A.T. 06/07/2009

MDC SUBEVENT DATA FORMAT

Overview

Network Header (DHDR)
First OEPB Dataword
OEPB Debug Data (at Request)
MDC Data (Verbose Mode or Compact Mode)
Padding Datawords

The **First OEPB Dataword** follows the **Network Header (DHDR)** and it is always present. The **First OEPB Dataword** indicated if debug data will follow. These debug datawords come before the MDC data. They contains all information regarding the status of the OEPB.

The **MDC Data** consists of **Verbose Mode** or **Compact Mode** datawords. The first one contains one hit of one TDC channel and eventually some debug information. The second one is thought to reduce the data load. Here only the important data are transported. One can switch between the two mode writing in one configuration register.

Note: this is what the OEP sends out, not what the Eventbuilder receives.

Network Header (DHDR)

The first and the third DHDR are built in the OEPB. The second one by the last hub level.

The **first DHDR** word contains the trigger bus information belonging to this data sample, namely:

31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Res			Pack	Trig Type				Trig Ran								Trig Nr															

- **Res** reserved bits
- **Pack** Pack bit ('0'pack,'1' don't pack)
- **Trig Type** Trigger type
- **Trig Ran** Trigger random
- **Trigger Nr** Trigger number

The **second DHDR** word contains the length of the data packet (+1) and the HUB address.

31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Event length(+1)																HUB TRBnet address															

The **third DHDR** word contains the length of the data packet following, as well as the TRBnet address of the module (OEPB) the data originates from:

31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Event length																TRBnet address															

First OEPB Dataword

The **First OEPB Dataword** contains the length of the debug information which follows. This data can be asked at request by the user and comes before the MDC Data.

31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Data Type				Resereved												Length															

- **Data Type**
  - **x"0"** OEPB status data disabled. No debug datawords will be trasnported
  - **x"1"** Debug information enabled. A number of datawords defined in **Length** field will follow. Here all OEPB information will be encoded.
  - **x"2" to x"F"** for future use
- **Resereved** for future use.
- **Length** number of datawords which follow

MDC Data (Verbose Mode)

Each dataword contains one hit. This format is the same for normal and for calibration trigger.

31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Mode	Event Nr				Reserved								TDC Nr				TDC Ch			Hit Nr	Data										

- **Mode**
  - **'0'** Verbose Mode selected
- **Event Nr** Incresing number of event
- **Reserved** for future use.
- **TDC Nr** TDC Number (1,...,12)
- **TDC Ch** TDC Channel (0,...,7)
- **Hit Nr** Number of hit '1' first hit, '0' second hit
- **Data** TDC data

MDC Data (Compact Mode)

In **Compact Mode** all single hit data words are just discarded; only good data are transmitted, in order to see the real noise behavior of one MB the mode has to be switched to **Verbose Mode**.

31	30 29	28 27 26 25	24 23 22	21 20 19 18 17 16 15 14 13 12 11	10 9 8 7 6 5 4 3 2 1 0
Mode	Data Type	TDC Nr	TDC Ch	Data Hit 0	Data Hit 1

- **Mode**
  - **'1'** Compact Mode selected
- **Data Type**
  - **"00"** TDC measurement data
  - **"01"** TDC calibration data. Three datawords per TDC channel are foreseen (3 dataword x 2hit/dataword).
  - **"10"** TDC measurement data with ERROR, reserved for token not retrieved
  - **"11"** TDC calibration data with ERROR, reserved for token not retrieved
- **TDC Nr** TDC Number (1,...,12)
- **TDC Ch** TDC Channel (0,...,7)
- **Data Hit 0** TDC data
- **Data Hit 1** TDC data

In case of calibration event, one TDC channel data is packed as follows:

31	30	29	28 27 26 25	24 23 22	21 20 19 18 17 16 15 14 13 12 11	10 9 8 7 6 5 4 3 2 1 0
1	0	1	TDC Nr	TDC Ch	Data2 (Hit 0)	Data1 (Hit 1)
31	30	29	28 27 26 25	24 23 22	21 20 19 18 17 16 15 14 13 12 11	10 9 8 7 6 5 4 3 2 1 0
1	0	1	TDC Nr	TDC Ch	Data4 (Hit 0)	Data3 (Hit 1)
31	30	29	28 27 26 25	24 23 22	21 20 19 18 17 16 15 14 13 12 11	10 9 8 7 6 5 4 3 2 1 0
1	0	1	TDC Nr	TDC Ch	Data6 (Hit 0)	Data5 (Hit 1)

Examples:...