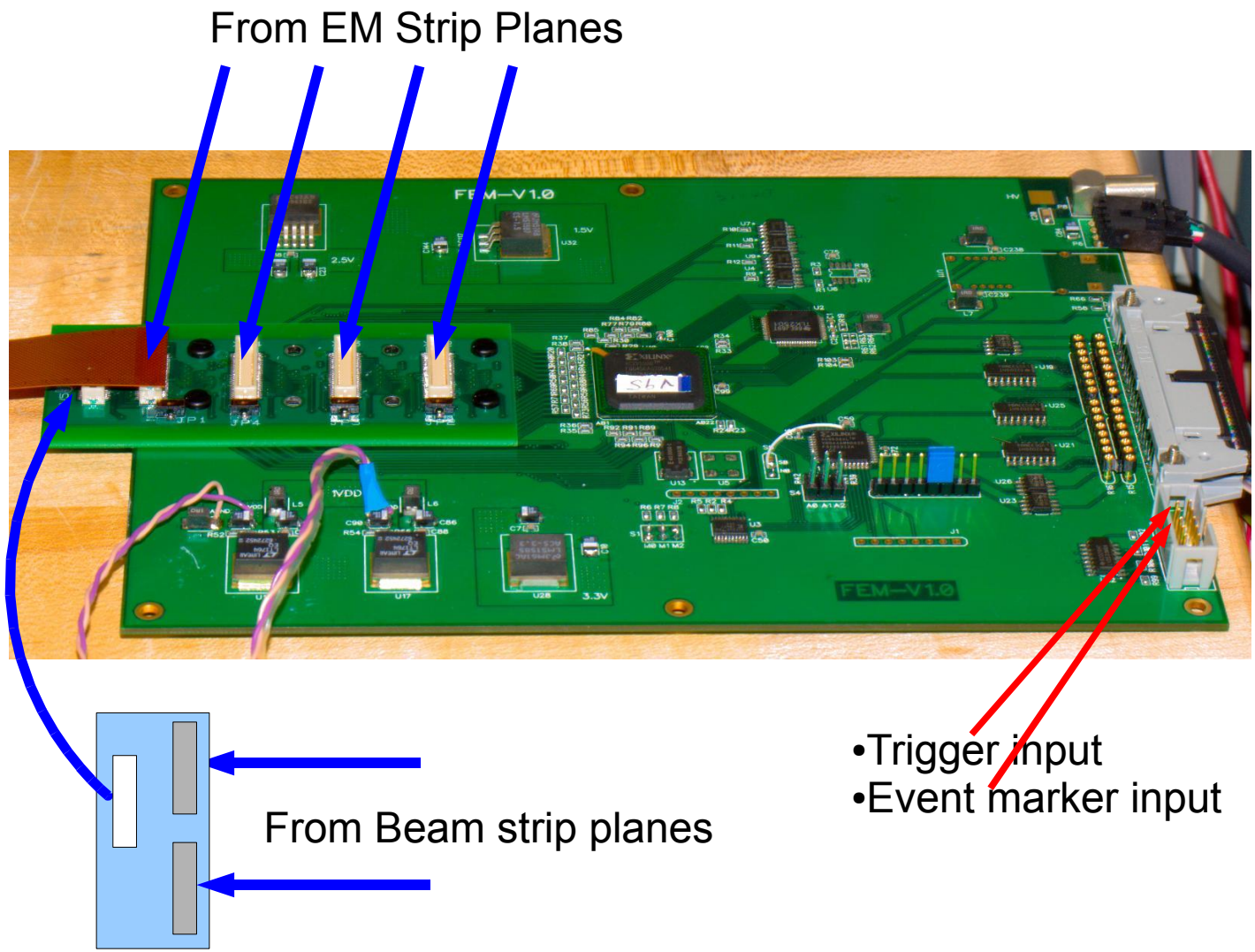
Strip FEM


From EM Strip Planes
FEM–V1.0
From Beam strip planes
•Trigger input
•Event marker input

Buffering time (inside FPGA) for 1 strip module = 10us, 256 bytes (non zero-suppressed).

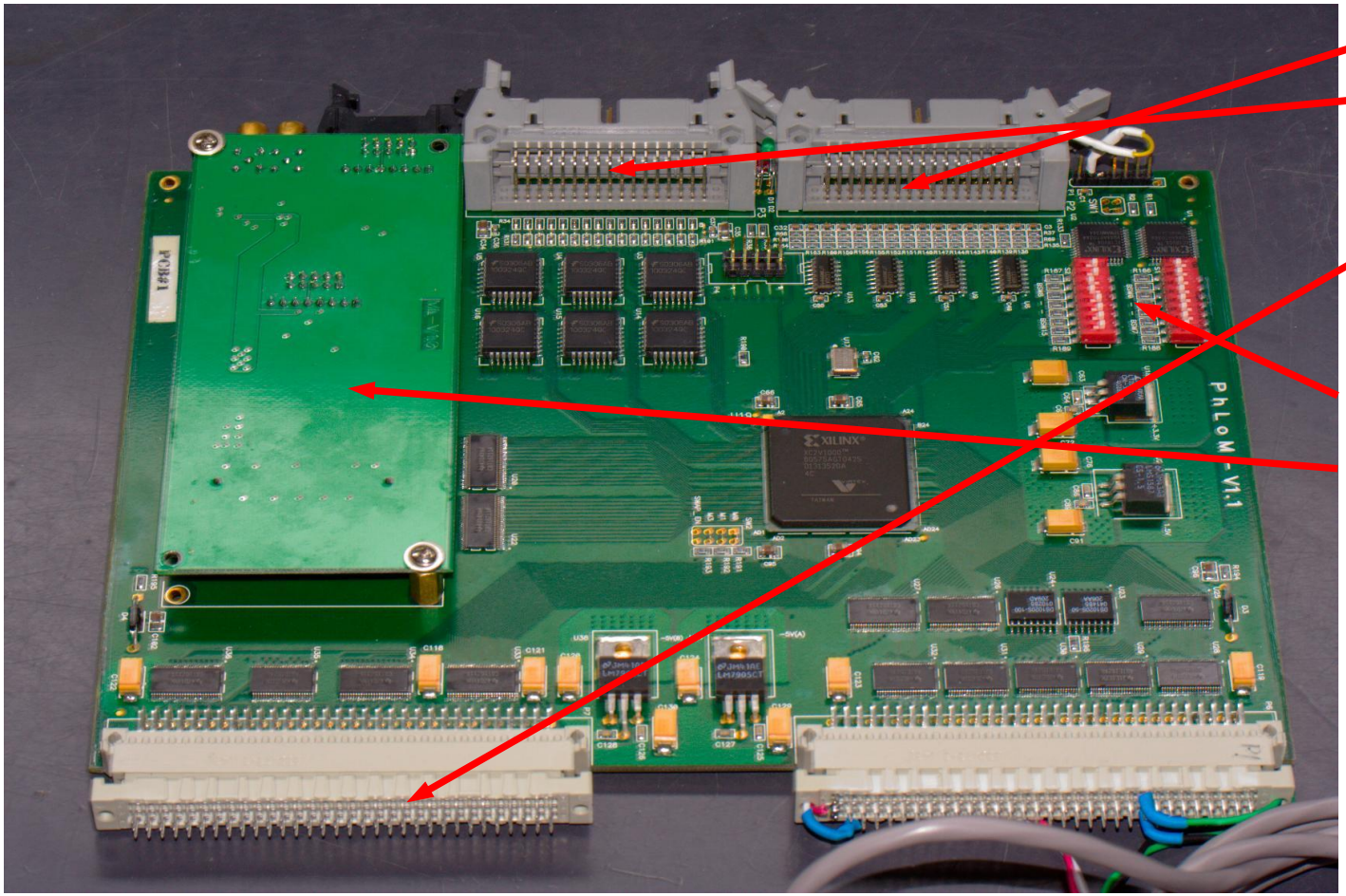
For max. setup (4*4+2)*2=36 modules the buffering time = 360us (if necessary it could be made 4 times smaller using parallel buffering), 9KBytes of data

For min. setup (1*4+2)*2=12 modules , buffering time 120us, event size 3KB.

The N3C daq throughput via ethernet = 2 MB/s. This corresponds to non-zero-suppressed rate of 200Hz for max. setup or 600Hz for min.setup.

<u>Asynchronous trigger issue.</u>
Only 25% of the applied triggers will have acceptable timing relative to internal clock. Three options:
1) Take everything, delete later.
2) Trigger logic takes care of optimal timing and does not generate. Requires accurate tuning.
3) The FEM generates the Reject signal.

Logic Module



- 32 ECL outputs,
- 32 ECL (comparator-based) inputs
- 64 TTL IO, could work as 32 LVDS pairs
- Mode switches.
- Custom daughter card, NIM and LVDS.
- Tap delays
- JTAG control
- Needs +5V (-5V if ECL needed)

Strip Data Format

Event size

Event type, trailer length

FPGA version, header size

Good code

Trigger number

FIFO status

Real time

Real time 2

CRC

```
0000 0124 1002 a020 900d c0de 0000 0419 0082 0008 6c49 1801 1624 8e34 8e7f 091e
3781 aa00 4001 3c02 3b03 3904 3c05 3f06 3e07 ac08 3f09 3b0a 3d0b 3b0c 3d0d 3e0e
3b0f ab10 4211 3c12 3f13 3614 4115 3c16 3b17 b618 3919 401a 3b1b 381c 3a1d 381e
371f b520 3d21 3a22 3d23 4024 3b25 3a26 3f27 b928 4129 3e2a 3f2b 3b2c 3a2d 3c2e
3e2f c030 3d31 3e32 3b33 3c34 3e35 3536 3e37 bd38 3939 403a 3d3b 3a3c 3d3d 3e3e
3b3f b440 3c41 4042 3b43 3d44 3a45 3846 3747 b548 3f49 3e4a 384b 3e4c 394d 374e
3c4f ba50 3f51 3a52 3953 3a54 3d55 3956 3957 bb58 3e59 415a 3c5b 3b5c 3d5d 395e
3d5f c460 3d61 3a62 3963 4064 3b65 4166 3e67 bd68 3b69 3b6a 3e6b 3c6c 3a6d 3d6e
3c6f bb70 3c71 3f72 3f73 4174 3f75 3e76 4077 be78 3e79 3b7a 407b 3e7c 407d 3c7e
```

SVX4 data steam:

We can mark the “marker events” with special event type