

Triggered streaming data packet structure:

A single data frame is sent over a TCP connection whenever a trigger signal is detected.

All integer values are little endian.

Frame format:

The first 4 bytes sent are an unsigned integer containing the *number of bytes, P, in the payload*. The remaining bytes contain the payload.

Frame offset bytes	Num Bytes	Content
0	4	payload length, P (uint32)
4	P	payload data

Payload format:

The payload consists of N pairs of signed 4-byte integers (i q values) followed by 10 unsigned 4-byte integer metadata flags and values.

N is the number of tones in the readout. which is variable and can always be calculated from the payload length as $N = (P - 40) / 8$.

Payload offset bytes	Num bytes	Contents	Type
0	4	i_0	int32
4	4	q_0	int32
8	4	i_1	int32
12	4	q_1	int32
...
8*N	4	i_N-1	int32
8*N+4	4	q_N-1	int32
P-40	4	flag0	uint32
P-36	4	flag1	uint32
P-32	4	flag2	uint32
P-28	4	flag3	uint32
P-24	4	flag4	uint32
P-20	4	flag5	uint32
P-16	4	flag6	uint32
P-12	4	flag7	uint32
P-8	4	packet_counter	uint32
P-4	4	packet_error	uint32

Note that the packet_counter should not be expected to increase by 1 on every trigger. It increments with every frame that is generated, but not all frames that are generated get transmitted when running off the trigger.

The packet_error should always equal zero. If it is greater than zero then the sample rate is probably set too high.

Example:

The readout system was setup to read N=1 resonances and triggered streaming was enabled. The packet structure is as follows:

The payload length will be P=48 bytes, there will 4 bytes for i0, 4 bytes for q0, 40 bytes of metadata.

Frame offset bytes	Payload offset bytes	Num bytes	Content	Comment:
0	-4	4	payload length	decimal value = 48
4	0	4	i_0	i value for tone 0
8	4	4	q_0	q value for tone 0
12	8	4	flag0	not used
16	12	4	flag1	not used
20	16	4	flag2	not used
24	20	4	flag3	not used
28	24	4	flag4	not used
32	28	4	flag5	not used
36	32	4	flag6	not used
40	36	4	flag7	not used
44	40	4	packet_counter	could be any number
48	44	4	packet_error	should be zero