OpenTRV

http://opentrv.org.uk

http://opentrv.org.uk/help-wanted/
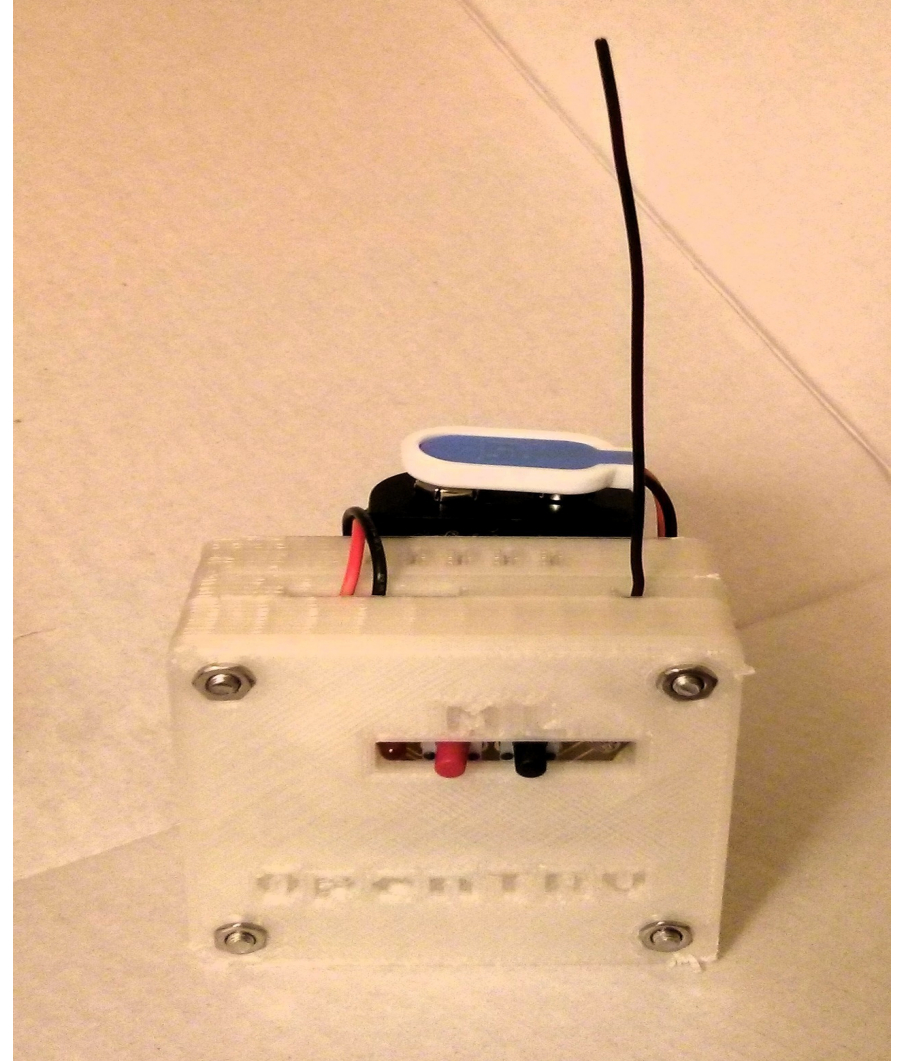
@OpenTRV

OpenTRV

More comfortable homes for less money, the open source way

Damon Hart-Davis
Project Lead

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Old and New

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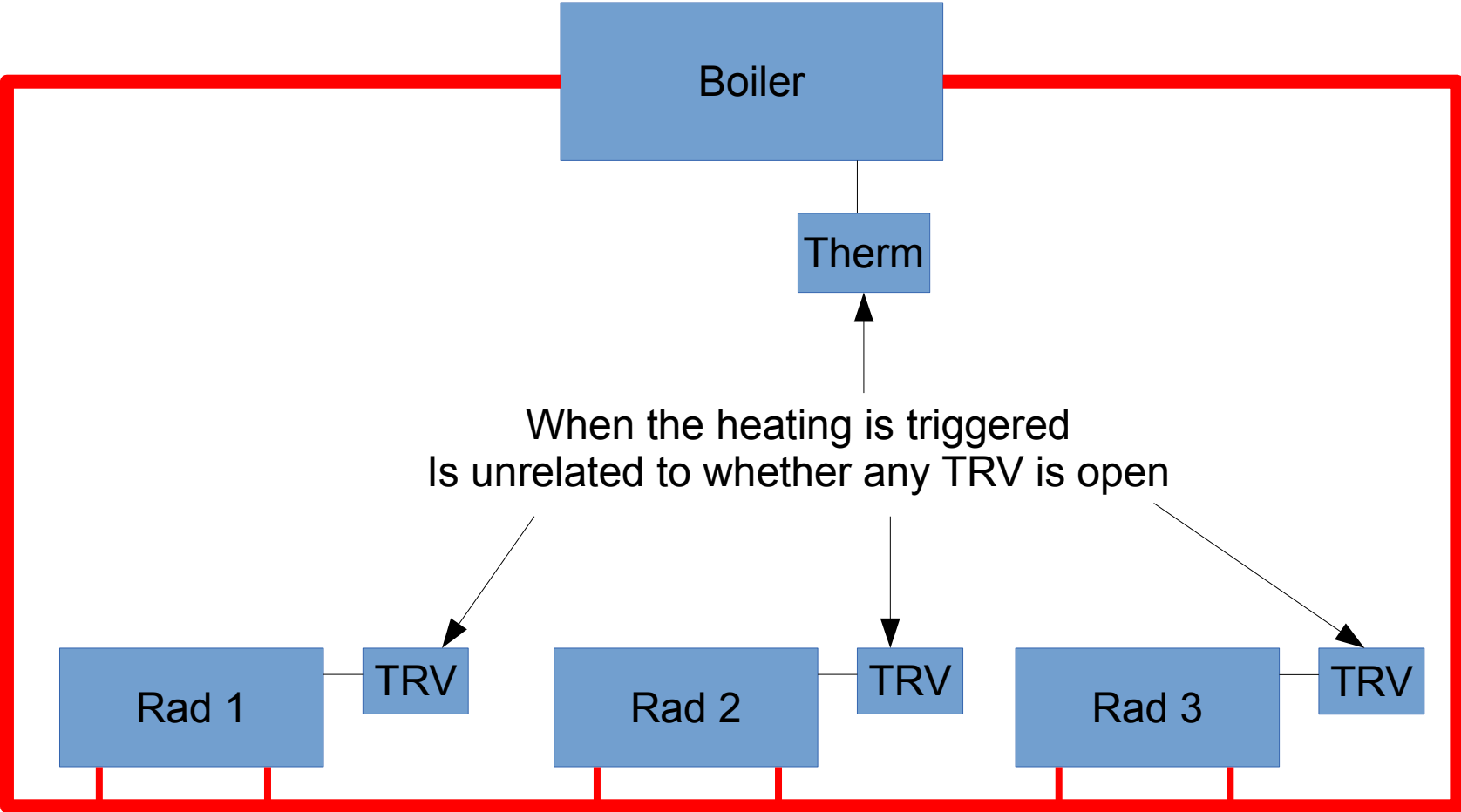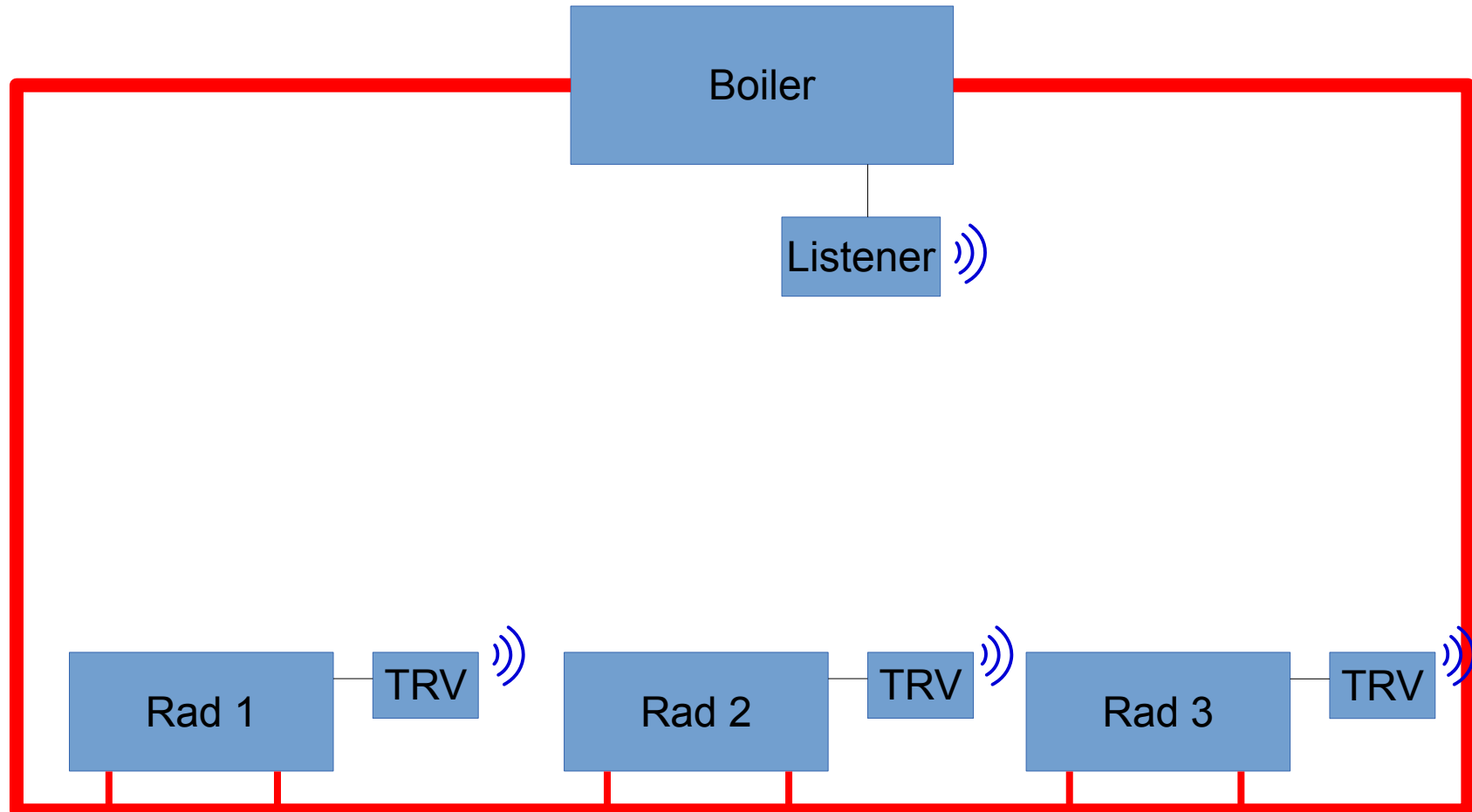
What is OpenTRV for?

- Heating is 60% of UK domestic energy consumption (DECC) = 20% of UK carbon footprint

- **Retrofit** is only practical solution

  - 20m UK homes extant in 2050

- 60% of £1400 * 20m homes = £17b/year

- Most homes in the UK are heated via central heating with gas boiler

- Most people heat empty rooms

- Better: a cosy warm **bubble of heat** that follows you around your home

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Naive Heating

Boiler

Therm

When the heating is triggered
Is unrelated to whether any TRV is open

Rad 1   TRV

Rad 2   TRV

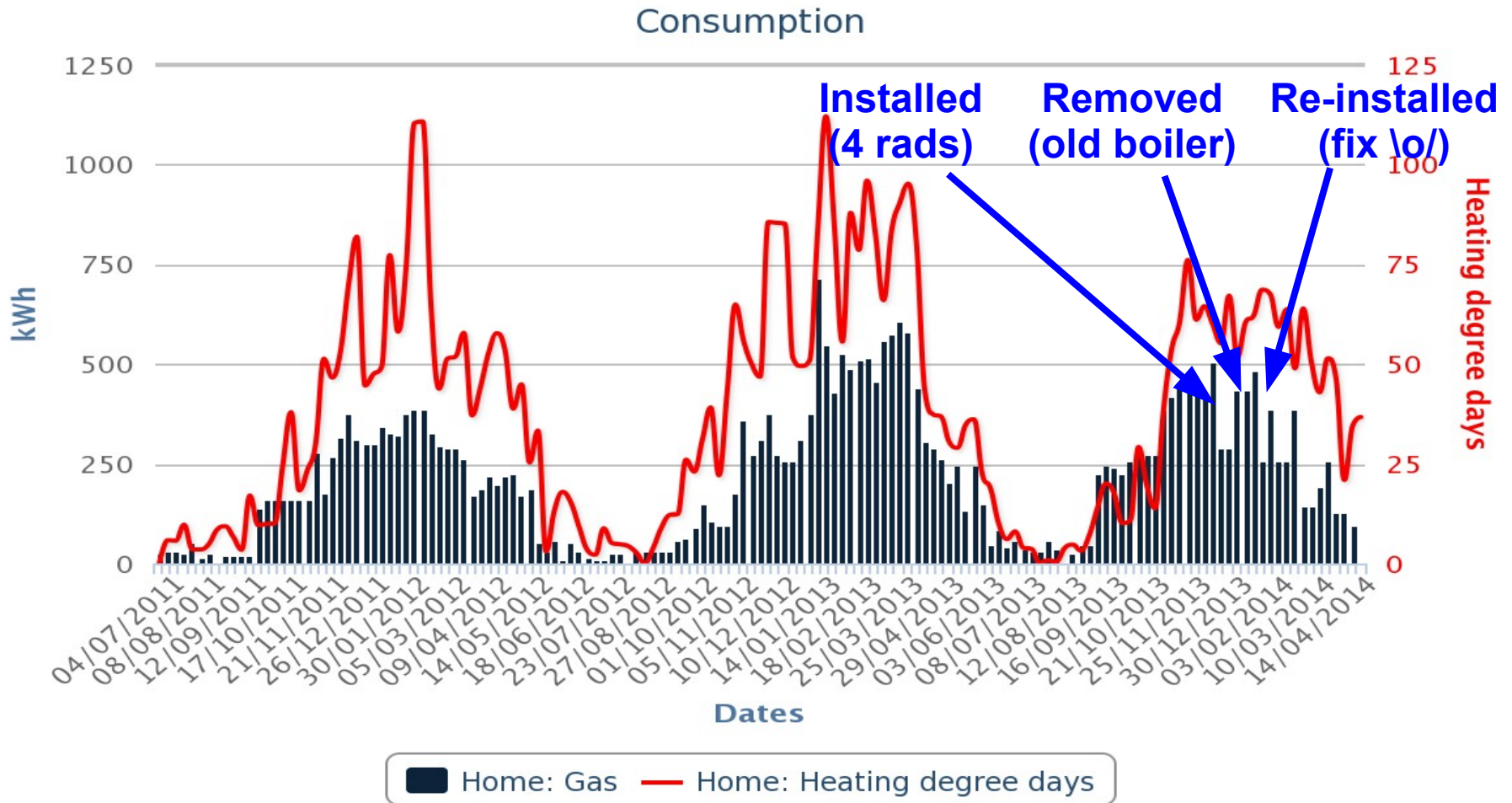Rad 3   TRV

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Smart Heating
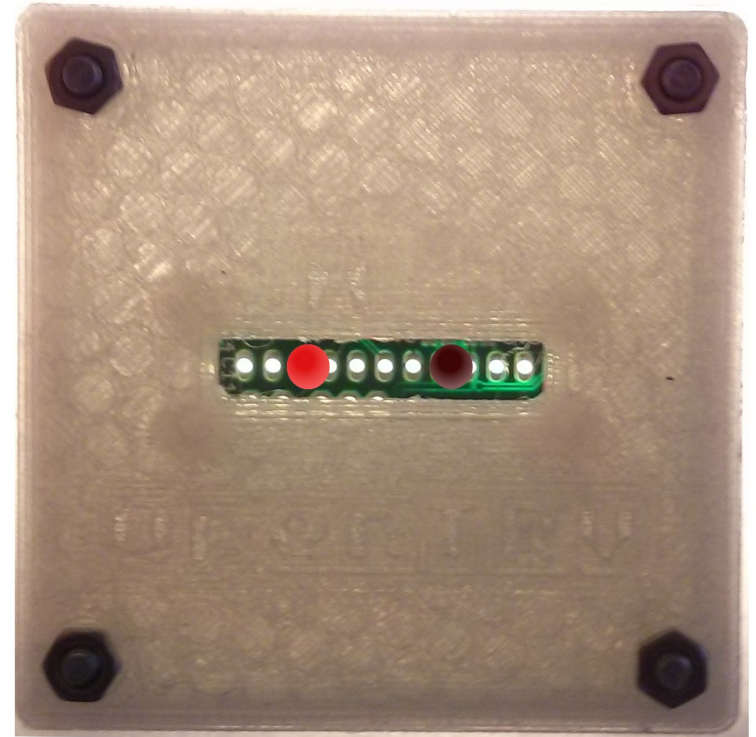
Smart Heating How?

- Zoning: ~50% savings possible

- Occupancy Sensing

- Anticipation: saving becomes delightful

- Cheap: ~£10/room

- Simple: Internet NOT required

- Interoperable for mix-n-match

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Does it Work?

Consumption chart showing Home: Gas (kWh) bars and Home: Heating degree days (red line) from 04/07/2011 to 14/04/2014. Annotations: "Installed (4 rads)", "Removed (old boiler)", "Re-installed (fix \o/)".

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- Easy to use
  - Can a 4 year old use it?
- Low cost (~£100/house)
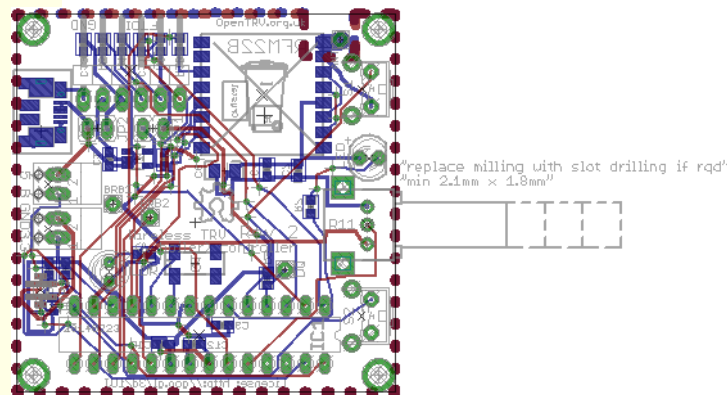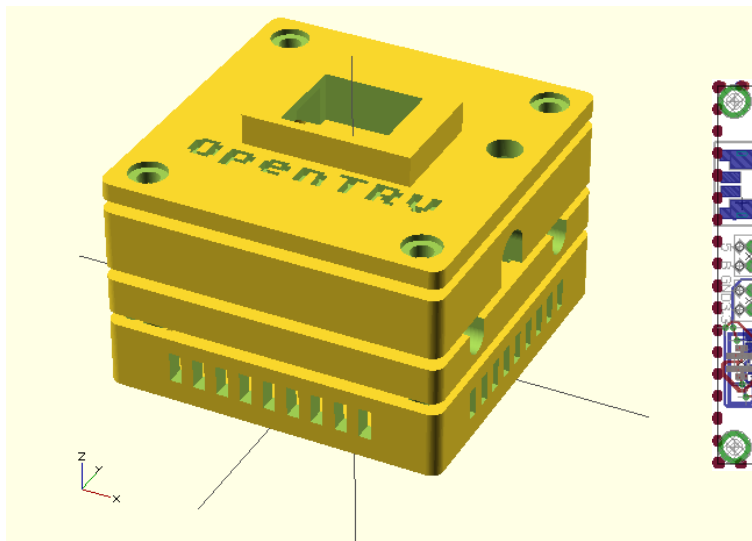- Retrofit
- No special skills needed

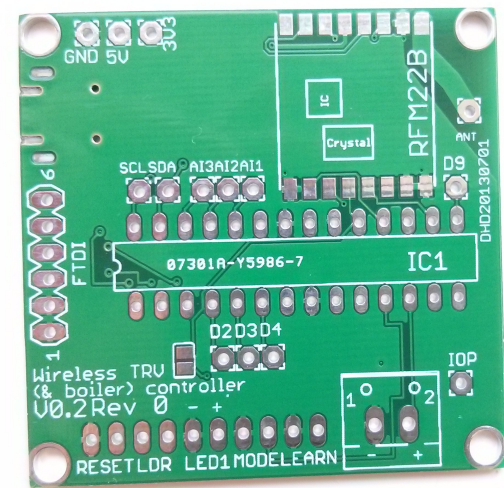**Mass market product**

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Giving it away

- Open source software (Apache)

- Open source hardware (Solderpad)

- Open source 3D box design (Apache)

Current state

- PCB design: Eagle (fourth revision)

- Microcontroller software
  - Early versions: PICAXE
  - Current version: ATmega

- Documentation

- Mailing lists

- IRC

- Web sites

- 3D box design: OpenSCAD

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tvrrug.org.uk

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Experiences

- Interest worldwide – recent enquiries from e.g. NL, Spain, Germany, UK

- Connecting Homes (3rd prize!)

- Dynamic Demand Hackathon

- Engaging with energy retailers

- Engaging with academia

- Engaging with government

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Future

- Trials (does it do what we say on the tin?)
- IoT: optional Internet / smartphone connectivity (emoncms?)
- New efficient and secure open protocol
- Own valve driving hardware 2014
- Hobbyist/DIY kits for sale 2014
- Help wanted (Foundation?):
    - Lawyer
    - Industrial / mechanical design engineer
    - Front-end / web site developer

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