

Hardware Implementation: Fibres, optical margins, tests done so far and planned

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Optical Power Test

- Test installation of new OM3 fibres done during EYETS 16/17
- During TS2: Patch cord between TRD patch panel, chamber 7_1_2 and GTU has been replaced by a long OM3 loop:

TRD patch panel → Muon patch panel (15m)

Muon patch panel → CR1 (130m)

CR1 → CR1 (5m)

CR1 → Muon patch panel (130m)

Muon patch panel → GTU (15m)

- Total length of loop: 295m

Test installation



Figure: Loop in CR1



Figure: New muon patch panel

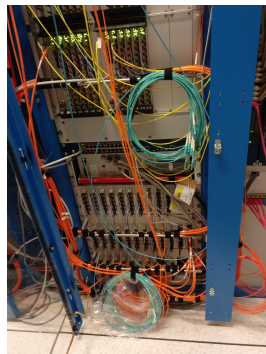


Figure: GTU and TRD patch panel

Test results

- Optical power read by GTU without loop: $578\mu\text{W}$
- Optical power read by GTU with loop: $289\mu\text{W}$
- \Rightarrow Total attenuation: 50%, corresponds to $1 - \sqrt{0.5} \approx 30\%$ loss on a single way (TRD patch panel \rightarrow CR1)

Other tests and Outlook

- Loop in CR1 has been removed and the Arria 10 Development Kit with a standard QSFP and a test firmware has been connected to the chamber
- \Rightarrow Signal of chamber 7_1_2 could be successfully recorded in CR1
- Some chambers are currently transmitting with very low optical power ($\leq 100\mu W$) and the readout with the development kit was not possible
- All sender diodes are specified up to a maximum transmit power of $1000\mu W$ and the actual transmit power can be remotely calibrated
- Calibration was not required in the past. Therefore it has not been done for all supermodules and the the chambers have varying output power

Plan for the future:

- Measure precise minimum power threshold with the CRU in the lab
- Calibrate all supermodules to a sufficient but reasonable value that does not expose the diodes to unnecessary currents