

Readout architecture for the Pixel-Strip module of the CMS Outer Tracker Phase-2 upgrade

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The Outer Tracker upgrade of CMS introduces new challenges for the front-end readout electronics. In particular, the capability of identifying particles with high transverse momentum requires high speed real time communication among readout ASICs. The Pixel-Strip module needs two different readout ASICs, namely the SSA for the strip sensor and the MPA for the pixelated sensor. At each Bunch Crossing, the strip data are transmitted to the MPA which is responsible for the particle discrimination. The proposed architecture allows for a total data flow between readout ASICs of ~ 100 Gbps and reduces the output data flow from 1.28 Tbps to 60 Gbps per module with a total power density < 100 mW/cm².

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