

Fermilab

Particle Physics Division / CDF Upgrade Project

Calibration Interface Card CIC Module

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Introduction

The Calibration Interface Card (CIC) is required to interface the COT and Muon Tracking Calibration system to the Trigger System Interface (TSI). The CIC will also provide synchronization to the CDF 132ns Clock.

The synchronized trigger signal the CIC produces, BNC_TRIG, will be used to drive the Trigger Input of a Berkley Nucleonics VME Digital Delay Generator (B951).

Modes of Operation

Internal Trigger Mode

When set for internal trigger mode, the CIC will monitor the CDF_CALEN* and CDF_CALIB(6:0)* lines and issue a trigger signal, BNC_TRIG, upon the recognition of a valid Calibration Enable. This BNC_TRIG signal will occur on the next CDF_CLOCK.

A valid Calibration Enable will occur whenever the CDF_CALEN* signal is low and the CDF_CALIB(6:0)* lines match the programmed setting of the CIC.

External Trigger Mode

When set for external trigger mode, the CIC will issue a BNC_TRIG following an external trigger, EXT_TRIG, upon the next CDF_CLOCK cycle.

Features

A number of features have been added to the CIC in order to aid the user. They are as follows:

- A copy of the BNC_TRIG signal
- A LED to indicate an active BNC_TRIG has occurred
- A copy of the backplane CDF_CLOCK signal

Implementation

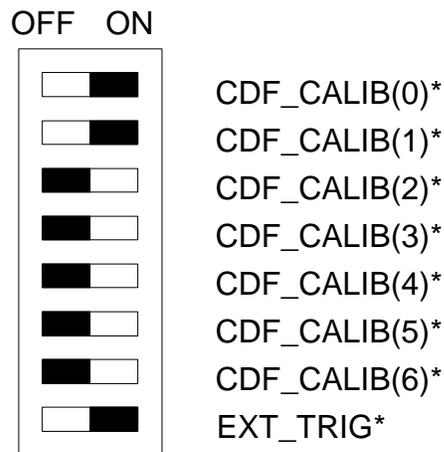
The CIC trigger pulse must be delivered to a Berkley Nucleonics VME Digital Delay Generator (B951). The B951 is a 6U VMEbus module which acts as a A16/D16 slave.

To implement the CIC and to house the B951 in a 9U crate, a special 6U-to-9U adapter module will be designed. This card requires little intelligence and will have no active VMEbus functionality, other than passing the required VMEbus signals to the BNC 951.

Board logic will monitor the CDF_CALEN*, CDF_CALIB(6:0)* and EXT_TRIG states and issue a BNC_TRIG when appropriate.

Programming

Since the CIC will have no VMEbus abilities, all programming will be done through Dip switches. The Dip Switch must program the CDF_CALIB(6:0)* lines as well as the trigger mode (internal or external). The Dip switch will be front panel mounted and will have the functionality shown below.



In the above switch setting, the CIC would send the BNC_TRIG pulse when the Trigger Supervisor sent a Calibration Enable with a CDF_CALIB(6:0) setting of 0x03.

Outputs

All outputs will be in the single-ended TTL and be brought out on Front panel accessible LIMO connectors.

These outputs include:

BNC_TRIG

BNC_TRIG (2) – A copy of BNC_TRIG
CDF_CLOCK

Inputs

The EXT_TRIG input will be single-ended TTL and be brought in on Front panel accessible LIMO connector.

Signal Indicator

A front panel mounted LED will indicate the presence of a BNC_TRIG signal.

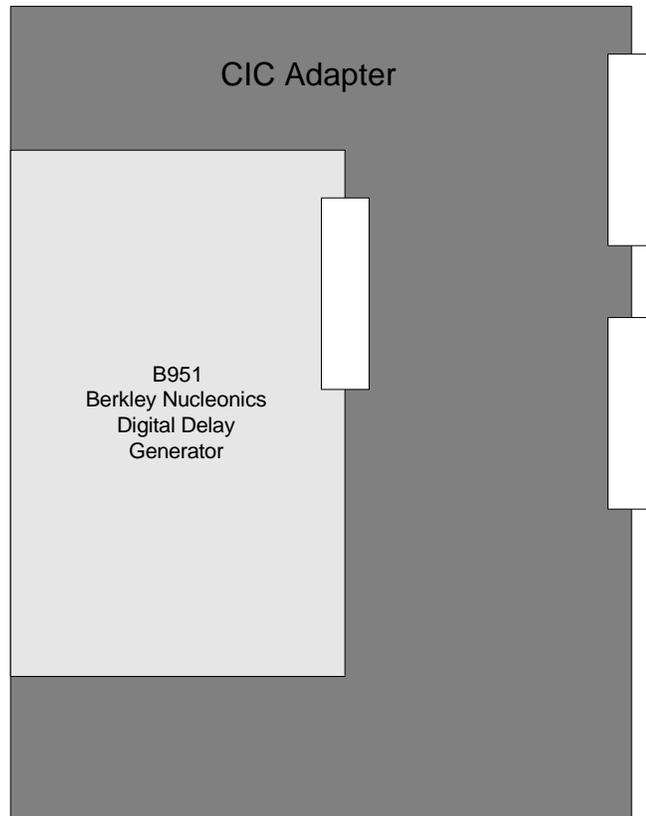
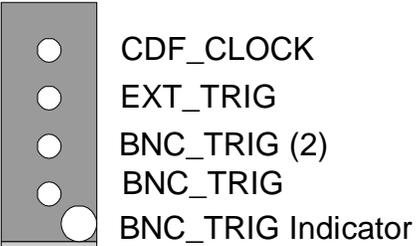


Diagram of B951 in CIC Adapter



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Front Panel View
of B951 and CIC Adapter

