

Handling e/g and t-counting Slice Data from CMM on the ROD

This document describes the requirements for handling slice readout for e/γ and τ -counting data on the Prototype ROD module. The slice data readout will be very similar to the slice data read out of the CPMs with single or multiple slice readout and zero suppression capability. The FPGA firmware needs to be developed to handle data and event formats as described below.

Reference:

- [1] Prototype ROD Specification Version 1.1a
- [2] Prototype Common Merger Module Version 1.1

1. e/g and t-counting Slice data as seen by the ROD

Data as seen by the ROD via the G-link is shown in figure 1 below. The data (35 bits/G-link data line) is merged on to the G-Link as follows:

1. G-Link data [D0:D13] will carry hit bits (3bits/threshold) from the 14 CPMs in the crate, plus its associated parity bit which arrives onto the CMM via the backplane.
2. The 12 bit BCID will be attached from D0 to D11 with the LSB at D0.
3. A five bit ID (M0-M4) will carry information such as crate number, System or Remote CMM and left or right CMM as shown in the diagram below.
4. On D14, bit 25 will carry the FIFO overflow flag
5. G-Link data [D14:D16] will carry sub-sums from CMM1 to CMM3 respectively from the other three crates which arrives from the backplane via the Rear Transition Module. This is only applicable to the System CMM for other remote CMMs (Crate CMMs) this field will be zeroed (including the parity bit). The ROD will know whether it is a system CMM or remote CMM from the M0-M4 field and will ignore contents of D14:D16 if it is a remote CMM
6. G-Link data [D17] will carry sub-sum from CMM
7. G-Link data [D18] will carry the total hit count (only applicable to the System CMM)
8. G-Link data [D19] is unused and will be set to zeros
9. There are 34 data bits and a parity (odd) bit on each of the G-link data lines. Some of the unused bits in the data stream is padded with zeros to make it compatible with other systems (jet counting)

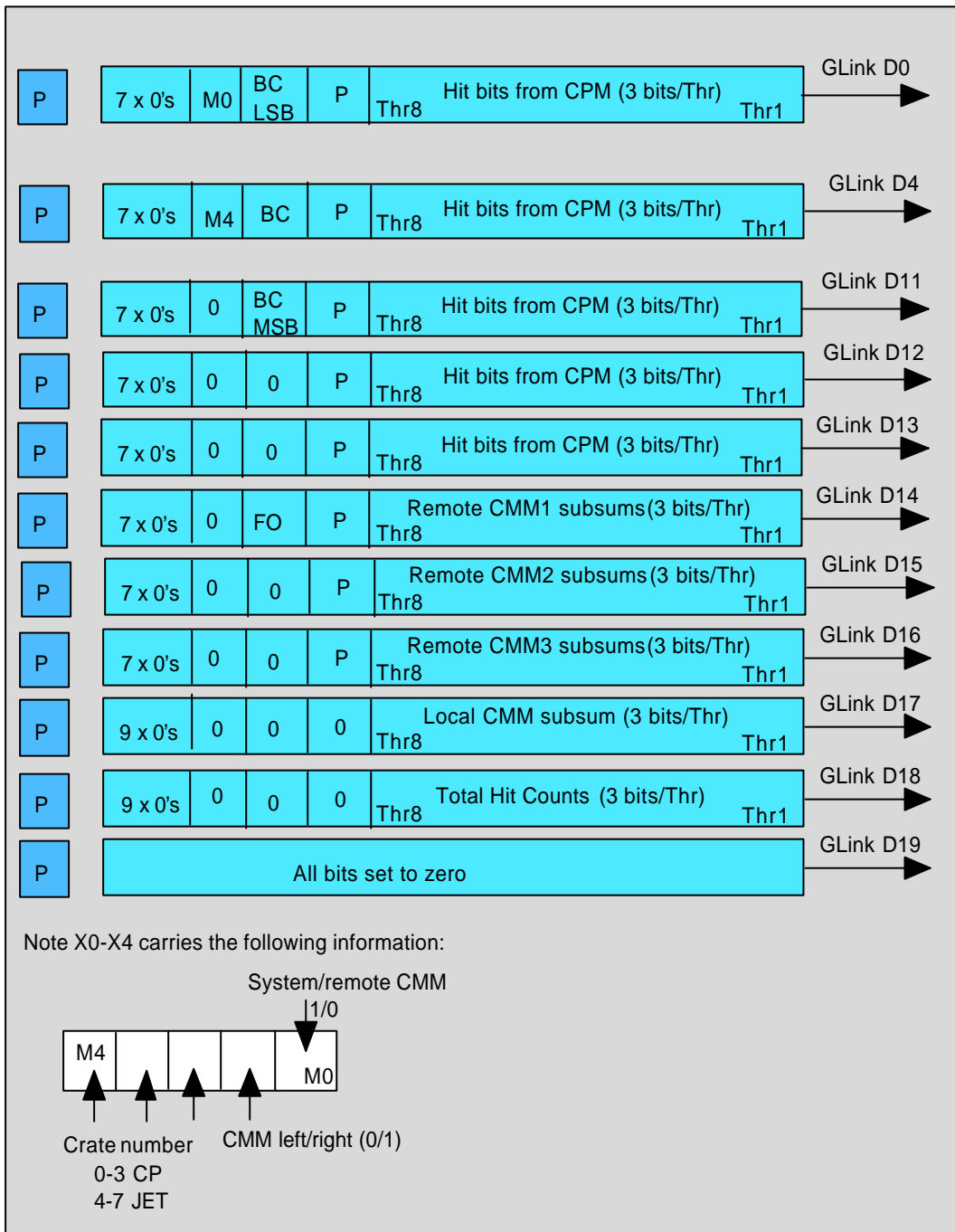


Figure 1: Data as seen by the ROD.

2. Event Format

The format of the CMM slice data sent to DAQ will be very similar to the CPM slice data event format with a header, data words, status words and a trailer (see 3.14 of [1])

The data word format will be as shown in the following diagram.

A4:A0 is required to identify the source of data (G-link data D0 to D19). Bits 31:29 is used as a word ID to identify the type of data or sub status.

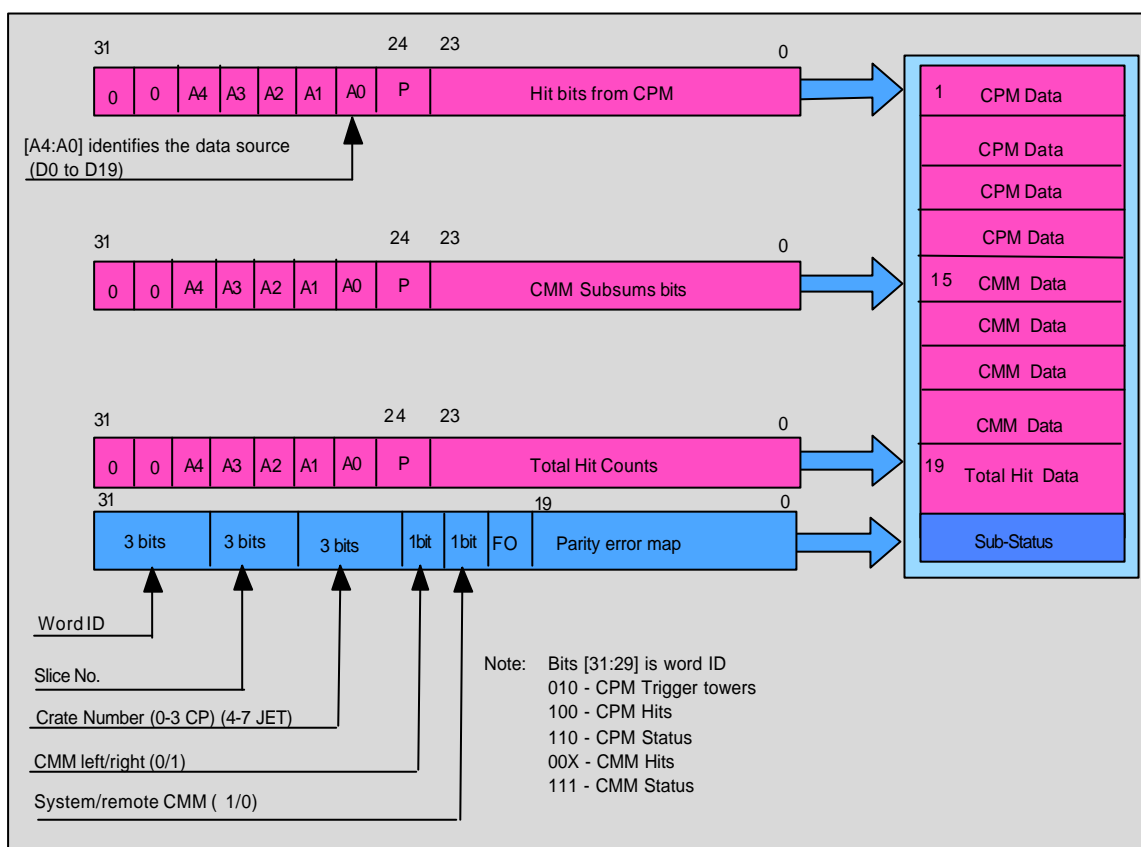


Figure 2: S-Link Data packet sent to DAQ

3. Status words

The status words will be as described in sections 3.10.1 and 3.10.2 of the Prototype ROD Specification Version 1.1a