

## Handling RoIs on the ROD

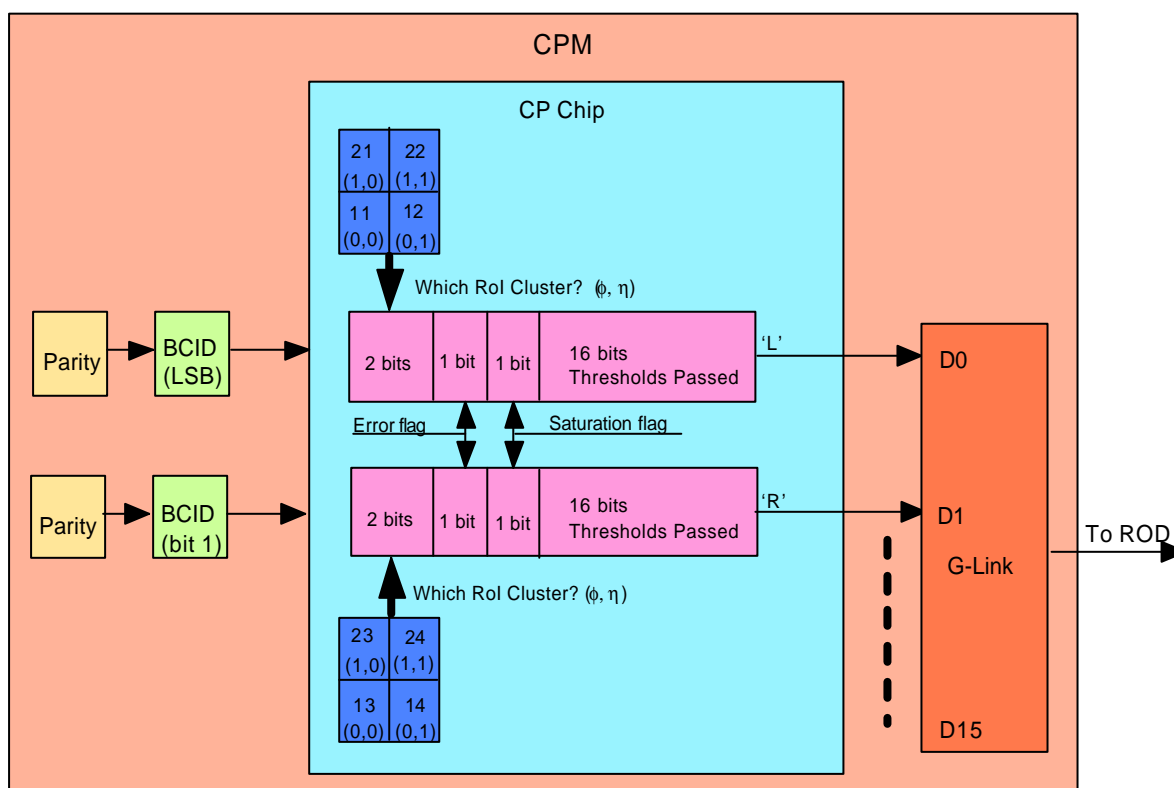
This describes the requirements for handling the RoIs on the Prototype ROD module. The FPGA firmware needs to be developed to handle data and event formats described below.

### Reference:

[1] Prototype ROD Specification Version 1.1a

### 1. RoI data as seen by the ROD

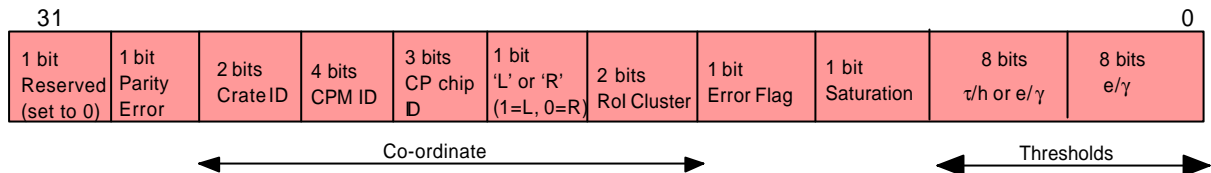
The RoI data as seen by the ROD is shown in figure below. Each CP chip will occupy two data bits of the G-link for the left (L) and right (R) RoI clusters, with L always on an even bit. There will be eight CP chips (0-7 identified by 3-bit Chip ID; see section 2 below) on the CPM occupying D0 to D15 of the G-Link starting from chip 0 on D0 and D1. The BCID and the parity bit will be added by the CPM to make it 22 bits per G-link data line per event. The 12 bit BCID will be attached from D0 to D11 with the LSB at D0. The process of transferring data from the CPM and receiving them on the ROD will be exactly the same as the DAQ data from the Serialiser FPGAs, except there will be only one time slice readout on a level-1 accept. If there were parity errors on the received data, this will be indicated on bit 30 of the data field (See section 2 below). Also the ROD will terminate the data transfer to level-2 if the number of RoIs exceeds a predetermined number held in the RoI overflow register (see memory map in [1]), this will be indicated in the status word 2 (see section 3 below)



## 2. Event Format

The format of the RoIs sent to level-2 will be very similar to the DAQ 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



### Notes:

1. The CP chip number is implicit from the connection to the data bits of the G-Link
2. The link number determines the CPM ID since each CPM will be uniquely assigned to a CPM.
3. Crate ID will be the ROD number since each ROD will uniquely handle data from one crate.

## 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