

DAQ Trigger interface for LP-TPC: Distributor Box status

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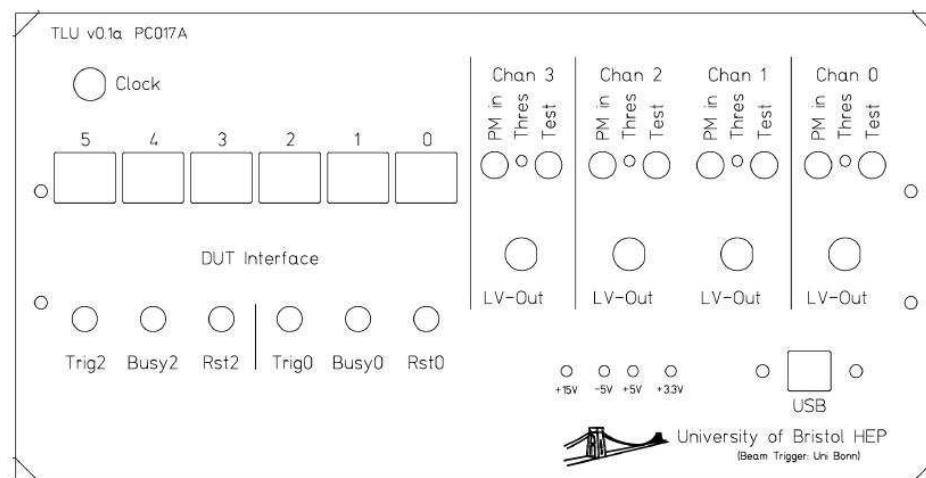
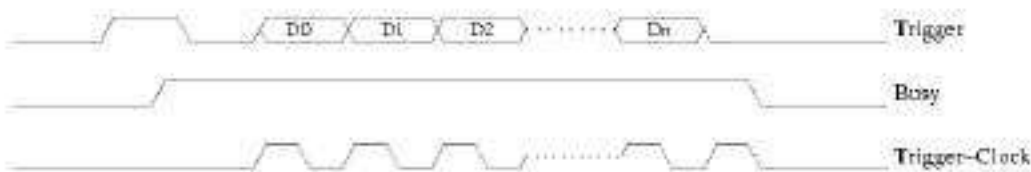
Eudet TLU Interface

TLU inputs:

- 4 comparators with level between ± 800 mV (LEMO connectots)
 - Up to 3 cosmic trigger signals: NIM format
 - 1 beam trigger
- **BUSY** signal from TPC (+ other detectors: Si) in LVDS format
 - None of r/o electronic provide such a signal (see later)
- Reset (LVDS) send by TLU: unused

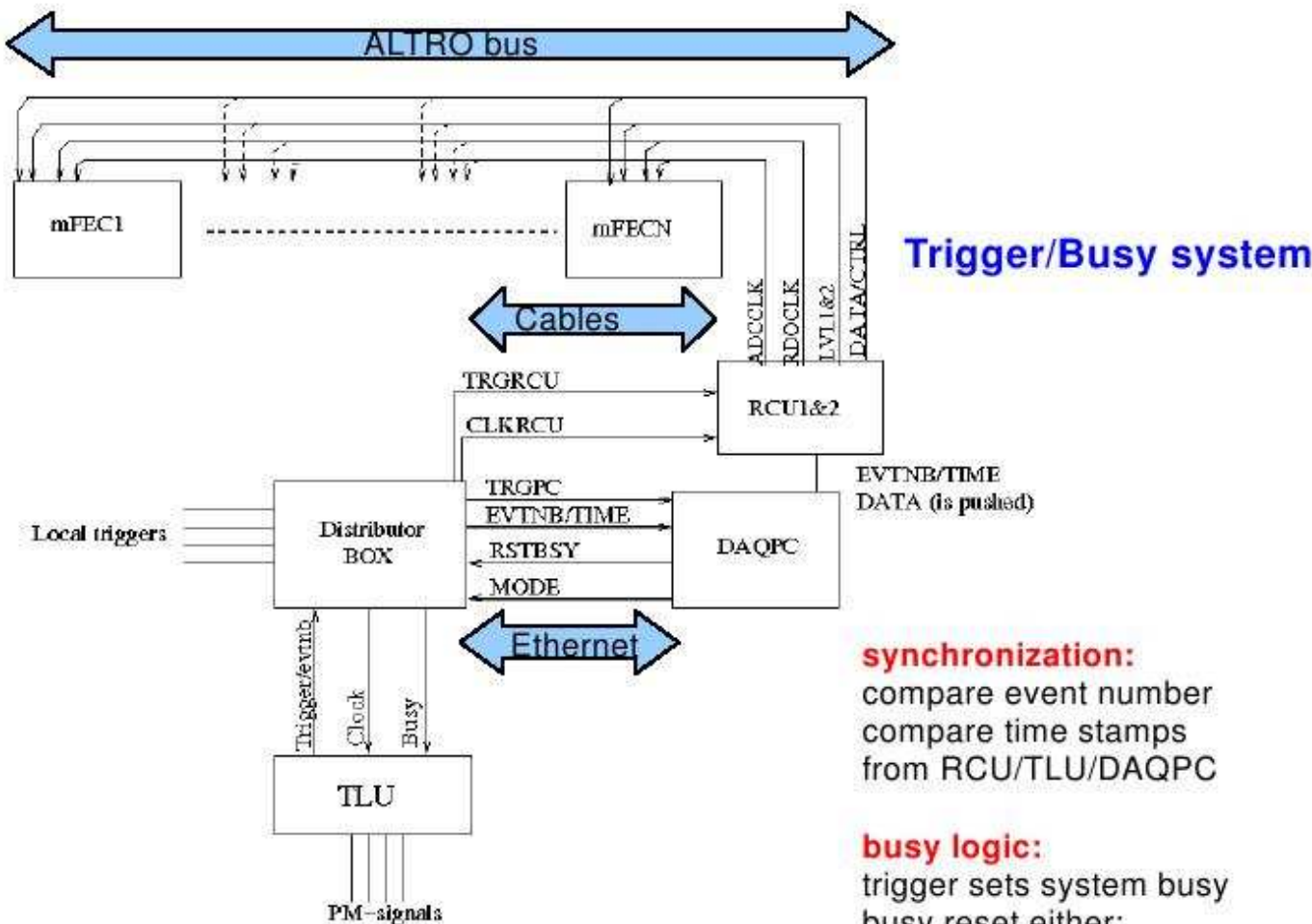
TLU outputs:

- Trigger signal (LVDS)
- Event number (LVDS) pulled out by a data clock (LVDS)



ALTRO Case (ALICE based r/o)

- ALTRO needs a 3.3 V Trigger signal and a clock
- ALTRO do not provide BUSY → Fixed timeout or ethernet
- Synchronisation (timestamp/event#) via special trigger count



Distributor box should:

- Translate trigger level
- Get event# from TLU
- Tag event with time
→ Send event # + time to DAQ computer
- Assert BUSY for a fixed time: waiting for DAC pc end of r/o
- provide soft trig / reset
- provide common clock

synchronization:
compare event number
compare time stamps
from RCU/TLU/DAQPC

busy logic:
trigger sets system busy
busy reset either:
1) DAQPC via ethernet
2) Fixed time in distributor box

T2K (AFTER) case and Silicium

T2K:

- AFTER needs an LVTTTL 3.3 V Trigger signal
- AFTER do not provide BUSY → Fixed timeout or ethernet
- Synchronisation (timestamp/event#) via LVTTTL 3.3 V signal
- Internal clock only (100 MHz)
 - Same as ALTRO from distributor box side apart from need for 1 more signal (reset)

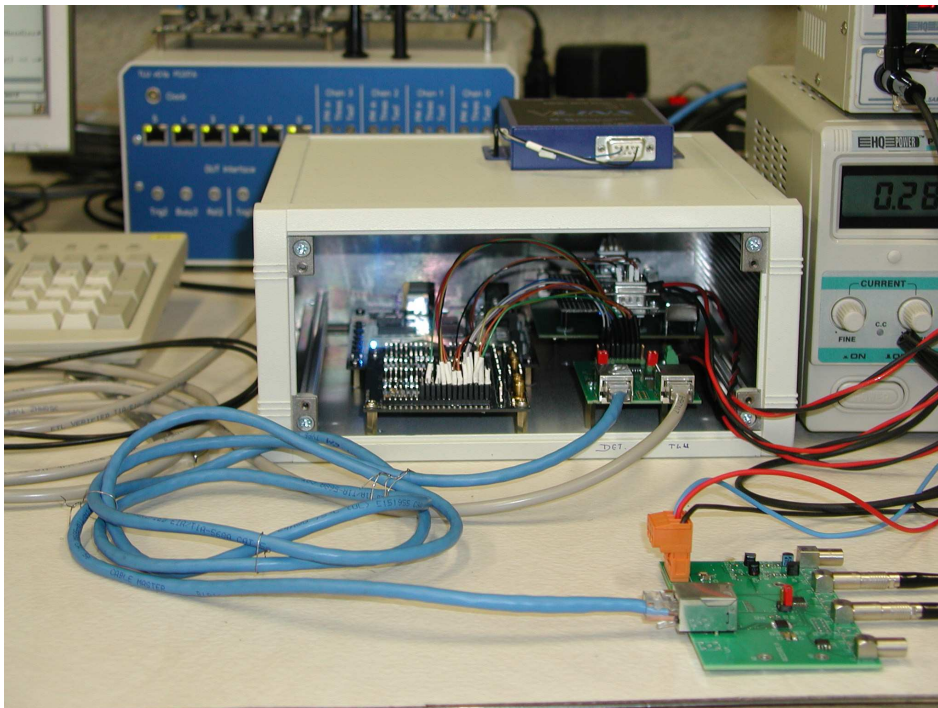
Silicium:

- Will receive event# from DBOX via ethernet
- No direct connection to TLU ? → No BUSY handshake ?
 - **Should be faster as TPC r/o or we are in trouble**

Distributor Box status

DBOX separated in 2 pieces:

- 1 logic unit:
 - LVDS Com to TLU (trigger, event#, BUSY handle)
 - eth Com to ALTRO, T2K and Si: config and event#
 - 40Mhz clock for all ALTRO: oscillator or external
 - 1 PLL with pahse shift possible for synchronisation
 - Standalone mode: 5 NIM, random or eth triggers
 - No need for TLU in this mode



- 1 fanout card:
 - Non magnetisable (close to det)
 - LVDS connection to logic box
 - Fanout triggers to RCU or T2K
 - 1 NIM trigger output (U2F/Bonn)
 - Fanout with PLL 40 MHz Clock

1 DBOX mostly ready and tested,
parts ordered for others

Test beam area equipment coming from Brussels

- TLU (about 30x15x15 cm) + one computer to control it
- Distributor box controlled through the DAQ PC size to be fixed
- TLU and DBOX to be located in the control hut
- Fanout card close to the detector
- Cable length to be specified (about 20m)

Integration with T2K electronic:

- Assuming TB and/or cosmics starting 15th of Sept., delivery is possible week before but COMMON tests are needed as well
- TCP/IP communication with DBOX to fetch event#

Integration with ALTRO electronic:

- 40 MHz clock delivery to RCU: where on RCU (need Luciano help)
- 40 MHz clock: needed clock stability ? 5 ppm according to Luciano ?
- Tests of whole system in Brussels (need soft from Ulf, in 2 weeks ?)