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Development and test of the DAQ system for a Micromegas prototype installed into the ATLAS experiment

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A Micromegas (MM) quadruplet prototype with an active area of $\{0.5 \text{ m}^2\}$ that adopts the general design foreseen for the upgrade of the innermost forward muon tracking systems (Small Wheels) of the ATLAS detector in 2018-2019, has been built at CERN and is going to be tested in the ATLAS cavern environment during the LHC RUN-II period 2015-2017.

The integration of this prototype detector into the ATLAS data acquisition system using custom ATCA equipment is presented. An ATLAS compatible ReadOutDriver (ROD) based on the Scalable Readout System (SRS), the Scalable Readout Unit (SRU), will be used in order to transmit the data after generating valid event fragments to the high-level Read Out System (ROS). The SRU will be synchronized with the LHC bunch crossing clock (40.08 MHz) and will receive the Level-1 trigger signals from the Central Trigger Processor (CTP) through the TTCrx receiver ASIC. The configuration of the system will be driven directly from the ATLAS Run Control System. By using the ATLAS TDAQ Software, a dedicated Micromegas segment has been implemented, in order to include the detector inside the main ATLAS DAQ partition. A full set of tests, on the hardware and software aspects, is presented.

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