Overview

This is a new controller board for the programmable load, designed around the STM32MP1 microprocessor, which contains a Cortex A7 core (suitable for running a full-blown operating system) as well as a Cortex M4 core (suited to running real time sensitive tasks with an RTOS) on the same package. To avoid needing to deal with BGA packages, high speed DDR routing, and a bunch of power rails, a MYIR MYC-YA15X SoM is used.

Connectivity

As with the previous designs of the load, it will feature an USB device mode connection, as well as standard 100Mbps Ethernet with a standard IPv4 and IPv6 stack. Additionally, a CAN expansion bus is provided to connect multiple units together, and possibly to other, larger loads down the road.

Internally, the controller provides both a high-speed SPI for the analog interface (to allow fast control of ADCs and DACs by software) as well as a low-speed I^2C interface, which is primarily intended for identification of the analog board, and some auxiliary control tasks like thermal management and input selection.

User Interface

Most of the user interface remains the same from the previous iteration, including the button and indicator layout on the front panel, barring some minor spacing changes.

However, the small greyscale OLED is replaced by a 800x480 4” capacitive touch LCD. This is driven directly by the LCD interface controller in the Cortex A7 side of the microcontroller, and provides an user interface that allows interaction by a hybrid means of the front panel buttons and touch controls.

Power

The switching AC/DC supply in earlier versions is replaced by a regular mains transformer, a standard rectifier and smoothing capacitors, followed by several DC/DC modules to generate the required voltages. Eliminating the AC/DC switching supply reduces the noise in the system, and provides greater isolation from mains.

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