The FE Electronics of the LHCb Straw Tube Tracker

The high voltage board provides the necessary voltage to bias the straw tubes. The low voltage board contains the necessary circuits for the readout and control of the straw tubes. The board is equipped with a microcontroller that monitors the operation of the electronics and provides feedback to the control system.

The ASDBLR board contains the amplifiers and discriminators for the straw tube signals. The signal from each straw tube is amplified and discriminated to determine whether a signal is present or not. The discriminator output is then used to trigger the readout circuit.

The GOL board contains the logic circuitry for the readout of the straw tube signals. The signals from the ASDBLR board are fed into the GOL board, where they are processed and converted into a digital signal. The digital signal is then transmitted to the central electronics for further processing.

The quality assurance system is used to monitor the performance of the electronics. This system includes a set of diagnostic tools that can be used to test the electronics and ensure that it is operating correctly.

The straw tubes themselves are made from a special material that is known for its excellent electrical and mechanical properties. The tubes are arranged in a spiral pattern around the beam pipe, with each tube providing a path for the passage of the particles to be measured.

The readout system consists of two stages: an analog front-end and a digital back-end. The analog front-end is responsible for amplifying and discriminating the signals from the straw tubes. The digital back-end is responsible for converting the analog signals into digital form and processing them for further analysis.

The FE electronics are designed to be highly flexible and can be easily reconfigured to accommodate changes in the LHCb experiment. The electronics are also designed to be robust and reliable, with built-in protections against electrical surges and other hazards.