

Electrical wiring for IP-BPM chamber

Piezo movers : power supply & strain gauges readout
Inner temperature probes if needed

Existing configuration at LAL :

- overview of the existing at LAL,
- existing ADC/DAC at LAL .

Desired configuration at KEK :

- desired overview at KEK,
- needed connections by flange.

The way to perform it :

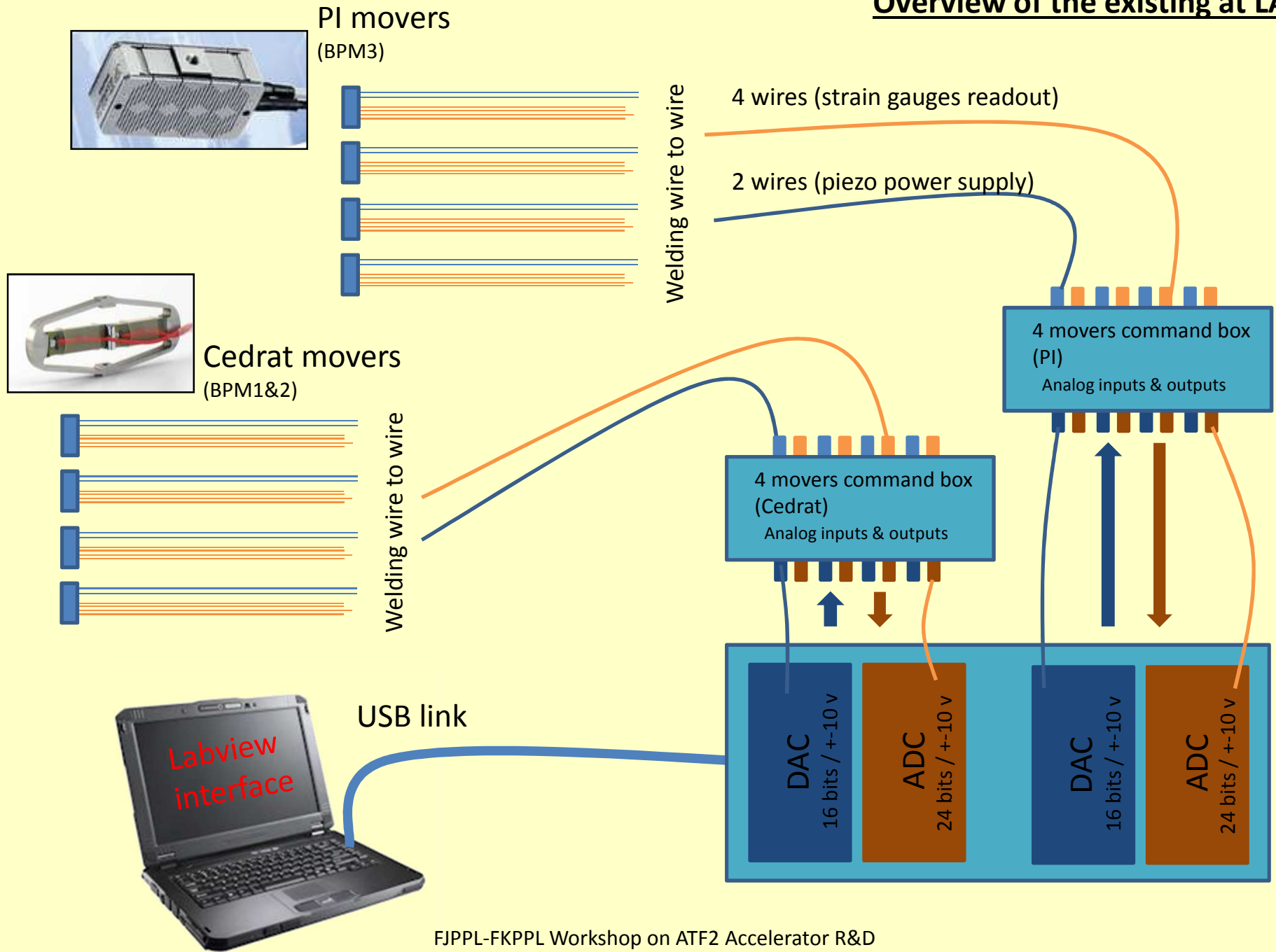
- an example of an connected flange,
- an example of ADC/DAC needed by LAL at KEK,
- approximate schedule.

Conclusion / questions :

- distance from warm zone to cold zone,
- piezo movers,
- movers command box,
- inputs / outputs electronics,
- laptop with NI Labview software.

Existing configuration at LAL

Overview of the existing at LAL



Existing ADC / DAC at LAL

USB link
for Labview interface



Rack for 4 modules
NI cDAQ 9174

PI mover
(x4)

2 wires (piezo power supply)

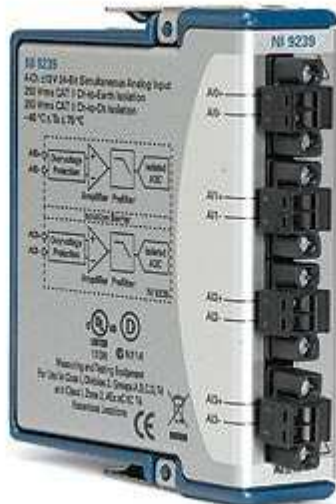
4 wires (strain gauges readout)

Cedrat
mover (x4)

2 wires (piezo power supply)

4 wires (strain gauges readout)

ADC module
24 bits / +-10V (input x4)



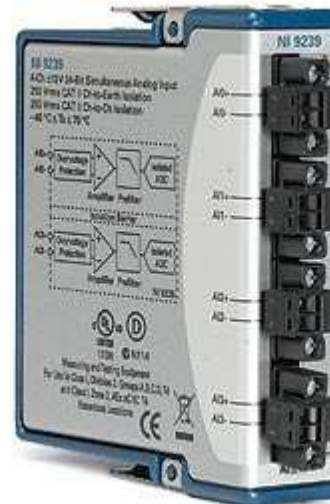
NI 9239

DAC module
16 bits / +-10V (output x4)



NI 9263

ADC module
24 bits / +-10V (input x4)



NI 9239

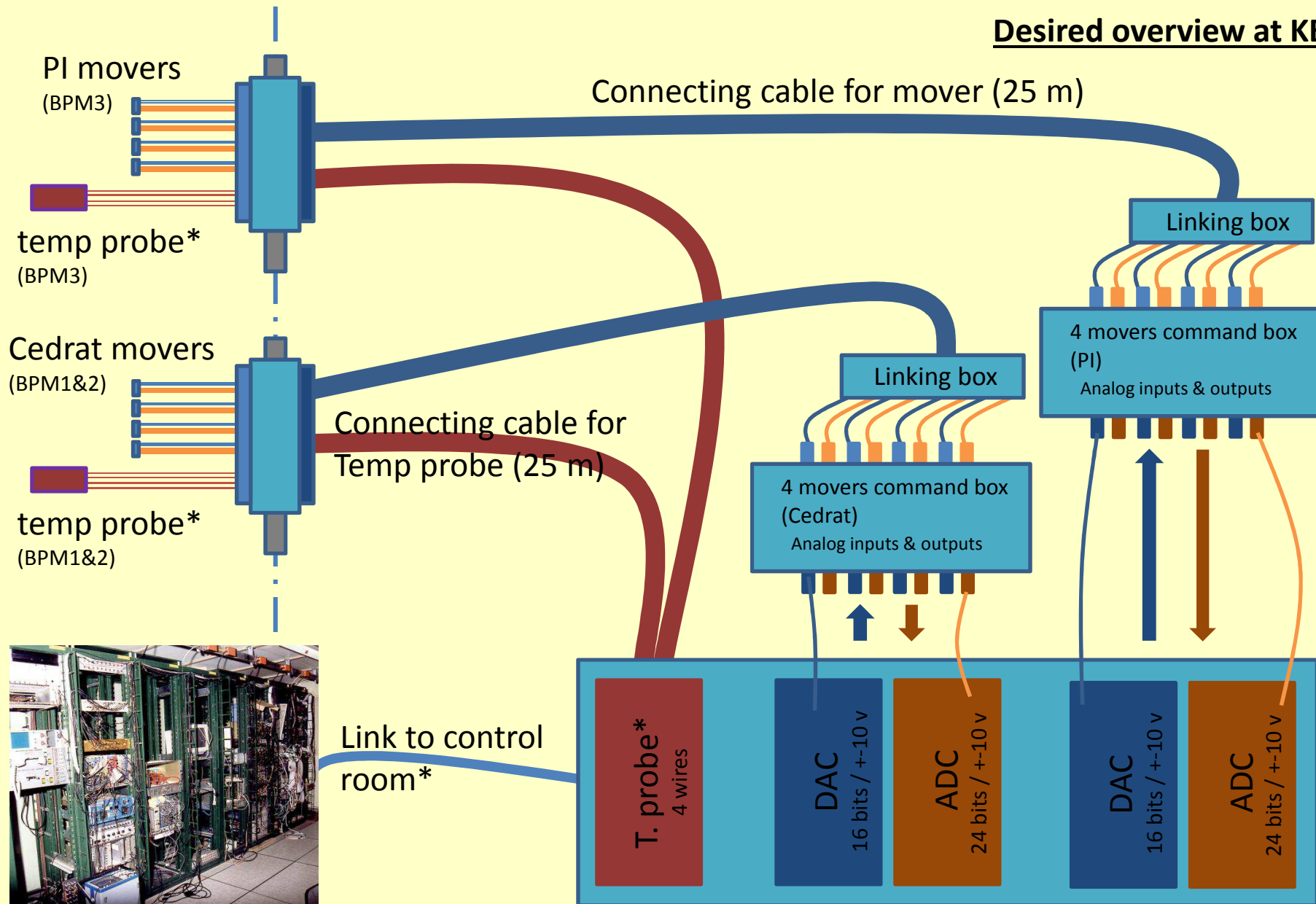
DAC module
16 bits / +-10V (output x4)



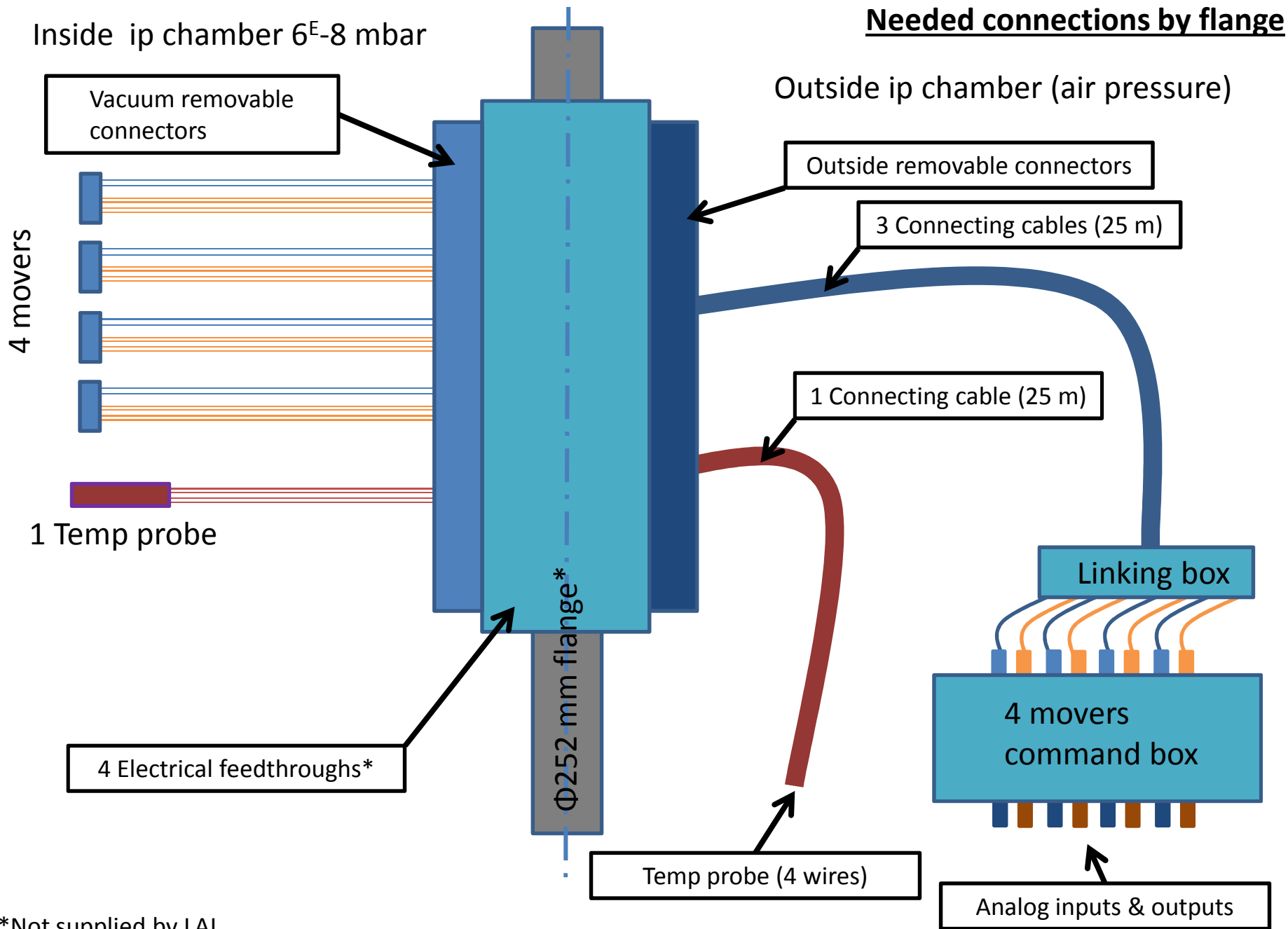
NI 9263

Desired configuration at KEK

Desired overview at KEK



* To be defined



*Not supplied by LAL

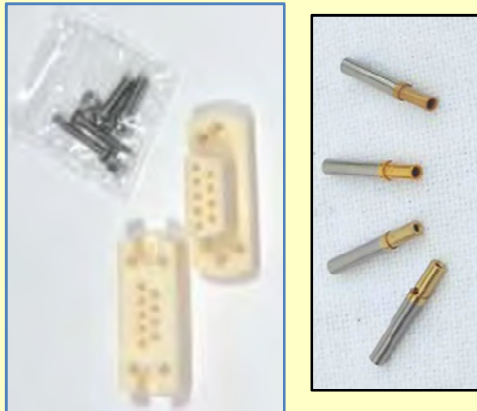
The way to perform it at KEK

An example of a connected flange

Inside ip chamber 6^E-8 mbar

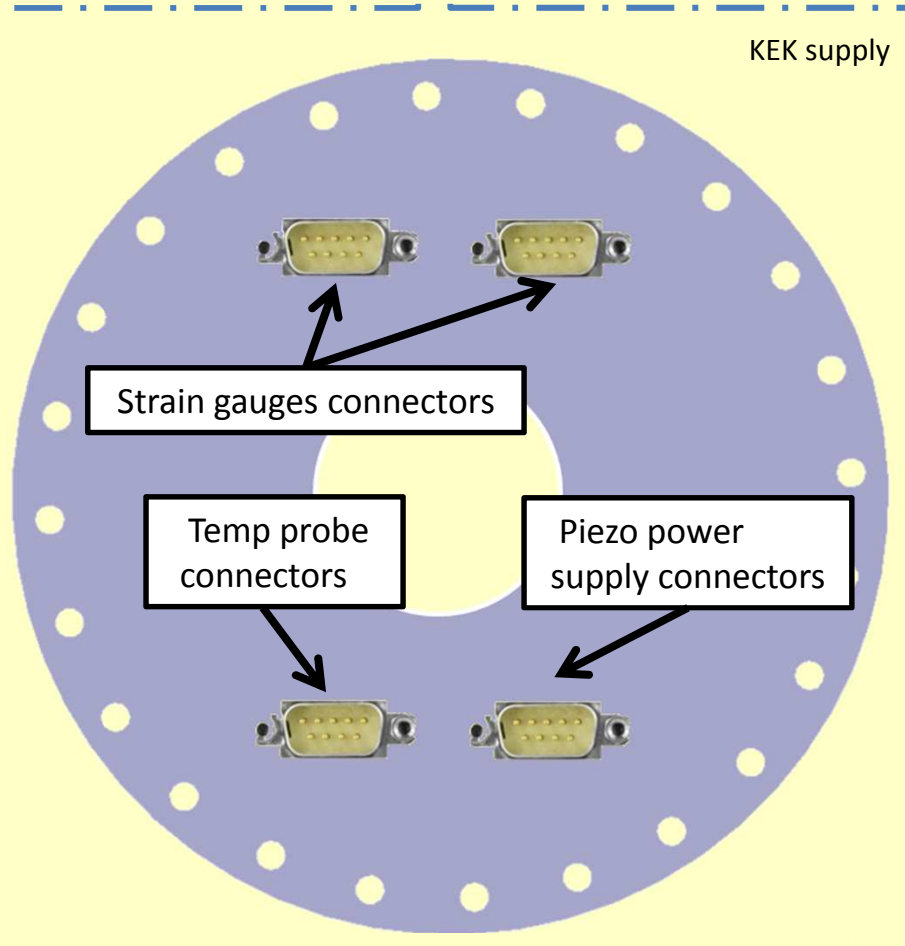
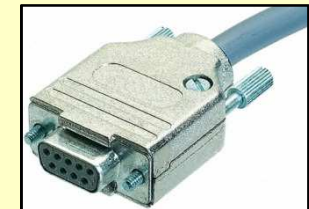
Outside ip chamber (air pressure)

2x4 Connectors subD9 female (Ceramic UHV)
Small crimp pins



KEK supply

2x 4x25m
'7 S/FTP' cable



Strain gauges connectors

Temp probe connectors

Piezo power supply connectors

The number of parts are given for the 2 flanges.

2x1 flange with 4 feedthroughs subD9 male for each flange
(feedthroughs position on the flange surface : KEK discretion)

Thanks to



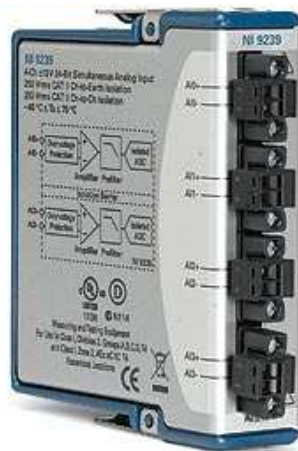
P. Cornebise SERDI-LAL

An example of ADC/DAC needed by LAL at KEK

Ethernet / RS432-485 / ...
link to connect with KEK
control room



Output : DAC
piezo power supply
16 bits / +-10Vc (input x4)



x2

Input : ADC
strain gauges readout
24 bits / +-10V (input x4)



x2

Input : ADC
Temp probe readout
(PT100 / PT1000) (input x4)



x1

These electronic modules must be connected to the control room
devices at KEK. No preference for National Instruments (NI), Keyence...

Approximate schedule

Decision
 ↓
 Be careful in holidays !

# Week	7	8	9	10	11	12	13	14	15	16	17	18
Cables	Order	Delivery	Link to electronics								Tests cables + connectors + movers*	
UHV connectors	Order							Delivery	Link to UHV connectors*			
Movers	Cleaning equipped base plate (movers / machined parts)								Link to UHV connectors*	Preparation for shipment		

*In a clean room

Conclusion Questions

Distance from IP chamber (warm zone) to movers / temp probes electronics (cold zone) :

- 25 m.

Temperature probes :

- need inside IP chamber ? How many (1 for BPM1&2 / 1 for BPM3) ?
- heating wire wound around the chamber to maintain constant the temperature ? KEK ?

Flanges supply :

- flanges with feedthroughs to be supplied by KEK ?
- subD9 male feedthrough as purposed by LAL ?

Electronics to connect to control room devices :

- LAL supply with NI modules and Labview software ?
- or KEK supply with LAL specs ?
- USB / RS 485 / ethernet link ?