

Components of SoLiD Readout

- The solid readout system consists of 64 channel readout boxes (one per frame).
 - Each readout box contains:
 - One ADC+FPGA board (64 channels)
 - Each ADC+FPGA board has one Trenz TE0712 module mounted
 - Two Amplifier boards (32 channels each)
 - One I2C pass-through board (connects I2C signals generated on ADC+FPGA board and connects to frame)
 - One power filter board (Connects to single power cable from services box. Has three cables inside electronics enclosure. Two supply amplifier boards. One supplies ADC+FPGA board
- Ten readout modules in a detector module are synchronized and controlled by a single services box.
 - Each services box contains:
 - Power supplies for readout modules. 48V input
 - Clock and synchronization fanout. (Takes a single set of clock and synchronization signals and fans out to the 10 readout boxes in a module.
 - Each clock and synchronization fanout consists of
 - One clock/sync main board
 - ... connected by a VHDCI cable to ...
 - One clock/sync interface FMC , which plugs onto
 - One Enclustra FPGA module
 - Each Enclustra FPGA module consists of
 - One PM3 base board
 - One Mars AX3 FPGA module
 - JTAG fanout (can program the ten FPGAs in a module from a single RJ45 Ethernet connection)
 - Each JTAG fanout consists of
 - One JTAG fanout board (this is a single PCB split in two with the pieces arranged side by side)
 - ... connected by a USB-A → USB micro-B cable to
 - One Minnow Board Turbot single board computer

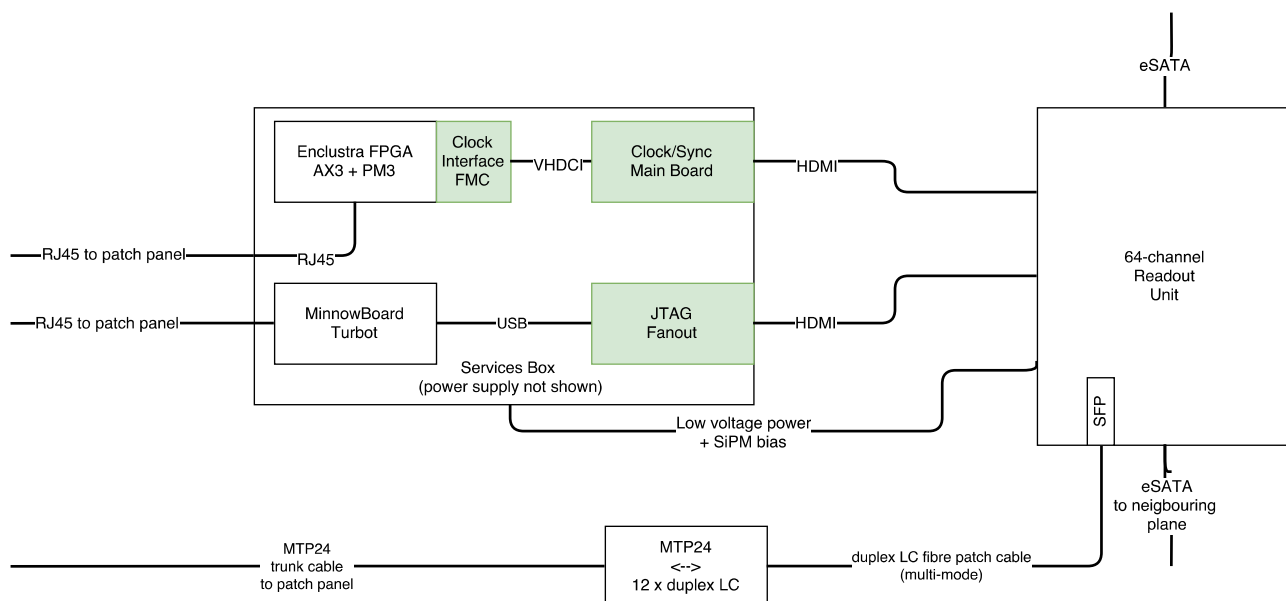


Illustration 1: Block diagram of a services box. One readout box is also shown

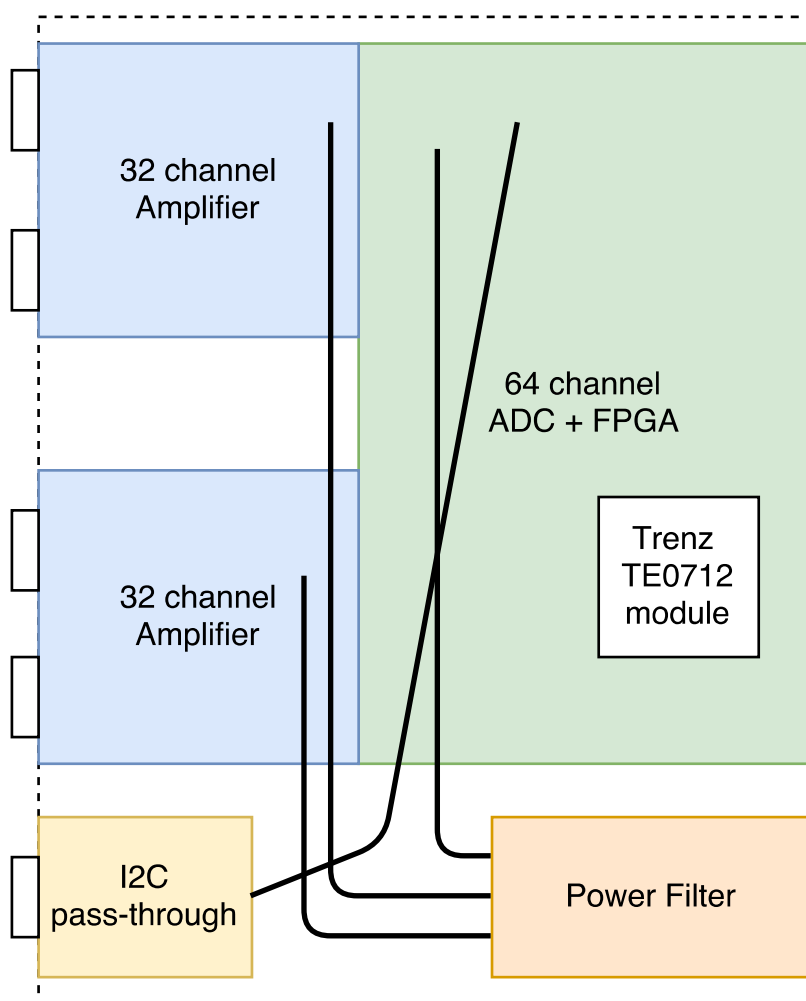


Illustration 2: Block diagram of a single 64-channel readout box

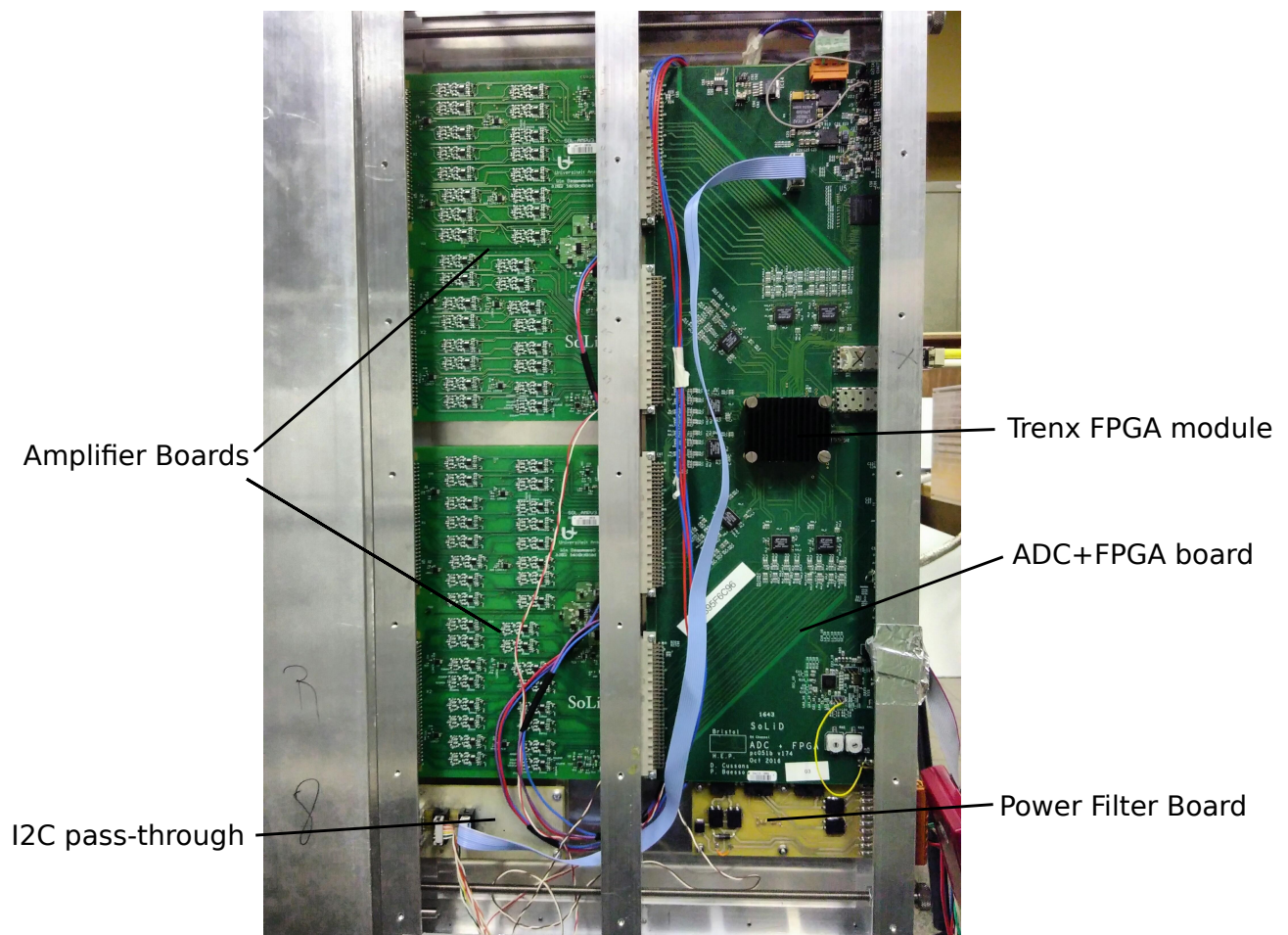


Illustration 3: Annotated photograph of a prototype readout box (connected to Calypso)