

User Manual

YouLess energy monitor

Model LS110



Version: 1.3-EN (Concept)

Date: 10/08/2013

 **YOULESS**
Energy monitor

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Version History

Version	Date	Description
1.0	05/12/2011	Initial release
1.1	01/03/2012	myEnergysave->Bidgely rebranding change
1.2	07/03/2013	Added flash procedure and small changes
1.3 (concept)	10/08/2013	Minor changes and improvements

Used Symbols



This text is relevant for computer users running the Microsoft Windows operating system.



This text is relevant for computer users running the Apple OS X operating system.



This text is relevant for computer users running the Linux operating system.



Warning of a potential pitfall that can occur in a specific case.



General information or tip.

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YouLess description

The YouLess is a networked digital device that reads and stores the electricity consumption from the main electricity meter. Current and historical meter readings are made available digitally on the local network (LAN) and / or on the internet, via the device ethernet network connector.

These data readings can be displayed on various devices, such as desktop computers, smartphones and tablets. This way, electricity consumption information is made visible in the users everyday digital environment.

Various software applications that can connect with the YouLess are made available for download freely.

Because of the open data interface of YouLess, it is also possible for third parties to read the measurement data from the network, and to integrate them in custom software or systems.

Device usage

The YouLess is designed to inform about how much electricity is consumed and when peaks occur, which creates awareness. Through this awareness, it is made easier to identify unnecessary energy consumption and thus save on energy costs.

Type indication

This manual applies to the YouLess model LS110.

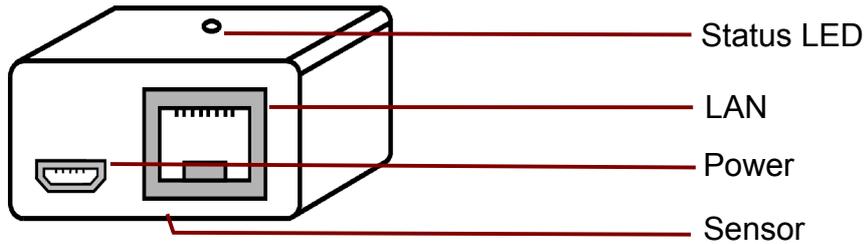
Package contents

The YouLess comes as a set with the following components:

- YouLess LS110
- USB wall mount power supply
- USB power cable
- Ethernet network cable



Physical interface



The YouLess is equipped with two connectors:

1. USB mini B connector for power supply
2. RJ-45 LAN connector for connection to a wired ethernet network.
The LAN connector features two built-in LEDs:
green: An ethernet link with a network device (switch, router or modem) is established
yellow: Network activity indicator (reception of data)

NB: when no network link is established, the yellow LED will function as an alignment help for positioning the YouLess on an analog meter.

The bottom side photo-sensor is used to read the electricity meter.

The top side green status LED gives information about the device state. The following LED status signals are possible:

Status LED signal	Signal meaning
2 seconds on, followed by 2 short consecutive pulses	The device has been restarted after a (power) reset
Off	Default state: device is waiting for a measurement pulse
Single pulse	The device detected a measurement pulse.
Blinking slowly (1 second on, 1 second off)	The device network adapter has not yet been configured and is in factory default mode; no IP address has been assigned
Blinking (½ second on, ½ second off)	The device is in de firmware update mode and waits for the firmware flash utility to start flashing
Blinking fast	The firmware flash utility is updating the device firmware by programming the device flash memory
Blinking very fast	The factory settings reset procedure has been performed and the device is busy wiping the internal non-volatile memory.
Continuously on	The web interface password reset procedure has been performed and the device is now accessible without a password

Preconditions

To make full use of all YouLess benefits, the following preconditions must exist:

1. A wall socket for the YouLess USB AC power adapter must be present. Alternatively, the YouLess can be powered from a device with a USB port, for instance a modemrouter. The provided USB cable can be used for this purpose.
2. The electricity meter on which the YouLess will be deployed, must provide one of the following options for reading the meter:
 - a rotating metal disc with a black or red marking (analog meter)
 - a LED pulse indicator (digital meter)

Generally, all electricity meters feature either of these readout capabilities, thus making the YouLess universally usable.

3. In order for the YouLess measured values to be available on the local network and/or the internet, the YouLess must be connected with the local network using the provided ethernet cable. Therefore, it is convenient if the internet modemrouter or another type of network connection socket is located near the meter.



If a wired network access near the electricity meter is not available or practical, a *wireless ethernet adapter* (not provided) can be used to wirelessly connect with an available WiFi network. A WiFi signal near the electricity meter is necessary for this alternative connection method.

Alternatively, if no WiFi signal is available near the meter, a *homeplug powerline adapter* (not provided) set can be used to connect the YouLess with the wired network. In this case, the network signal is transmitted over the mains power cables using wall mount powerline adapters.

The latter precondition is not strictly required since the YouLess features an internal logging memory in which up to 1 year of readings can be recorded. This log data, for example, can be read out at certain times with a laptop and a direct cable connection. However, in such a scenario not all capabilities of the YouLess are exploited. It is therefore recommended to use the YouLess as a connected device in order to fully benefit from all capabilities.

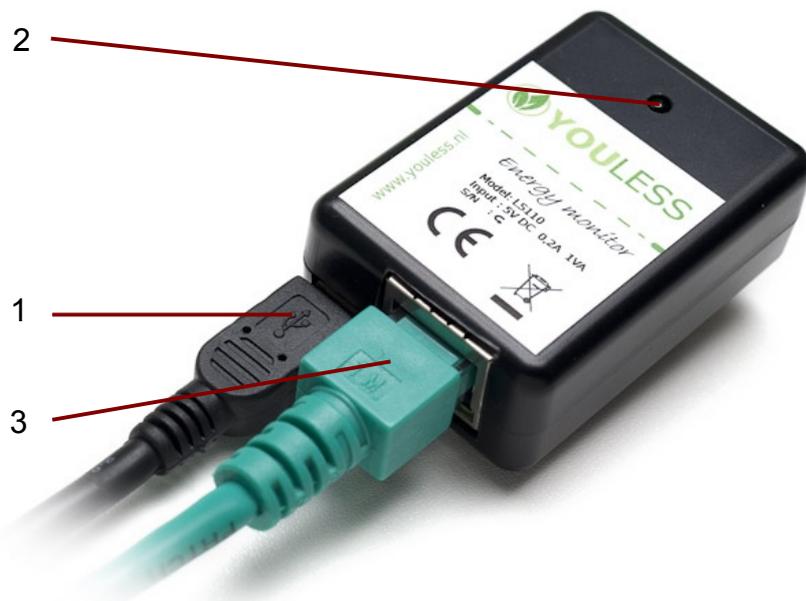
Network configuration

The YouLess is a network device, like for example a Network Attached Storage (NAS) or a media player. Such devices must have a network IP address assigned to them in order to be accessible on the network. The YouLess utilizes a fixed (static) IP address which is to be configured when installing the device.

Since it can be useful to be able to access the YouLess web interface during the physical installation on the electricity meter, the topic of network configuration is covered in this manual before the physical installation on the electricity meter. Thus, the YouLess does not need to be placed on the meter yet in order to perform the network configuration. It is sufficient for the YouLess to be connected somewhere on the local network and to be powered.

Connect the YouLess to the local network as follows:

1. Plug the USB AC adapter into a wall socket and connect the YouLess to the USB adapter with the provided USB mini cable.
2. Verify that the status LED on the YouLess blinks slowly to indicate that the network settings are not yet configured. If the LED is not blinking slowly, please refer to paragraph *Reset to factory defaults* on page 25.
3. Connect the LAN connector to the internet modem or other network appliance using the provided network cable. The network connector rectangular green link LED lights continuously to indicate that there is a network link. The network connector rectangular yellow LED blinks occasionally to indicate network activity.





Configuration with the Windows configuration wizard

In order to ease the network configuration, a network configuration wizard tool for Windows is provided. This wizard automatically assigns an IP address to the YouLess after stepping through a few wizard screens.



The configuration wizard does not install any software on your PC and does not apply any changes to your PC. The wizard is run only once and therefore does not need to be installed. The sole purpose of this utility is to make the network configuration easier.

Requirements

The following elements are required:

- The wizard executable file *YouLess-config.exe*. This utility can be downloaded from the YouLess site <http://www.youless.net>
- A Windows XP/Vista/7/8 PC with a network connection (wired or wireless).
- The configuration wizard must run with Administrator privileges. Windows will automatically ask for permission for elevated execution privileges.



The configuration wizard requires Administrator privileges only to access certain network functions needed to configure the YouLess.

- Any firewall software should preferably be disabled while running the configuration wizard.



Firewall software might obstruct the configuration wizard. Therefore, it is recommended to temporarily disable firewall software while running the configuration wizard.

Configuration wizard

De YouLess network settings can be configured using the configuration wizard:

1. On the Windows PC, run *YouLess-config.exe*. Click “Next” after the welcome screen.
2. Make sure that the YouLess is powered and connect the YouLess to the local network. Click “Next” to proceed.



- In the first screen, enter the last two combinations of the YouLess serial number. These two combinations can be found on the back of the YouLess device. Click "Next" to continue.



- On the next screen, select the network adapter from the drop down list which connects the PC to the home network. Most computers will have one (fixed) or two (fixed + wireless) network adapters. The wireless adapter can usually be recognized by the name (WiFi or Wireless). If the wireless network has the same IP numbering as the wired network, then both types of adapters can be selected for the purpose of configuration. If however these networks are different, then the wired network adapter must be selected.
- After the network adapter is selected, the associated network numbering topology of the network is automatically detected and an appropriate IP address for the YouLess will be suggested. Optionally, an alternative IP address may be entered. Click "Configure" to start the configuration process.
- The wizard will now show the progress of the YouLess configuration process. Finally, on the last screen a hyperlink to the YouLess will be shown. Click on this hyperlink to browse the YouLess web interface.



It is recommended to make note of the assigned IP address and / or create a bookmark in the browser. This IP address is needed to access the YouLess with browsers, apps and widgets.



Manual network configuration

It is preferable to use the configuration wizard as this will quickly and easily take care of the network configuration. However, the network configuration can be also be done manually without using the configuration wizard.

For this purpose, the network settings of the (Windows, Mac, Linux, ...) computer, with which the YouLess network setting is to be configured, will have to be temporarily altered according to the following generic steps:

1. Connect the YouLess to the local network as described on page 8. Make sure that the computer with which the YouLess is to be configured is also connected with this local network, preferably with a fixed network cable.



In rare cases it is possible that the modemrouter blocks communications with these altered network settings. In such a situation, the YouLess can be connected directly with the computer using the provided network cable. The computer network adapter should support Auto MDI / MDI-X for this to work. For modern computers, this is usually the case.

2. Change the network settings of the computer so that the IP address of that computer is set up with a netmask of 255.255.255.0 and an IP address of 10.10.10.11. If you are using Mac OS X, refer to the next paragraph for a more specific guide.
3. Use a browser to navigate to <http://10.10.10.10>. This is the YouLess factory default IP address.
4. Select the "Network" menu in the YouLess web interface and enter an IP address for the YouLess that matches the network numbering topology (refer to paragraph *Network*, page 18). For example, 192.168.1.14 could be used in the situation where addresses on the local network begin with the three numbers 192, 168 and 1.
5. Enter the gateway IP address (the LAN IP address of the modemrouter) in the Gateway field. This could for example be 192.168.1.1 or 192.168.1.254.
6. Restore the computer network settings to the original settings and then navigate with a browser to the IP address that was set in step 3 to verify that the IP configuration works correctly.



It is recommended to make note of the assigned IP address and / or create a bookmark in the browser. This IP address is needed to access the YouLess with browsers, apps and widgets.



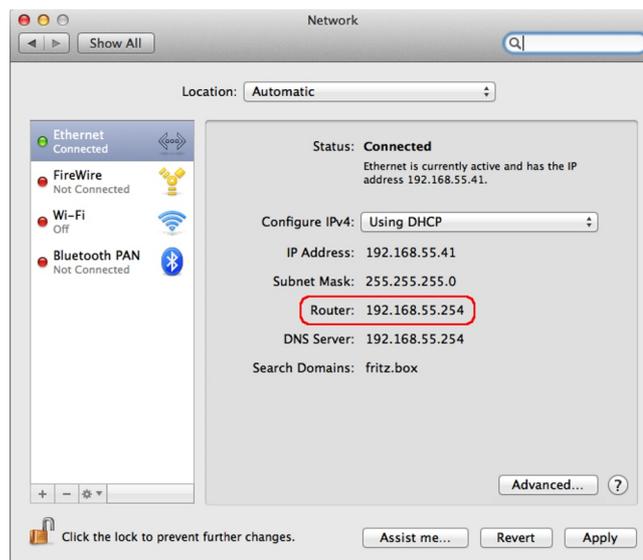
Manual network configuration on Mac OS X

Since the configuration wizard does not run on OS X, step 2 and step 5 of the generic manual configuration guidelines are made more specific for this particular operating system in this paragraph. With regard to the other steps, the generic steps described in the previous paragraph can be followed.

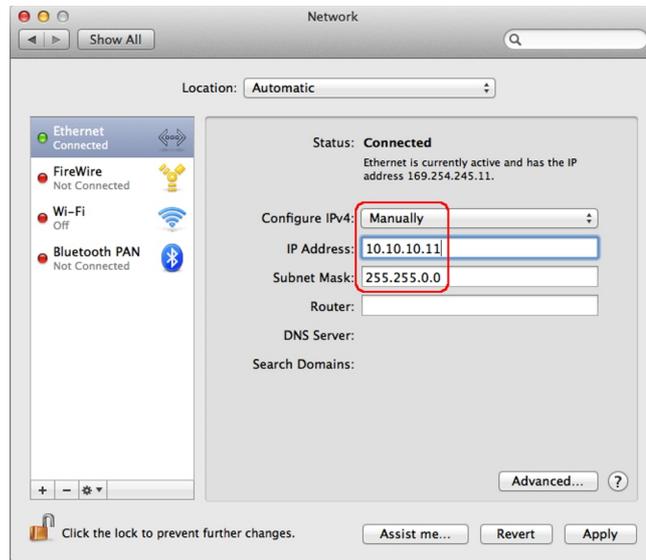
- Step 2a: Open the *System preferences* window and select *Network*.



- Step 2b: In the list to the left, select the network adapter with which the computer is connected to the local network. If this connection is established with a fixed network cable, then this will be the *Ethernet* adapter. Make note of the *Router* IP address (encircled in red in the figure below), as this will be needed in step 5 of the generic guide.



- Step 2c: From the *Configure IPv4* drop-down, choose *Manually*. Enter the IP address 10.10.10.11 in the IP address field. The subnet mask can remain set to the default value 255.255.0.0



- Continue with the generic guide steps 3 to 6 from the previous paragraph. In step 4 of the generic guide, the router IP address listed in step 2b is needed. In order to obtain a suitable IP address for the YouLess device, replace the last digit of this router address with `.14` (or an other available address) and enter this as the device IP address. In step 5 of the generic guide, the router address from step 2b can be entered as gateway address. Restore the computer network settings in step 6 by selecting *Using DHCP* in the *Configure IPv4* drop-down.



Network configuration on Linux

Linux users can configure the YouLess network interface by entering the following commands in a shell:

```
sudo arp -s <ip> 72:b8:ad:14:yy:zz
```

```
ping <ip>
```

Where `<ip>` is the IP address that is to be assigned, and `:yy:zz` matches the last 2 combinations of the device serial number. These 2 number combinations can be found on the back of the YouLess.

On success, the ping command will return without an error return value (in other words, the ping succeeds). Also, the YouLess status LED will stop blinking.

The newly set IP address can now be navigated to with a browser. Select the “Network” menu in the web interface, and enter the gateway IP address as described in paragraph *Network* on page 18.

Meter settings

For a proper configuration of the YouLess, the electricity meter type and meter constant need to be configured as well. Configure these parameters before starting the physical installation of the YouLess on the electricity meter, according to the instructions given in paragraph *Electricity meter* on page 19.

Physical installation on the electricity meter

The YouLess is fitted with an adhesive strip on the back of the device. An identical separate adhesive strip is included, which has to be put on the electricity meter. The YouLess can then be attached by simply "clicking" it on the electricity meter. If needed, the YouLess can just as easily be detached from the meter as well.

Positioning

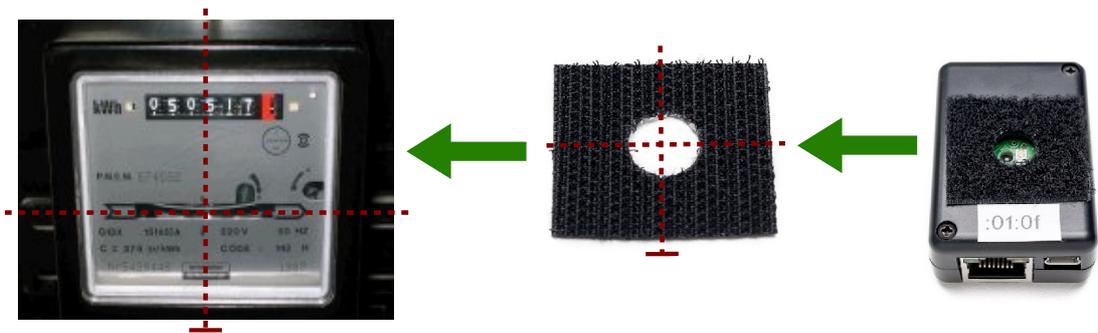
Clean the surface of the electricity meter to ensure optimal adhesion to the meter.

Remove the cover film of the separate adhesive strip, and put the strip on the meter according to the directions provided below.

Analog meter

On analog meters (rotating disc) the YouLess detects the movement of the black or red marking on the metal disc. Every time the marking comes into view, a measurement pulse is registered.

Put the adhesive strip on the meter in such a way, that the middle of the hole in the strip is aligned with the middle of the rotating disc.



Subsequently, attach the YouLess on the meter by aligning the strip on the meter with the strip on the YouLess. Preferably, the connectors of the YouLess will be pointing downwards.

A method of achieving correct alignment, is to keep the red light beam focused on the disc center. Keep an eye on the red light dot, while looking at it sideways. Now move the Youless ever closer to the meter while keeping the red light dot on the disc center, until finally the YouLess is in position.

On the front of the YouLess, a dotted horizontal line is visible. This line should align with the rotating disc horizontal plane.

The alignment should be done quite precisely. The YouLess has a built-in alignment help function to aid in fine-tuning the alignment.



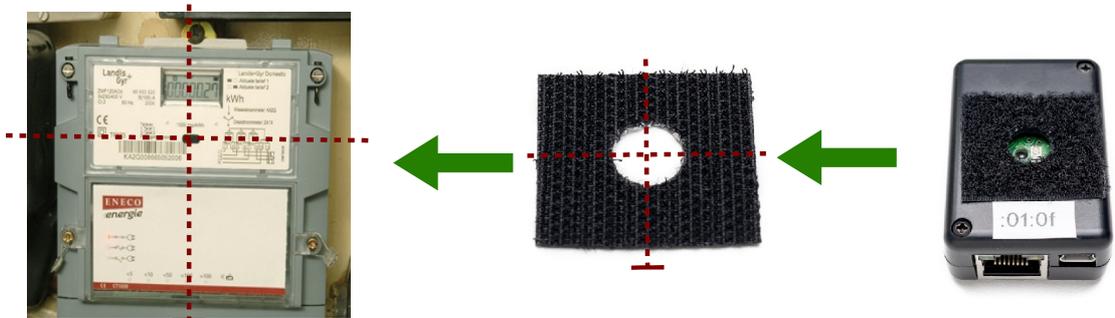
In order to use the alignment aid, the YouLess meter configuration setting must be set to the *Analog* meter type. Refer to paragraph *Meter* for this configuration setting.

When the YouLess is powered, but not yet connected to the local network, the yellow LED in the ethernet connector functions as an alignment indicator. The faster the LED is blinking, the higher the sensor input level of reflected light is. When fine-tuning to the last millimeter, a higher input level is indicative for a better alignment with the metal disc.

Digital meter

On digital meters, the YouLess detects measurement pulses coming from a visible or invisible (infrared) LED on the electricity meter. Whenever this LED flashes, a measurement pulse is recorded.

Locate the pulse LED position on the meter. Digital meter often have multiple LEDs. The pulse LED can be recognized by the meter constant which is usually printed near to it, e.g. "1000 Imp/kWh" or "500 Imp/kWh". Put the adhesive strip on the meter in such a way that the pulse LED can be seen through the hole in the strip.



Subsequently, attach the YouLess on the meter by aligning the strip on the meter with the strip on the YouLess. Preferably, the connectors of the YouLess will be pointing downwards.

Verification

After the YouLess has been attached on the meter, the correct positioning can be verified and perhaps adjusted if necessary. The latter is especially of importance with analog meters.



The meter type and the meter constant have to be already configured in the YouLess, according to the instructions in paragraph *Meter* in order to verify the positioning.



It is recommended that the power consumption level is not too low during the verification, so that pulse detections occur frequently enough to quickly verify the correct positioning.

Whenever the black or red marking on the rotating disc (analog meter) comes into view, or the pulse LED (digital meter) gives a measurement pulse, the YouLess status LED will briefly flash to indicate the pulse detection. With analog meters, it can take a minute or two before the YouLess has adjusted the detection algorithm to the lighting conditions.

The detection of a measuring pulse can also be seen on the *Home* page of the YouLess web interface.

Each time a pulse is detected, this is briefly indicated by a dot behind the *Sensor signal* value. The kWh counter is then increased. The YouLess kWh value does not necessarily have to be the same value as the kWh of the meter itself, but it should increase in value synchronously with the kWh value on the meter.

The screenshot shows the 'Home' page of the YouLess web interface. It features a navigation menu with 'Home' and 'Overview' highlighted. The main content area displays the following information:

- Model:** LS110
- Firmware version:** 1.2.0.EN
- Meter reading:** 3629,137 kWh — Meter kWh value is increased
- Power:** 288 Watt
- Sensor signal:** 101% • — Pulse detection is indicated with a dot
- Upload:** OK (05)

At the bottom, there is a 'Help' link.

Analog meter

On analog meters, the YouLess shines light on the rotating disc. The *Sensor signal* value gives the average level of reflected light that falls on the detector. For optimal detection this value should preferably lie between 6% and 80%.

Each time a pulse is detected, this is briefly indicated by a dot behind the *Sensor signal* value. The *Sensor signal* value shown during that time, gives the level of reflected light during the pulse detection, as opposed to the average level which is normally given. Because the black/red marking on the disc attenuates the light reflection, this value will be lower than the average value. For a reliable detection the *Sensor signal* level during a pulse detection should be at least about 40% lower than the average level normally given. When the *Sensor signal* level becomes too high (far in excess of 80%) it is possible that the 40% drop cannot be achieved because of signal saturation. It is recommended to alter the positioning in such cases in order to establish a lower average signal level.

In case of doubt regarding the positioning of the YouLess, one can also monitor the *Sensor signal* level while moving the YouLess until a correct *Sensor signal* level is found. Since the *Sensor signal* value is averaged over a longer period of time, this should be done slowly. Alternatively, the alignment aid can be used as described in paragraph *Analog meter*, page 14.

Digital meter

Each time a pulse is detected, the *Sensor signal* value gives the light intensity level of the measured pulse. This level should preferably be around 100% and in any case should be at least 70% for a reliable detection.

Web browser interface

The YouLess web interface can be accessed with any web browser such as Internet Explorer, Firefox, Safari, Chrome, etc. Enter the YouLess IP address in the browser address field (See page 8) while being connected to the local network.



Besides the standard web interface HTTP port 80, the YouLess is also accessible on port 32848, 16464 and 49232. These alternative ports are useful in port forwarding setups when the modemrouter is unable to translate port X to port Y, limiting the number of devices that can be accessed on port 80 to one.

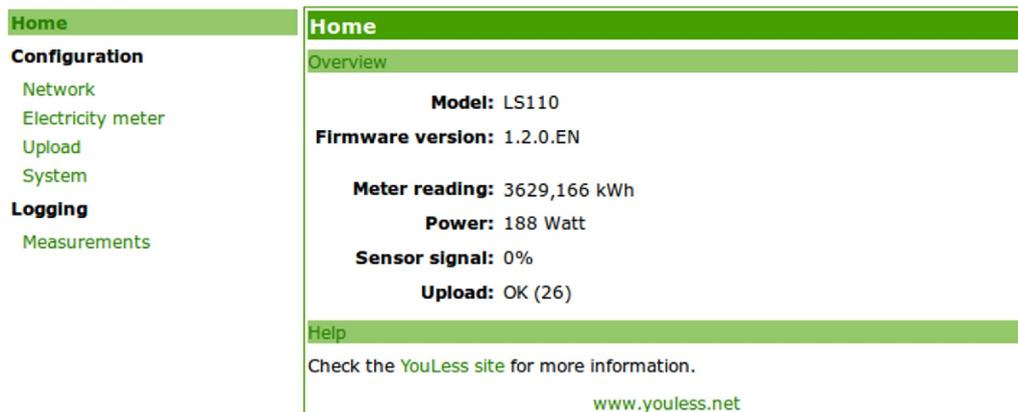
In this chapter the functionality of the various web pages are documented.

Overview

The YouLess web pages consist of a menu part to the left and the selected menu screen on the right.



YouLess energy monitor



On the *Home* page, current version and status information is shown.

The menu group *configuration* groups the pages with which various YouLess settings can be configured.

In the menu group *Logging*, reports can be generated based on historical measurements that have been logged in the internal memory of the YouLess.

In the next paragraphs, these pages are further detailed with regard to their functionality.

Home

On the *Home* page, the following fixed identification information is presented:

- **Model:** YouLess device type specification
- **Firmware:** Version of the firmware loaded in the YouLess

Also, the following dynamic information is presented on this page:

- **Meter reading:** The current YouLess internal kWh meter counter. This counter value does not necessarily have to be equal to the reading of the electricity meter itself (see also paragraph *Electricity meter*, page 19).
On each pulse detection, the reading value is incremented.



After a power outage, the YouLess meter reading will be preserved with a resolution of one tenth of a kWh. If for example the meter reading were to be 3629,123 kWh prior to the outage, the meter reading after the outage would be 3629,100 kWh.

- **Power:** Current power consumption in Watt.
On each pulse detection, this power value is calculated again and automatically updated on this page.
- **Sensor signal:** The average light intensity level measured by the YouLess sensor eye. For a digital meter, this value will be 0% most of the time. On each measurement pulse detected, this value will briefly be near 100%.
For analog meters, the average light intensity level of the light being reflected by the rotating disc's edge is measured.
Whenever a measurement pulse is detected, a dot will be visible briefly after the intensity level value (see also paragraph *Verification*, page 15) in both analog and digital mode.
- **Upload:** In case the YouLess is configured to send measurement data to an online energy manager service, the upload status is shown here. If the most recent upload was successful, then the status will be *OK*. Between parentheses, a countdown in seconds till the next upload is shown. If there was no successful update during a longer period of time, or if no upload is configured, an asterisk (*) is shown. If an explicit error is returned by the online service, then the (HTTP) error code is shown between parenthesis.

Configuration

Network

The network settings of the YouLess can be configured on the *Network* page.



If the configuration wizard was used during the YouLess installation, then the network settings have already been configured correctly by the configuration wizard.

The ethernet hardware address (MAC address) of the YouLess can be found on this page. This is a unique identification number, which is also the device serial number of the YouLess. This number cannot be altered. The first 4 MAC address number combinations for YouLess model LS110 are fixed to 72:b8:ad:14. The last 2 number combinations are variable; these numbers are also printed on the back of the device.

Home

Configuration

Network

Electricity meter

Upload

System

Logging

Measurements

Network

Addresses

MAC Address: 72:b8:ad:14:0a:00

IP Address:

Gateway Address:

www.youless.net

On this page, the following settings can be configured:

- **IP Address:** The YouLess local network IP address. This address must be unique on the local network.
- **Gateway Address:** The IP address of the internet modem (router) on the local network. This modem (router) provides YouLess with access to the internet. Over the internet, the YouLess can synchronize time and optionally upload measurement data to a cloud based energy management service.

Click on the **Save** button to save the settings in the YouLess non-volatile memory. On incorrect input, the input is rejected and the old settings remain active.

If the configured gateway address was not found on the local network, an asterisk (*) will appear behind the gateway field. If the address was found on the network, but the YouLess could not access the internet (DNS), a cross (X) will appear behind the gateway field. If needed, refresh the displayed status by pressing the F5 key to reload the page.

Electricity meter

On the *Electricity Meter* page, the properties of the electricity meter can be configured.

Home

Configuration

Network

Electricity meter

Upload

System

Logging

Measurements

Electricity meter

Settings

Meter type: Digital (LED)
 Analog (rotating disc)

Meter reading:

Pulses/kWh:

www.youless.net

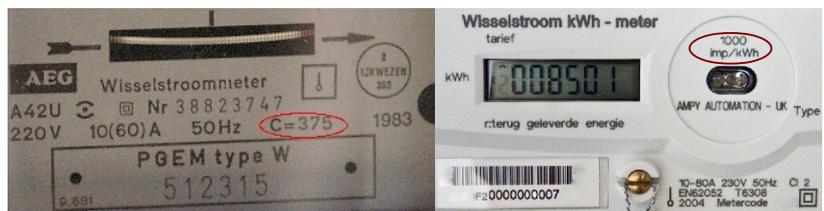
The following meter properties must be configured correctly for the YouLess to operate properly:

- **Meter type:** In chapter *Physical installation on the electricity meter* (page 14) a description is given of how the meter type (analog or digital) can be determined. In this setting, the correct meter type can be configured. On an analog meter, the YouLess will use a LED on the bottom of the device, with which the rotating disc is illuminated.
- **Meter reading:** The YouLess keeps track of the kWh total with an internal kWh counter. This value can, but does not need to be the same as the counter of the electricity meter. Both counters will however increment synchronously, with the difference remaining constant. For single rate meters it is possible to let both counters run fully synchronized with the values being equal. For this purpose, the kWh counter value of the meter can be read of the meter and then entered in this field. The check-box must be checked first in order to enable setting the kWh counter value. For double rate meters, the two counter values could be added and this sum could be entered in this field. The YouLess then runs synchronously with sum of the two counter values.



If the YouLess has been binded with a cloud energy management service, a manual change in the meter reading will influence the analysis of the energy management service on the uploaded data; the manual change will appear as a real change.

- **Pulses/kWh:** The number of measurement pulses (the number of times a pulse LED will flash on a digital meter or the number of times the marking on the rotating disc passes by on an analog meter) that the electricity meter gives per kWh of electric energy, is an important configuration setting for the YouLess. This meter constant varies depending on the electricity meter model and is printed on the front of the electricity meter.



The presentation format of this meter constant may differ per model. Some common presentation formats are:

- C=, a=, A=
- Imp/kWh, omw/kWh, p/kWh, r/kWh, tr/kWh, U/kWh,

In rare cases, the “reverse” value may be presented on the meter, i.e. Wh/imp. In such case, the parameter value will be a low number (less or slightly above 1). Divide 1000 by this value in order to obtain the *Pulses/kWh* parameter value.

If the meter constant is named A or a (instead of C), then the constant is expressed in kilowattminutes. This value must be multiplied with 60 in order to obtain the *Pulses/kWh* value.

Common values for the meter constant are 375, 600 and 1000, but there are many other possibilities. The YouLess will accept all values ranging from 1 till 10000.

Click on the **Save** button to save the settings in the YouLess non-volatile memory. On incorrect input, the input is rejected and the old settings remain active.

On analog electricity meters, the rotating disc is illuminated with a regular or high illumination level. This illumination level is determined automatically. When the illumination level is high, a plus (+) sign is made visible behind the *pulses/kWh* configuration field.

Upload

The YouLess can upload measurement data to a cloud based energy management service that provides insights in energy usage patterns. Once binded with the service, the YouLess uploads meter reading updates to the online service at regular time intervals, which stores the data in a personal account. This data can be used by the service to create visualizations and reports about the recorded energy use (see chapter Information sources, page 30).

With the standard firmware, the YouLess can be binded with the free online energy manager *Bidgely*. This paragraph describes the binding (or upload activation) procedure with *Bidgely*. If an alternative firmware is loaded in the YouLess, which binds with another online service, then the procedure will be similar. After completion of the procedure, the YouLess will have authorization to upload measurement data to a personal *Bidgely* account. The upload will be “activated”.



Electricity consumption data is personal data. If you make use of an online service, your personal energy consumption data is stored by this service. Online services with which YouLess can bind are not part of YouLess. Please refer to the privacy statement of *Bidgely* on <http://www.bidgely.com/security>, which states that *Bidgely* does not share any personal information with any third party.

In order to be able to upload data to Bidgely, a personal *Bidgely* account needs to be created first. Register for an account on <http://www.bidgely.com> by clicking on the “Sign Up” button. After registration, you will be able to access your personal “Energy Dashboard” with a personal username and password.

Initially, when the upload is not yet activated, the *Upload* page looks as follows:

YOULESS YouLess energy monitor

Home
Configuration
 Network
 Electricity meter
 Upload
 System
Logging
 Measurements

Upload
Bidgely
Status: Not activated
Activate: Bidgely activate upload
www.youless.net

After clicking the “*activate binding*” link, a new browser tab will be opened displaying the *Bidgely* device binding page.

Thank You for selecting Bidgely as your Home Energy Management Provider.

Your Device Manufacturer: YouLess

Your Device Model: LS110

Your Device ID: 72b8ad140a00

Activation Token: fd6335d9236da39a

Please click on the button below to register your device with Bidgely

Register Device

Click the “*Register Device*” button to activate the device binding with *Bidgely*. You will be redirected to the YouLess *Upload* page after clicking this button. If the activation was successful, the *Upload* page will now look as follows:

<ul style="list-style-type: none"> Home Configuration Network Electricity meter Upload System Logging Measurements 	<div style="border: 1px solid green; padding: 5px;"> <div style="background-color: #4CAF50; color: white; padding: 2px;">Upload</div> <div style="background-color: #e8f5e9; padding: 2px;">Bidgely</div> <p>Status: Activated</p> <p>Token: a0d441a0dd56b7eb</p> <p>Deactivate: Bidgely deactivate upload</p> <p style="text-align: center;">Check your consumption on Bidgely</p> <p style="text-align: center;">www.youless.net</p> </div>
-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

The status has now been changed to “*Activated*”. The *Token* field shows the device token generated by *Bidgely*, which gives the YouLess authorization to upload measurement data to your *Bidgely* account.

On the *home* page, the upload of data can be verified by checking the Upload field (see paragraph *Home*, page 17). The upload starts within a minute after activation. On the *Bidgely* energy dashboard, the upload status can be verified as well by checking the “*Real time energy demand*” widget or the “*My Profile->Energy Monitor Setup*” menu.

By clicking the link “*Bidgely deactivate upload*”, the activation will be undone. After deactivation, the YouLess will stop sending measurement data to *Bidgely*.

At any time, the upload can be activated again in the same way as before by following the activation steps again. Typically, a new *Token* value will be assigned when the binding is activated once again. New measurement data will be added to the existing data that was uploaded before. A data “gap” will however exist in the time period during which the upload was deactivated. In this period the average power usage will be visible as a flat line in the graph. That is to say, there will be no detail information, but the total usage will still be correct.

For documentation regarding the online services to which the YouLess can bind, refer to the concerning online services. See also chapter Information sources, page 30.

System

General system settings can be configured on the *System* page.

The YouLess synchronizes the internal clock over the internet. This time is relevant for the internal log functionality and for the optional upload to a online energy management service.

A periodic time synchronization occurs automatically when an internet connection is available to the YouLess, but if needed, an immediate synchronization can be requested by clicking the “Synchronize now” link. In case a time synchronization was not executed successfully (yet), an asterisk (*) is displayed behind the indicated time.

The internal time can also be set manually in case no internet connectivity is available. Use the arrows to set the correct time.



After a power failure, the last known clock time will be preserved with 10 minute accuracy. If for example the power failure occurs at 16:23, then the time after device reboot will be 16:20. If internet connectivity is available, the correct time will be set automatically very shortly after the reboot. Without internet connectivity, a manual correction of the time will be necessary after the reboot.

Optionally, access to the YouLess web interface can be password protected. Enter a password in the *Password* field and click on the *Save* button.



The password string length is limited to a maximum of 21 characters and must consist of alphanumerical characters and/or the characters `- _ ~`.

After setting the password, a session password will be requested when accessing the YouLess web interface, unless the password string is empty.

In case the password is forgotten, the password can be erased with the (partial) reset to factory defaults procedure (see paragraph *Reset to factory defaults*, page 25).

Logging

Measurements

The YouLess has an internal log for measurement data. However, because of a limited memory capacity the internal log resolution is lower than the resolution of an online service. Still, the internal log resolution is sufficient to gain insight in energy usage patterns.

De internal log is intended for use cases where no internet connectivity is available, or when it is undesired to store private energy usage data with a third party. Furthermore, the internal log serves as data cache for software applications such as apps and widgets.



For the internal log function, the YouLess internal clock must be set with the correct time. See also the previous paragraph *System*.

The *Reports* page provides a selection of reports for different time scales. After selecting one of these reports, a tabular report with timestamps and the corresponding recorded values will be presented.

Usage (Watt)
05:20 390
05:30 252
05:40 228
05:50 294
06:00 288
06:10 306
06:20 330
06:30 345

In the example above, the average power usage between 6:00 en 6:10 equals 288 Watt.

Reports are available for the following time scale categories:

- **Year:** For each month of the year, a report can be chosen. The report list shows the measured daily energy use in the chosen month expressed in kWh. Up to a year of daily values are stored internally.
- **Week:** For each day report, a list is shown with the average hourly power use expressed in Watt. Hourly values are kept internally over the last week.
- **Dag:** For each 8 hours period, a report with the average power use per 10 minutes is expressed in Watt. 10 minute values are kept internally over the last 24 hours.
- **Uur:** For each half hour period, a report with the average power use per minute is expressed in Watt. Minute values are kept internally over the last hour.

Special functions

Special YouLess functions that are not often needed, are documented in this chapter.

Reset to factory defaults

The following data is stored in the YouLess non volatile memory:

- The current meter reading
- The current time
- Upload settings
- Network settings
- Web interface password (optional)
- Internal measurements log

In factory default condition, this memory is empty.

It is possible to completely erase the YouLess internal non volatile memory and thus to restore the factory default settings. This procedure is described in this paragraph.

As a less rigorous measure, it is also possible to only erase/reset a certain YouLess setting, namely the network IP address and/or the web interface password. This partial reset is intended for a situation in which the network settings or password are no longer known, but in which case it is undesirable to lose the meter reading and internal log values.

Generic procedure

For security reasons, the factory default reset procedure can be performed only when having physical access to the device. For this procedure, use is made of the fact that the YouLess network adapter can detect the presence of a network link. That is to say that the unplugging and subsequently plugging in of the network cable is interpreted as the pressing of a button. This operation needs to be repeated a specific number of times in order to give a certain reset signal. Before each repetition, wait first until the green rectangular LED in the network connector is on before unplugging the cable again.

This procedure can be described in more detail in the following steps:

1. Make sure the YouLess is powered and connected with the local network. The green rectangular LED in the YouLess network connector is on to indicate the presence of an ethernet network link.
2. Unplug the ethernet cable. The green rectangular LED in the YouLess network connector will be turned off immediately.
3. Plug in the ethernet cable again and wait until the green rectangular LED in the network connector is on again. This will usually take about a second.
4. Go back to step 2, unless the operation is executed the right number of times to give the desired reset signal (see next sub paragraph).

Specific procedure

Depending on the number of times the operation described in the previous sub paragraph is executed, a certain reset or restore signal is given to the YouLess:

- **3x:** The round green YouLess status LED will go on. If a password was set in the YouLess, then this password is erased. Access to the YouLess web interface is now possible without a password.
- **4x:** The round green YouLess status LED blinks slowly. The network settings have been reset. The YouLess network settings can be configured again using the network configuration wizard (see chapter *Network configuration*, page 8).
- **5x:** The round green YouLess status LED blinks very fast. The internal non-volatile memory is being erased. After all memory is erased, the YouLess will perform a reboot. The YouLess has now been reset to the factory default condition. The round green status LED blinks slowly to indicate that the network settings are not yet configured.

Note that erasing (part of) the non-volatile memory is a permanent and irreversible operation. That is to say that the erased information cannot be retrieved afterward.

Flashing firmware updates



It is possible to load new or alternative firmware versions in the YouLess over the network (flashing). A firmware version is made available by YouLess as an executable program (flash utility) that contains both the firmware image and the software program that performs the flash procedure. YouLess settings and the internal log memory are preserved after a firmware update.

Requirements

The following elements are required in order to be able to flash the YouLess firmware:

- The flash utility executable file *youless-flash-X.exe*. (X indicating the firmware version and/or variant).
Flash executables can be downloaded from the YouLess site on <http://www.youless.net>
- A Windows XP/Vista/7/8 PC with a network connection to the same local network with which the YouLess is also connected.
- The network connection is preferably wired and not wireless.
- If the YouLess is password protected, the password should be temporarily cleared.

Note: in principle, the YouLess can also be flashed when password protected, however the so called *blind flash* variant of the procedure must then be used (see *Blind flashing* on page 28).

- If firewall or virusscan software is active, then this software should preferably be disabled temporarily during the flash procedure.



Firewall and virusscan software might obstruct the flash utility. Therefore, it is recommended to temporarily disable firewall and virus scanner software while running the configuration wizard.

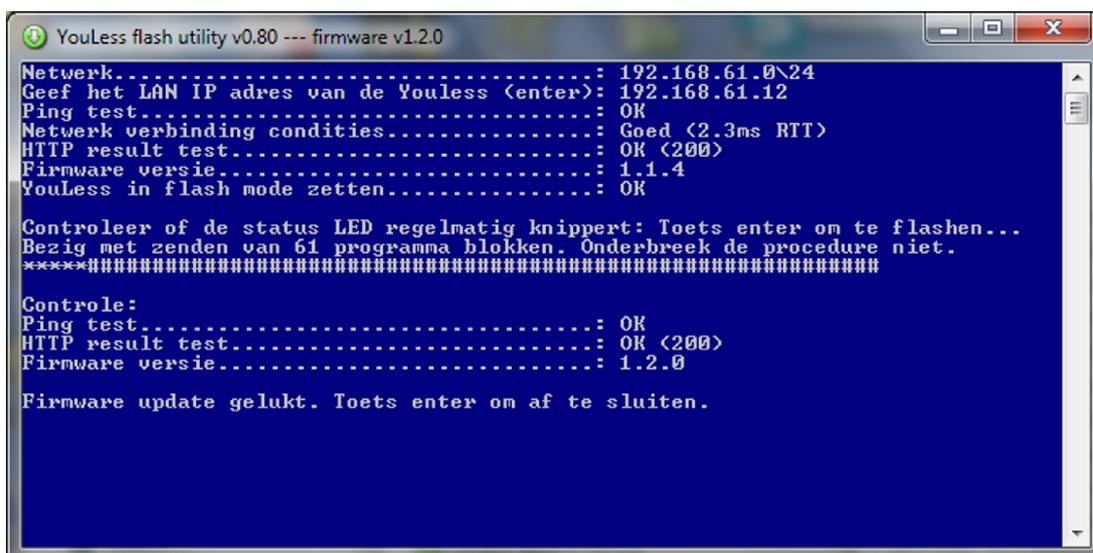
Alternatively, it is also possible to flash the YouLess firmware using a direct ethernet cable connection between the computer and the YouLess (see paragraph *Flashing with a direct*

ethernet cable connection on page 28).

Flash procedure

The firmware flash procedure is performed by following the steps described below:

1. Execute the executable file *youless-flash-X.exe* on a Windows PC. Press the enter key after reading the initial information shown.
2. The flash utility will detect the local network numbering topology and will ask for the YouLess IP address. Enter this address and press the enter key.
Since the YouLess must be on the same local network as the computer being used to run the flash utility, the entered IP address is required to be a local network address.
3. The flash utility will perform a number of checks on the YouLess and the network conditions. When all checks are passed, the YouLess will be put in *flash mode* by the flash utility. The round green status LED of the YouLess will be blinking in flash mode with a pattern of half a second on and half a second off. Verify that the YouLess is in flash mode by checking the status LED, and then press the enter key to start the flash procedure.
4. The duration of the actual loading / flashing is about half a minute. During flashing, a progress bar shows the progress. The YouLess status LED blinks a bit faster than before while flashing. This flash phase should *not* be interrupted.
5. After all firmware blocks are sent, a verification is performed. The flash utility will report success when this verification test is passed. If for some reason the flash procedure has failed, for instance because of an interruption or some other cause, then the flash utility will recommend to retry the flash procedure (see paragraph *Blind flashing* on page 28).



```
YouLess flash utility v0.80 --- firmware v1.2.0
Netwerk.....: 192.168.61.0\24
Geef het LAN IP adres van de Youless <enter>: 192.168.61.12
Ping test.....: OK
Netwerk verbinding condities.....: Goed <2.3ms RTT>
HTTP result test.....: OK <200>
Firmware versie.....: 1.1.4
Youless in flash mode zetten.....: OK

Controleer of de status LED regelmatig knippert: Toets enter om te flashen...
Bezig met zenden van 61 programma blokken. Onderbreek de procedure niet.
*****#*****

Controle:
Ping test.....: OK
HTTP result test.....: OK <200>
Firmware versie.....: 1.2.0

Firmware update gelukt. Toets enter om af te sluiten.
```

If the flash utility does not succeed in bringing the YouLess in flash mode, then this may be caused by:

- A virus scanner and/or firewall software (notably Avast)
- A network with a managed switch which uses VLAN tagging. Generally this is not used in household networks, but it may be encountered in professional networks.

In the last case, the alternative direct cable flash procedure can be used (see paragraph *Blind flashing* on page 28).

Blind flashing

Blind flashing is a variant on the flash procedure described previously. This variant is called blind because the flash utility:

- cannot perform checks before flashing.
- cannot bring the YouLess in flash mode.

The flash utility will revert to tot blind flashing if one of the following situations is applicable:

- The YouLess is password protected.
- The YouLess is connected with the computer with a direct ethernet cable connection.
- The YouLess is no longer accessible on the network after a previous flash attempt was not successful.

If these cases, the flash utility will ask for the YouLess to be put in flash mode manually by interrupting the power supply through the USB cable. After this interruption the YouLess status LED will start blinking to indicate that the YouLess is in flash mode.

Note: The Youless will enter flash mode after power interruption only when at the same time the flash utility is running and requesting the power interruption.

The remainder of the blind flash procedure is the same as described in point 4 of the previous paragraph. The flash utility cannot verify the flash result when the YouLess is password protected or when it is connected to the computer with a direct cable connection. In these cases, the end result should be verified by using the YouLess in normal operation again.

Flashing with a direct ethernet cable connection

Flashing the YouLess on the network/location where it is situated during normal operation is usually the most convenient choice. However, it is also possible to flash the YouLess by connecting a direct cable connection (without using network equipment) to the computer running the flash utility.

An advantage of using a direct cable connection is that the chance on network interferences are minimized. However, the disadvantage is that the YouLess is not flashed while being connected to the same network as during normal operation, and that the flash utility will not be able to verify the end result.

In order to be able to flash with a direct ethernet connection, the computer running the flash utility must:

- have a wired ethernet connector that supports *Auto MDI/MDX*. Modern computers almost always have *Auto MDI/MDX* support.
- The IP address settings of the ethernet port are set to “automatically obtain an IP address” (DHCP). Especially for portable computers, this is usually the case.

The flash utility will detect the direct cable connection situation and revert to *blind flashing* as described in the previous paragraph.

Troubleshooting



The flash procedure can always be retried. The YouLess cannot get into a state in which it needs special operations in order to be revived (cannot be bricked). It is possible though that the firmware does not operate properly afterwards when the first flash attempt is not successful, but the solution to this is simply to retry the flash procedure.

Upon encountering problems, check whether the requirements listed on page 26 are met. Use a wired ethernet connection tot the network if the WiFi signal strength is poor.

When a flash attempt did not succeed, a retry attempt can be made, if needed following the *blind flashing* procedure.

When encountering persistent problems, try the *direct cable connection* variant of the procedure or try using another computer to run the flash utility on.

Information sources

Information sources are listed below:

YouLess website

On the YouLess website, the latest version of this document can be found. Besides this user manual other useful information sources can be found here. For more information, refer to <http://www.youless.net>.

Bidgely

Bidgely is a free online energy management service by *MyEnerSave Inc.* This service has a focus on energy consumption analysis and the reduction of this consumption. With the regular firmware, the YouLess can upload energy usage information to this service. For more information, refer to <http://www.bidgely.com/>.

PVOutput

PVOutput is a free online service focusing on monitoring, sharing and comparing of generated solar energy. With the PVOutput firmware, the YouLess can upload generated energy information to this service. For more information, refer to <http://www.pvoutput.org/>.

Solar-Yield

Solar-Yield is a free online service focusing on monitoring, sharing and comparing of generated solar energy. With all firmware versions, Solar-Yield can auto-fetch daily generated solar outputs from the YouLess provided that the YouLess is accessible from the internet. For more information, refer to <http://www.solar-yield.eu/>.

Technical Specifications

Algemeen	
Model	YouLess LS100
Dimensions	53x37x20 mm
Weight	25 gram
Power supply	5.0 Volt DC
Power supply connector	USB mini-B
Consumed power	0.8 Watt
LAN	IEEE 802.3 10BASE-T half duplex
LEDs	ethernet Link (green), ethernet Act (yellow), YouLess status (green)
Temperature (storage)	-25 – 75 °C
Temperature (operational)	0 – 40 °C
Relative humidity	10 – 90 % (non condensing)
Color	black
kWh measurement accuracy	Equal to the electricity meter accuracy when the YouLess is installed properly
Calculation of power on analog electricity meters	
Accuracy power calculation	2%
Minimal detectable power	5 Watt ¹
Maximal detectable power	25 kWatt
Calculation of power on digital electricity meters	
Accuracy power calculation	0,5%
Minimal detectable power	1 Watt
Maximal detectable power	25 kWatt
Internal log ²	
Rounding error internal log	1-2%
Maximal internal log periode	1 jaar
Life length log memory	7 jaar ³
Protocols	
Management	HTTP webinterface
Interfaces	JSON interface, Bidgely API, PVOutput API

¹ With a meter constant of 475 imp/kWh

² These limits are only applicable to the internal memory capacity of the YouLess. In combination with external energy management services or software, these limits do not apply.

³ With an average yearly usage of 3500 kWh

Safety and warranty

Safety information

The following safety measures must be observed during the use of the YouLess:

- Install and use the YouLess according to the instructions as described in the applicable documentation.
- Do not use the YouLess or any of the included components like the power supply, if these are damaged.
- Do not expose the YouLess to high temperatures, strong sunlight or high humidity (see chapter *Technical Specifications*, page 31).
- Do not bring the YouLess or any of the included components like the power supply in direct contact with water or any other liquid.
- Do not open the enclosure of the YouLess.

Maintenance

The YouLess does not require any specific maintenance. For cleaning of the YouLess enclosure, a slightly damp cloth can be used. Make sure that the YouLess is not powered during this cleaning. Only restore power when the YouLess surface is completely dry.

Warranty

Great care is taken into producing and testing each YouLess device. Should there be a defect despite all taken precautions, then customers are entitled to a manufacturer's warranty period of 24 months after purchase. This warranty is valid for the complete product, including the included power supply and cables.

All other liabilities, including consequential damages, are excluded. Post Fossil B.V. can not be held responsible or liable for any action, result, or damage caused by illegal and / or improper use of the YouLess. In the appendix of this user manual a complete limitation of liability is included.

For customer support, please contact the support desk via the contact form on the YouLess website <http://www.youless.net> or through a reseller channel. Be sure to have the serial number at hand (which can be found on the back of the YouLess).

Conformity

PostFossil B.V. declares that the YouLess Energy Monitor is in accordance with the European EMC directive 2004/108/EG and is in accordance with the following harmonized norms:

- EN 55022
- EN 55024



Contact

YouLess is een a trade name and trademark of PostFossil B.V.

PostFossil B.V.

Zilvergracht 61

2652 HT Berkel en Rodenrijs

www.postfossil.nl

For customer support, the contact form on www.youless.net can be used.

Appendix

LIMITATION OF LIABILITY

TO THE EXTENT PERMITTED BY APPLICABLE LAW, POST FOSSIL BV AND ITS SUPPLIERS AND AUTHORIZED RESELLERS DON NOT ACCEPT ANY LIABILITY, WHETHER BASED IN CONTRACT OR TORT (INCLUDING NEGLIGENCE), FOR ANY INCIDENTAL, CONSEQUENTIAL, INDIRECT, SPECIAL, PUNITIVE OR PENALTY FEE ABOVE THE ACTUAL DAMAGE OR FOR LOSS OF REVENUE OR PROFITS, LOSS OF BUSINESS, LOSS OF INFORMATION OR DATA, OR OTHER FINANCIAL LOSS ARISING OUT OF OR IN CONNECTION WITH THE SALE, INSTALLATION, MAINTENANCE, USE, PERFORMANCE, FAILURE OR INTERRUPTION OF ITS PRODUCTS, EVEN IF POSTFOSSIL BV OR ITS AUTHORIZED RESELLER HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES, AND LIMITS ITS LIABILITY TO REPAIR, REPLACEMENT OR REFUND OF THE PURCHASE PRICE PAID, AND OTHER AT THE DISCRETION OF POSTFOSSIL BV. THIS LIMITATION OF LIABILITY FOR DAMAGES WILL BE EFFECTIVE EVEN IF A REMEDY SET FORTH IN THIS WARRANTY FAILS OF ITS ESSENTIAL PURPOSE.

SOFTWARE

The YouLess network configuration wizard tool for Windows has come about thanks to the NSIS system.

YouLess thanks Tuxgraphics for granting explicit van expliciete permission for the use of the Tuxgraphics IP stack under the LGPL licence.

YouLess thanks Jee Labs for making available the enormous wealth of knowledge, code and inspiration.

The YouLess contains a bootloader of which the source code is licenced under GPL. The source code of the bootloader can be obtained on request.

All rights on the YouLess application firmware are reserved.

All rights on the software gadgets, widgets, applications, apps and tools surrounding the YouLess product are reserved.

ELECTRONIC WASTE

(Applicable in the European Union and other European countries where separate waste collection is implemented)

This product and electronic accessories (power adapter, USB cable, network cable) should not be disposed of with other household waste at the end of their useful life.

To prevent possible harm to the environment or human health from uncontrolled waste disposal, this product and electronic equipment should be separated from

other types of waste in a responsible manner, thus promoting the sustainable reuse of material resources.

Users should contact the municipality where they live for information about how and where electronic waste can be disposed of for environmentally friendly recycling.