

Remote Access to Xilinx Programmable Devices in the CSC Endcap Muon Electronic System at CMS

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We present the status of hardware and software tools for remote access to Xilinx programmable devices in the Cathode Strip Chamber Endcap Muon Electronic System at the CMS experiment at CERN.

Summary 500 words

The electronic system serving 468 Cathode Strip Chambers (CSC) in the endcap regions of the CMS experiment at CERN comprises more than 3600 boards with Xilinx programmable devices. Approximately 2500 boards are mounted directly on CSC chambers; 1116 boards are housed in the 9U VME crates on the periphery of the CMS iron disks in the experimental hall, and 60 boards are located in five 9U VME crates in the underground counting room. Most of the programmable devices are mature Virtex, Virtex-E, and Virtex-2 FPGA and XC18V02/04 PROMs. In order to improve the trigger and reconstruction efficiency at the largest values of pseudorapidity, approximately 15% of the programmable boards will be modified or replaced with the new ones based on more advanced Xilinx families. Fast and reliable remote access to all programmable devices is indispensable for periodical firmware upgrades, modifications and monitoring. Currently files produced by the Xilinx development system are converted into the VME code that subsequently provide serial JTAG access to the FPGA and PROM devices. The on-chamber mounted devices are accessed via the VME boards in the peripheral crates. We present here the status of hardware and software tools for remote access; provide estimates on times required to download a fraction or the whole system; outline our plans for future upgrades.

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