

## Geiger Card readout format

A PC based program communicates with the VME hardware over a USB link. Data is written to local disk in text format. All values are hexadecimal. The following format closely follows that specified for the Manchester 90-cell prototype, with some modifications.

The text file has a number of lines each with keywords followed by data in a fixed format.

The file contains a header with the description of the run configuration. This is not relevant for the time being.

```
THRESH CARD 0 A0A0A0A0A0A0A0A0A0A0
THRESH CARD 1 A0A0A0A0A0A0A0A0A0A0
...
THRESH CARD A A0A0A0A0A0A0A0A0A0A0
```

```
TRIGCONF XXX XXXX XXX XXX XXX X
RUNSTART
```

Followed by events:

```
Event 00000001 Fri Apr 01 23:54:40 2009
```

```
CARD C status 0XXX
```

```
D0 YYYY ZZZZ
```

```
D1 XXXX XXXX XXXX XXXX XXXXX
```

```
D0 YYYY ZZZZ
```

```
D1 XXXX XXXX XXXX XXXX XXXXX
```

```
D0 YYYY ZZZZ
```

```
D1 XXXX XXXX XXXX XXXX XXXXX
```

```
CARD C status 0XXX
```

```
D0 YYYY ZZZZ
```

```
D1 XXXX XXXX XXXX XXXX XXXXX
```

```
D0 YYYY ZZZZ
```

```
D1 XXXX XXXX XXXX XXXX XXXXX
```

```
...
```

```
Event 0000xxxx Fri Apr 01 23:54:40 2009
```

```
CARD C status 0XXX
```

```
D0 YYYY ZZZZ
```

```
D1 XXXX XXXX XXXX XXXX XXXXX
```

```
D0 YYYY ZZZZ
```

```
D1 XXXX XXXX XXXX XXXX XXXXX
```

```
D0 YYYY ZZZZ
```

```
D1 XXXX XXXX XXXX XXXX XXXXX
```

```
CARD C status 0XXX
```

```
D0 YYYY ZZZZ
```

```
D1 XXXX XXXX XXXX XXXX XXXXX
```

```
D0 YYYY ZZZZ
```

```
D1 XXXX XXXX XXXX XXXX XXXXX
```

```
ENDRUN
```

The keywords are

**THRESH CARD C A0A0A0A0A0A0A0A0A0**

The analogue threshold values for each card are recorded. There are ten ASICS per card and each has its own 8 bit threshold, represented by a two digit hexadecimal number. The thresholds are written in order, 0 to 9.

**TRIGCONF XXX XXXX XXX XXX XXX X**

This is the configuration data for the logic implemented in the CAEN board. In order it is

- XXX** The drift delay register, the delay added between the trigger and 'stop-A'
- XXXX** The Alpha register, the delay between 'stop-A' and 'stop-measure'
- XXX** Trig mask 0, the hitmask for card 0
- XXX** Trig mask 1, the hitmask for card 1
- XXX** Trig mask 2, the hitmask for card 2
- X** Trig mask N, the mask of NIM trigger enables.

This is only output when the trigger logic is enabled (ie when you have a CAEN board and have enabled it). The delay registers count in 25nsec steps. Eg 256 (= 100) = 6.25  $\mu$ sec

**RUNSTART** - Indicates runstart

**Event 00000001 Fri Apr 01 23:54:40 2009**

Indicates an event, with event number and the time the PC saw the event.

**CARD C status 0XXX**

This indicates the card that is about to be read out, and shows its hit mask.

**D0 YYYY ZZZZ**

**ZZZZ** Geiger cell address word as defined in Doc-DB 1570

**YYYY** Hardware address word (not relevant for the time being – useful for debugging only)

**D1 XXXX XXXX XXXX XXXX XXXXX**

**XXXX** ASIC status word, indicating which channels were hit. In binary I believe the encoding is '0000'ccAc'cAcc'AccA'

**XXXX** Anode TDC

**XXXX** Cathode top TDC

**XXXX** Cathode bottom TDC

**XXXXX** Alpha TDC