Double Timepix Quad + 3 GEM Module

anode plane

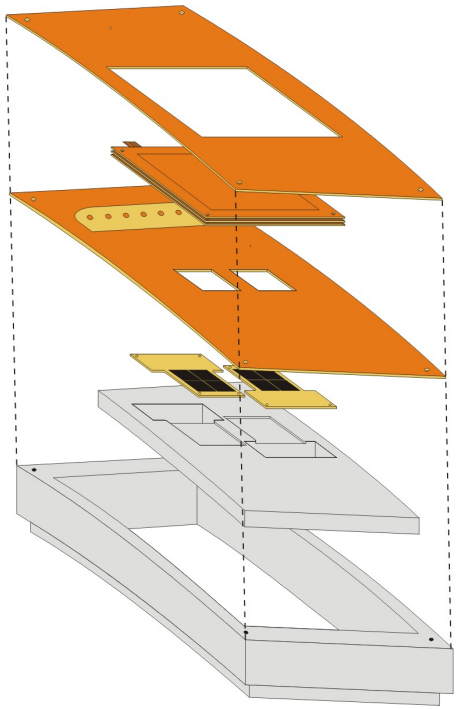
GEMs

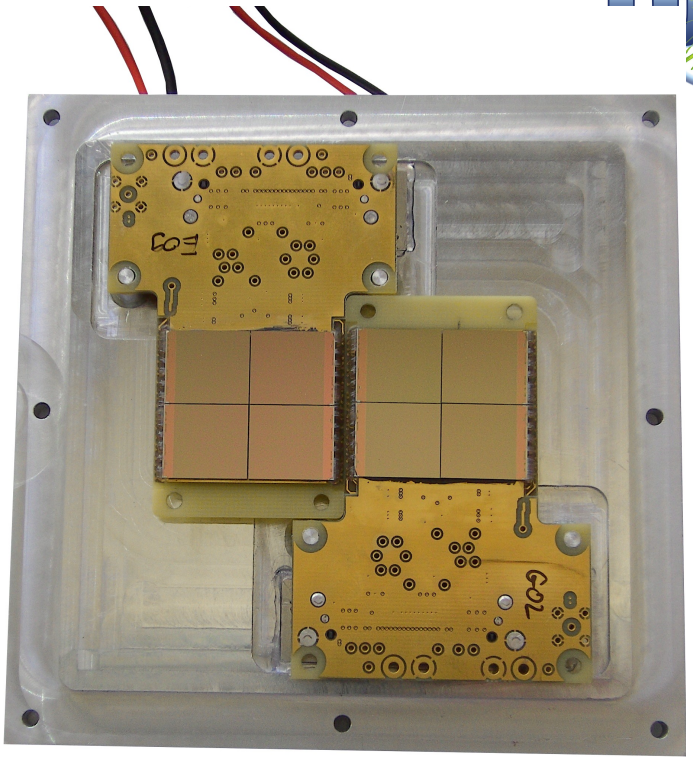
readout plane

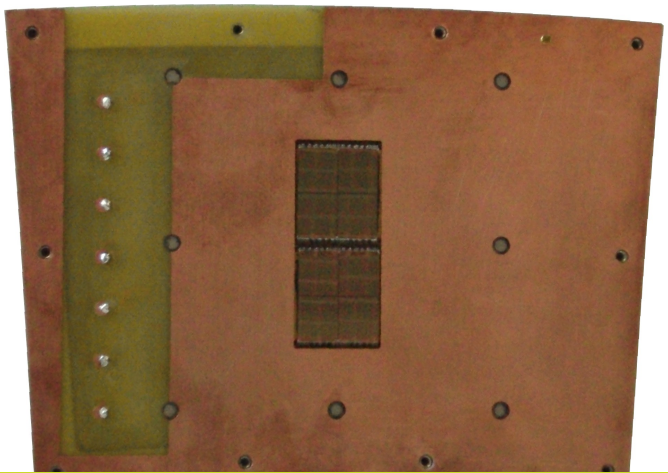
quad-boards

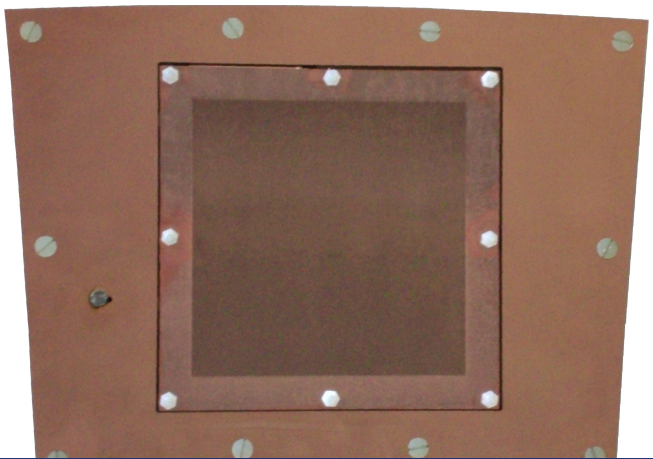
reinforcement of anode plane

redframe









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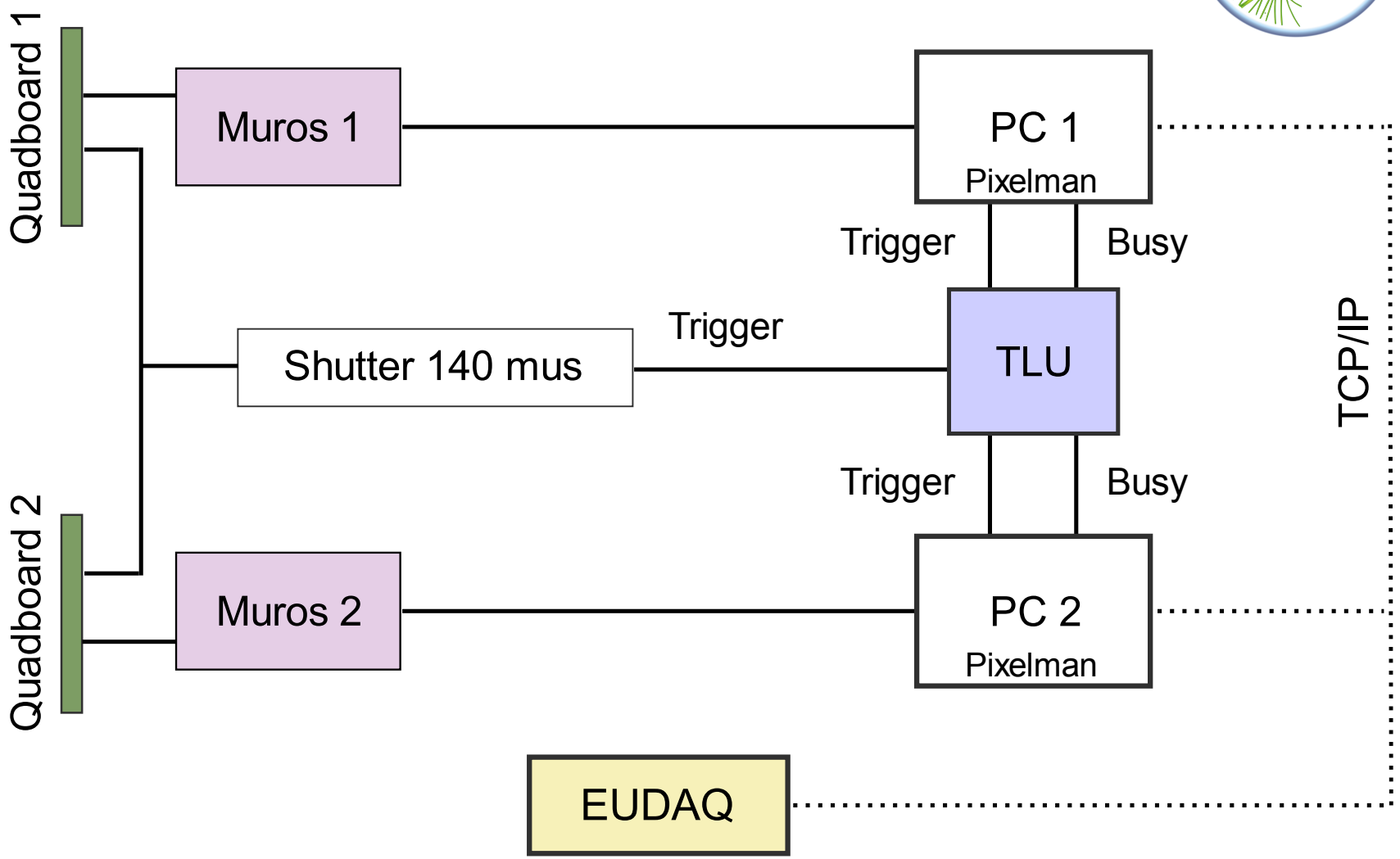
Readout Scheme



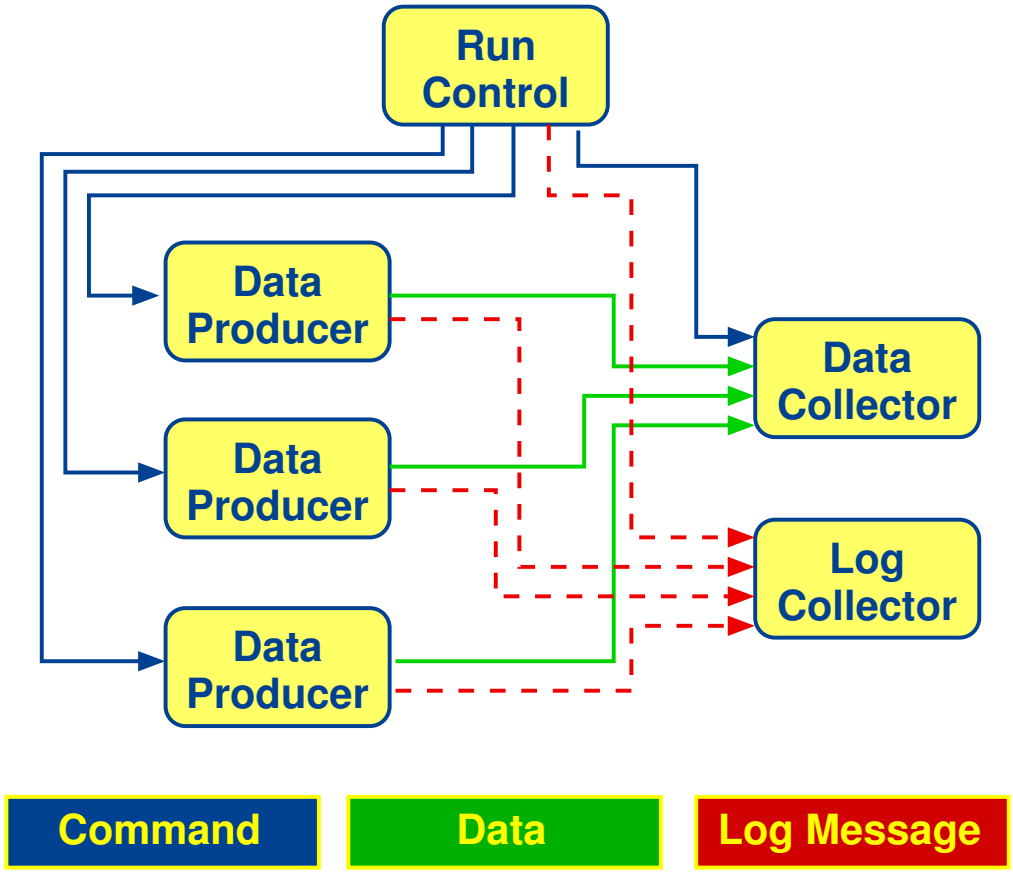
EUDAQ: The EUDET Data Acquisition System

DataProducer: Pixelman plugin which communicated with EUDAQ

- Receives commands from Run Control
- Sends data to Data Collector
- Sends messages to Log Collector

DataCollector:

- Receives raw data
- Performs event building
- New: Plugin mechanism
  LCIO converter plugin for every raw data format



The Hardware Shutter

- Timepix measures clock cycles to end of shutter window
  $\Rightarrow$ precise length, small jitter
- Software shutter is not precise (Windows timing: 1ms)
  $\Rightarrow$ use precise hardware pulse generator

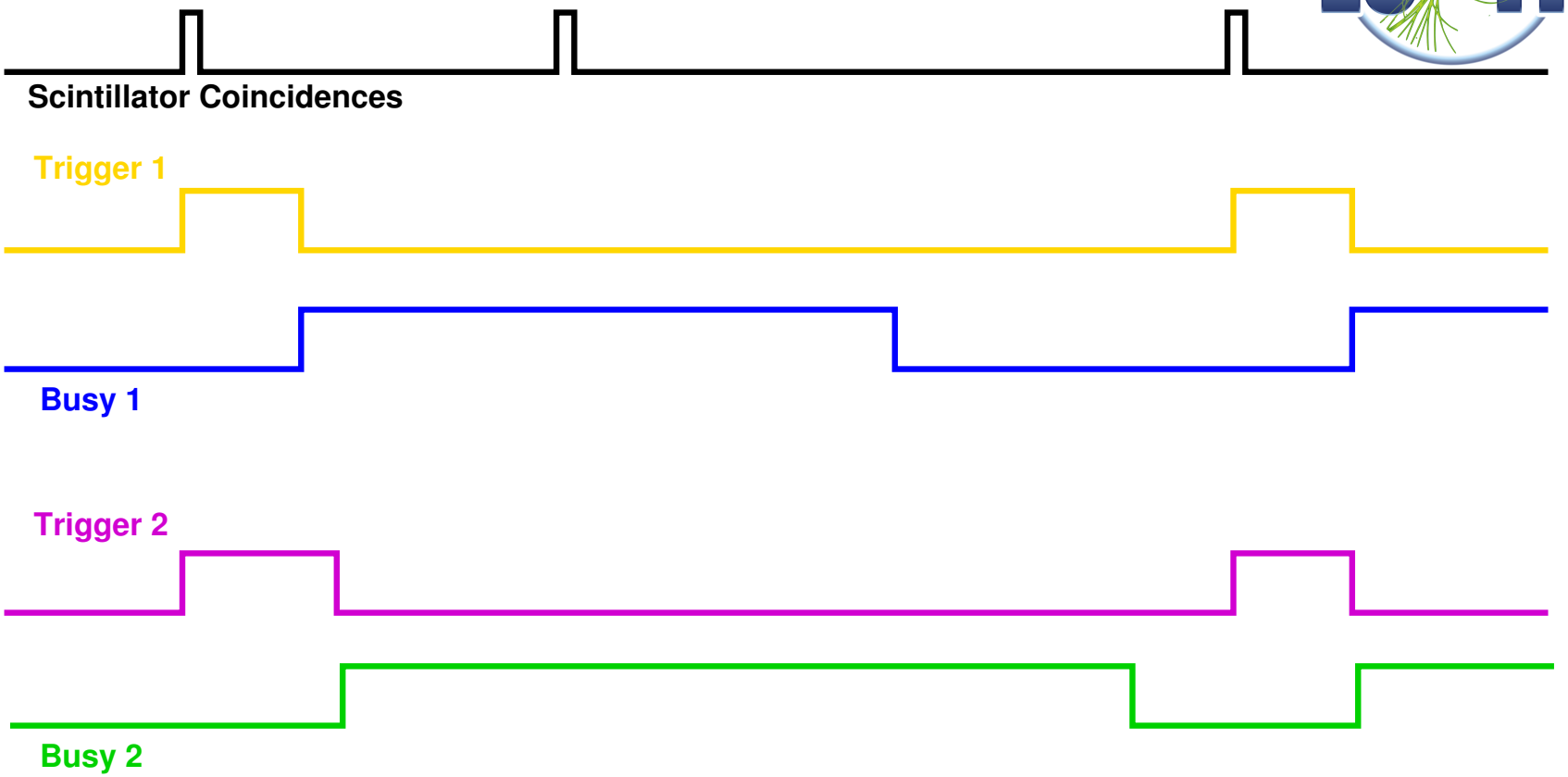
Software problem:

- Latest Pixelman version does not support hardware shutter any more
  $\Rightarrow$ Bypass the Muros and give shutter signal directly to chip

Attention: Shutter and readout have to be synchronised. Opening the shutter while reading out the chip will disrupt the communication. Chip has to be reset.

- TLU inhibits triggers while device is busy.

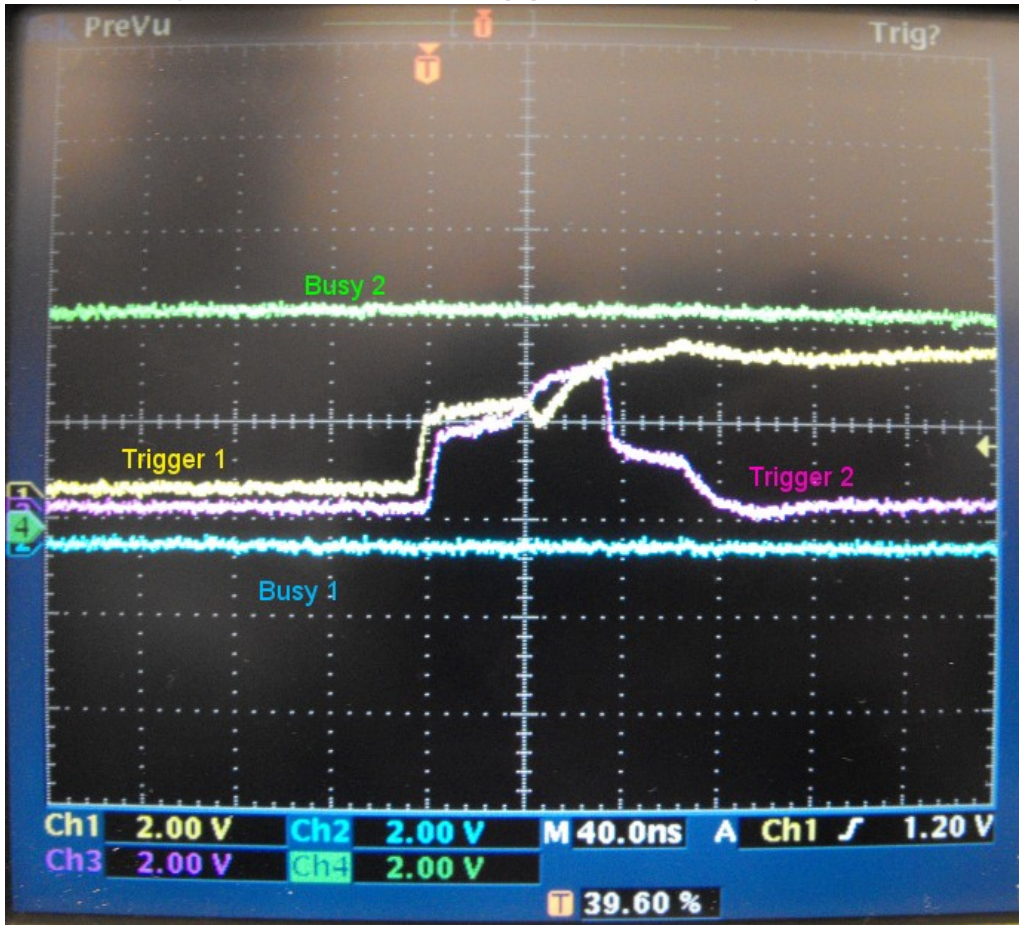
The TLU Trigger-Busy-Handshake



- TLU signalises trigger for each device
- DAQ device asserts busy, TLU takes down trigger
- TLU blocks all further triggers while any of the devices is busy

TLU Problem

The TLU does not always block the trigger properly:

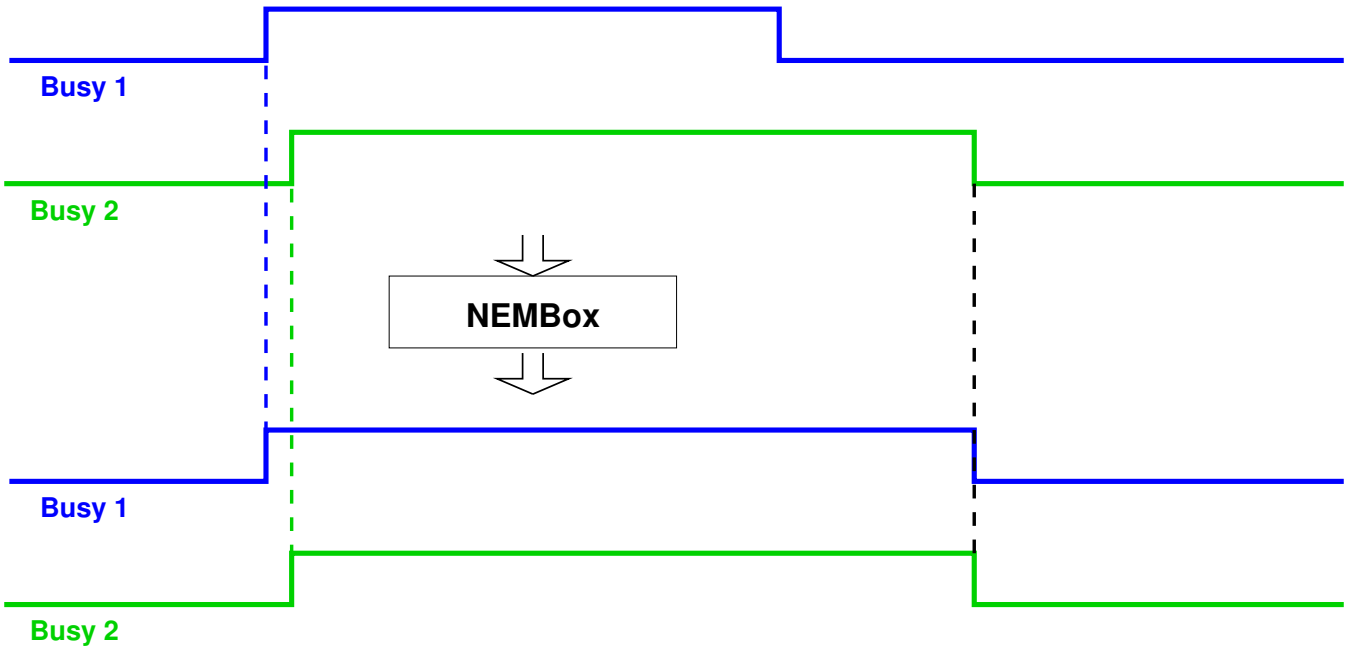


- Event numbers get out of sync
- Communication with Timepix chip is disrupted

Solution to the TLU Problem

Special "OR" realised using a programmable logic box (NEMBox):

- Channels are raised asynchronously
- Channels are lowered synchronously



$\Rightarrow$ Trigger system works perfectly!

Measurement Schedule

Ar/CO_2 70/30 (finished):

- Different drift distances
- Different angles
- Different particle energies
- Different GEM settings

T2K Gas (starts tomorrow):

- Different drift distances
- Different angles
- Different particle energies
- Different GEM settings
- Laser dots

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