First test of MCM prototype board

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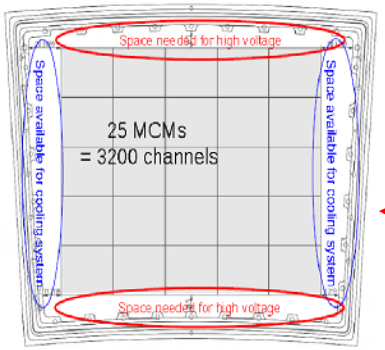
Agenda

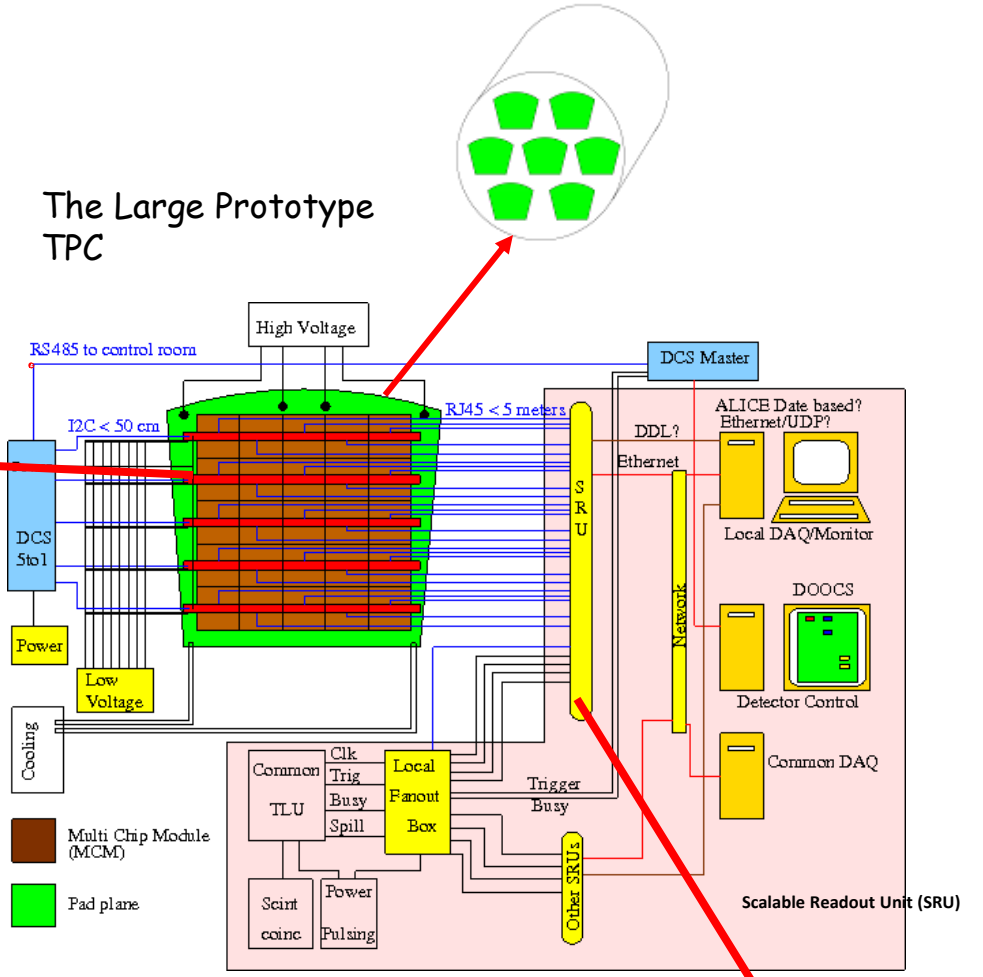
- Background
- Test setup
- Current status and future plan

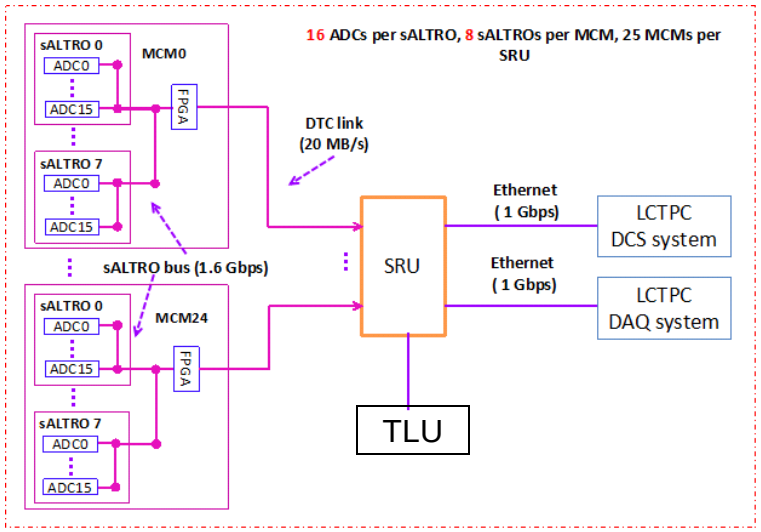
Background

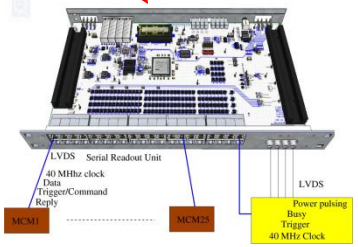


MCM on a pad module

The Large Prototype TPC







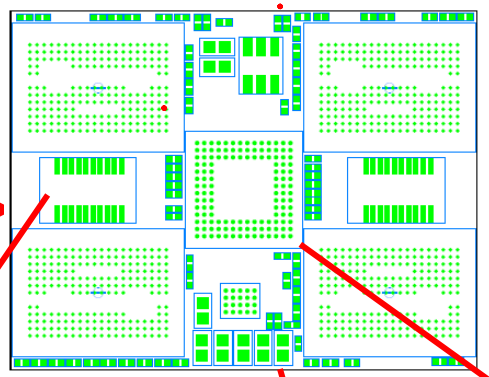
Background

FEC with 8 ALTRO

17 cm

19 cm

MCM with 8 SALTRO on carrier boards

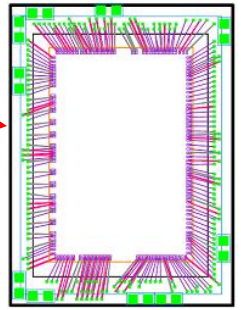


25 mm

32.5 mm

CPLD

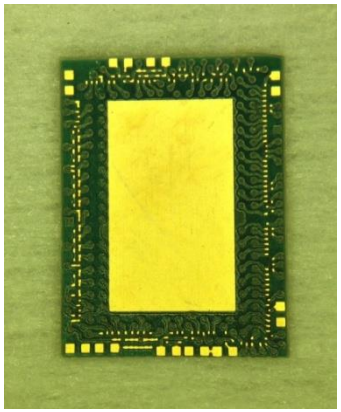
Carrier Board



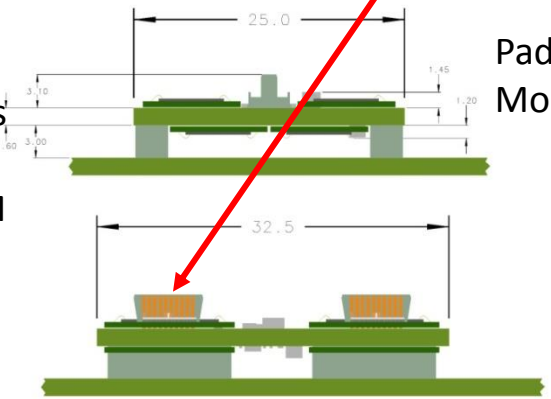
12 mm

8.9 mm

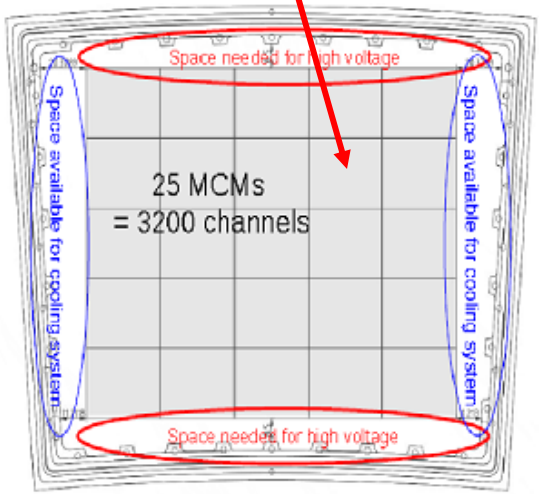
Carrier Board PCB



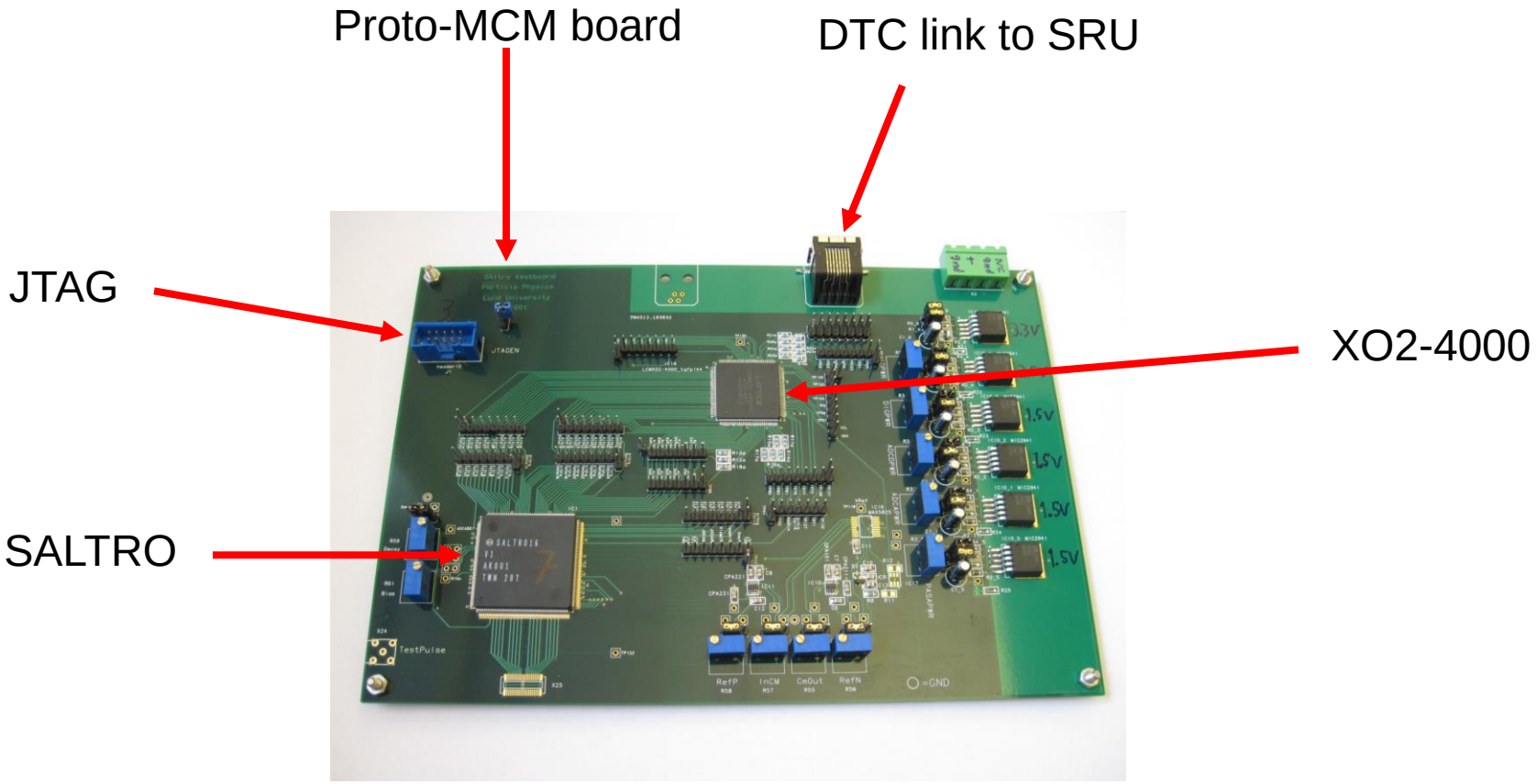
Side views of an MCM



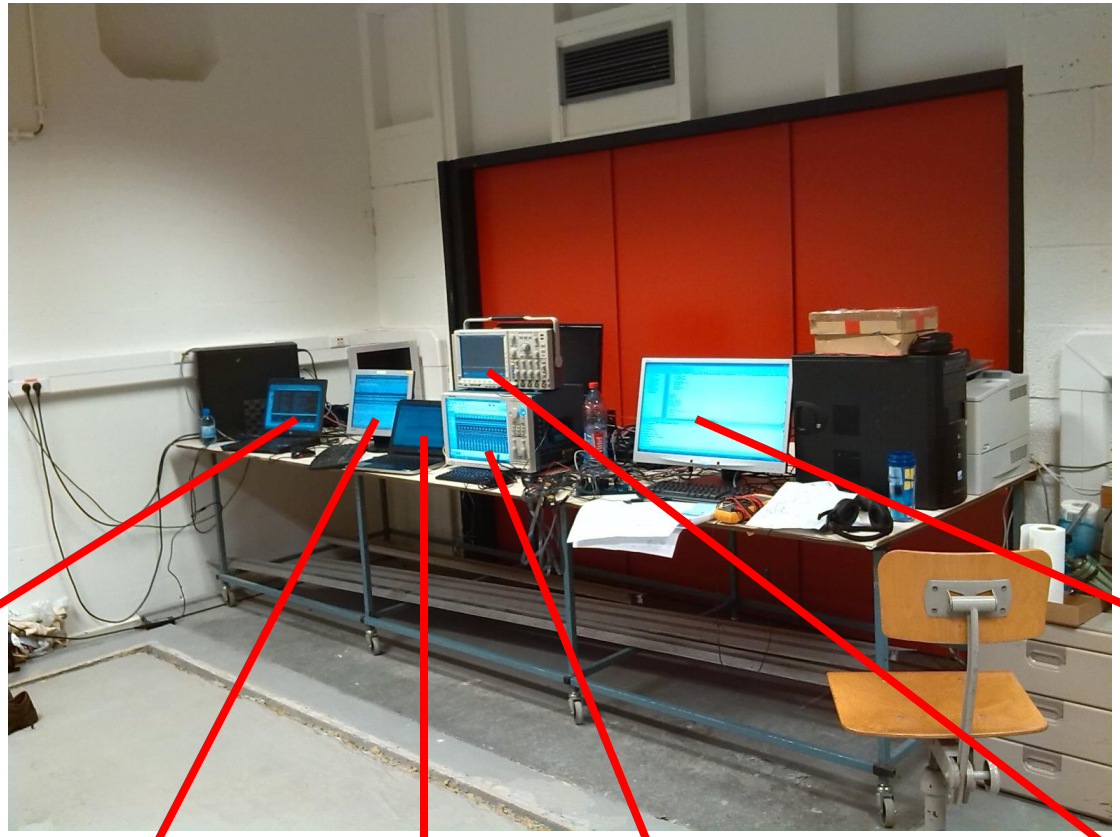
Pad Module



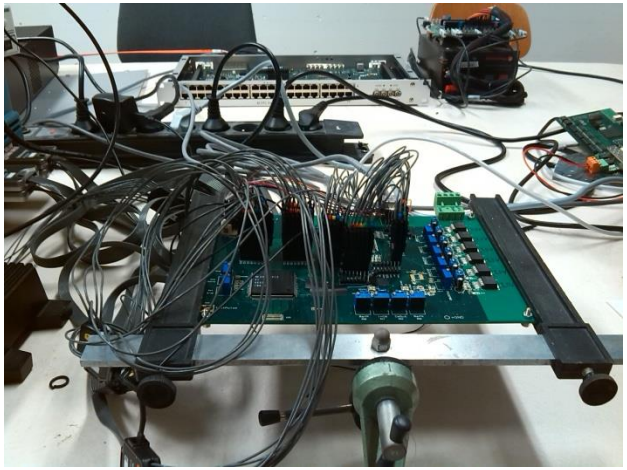
Background

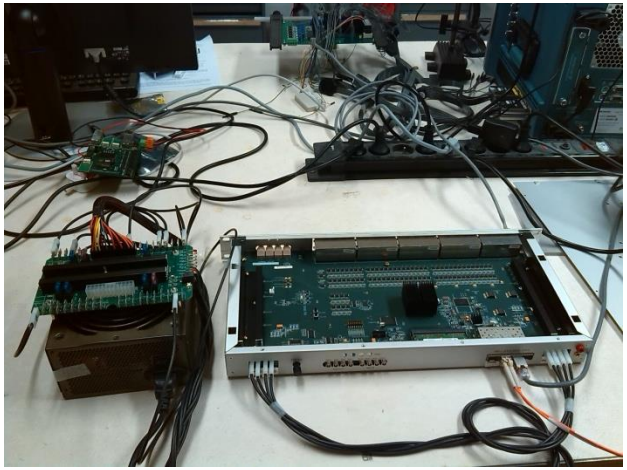


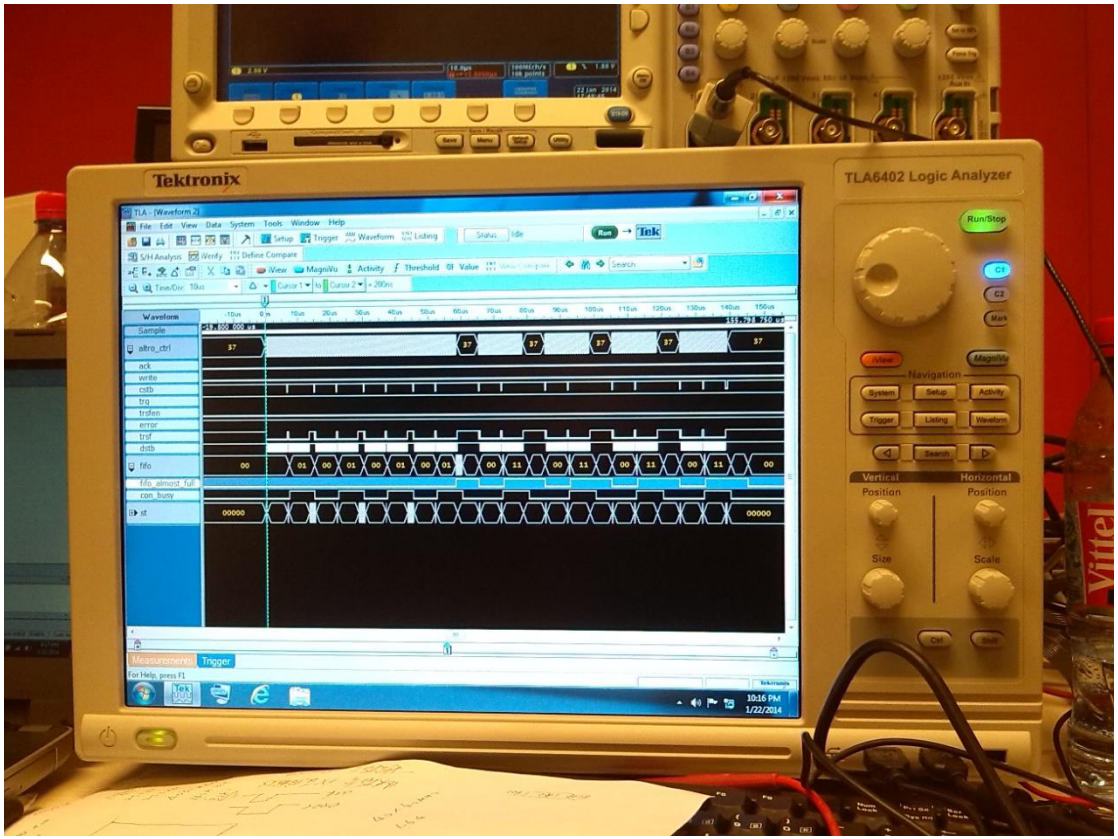
Test setup


DAQ PC
(Ethernet
based)
DAQ PC(DDL based)
SRU programmer
Logic Analyzer
Oscilloscope
MCM programmer

Test setup





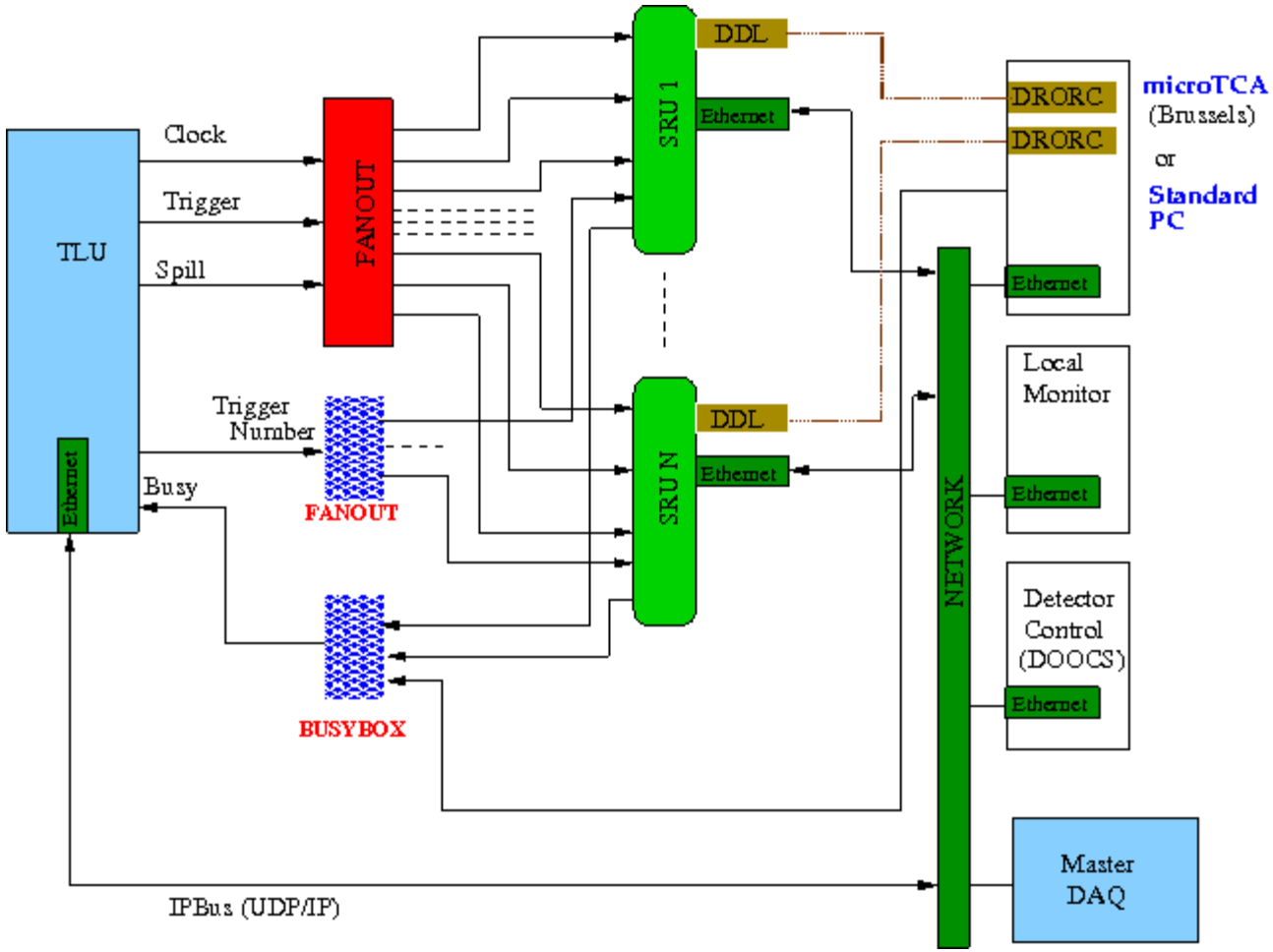

Tektronix
TLA6402 Logic Analyzer
Run/Stop
Navigation
Vertical
Position
Horizontal
Position
Size
Scale
Measurements
Trigger

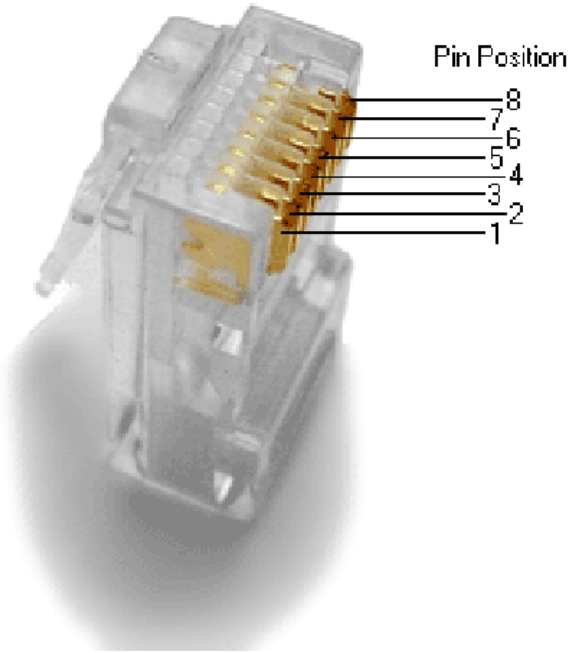
Current status and future plan

- Current status:
- DTC protocol implemented on CPLD (160Mbps)
- Communication between CPLD and Saltro (Verified by accessing register)
- Implement Ethernet based slow control path
- Future plan:
- Three identical setup at Lund, Brussels and Wuhan
- Further firmware design (power pulsing and I2C configuration etc)
- Development of Ethernet based DAQ system
- Common DAQ integration

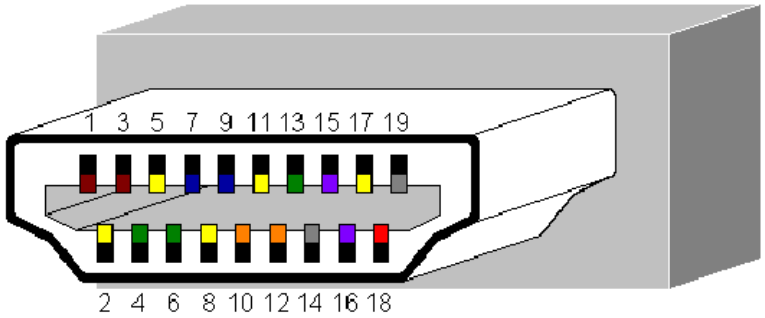
Thank you !

backup


TLU
Ethernet
Clock
Trigger
Spill
Trigger Number
Busy
FANOUT
FANOUT
BUSYBOX
SRU 1
SRU N
DDL
Ethernet
DDL
Ethernet
DRORC
DRORC
Ethernet
microTCA
(Brussels)
or
Standard PC
Local Monitor
Ethernet
Detector Control (DOOCS)
Ethernet
NETWORK
Master DAQ
IPBus (UDP/IP)

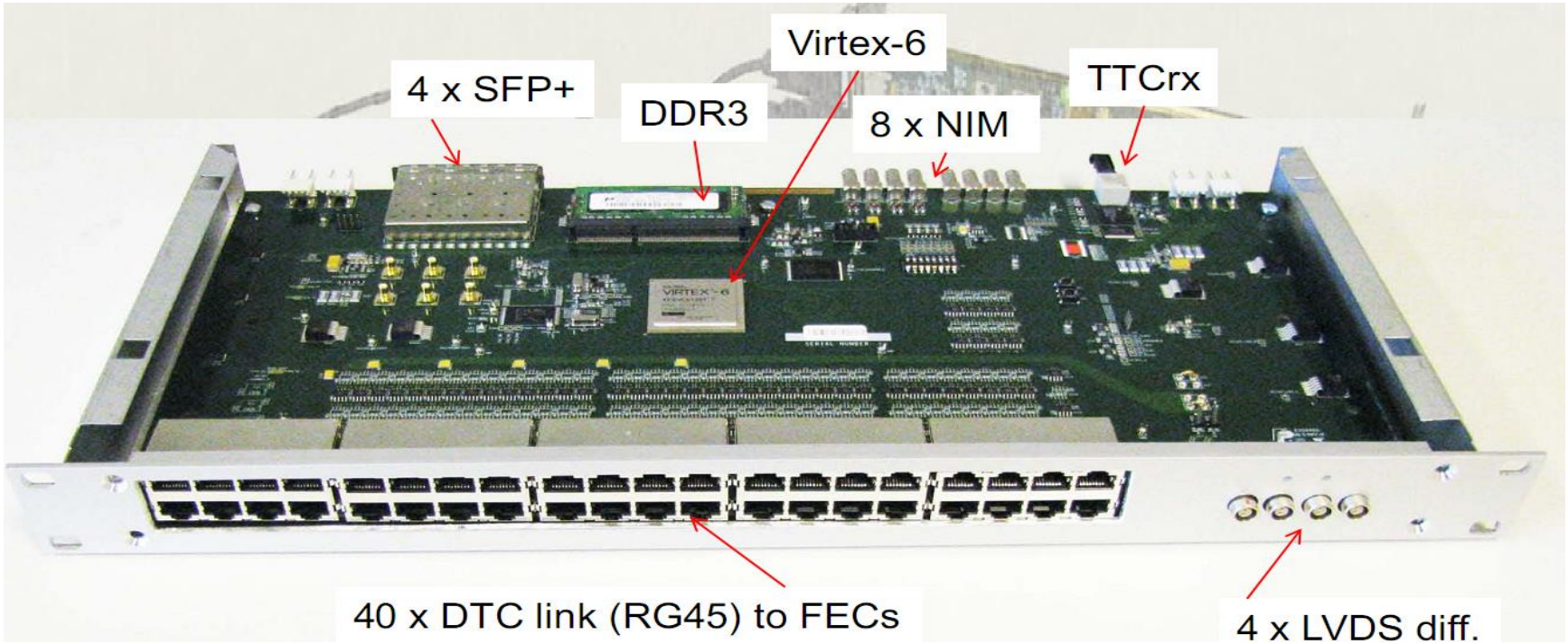


(a) 8P8C (RJ45) plug.



(b) HDMI type-A plug.

RJ45 pins		HDMI pins		Asynchronous Mode	Synchronous Mode	Comments
−	+	−	+			
7	8	16	15	Trigger	Trigger	Selectable between synchronous and asynchronous trigger under software control.
3	6	9	7	Busy	Busy	
1	2	12	10	DUT Clock	Unused	
4	5	6	4	Shutter/Spill	Shutter/Spill	
		3	1	Unused	Clock	N.B. When using RJ45 in synchronous mode need to get clock from separate connector.



Pins		
1	T2	DTC_clockp
2	R2	DTC_clockn
3	T3	DTC_trigger/controlp
4	R1	DTC_data1p
5	T1	DTC_data1n
6	R3	DTC_trigger/controln
7	T4	DTC_data2p
8	R4	DTC_data2n

Two possible way to connect TLU and SRU
RJ45 to DTC (only asynchronous mode)
Passive board convert HDMI to LVDS
Both need modification of SRU firmware