AIDA White Rabbit Data formats

All data items are 64 bits handled as two 32 bit words. These two words are formatted as follows.

All Timestamps have a 1nano second LSB.

ADC Data Format

Bit Position	31	30	29	28	27 to 16	15 to 0
Field Value	1	1	Fail	Veto	Channel Ident	ADC data
Bit Position	31 to 28				27 to 0	
Field Value	0				White Rabbit Time Stamp 27:0	

For the Aida fee64 module the Fail bit is currently not used. Will be 0.
The Veto bit (bit 28) will contain the ADC Range setting: (0 = low; 1 = high).

For R3B data the ADC data occupies 12 bits which enables support for the 4K channels per module. These two words are formatted as follows.

Channel Ident format (Aida FEE64 modules) (12 bits)

Bit Position	11 to 6	5 to 0
Field Value	FEE64 Module Number	Channel Number

All other Information is sent in the following format

Bit Position	31	30	29 to 24	23 to 20	19 to 0
Field Value	1	0	Module Number	Information Code	Information Field
Bit Position	31 to 28		27 to 0		
Field Value	0		White Rabbit Time Stamp 27:0		

The Module number identifies the source of the information. This will be an FEE64 module.

Information code will be able to identify one of 16 possible information words. The information Field is defined for each of the codes.

The Information codes identified are as follows

Information Type	Code	Information Field Definition
Pause TimeStamp	2	White Rabbit Timestamp bits 47:28
Resume TimeStamp	3	White Rabbit Timestamp bits 47:28
White Rabbit TimeStamp Marker	4	White Rabbit Timestamp bits 47:28
White Rabbit TimeStamp Marker	5	White Rabbit Timestamp bits 63:48
Aida FEE64 discriminator data	6	FEE64 discriminator hit pattern
AIDA Correlation scaler	8	information index (16-19) + data (0-15) index=0 data=scaler (0-15) index=1 data=scaler (16-31) index=2 data=scaler (32-47)

The White Rabbit TimeStamp Markers (4, 5) are sent by each FEE64 once every 512 White Rabbit T0 pulses. The T0 pulse occurs at 10uS intervals. Thus the period between Markers is 5.12mS.

The Markers are sent in the order 5 followed by 4. This should cover the occasion when the 48 LSBs 'roll-over'.

<u>The operation of Pause and Resume with the Markers is currently under development.</u>