Straw Tracker will be able to send data in two different modes: stand alone (SA) and L0 trigger matching. The following presents the data format for both modes.

# Stand Alone Data Format

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Flags | | | | | | | | | | | | | | | | Coarse Time 16-most | | | | | | | | | | | | | | | |
| SA Data Word #1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SA Data Word #2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SA Data Word #3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| … | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 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 words are contained in a single UDP packet, the payload packet is:

**Coarse Time 16-most**: self explaining, a single UDP packet will contain the data of time window of ~1.6s.

### Stand Alone Data word

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Err | | Straw ID | | | | | | | | E | Fine Time | | | | | Coarse Time 16-less | | | | | | | | | | | | | | | |
| 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 |

Each SA Data Word is a 32-bits word:

**Coarse Time 16-less**: are the less 16 bits from the coarse time

**Fine time**: is the sub-nanosecond hit fine time

**E**: is the edge type (1: trailing; 0: leading)

**Straw ID**: self explaining, this straw ID it is unique for each SRBs

**Err**: error flags

# Level 0 Trigger Matching Data Format

Straw spectrometer data will be packet as described in the living note “NA62 data formats” (November 15th 2013). One MEP packet will contain one event data block from the SRB (Straw Readout Board).

## Event data block for STRAW spectrometer

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Packet Length | | | | | | | | | | | | | | | | L0 trigger type | | | | | | | | | | Flags | | | | | SRB ID | | | | |
| Coarse time first slot | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 16-bits data word | | | | | | | | | | | | | | | | | | 16-bits data word | | | | | | | | | | | | | | | | | |
| 16-bits data word | | | | | | | | | | | | | | | | | | 16-bits data word | | | | | | | | | | | | | | | | | |
| 16-bits data word | | | | | | | | | | | | | | | | | | 16-bits data word | | | | | | | | | | | | | | | | | |
| … | | | | | | | | | | | | | | | | | | 16-bits data word | | | | | | | | | | | | | | | | | |
| … | | | | | | | | | | | | | | | | | | … | | | | | | | | | | | | | | | | | |
| N edges slot 3 | | | | | | | | N edges slot 2 | | | | | | | | | | N edges slot 1 | | | | | | | | | | N edges slot 0 | | | | | | | |
| N edges slot 7 | | | | | | | | N edges slot 6 | | | | | | | | | | N edges slot 5 | | | | | | | | | | N edges slot 4 | | | | | | | |
| N edges slot 11 | | | | | | | | N edges slot 10 | | | | | | | | | | N edges slot 9 | | | | | | | | | | N edges slot 8 | | | | | | | |
| N edges slot 15 | | | | | | | | N edges slot 14 | | | | | | | | | | N edges slot 13 | | | | | | | | | | N edges slot 12 | | | | | | | |
| 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 |

Each MEP contains one SRB data block, and it is organized as follows (header, data payload and counters):

**SRB id**: is the id of the specific SRB how is sending the packet

**Flags**: reserved for errors handling

**Packet Length**: is the length of the packet in bytes (header and counters included)

**Coarse time first slot**: is the time stamp for the first 25 ns window

### Data word

Each data word is 16 bits long and is defined as:

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Err | | Straw ID | | | | | | | | E | Fine Time | | | | |
| 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |

**Fine time**: is the sub-nanosecond hit fine time

**E**: is the edge type (1: trailing; 0: leading)

**Straw ID**: self explaining, this straw ID it is unique for each SRBs

**Err**: error flags