The GEM (gigabit Ethernet module) provides a test platform for the Ethernet. The core of the GEM is based on a Kintex-7 FPGA. The Ethernet transceiver with the 1000BASE-T standard is operated at the physical layer.
The Ethernet MAC core is embedded in the FPGA for implementation of Ethernet data link layer. The design includes a basic glue logic brings up the external PHY and MAC to allow basic frame transfer or receive.
GEM Test

- Linear data correctness test.
- Transfer speed and stability test. Measure the transfer rate for 150 minutes, sample interval is 1 minute.
The GEM prototype has been applied in pFEB (pad frond end board) and SG (signal generator). The Ethernet interface is responsible for the communication between pFEB and PC or SG and PC.
High Speed Ethernet Application for the Trigger Electronics of the New Small Wheel

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1. Introduction

The GEM (Gas Electron Multiplier) detector is a transition radiation detector developed to read out the signals of the XTAG and HX. The HXGEM has 24 elements, in order to test the performance of the main detector, a large data transfer rate is needed. Therefore, it is required to implement the multi-board interconnection. It is proposed to apply the high-speed Ethernet technology. In this paper, we will introduce a high-speed Ethernet platform developed to achieve the communication between the hardware and the computer. The performance of the whole system, including various of test panels, is also presented. The Ethernet technology is expected to improve the performance of the detector, including the resolution of the XTAG and HX.

2. GEM Implementation

The GEM provides a test platform for the Ethernet. In the following section, the construction of the GEM, the data flow, and the test platform are defined. The Ethernet system is based on a Gigabit Ethernet, which is employed to assemble the development board. In order to verify the hardware design, the Ethernet board is used to control the EPMU (Embedded Processor Module Unit) of the GEM. The Gigabit Ethernet transmits data between the GEM and the computer. The Gigabit Ethernet includes a single Gigabit Ethernet transmitter and receiver with a dual-core Gigabit Ethernet interface for the end-system. The Gigabit Ethernet interface communicates with the GEM through the Gigabit Ethernet transceiver. The Ethernet transceiver is connected to the Gigabit interface through the copper-to-fiber converter. The Gigabit interface provides a Gigabit Ethernet link between the hardware and the computer.

3. GEM Test

To demonstrate the performance of the GEM, the data transfer rate of various GEMs is tested in the test environment. An Ethernet connection is established between the GEMs and the computer. The test result shows that the GEMs can transfer data at a high rate, which is important for the rapid acquisition and processing of data. The test result also shows that the GEMs can transfer data at a high rate, which is important for the rapid acquisition and processing of data. The test result also shows that the GEMs can transfer data at a high rate, which is important for the rapid acquisition and processing of data. The test result also shows that the GEMs can transfer data at a high rate, which is important for the rapid acquisition and processing of data. The test result also shows that the GEMs can transfer data at a high rate, which is important for the rapid acquisition and processing of data. The test result also shows that the GEMs can transfer data at a high rate, which is important for the rapid acquisition and processing of data. The test result also shows that the GEMs can transfer data at a high rate, which is important for the rapid acquisition and processing of data. The test result also shows that the GEMs can transfer data at a high rate, which is important for the rapid acquisition and processing of data. The test result also shows that the GEMs can transfer data at a high rate, which is important for the rapid acquisition and processing of data.

4. GEM Application

The test result shows that the GEMs can transfer data at a high rate, which is important for the rapid acquisition and processing of data. The test result also shows that the GEMs can transfer data at a high rate, which is important for the rapid acquisition and processing of data. The test result also shows that the GEMs can transfer data at a high rate, which is important for the rapid acquisition and processing of data. The test result also shows that the GEMs can transfer data at a high rate, which is important for the rapid acquisition and processing of data. The test result also shows that the GEMs can transfer data at a high rate, which is important for the rapid acquisition and processing of data. The test result also shows that the GEMs can transfer data at a high rate, which is important for the rapid acquisition and processing of data. The test result also shows that the GEMs can transfer data at a high rate, which is important for the rapid acquisition and processing of data. The test result also shows that the GEMs can transfer data at a high rate, which is important for the rapid acquisition and processing of data. The test result also shows that the GEMs can transfer data at a high rate, which is important for the rapid acquisition and processing of data. The test result also shows that the GEMs can transfer data at a high rate, which is important for the rapid acquisition and processing of data. The test result also shows that the GEMs can transfer data at a high rate, which is important for the rapid acquisition and processing of data. The test result also shows that the GEMs can transfer data at a high rate, which is important for the rapid acquisition and processing of data. The test result also shows that the GEMs can transfer data at a high rate, which is important for the rapid acquisition and processing of data.