WikiHouse Open Controls

This is the first WikiHouse that we have hacked with open source electronics.

We are very excited to share this system with you because the electronics are (we think) rather special :

- The house is operating on a low voltage DC system so the electronics are energy efficient and safe (rather than the standard AC system we currently use)

- The electronics are modular and adaptable so you can easily reposition and reprogram any of the electrical components, think plug and play electronics (instead of making expensive and sometimes complicated decisions just to make simple changes in your own home)

- The system showcases not only the opportunity to return control of the house to its owner, but also the possibility of household data ownership (as opposed to current practice where data collected by sensors or 'smart' appliances is owned by a private corporation)

Please do play with the controls and enjoy experimenting with the house!

Wikihouse Services

Design principles

Provide a combined DC power and data infrastructure that is designed for low power DC devices (mobile phones, tablets, LED lighting, etc.).

Provide a safe DC wiring and plugging system that allows end users to relocate and reconfigure the sensing, lighting, heating/ventilation and other services devices without the need of major works involving professionally qualified technicians. The kitchen and the house electrical panel are the only two places with AC sockets. The rest of the house uses ethernet cables and Power over Ethernet (PoE) to distribute 48V, that is transformed to 12V and 5V at the socket, using three types of plugs: RJ45 (48V), car adapter (12V) and USB (5V).

Use the converged power and data infrastructure to create a sensing, actuation and home automation network using open source software and open design. The entire system schematic is shared.

Introduce full white spectrum, high colour rendering, professional LED lighting to a domestic application. Domestic LED lighting has been provided by most of the manufacturers by retrofitting LEDs to the AC infrastructure, compromising on quality of the emitted spectrum and on dimming capabilities. Wikihouse 4.0 has a 24V DC power system with constant current dimming from a centralised panel and full spectrum, high colour rendering LEDs.

WikiHouse
v 4.0

Electrical and IT Services

Wiring Schematic Diagram

Electrical panel

Kitchen – hybrid power

Room – only low voltage DC power

AC Power 230V

AC Consumer Unit

AC Twin Socket Outlet

AC Twin Socket Outlet

PoE Switch

RJ45 Outlets

Wifi Router

Open Energy Monitor

OpenHAB Control Server

DC fan motor power supply

Arduino Motor Controller

DMX Lighting Controller

DMX DC Constant Current LED Driver

AC Twin Socket Outlet

Kitchen Appliances

DC PoE Power and Data Socket outlet

Arduino Sensor

Commercial Ventilation Unit

DC PoE Power and Data Socket outlet

Arduino Sensor

12V DC devices

USB 5V DC devices

DC LED Spotlight

openMVHR Ventilation Unit

AC Twin&Earth

Cat5E 48V

Cat5E Data

12V / USB 5V

DMX

Twin DC 24V

Twin DC 12V

WikiHouse v 4.0

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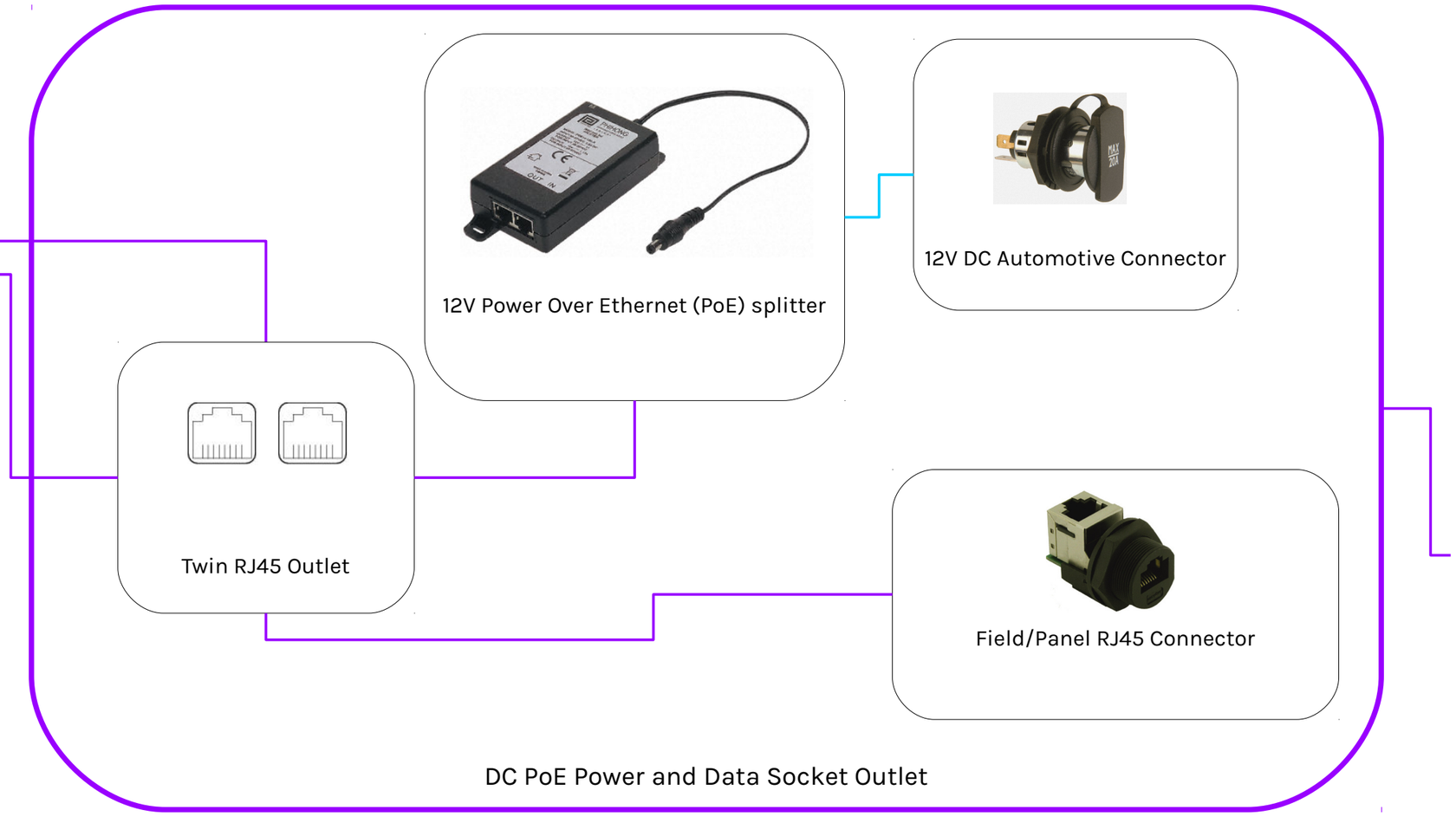
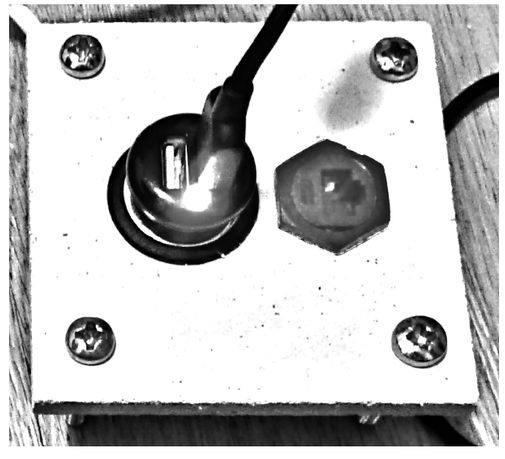
DC Power + Data Socket Outlet



Type A USB adapter



Cat5E 48V

Twin DC 12V

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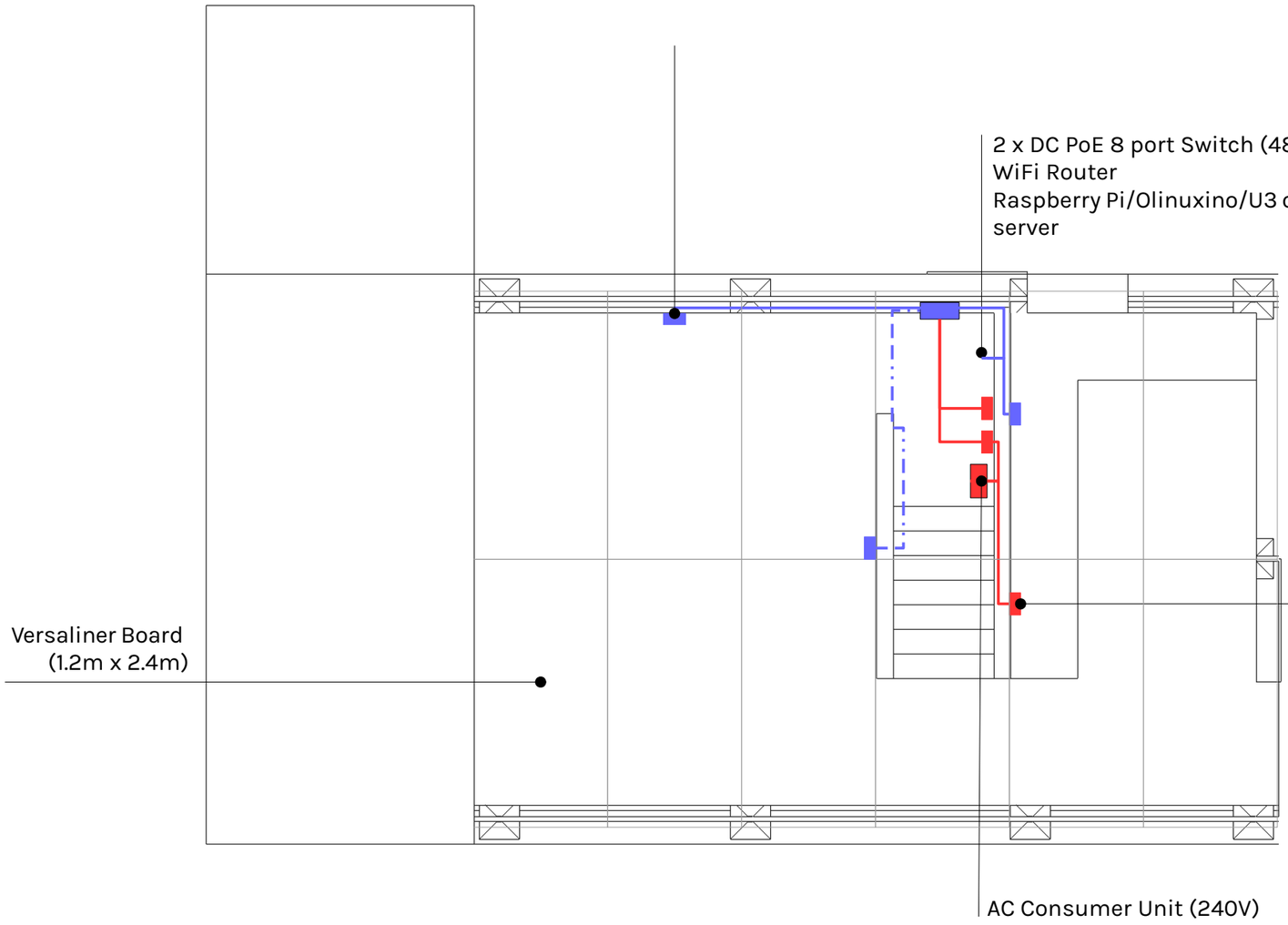
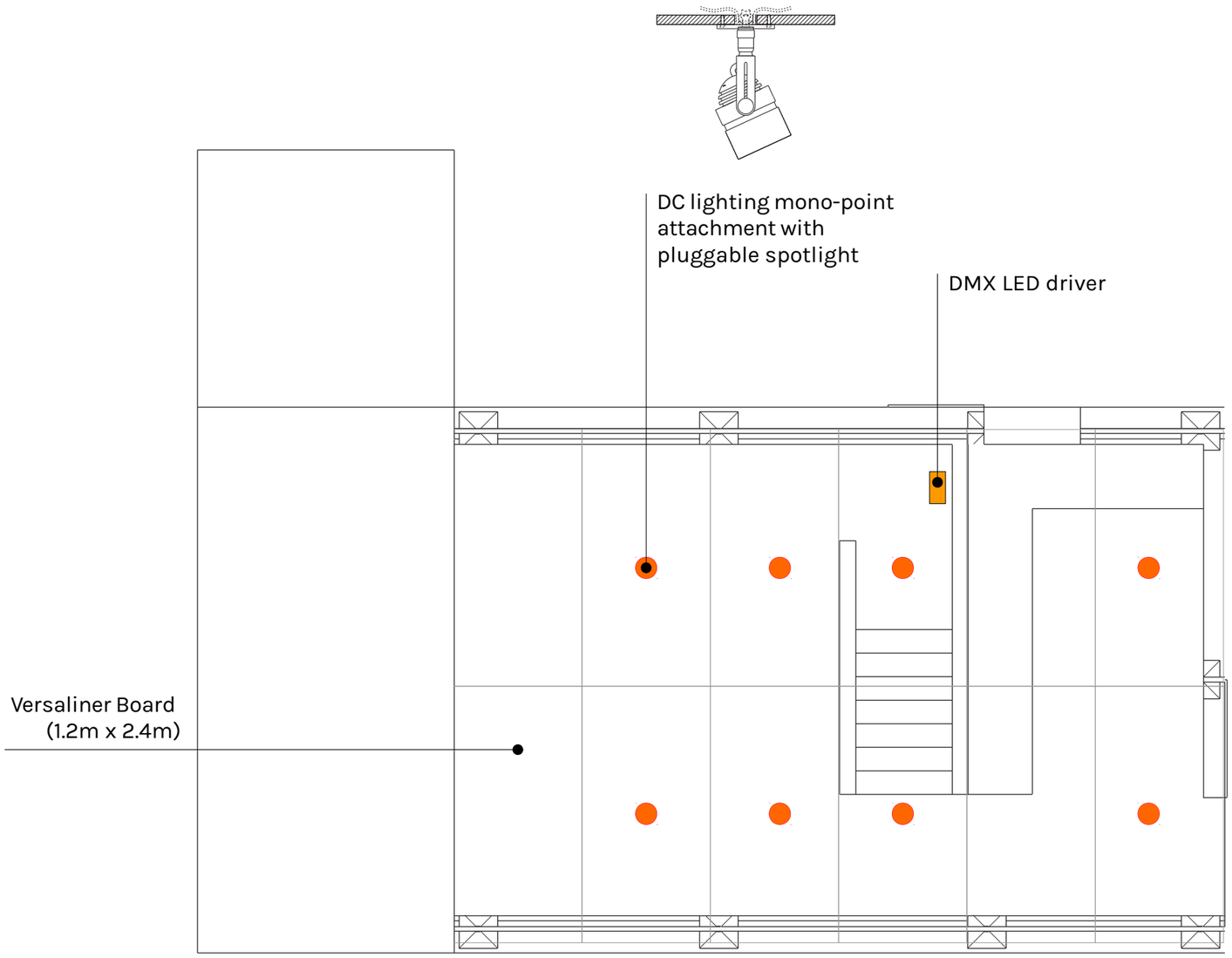


http://uk.rs-online.com/web/p/processor-microcontroller-development-kits/8111284/


DC lighting mono-point attachment with pluggable spotlight
DMX LED driver
Versaliner Board (1.2m x 2.4m)