

Adapter Plus with Two way Raspberry Pi Transceiver board



Introduction:

The ENER314-RT add-on board can be used to Control devices and monitor devices requiring 433 MHz ISIM band control directly from a Raspberry Pi equipped with the radio transceiver PCB which incorporates a radio receiver and a transmitter. The ENER002 Control Adapter is part of the Energenie home automation range. The Control Adapter allows you to switch the power on or off.

Instructions: Preparation

Connect the Energenie RT board to the raspberry pi as shown in figure 1. Connect the raspberry pi to a USB port using a micro USB to USB cable. Connect a HDMI cable from the raspberry pi to the monitor. The cable can be connected to a computer, laptop or adapter which is switched on. Once the raspberry pi has booted to the desktop ensure that the RT board software (pyenergenie-master.zip which can be downloaded from <https://github.com/Energenie/pyenergenie>) has been saved unto the raspberry pi.



Figure 1

Instructions: Software

You will find the following python scripts when you unzip pyenergenie-master.zip:

- Legacy.py (This script is compatible with the following products)
 - ENER002
 - ENER010
 - MIHO002
 - MIHO007
 - MIHO008
 - MIHO014
- Monitor.py (This script is compatible with the following products)
 - MIHO004
 - MIHO005
 - MIHO013
- Switch.py (This script is compatible with the following products)
 - MIHO005

Instructions: Switching the Control Adapter

You will be able to switch the Control Adapter. Legacy.py script will switch the Control Adapter.

1. Use the Download As Zip link to the right of this page: <https://github.com/Energenie/pyenergenie>
2. unzip the software

unzip pyenergenie-master.zip

cd pyenergenie-master

cd src

3. Run the legacy test program with control adaptors. This will initiate the learning procedure
sudo python Legacy.py

*Press **Y** for yes or **N** for n. Follow the on screen instructions. Put the sockets into learning mode!*

```
pi@raspberrypi: ~/pyenergenie-master/src
File Edit Tabs Help
pi@raspberrypi:~$ cd pyenergenie-master/src/
pi@raspberrypi:~/pyenergenie-master/src$ sudo python legacy.py
warning: method is untested:<function receive_len at 0x76ac72b0>
starting legacy switch tester
radio init
radio as OOK
Do you want to program any switches?
y
Learn switch 1?
y
Press the LEARN button on any switch 1 for 5 secs until LED flashes
press ENTER when LED is flashing
ON
Device should now be programmed
Testing...
OFF
ON
OFF
ON
OFF
ON
OFF
ON
Test completed
Learn switch 2?
```

Instructions: Address bits and Control bits

Install the board on to the row of pins as show in the picture and connect your Raspberry-Pi as normal to a monitor, mouse, keyboard and USB power supply.

Note: The RF transmitter add-on board must be connected securely first before powering on the R-Pi. Connecting after the R-Pi is on may result in the device freezing.

The pin header connects to the add-on board as follows to allow you to control the GPIO lines as outputs to drive the radio frequency transmitter.

Figure 2 (GPIO pin header)

The board will communicate with the ENER002 radio controlled sockets using Each board transmits a frame of information using On-Off-Keying (OOK) which is a basic form of Amplitude Shift Keying (ASK). This frame includes source address (20 bits) and control data (4 bits).

Here are the pairs of codes using D0-D3 signals that can be sent to control sockets.

D3	D2	D1	D0	Meaning	D3	D2	D1	D0	Meaning
1	0	1	1	All on	0	0	1	1	All off
1	1	1	1	socket 1 on	0	1	1	1	socket 1 off
1	1	1	0	socket 2 on	0	1	1	0	socket 2 off
1	1	0	1	socket 3 on	0	1	0	1	socket 3 off
1	1	0	0	socket 4 on	0	1	0	0	socket 4 off

The receivers within the ENER002 have 4 address slots and the above codes are the combinations to control them.

There are a maximum of 4 channels per address. Users can alter the address of the Pi to increase the number of channels by changing the following line:

```
HOUSE_ADDRESS = None # Use default energenie quasi-random address 0x6C6C6
##HOUSE_ADDRESS = 0xA0170 # Captured address of David's RF hand controller
```

This can be found in Legacy.py

CODE Word

Code word consists of full set of serial data format. The combination is as follow:

Sync.	20 Address Bits (C0~C19)	4 Data Bits (D0~D3)
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Each code word consists of 20 address bits, 4 data bits and a synchronous bit. The transmission sequence is as the diagram shown:

Sync	C0	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15	C16	C17	C18	C19	D0	D1	D2	D3
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