The detectors for the trigger and Data Acquisition (DAQ) path of both detectors can be divided into two major categories, on-detector and off-detector electronics. The communication between the on-detector electronics boards is established with the use of mini Serial Attached Small Computer System Interface (SASi) (miniSAS) cables.

On the other hand, the SCA configure the VMMs, according to commands received by the L1DDC. Both companion chips are interfaced with the L1DDC via e-link, a custom serial communication scheme comprised of two data lines and a clock line, capable of reaching speeds up to 320 Mbps.

The off-detector electronics (Front End Link eXchange (FELIX), TP sector logic and Small Sector. Functionalities as required by the new ATLAS detector and trigger components. Before the installation of a sector on the NSW, various tests are taking place in order to validate the electronics. The L1DC, features three Gigabit Transceiver (GTX) ASICs which act as High-speed transceivers, capable of accessing front-end data from multiple sources and forwarding them to optical link at a data rate of 4.8 Gbps. The L1DDC uses differential pairs for the communication with the front-ends in the context of the project “Develop of an advanced system for precise tracking.” They are table equipped with Micromegas detectors. The Micromegas detectors have a small conversion region (5 mm) and fine strip pitch (~0.4 mm) resulting in excellent spatial resolution and are primarily used for precise tracking. They are able to track particles with a precision of order 100 μm/detection gap while withstanding a particle rate up to around 20 kHz/cm². In total the MVM NSW has ~1 K Data Driver Cards (Level-1 DDC & Address in Real Time - ART DDC). 8 ~ K Front-End Boards (MMFE8) and ~300 Low Voltage Distribution Boards (LVDBs). The Low Voltage Distribution Board provides +2.1 M electronic channels in total, the operation of MMFE8 and the interface of NSW with the ATLAS Trigger and Data Acquisition (TDAQ) system with proper way, is challenging.

The threshold level per channel is trimmed to mask the noise levels is a crucial electronic challenge. Before the installation of a sector on the NSW, various tests are taking place in order to validate the electronics. The L1DDC, features three Gigabit Transceiver (GTX) ASICs which act as High-speed transceivers, capable of accessing front-end data from multiple sources and forwarding them to optical link at a data rate of 4.8 Gbps. The L1DDC uses differential pairs for the communication with the front-ends in the context of the project “Develop of an advanced system for precise tracking.” They are table equipped with Micromegas detectors. The Micromegas detectors have a small conversion region (5 mm) and fine strip pitch (~0.4 mm) resulting in excellent spatial resolution and are primarily used for precise tracking. They are able to track particles with a precision of order 100 μm/detection gap while withstanding a particle rate up to around 20 kHz/cm². In total the MVM NSW has ~1 K Data Driver Cards (Level-1 DDC & Address in Real Time - ART DDC). 8 ~ K Front-End Boards (MMFE8) and ~300 Low Voltage Distribution Boards (LVDBs). The Low Voltage Distribution Board provides +2.1 M electronic channels in total, the operation of MMFE8 and the interface of NSW with the ATLAS Trigger and Data Acquisition (TDAQ) system with proper way, is challenging.

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