

ONLINE kWh meter /pulse counter

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The Power of simplicity and reliability!

FEATURES of Counter using **iBOX-2S system**

- * A smart counter for puls generating sensors like kWh / Gas / Water / Flow/ Rain/Traffic
- * Data (kWh / counter values) automatically send to your own FTP-Server or Cloud
- * Read Counter/ kWh values in LAN network using embedded webserver or web display (see below)
- * Ultra low power mode option: typ 10 mW (700 mW in Full power mode)
- * Safe data transfer (in low power mode): Ethernet port only active during short periods of data transfer
- * Low Cost Industrial grade European MID certified kWh meter
- * Choose your own kWh meter 1/3 phase and Accuracy Class of kWh meter system : A (2%), B (1%) OR C (0.5%)
- * Can also be used as "add on" to existing kWh meters with pulse output (SO)
- * Flexible configuration with any puls generating kWh meter (1 /3 phase)
- * Expandable to kWh meter network with many remote kWh meters (eg for monitoring PV Systems)
- * Pre-scaler option (1...12 Bits) with adjustable counter range : $16 \cdot 10^6$ up to max $6 \cdot 10^{10}$
- * Independant Energy Monitoring for research, evaluation and registration
(no connection with inverter etc required, simply connect to pulse output of kWh meter)
- * Optional Safe Data logging to 2GB uSD Card & automatic FTP Transfer of Recorded Data file to a Server



Infographic of kWh meter

MAIN FUNCTION

Measuring CUMULATIVE kWh production (or consumption), by using a pulse output (SO) of kWh meter
The TOTAL number of pulses (or kWh) is transferred at pre-adjusted intervals to your FTP server or Cloud
(in the so called current value file, which is an overwriting file for reducing disk space)
By using your own database system a complete network of kWh meters can be monitored & managed

MAINTENANCE & RELIABILITY

The kWh counter of the **iBOX-2S** system is **NON-VOLATILE** (no lost of data when power is disconnected) and has standard a double backed up memory with professional (replaceable) CR123A Lithium batteries, intended for operation and maintenance during many years (typ 20-30 years). Moreover the counter of the **iBOX-2S** is counting pulses **even when the power is disconnected and keep the values.**

The systems are uninterrupted in use since beginning of 2014!

If a system needs to be replaced, the online displayed kWh value can be still correct by adding an offset easily at the server (by using the backup value at the server or at the kWh meter itself!)

In order to make a new start from zero the counter can be reset to zero by using a simple procedure.

APPLICATIONS

- Remote Online kWh Monitoring of PV Solar Energy Systems, Wind Energy Projects , Energy Management
- Monitoring of efficiency (and early fault detection) by using an additional Solar Radiation sensor
- Power and Energy Performance Evaluation of Solar / PV / Wind Energy System
- Research & Development of PV Solar / Wind Energy systems
- Other pulse generating sensors and transducers (Flow, Traffic, Rain, Wind speed etc)

COUNTER CONFIGURATIONS

Counter configuration nr 705 :

Cumulative Non volatile Counter 24 bits without reset (value string to server) for eg kWh, Gas etc

Counter configuration nr 706 :

Cumulative Non volatile Counter 24 bits without reset (value string to server with datalogging +FTP option)

Counter configuration nr 707 :

Counter 24 bits with reset (current value string to server) for eg rain

Counter configuration nr 708 :

Counter 24 bits with reset (current value string to server with datalogging +FTP option)

Counter configuration nr 709 :

Counter 24 bits with average value during interval (current value string to server)

eg for power (Watts) , Flow (m³/h), wind speed (m/s) etc

Counter configuration nr 710 :

Counter 24 bits with average value during interval (current value string to server with logging +FTP option)

eg for power (Watts) , Flow (m³/h), wind speed (m/s) etc

Note: 24 bits counter has range 0-16769000 pulses (without optional pre scaler, adjustable from 2...12 bits, fixed). Maximum range with 12 bits prescaler is **max 6*10¹⁰** pulses

After overflow the counter will start again from zero.

SETTINGS MANAGEMENT

Adjustable Settings eg : (see also the [iBOX-2S](#) and the manual)

- iP settings iBOX-2S and server (iP nr, username, password, folder)

- Upload interval of current value file: update interval: eg 1, 10, 15 minutes, 1 hr.

- Logger/site identification possibilities in text, file names and folder names eg postalcode+nr and pulsvalue

- The standard calibration is counting pulses, optional possibility is to use a "pulse- value" eg 1 pulse is 1 Wh

The kWh values can also be read in LAN network by using the built-in webserver by using your browser.

Note:

When more iBOX-2S systems are used with the same configuration (705) each system can be configured with its own specific parameters , like Server iP address, logger identification: site name (eg postal code+nr), puls value, Filename and Server folder.

This can be carried out by using an unique set-up configuration file, which can be modified by the user.

The uSD Card can be programmed with these parameters, and the iBOX-2S will operate according to these settings.

The specific configuration file name can be stored eg in a specific folder (eg with name postal code+nr+puls value) for backup.

OPTIONS

- Pre scaler: (specify at order 2/4/6/8/...12 bits)

> eg pre scaler value 2 bits /4, so counter range will be 4*16000000

> eg pre scaler value 3 bits /8, so counter range will be 8*16000000

Example with prescaler /16 and 1 puls /Wh, with PV yearly 5000 kWh:

Effective iBOX kWh Counter range: 256000 kWh with effective resolution 0.016 kWh

Overflow after 245000/5000 = 51.2 years!

- 4G Router or WiFi connection, which can be switched on only during data transfer (in low power mode)

- Customized systems with additional inputs / outputs like:

> temperature, solar radiation, wind speed, analog signals, 4-20 mA signals, status etc

> extra 24 bits non volatile counter

> remote control outputs (open collector/ relay 220V /6A)

- Optional monitoring of power voltage / backup voltage

- Ultra low power consumption for solar/battery operation with 4G router

WEB DISPLAYS (see www.ekopower.nl)

Customized Web Displays are available, see examples which can easily be integrated into your own website (using php). EKOPOWER can assist in setting up a Windows 2019 Server with php activation.