TGLD: A 16-CHANNEL CHARGE READOUT CHIP FOR THE PHENIX PAD CHAMBER DETECTOR SUBSYSTEM AT RHIC

W. L. Bryan,[1] *U. Jagadish,*[1] *C. L. Britton,*[1] *S. S. Frank,*[1] *M. N. Ericson,*[1]
M. L. Simpson,[1] *G. R. Young, L.G. Clonts,*[2] *R. S. Smith,*[2]
A. Oskarsson,[3] *T. Mark,*[4] *E. O'Brien,*[5] *V. Greene* [6]

This paper describes TGLD, a charge readout chip for the PHENIX Pad Chamber (PC) subsystem at Brookhaven National Laboratory's Relativistic Heavy Ion Collider (RHIC) in Upton, NY. Due to the PC's high channel density, the TGLD and associated circuitry operate within the active detector region as permanent, zero access components, with remote set-up and test during collider operation. The TGLD design accommodates varying pad capacitance and charge gain for three detector subassemblies that detect particles at three different distances from the PHENIX collision vertex. The design also provides adjustable discrimination thresholds from MIP/10 to 2 MIP (Minimum Ionizing Particle). Three TGLD chips operate with a complimentary digital memory unit (DMU) to form 48 channel low power, low mass, readout cards. Partitioning of readout electronics and address control for robust remote operation are discussed. Component and system test results are also reported.

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1. ORNL Instrumentation and Controls Division.
2. University of Tennessee, Knoxville.
3. University of Lund, Sweden.
4. McGill University, Montreal, Canada.
5. Brookhaven National Laboratory, Upton, NY.
6. Vanderbilt University, Nashville, TN.