



Kria-as-a-Service

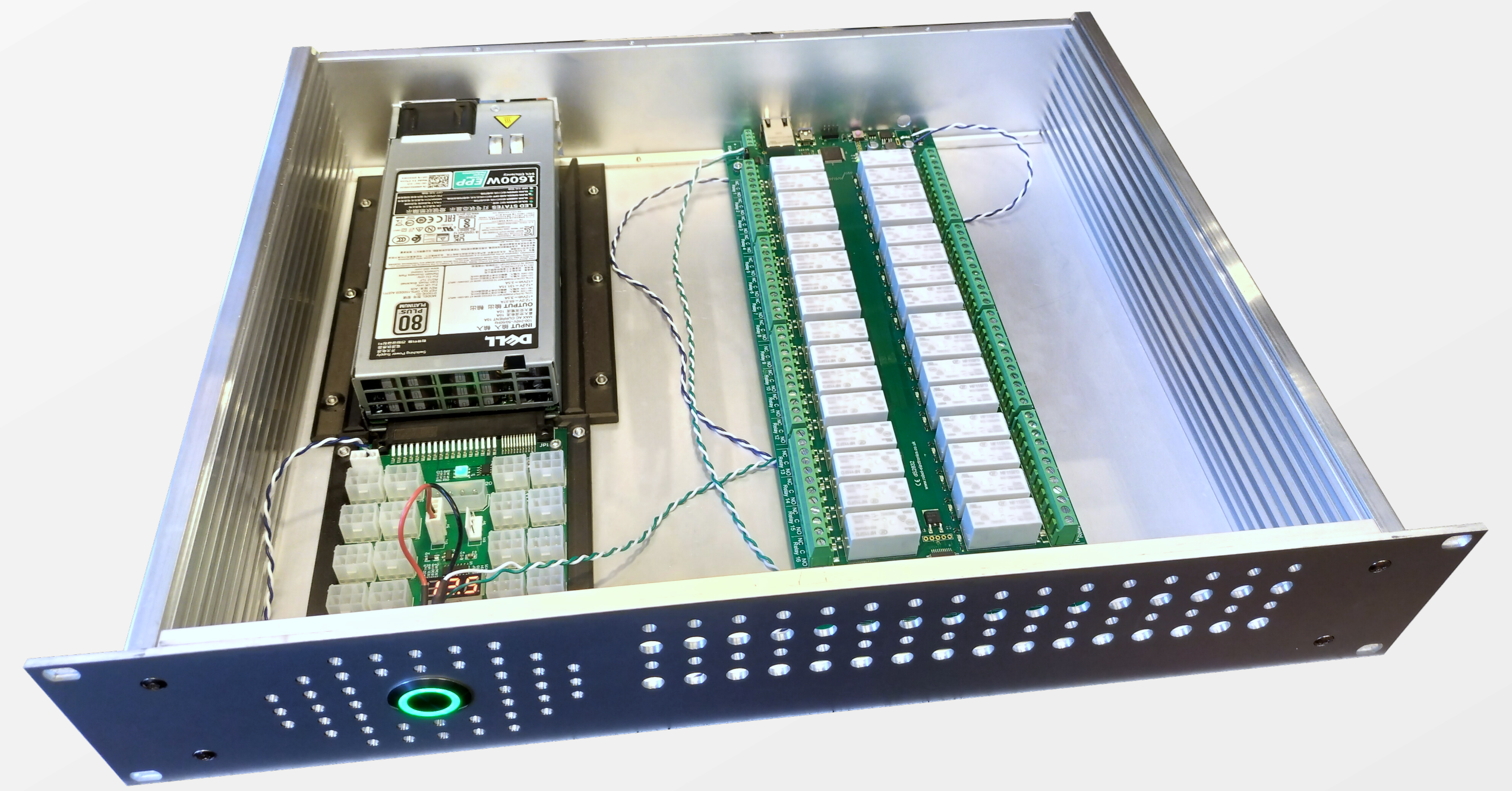
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About KaaS

KaaS is a work-in-progress online platform for web-based digital hardware design and FPGA development.

- 32 individual Kria KV260 development boards, extendible up to 64
- Fully usable through a Jupyter Notebook web-interface
- Reserve one or more boards through a web-based booking system, like booking a meeting room
- Every user has root access for full experimentation freedom
- Already used in two courses and by researchers



Power distribution

With up to 64 boards rack, power distribution becomes a challenge. A custom power distribution unit (PDU) was designed to address this challenge. The work-in-progress can be seen in the picture above.

- 1600W replacable power supply
- 32 12VDC (3A max) outlets (2 PDUs to power 64 boards)
- RJ45 Ethernet interface for remote power output toggling
- Power indicator LED above each barrel jack
- PDU power button with ring LED indicator
- Fits in a 19" server rack, 2U tall

The ability to toggle power outputs remotely is important, as an incorrect bitstream provided by the user can soft-brick the board. By means of this PDU, each board can be monitored and power-cycled if necessary.

Booking and clean-up

A web-based booking system is planned that will allow people to reserve one or more boards for a predefined period of time. Users can log in (automatically) with their UT credentials. This enables teachers to reserve a number of boards for the duration of a course so students can use it for their assignments. It also allows researchers to book and use a development board for experimentation.

When a reservation ends, the board should be reset for the next user. Since users have root access to the boards they use, it is important to not only wipe the user data but also restore the file system its configuration to a known state. To this end, a janitor system is planned that will provide every user with a clean slate once a booking period begins.

Custom mounting solution

A custom bracket has been developed, which attaches to the development board. This allows the board to be mounted in a custom-made metal frame. Each frame can hold up to eight development boards. The design of the brackets allow for quick and easy removal of boards during maintenance.

