance 1 or entrance 2
- The polarity if the impulse giver is a semiconductor. The maximum voltage drop must be less than 0.7V, and any leakage current less than 1µA.
- The impulse giver must be 'potentially free', maximum 3.3V/1mA.
- If this does not meet these requirements, an optical insulator must be installed.
- The minimum pulse duration must be greater than 10msec and the speed between 2 pulses should not be faster than 10 pulses/sec.
- Since the inputs resistors are quite high due to the power consumption, there should be no large distances between the impulse giver and the PPC.04. A length of 2 meters can be acceptable. If a greater distance is required, one must use shielded (audio) cable, and the shielding is connected to a grounding.

USB:

If desired, all measured values of the P1 port can be sent to the USB port:

- Power- import low – import high – export low – export high – gas – ...
- Any connected external pulse inputs are added in registers, and are also sent to the USB port as a counter position.

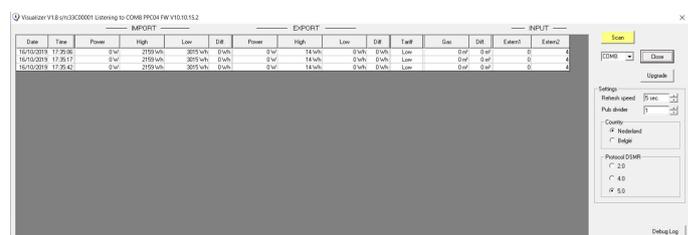
The serial protocol for retrieving and reading data is fairly simple, so it can be easily implemented in external applications

PPC.04 Visualizer:

The PPC.04 Visualizer allows you to change the configuration:

- The reading speed can be set between 5 and 60sec.
- The 'land version' BE or NL and the meter protocol can be changed (RATE: BE = invers NL...)
- The pulse weight of the pulse outputs can be set via the divider, standard 1 pulse/wh or 1 pulse/1L gas
- The firmware can be updated
- The data-string from the P1 port can be read out and exported to a csv file. This can be useful to detect anomalies in protocol between different meters.
- Each change will automatically become active.

Fig. Printscreen on the PPC.04 Visualizer



LED:

The module contains 2 status LEDs (L1-L2), which shows the power voltage and communication with the P1 port.

2. Serial protocol

With the following protocol one can write his own application:

Protocol

Statement:

- TX: STARTCHAR (* = 42) +INSTRUCTION + STOPCHAR (# = 35)

- RX: STARTCHAR (*) + INSTRUCTION+ LENGTH DATA + DATA +STOP (#)

Baudrate: 115200 8N1

FWversion:

TX: *86#

Rx:START+INSTR+LEN+FW1+FW2+FW3+FW4+SPEED+NL_BE+DSMR+DIV+STOP

Ex.: 42+87+8+19+1+21+60+2+5+1+35

(in this example, FW version 19.1.2.1, poll speed 60sec, BE as country choice, DSMR5.0 and divider 1/1)

Note. Default is the poll speed 60sec, the country choice BE (2)

SETUP: Change settings:

TX: *66+SPEED+NL_BE+DSMR+DIV+#

Vb.:42+66+5+2+5+2+35

Poll speed 5sec – BE – DSMR5.0 – divider 1 / 2

RX:42+85+35 (85 = ACK)

REQUEST DATA:

TX: *64#

RX:START+INSTR+LEN+DATA+STOP

RX:*65+52+xxxxx+#

There are 13 data's, each 4 bytes, according to the IEEE-754 protocol

Order dates:

1. IMPORT POWER (W)
2. IMPORT ENERGY HIGH TARIFF (Wh)
3. IMPORT ENERGY LOW TARIFF (Wh)
4. IMPORT PULSCOUNTER : number of pulses to OUT (= difference between current meter position H+L and previous meter position H+L with the chosen interval 5-60sec (Wh))
5. EXPORT POWER (W)
6. EXPORT ENERGY HIGH RATE (Wh)
7. EXPORT ENERGY LOW RATE (Wh)
8. EXPORT PULSCOUNTER : Number of pulses to OUT (= difference between current meter position H+L and previous meter position H+L with the chosen interval 5-60sec (Wh))
9. GAS (liter)
10. GAS DIFFERENCE (litre) = difference between current and previous measurement
11. RATE (1 = LOW RATE NL, HIGH RATE BE / 2 = HIGH RATE NL, LOW RATE BE)
12. INPUT1 COUNTER
13. INPUT2 COUNTER

The Demo program 2-WIRE PPC04 visualizer can be downloaded from the 2-Wire website.

3. General note:

- If you have created your own application on the PPC.04 please give us a please note so that we can mention this on the website.
- You can also use an RJ11 4P/4C cable but then the power supply has to come via USB
- the order of connection is important. First connect the P1 port and then the USB, otherwise your first meter reading may be zero and this is followed by a large meter reading when connecting with P1 and that creates a lot of pulses which all need to be processed in succession in the form of physical outgoing pulses

4. Technical information:

General:

P1 port to Pulse Converter: Standalone module for reading P1 port data and converting it to pulses or serial transmission to the USB port.

Operating conditions:

Operating temperature range: 10 °C to 50 °C
Storage temperature range: -10 °C to 60 °C
Maximum humidity: 90%, no moisture condensation
Max. mounting height : 2000m

Physical properties:

Housing: plastic, self-extinguishing. UL94-V0
Degree of protection: IP20, EN 60529
Fitting indoors or in waterproof housing
Dimensions (h x b x l): DIN Rail 2 modules

Weight: about 30 grams

Connections:

Inputs:

- P1–PORT RJ11 6P6C: via cross-cable to P1-port digital meter
- 2 PULSE INPUTS: zeropotential max 3.3V/1mA (ex. WATER-GAS)

Outputs:

- 4 PULSE OUT ISOLATED max 40V/50mA, impedance approx 100 Ohm, with polarity
Common= -pool: :
+ pole: IMPORT – EXPORT – GAS – TARIFF (high tariff = closed state)

PROTOCOLS: DSMR2.0 – 4.0 – 5.0 NL-BE

USB: Communication to PC/PLC/Raspberry/ ...

Nutrition:

- via P1-PORT if any
- of via USB micro USB (5V/100mA)

Labels:

RoHS: Non-toxic, acc. to guidelines WEEE/RoHS

CE: In accordance with EMC and low voltage directive: HBES – EN 50090-2-2 and EN60950 – 1: 2006.

5. Installation instructions

The installation must be carried out by an approved installer and in accordance with the rules in force.

During installation, account must be taken of (non-exhaustive list):

- the laws, standards and regulations in force.
- the state of the art at the time of installation.
- this manual which only mentions general provisions and must be read in the context of each specific installation.
- the rules of good craftsmanship.

This manual must be attached to the file of the electrical installation. The 2-Wire website always has the latest manual of the product.

6. Support

Do you want to exchange the product in case of a possible defect? Please contact your wholesaler or the 2-wire support service. The contact details can be found on our website www.2-wire.net/contact/

7. Guarantee conditions

The warranty period is two years from delivery date. The date of delivery is the invoice date of purchase of the product by the consumer. If there is no invoice available, the production date applies.

The consumer is obliged to inform Qonnex bvba in writing of the lack of conformity, and this at the latest within two months of adoption.

In the event of a lack of conformity, the consumer is only entitled to a free repair or replacement of the product, which is determined by Qonnex.

Qonnex is not responsible for any defect or damage caused by improper installation, improper or negligent use, improper operation, product transformation, maintenance in violation of maintenance regulations or an external cause such as moisture damage or damage from span.

The mandatory provisions in national legislation on the sale of consumer goods and the protection of consumers in countries where Qonnex sells directly or through distributors, agents or permanent representatives take precedence over the above provisions

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