

Instructions

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www.pedallog.co.uk

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pedalog

the pedal power monitor

Overview:

The **pedalog** is a power and energy monitor specifically designed for use with pedal generators.

There are many pedal power generating devices around – for example: for recharging batteries, powering sound systems or cinemas.

pedalog has been specially designed to monitor the power and energy generated by these devices. Data can be collected and used to increase the educational value of pedal power demonstrations.

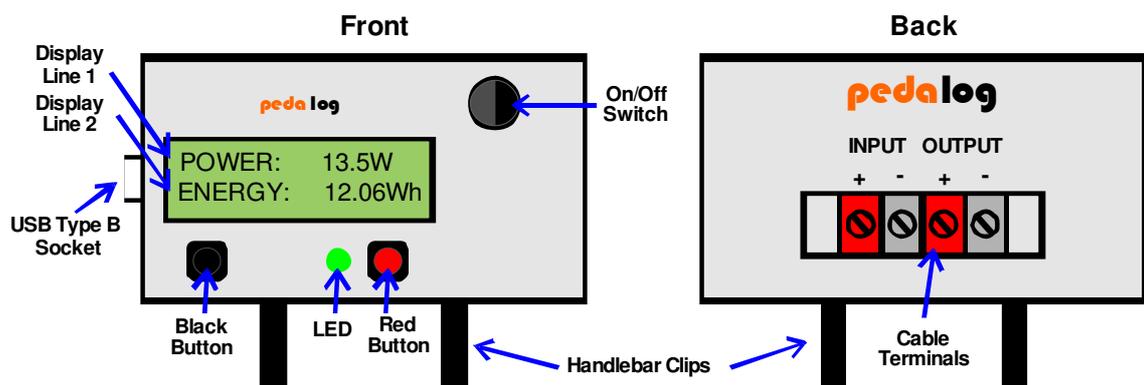
pedalog monitors power, energy, voltage, current, maximum power, average power and time taken by the user along with the potential money income from the energy generated. Information is displayed on an integral LCD screen.

The USB connection allows computer interfacing for data display and recording, either through the available software or to your own application.

Operational overview:

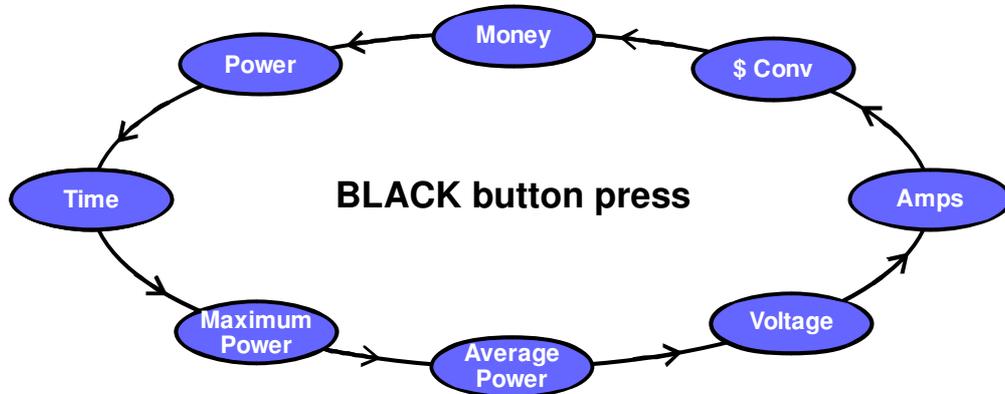
pedalog has been designed to show to the user how much instantaneous power and cumulative energy they have generated.

pedalog is designed to be easy to operate. There are three main switch: an On/Off switch, a red button and a black button.

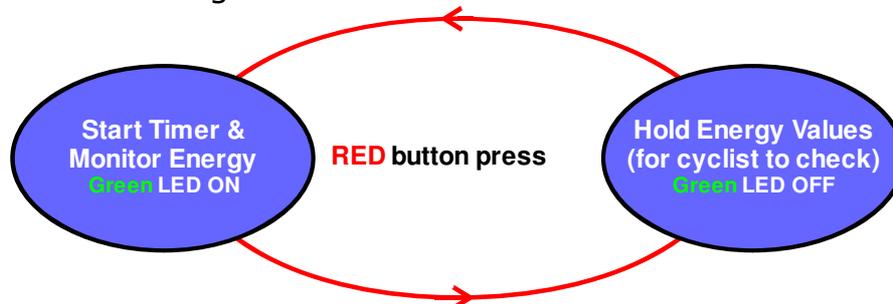


Start by switching on the on/off switch. The display should appear (with a back-light). This display should read 'MONEY:' on line 1 and 'ENERGY:' on line 2. The green LED will flash approximately once per second. The flashing LED is designed to inform the user that the unit is switched ON.

The **BLACK** button scrolls through the various parameters that can be displayed on the top row of the LCD screen. The bottom row will always display the energy generated. Keep pressing the button to get to the required value, as they are cyclical.



The cyclist starts by pressing the **RED** button. This starts the unit recording the energy and a timer will start to count up. The green LED will switch to being constantly ON. The user can then pedal and the instantaneous power and total energy generated will be displayed on the LCD screen. When the user has finished their time on the generator then they press the **RED** button again. This will hold the values so they can be recorded or explained. When the next user would like to have a go, they press the **RED** button and the unit will start again from zero.



The LCD backlight will switch on when any button is pressed once or if the input voltage level is greater than 10V. If no power is generated and no buttons pressed then the backlight will switch off after 30 seconds. Press any button to switch the LCD backlight back on.

The money display has been included to relate the energy generated to a day-to-day equivalent. The money display option shows the cost of the energy generated, with the energy is paid for at the money conversion value (" \$ conv"). The money display is in pence, i.e. a display of 1.00p is equivalent to £0.01 or a display of 0.01p is equivalent to £0.0001.

The money conversion value (" \$ conv") is the rate in pence per kilowatt-hour (p/kWh) at which the energy is paid for. This is typically set to 41.5p/kWh as that is close to the Feed-In-Tariff which the

government is paying for solar PV generated energy (when these instructions were written). You could set this to the amount you pay for your electricity in p/kWh, typically around 12-18p/kWh. This value can be adjusted from 0.0p to 999.5p in steps of 0.5p. To enter the adjustment mode you must first be displaying the "\$ conv" on the display. Then press both the RED and BLACK buttons at the same time. The screen will say "Adjust Mode". You can then use the RED and BLACK buttons to adjust the value up and down. Pressing both RED and BLACK at the same time will return from the adjustment mode and store the value you have chosen.

pedalog has 4 x AAA in-built Ni-MH rechargeable batteries. These are recharged from the input power from the pedal generator, as long as the input is greater than 12V. This is designed for pedal generators with an output voltage of 12V or greater. With a fully charged battery the device will run for around 3 hours. When the input is greater than 12V then the battery will be recharged and hence the unit will be powered for longer. The rechargeable batteries can be removed and recharged separately, if required, by undoing the cover screws. This should only be required if the battery has been totally discharged or the unit has been left for a long time without any input.

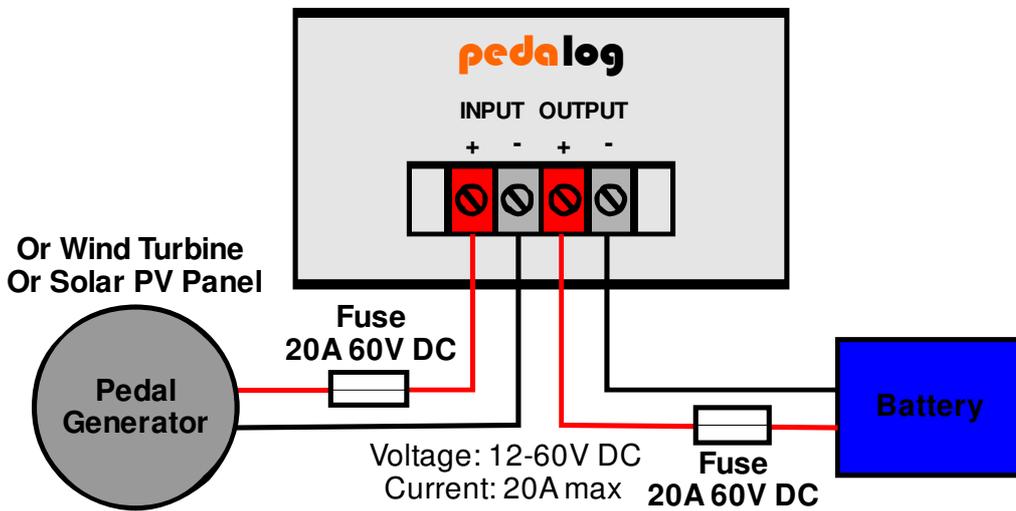
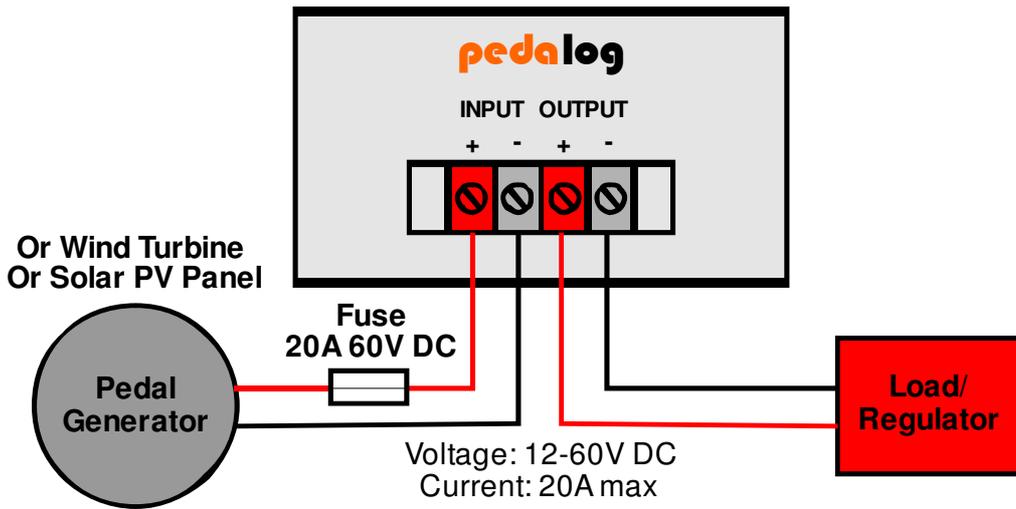
Do NOT use a non-rechargeable battery in this device.

Specifications:

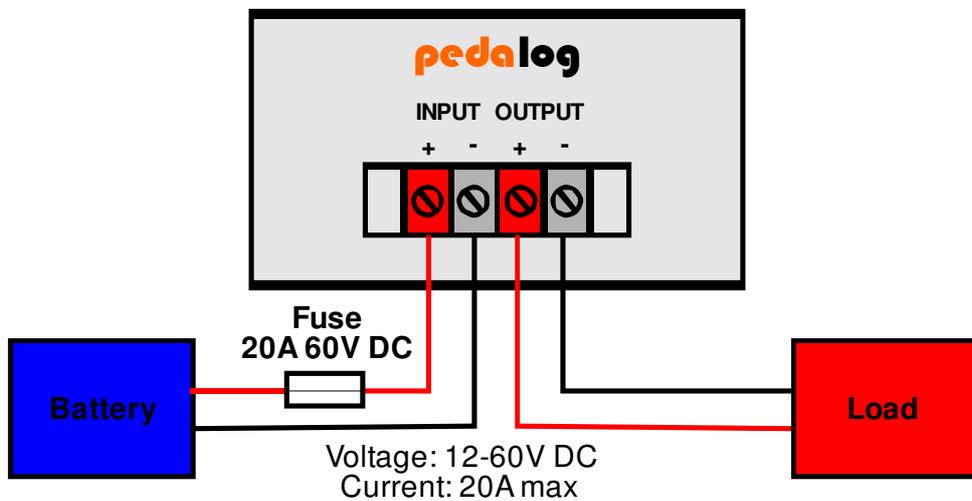
Parameter	Specifications	Value	Notes
Input voltage	+12 to +60	V DC	Must be above the lower voltage to recharge the in-built batteries.
Max Input Voltage	60	VDC	
Voltage resolution	0.1	V	0.1% resolution
Max Current	20	A	This depends upon shunt – other values can be used
Current resolution	0.01	A	0.1% resolution
Sample rate	2000	Hz	Set in software
ADC resolution	12	Bit	
Averaging rate	2	Hz	Set in software
Current consumption	30-200	mA	Depending upon battery recharging

Installation & Wiring diagram:

pedalog is wired into the system as shown below. The device must measure the current and voltage hence must be wired into the main cable from the pedal generator to the load.



Wiring diagram for connection to battery storage
WARNING: Use correct fusing as battery can supply high currents



Wiring diagram for connection between battery and load
WARNING: Use correct fusing as battery can supply high currents

DO NOT exceed the maximum ratings.
DO NOT short circuit the output terminals.
DO NOT reverse the polarity of the terminals.

The fuses shown are important to ensure that, if there is a fault or short circuit, then the system will be protected. These fuses are especially important if there is a battery within your system.

The display should clip onto the handle-bars of the bicycle. This allows the rider to easily access the device and read the display. Please contact info@re-innovation.co.uk if you would like any specific information for your application.

Software Installation:

Software is available for the **pedalog**. At present it is only available for Windows operating systems (we are working on Linux and Mac versions). A separate guide is available for software installation and details. Please visit www.re-innovation.co.uk or contact info@re-innovation.co.uk for more information.

Troubleshooting:

Green LED not flashing

- Unit switched on? – switch unit on
- Battery discharged? – try pedalling to recharge battery

Dim or no LCD display

- Unit switched on? – switch unit on
- Battery discharged? – try pedalling to recharge battery

No power to the load

- Fuse blown? – check and replace fuse
- Loose cable? – check all connections

Please contact info@re-innovation.co.uk if you have any problems with this unit.

Contact Information

pedalog has been designed by Renewable Energy Innovation. Please email info@re-innovation.co.uk for full contact information. Please also see: www.pedalog.co.uk and www.re-innovation.co.uk.

You can buy a ready built unit, a kit of parts, programmed microprocessors or download free constructional plans from www.pedalog.co.uk. Your feedback and ideas for future plans are greatly appreciated.

Other uses for **pedalog**:

- Wind and solar photovoltaics power and energy measurement
- 12V/24V DC load energy monitoring

RE-Innovation is developing a number of energy and power monitors. Please check as there might be a more suitable product for your application. Please contact info@re-innovation.co.uk if you have different applications or would like any advice or information.

Guarantee

We want you to be happy with this product. If, for any reason, you are not satisfied with this device then please return it for a refund (sorry, but your postage and packing costs cannot be covered). Please contact info@re-innovation.co.uk for information on returning the product.

End-of-use Policy

RE-Innovation is committed to ensuring the long-term sustainability of their products. Products are design and built partially using solar power and are designed to be re-usable and repairable. If the device is no longer required, please return to the supplier and the product will be re-used or re-cycled (contact the above email for address and more details).