# TOTEM Roman Pots

MPP Meeting 19/06/2015

# TOTEM Roman Pots Control System Structure

CCC UI / BE-CO

DCS / TOTEM

RPCS / PH-DT

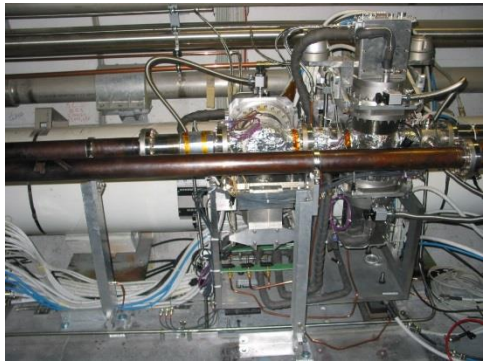
PXI

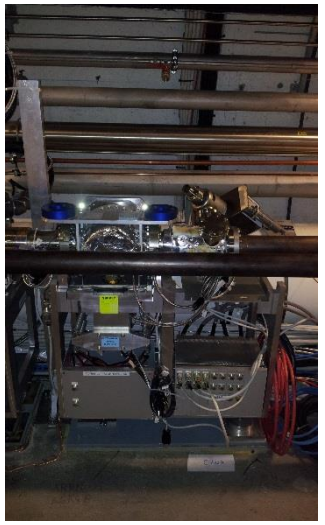
Rack Motor Control
+ Interlock Mngt

FESA Gateway / EN-ICE

DIM

Roman Pots / TOTEM

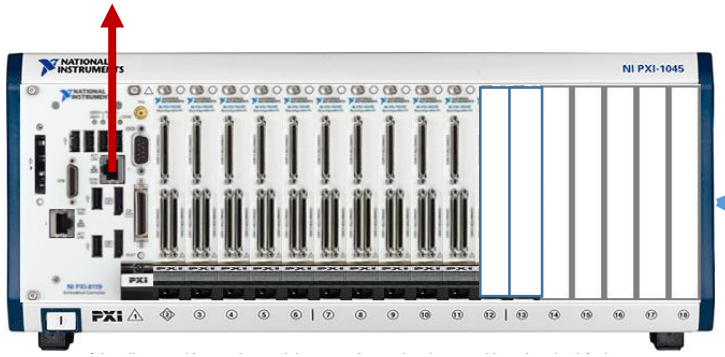




# TOTEM PXI Structure

**Before LS1 -> 24 pots**

To FESA Server and DCS through DIM




One PXI for :
- LVDT Measurement and Interlock generation
- RS485 communication with encoder
- DIM Communication with FESA and DCS
- Resolver not included

**After LS1 -> 32 pots + Resolver integration**

To FESA Server and DCS through DIM


PXI for Motor Control including:
- RS485 communication with encoder
- Resolver Measurement
- DIM Communication with FESA and DCS

Data exchange between PXIs via NI Shared Variables :
- Inner and Custom limits
- LVDT Positions


PXI for LVDT including :
- LVDT Measurement and Interlock generation

# Bug and solution

## Bug during 08/06/2015 TOTEM RP Alignement

- **Use of NI Shared variables to exchange information between PXI controllers over the network**

- **Misconfiguration of NI Shared Variable:**
  - A FIFO buffer could be linked to this variable,
  - If this buffer is empty, reading the variable returns an empty value
  - At the Shared Variable creation, by default, the buffer option is activated
  - The Shared variable used to set the limits in the second PXI was configured with a buffer.

- The consequence is that sometimes, the array which contained the custom limits handled by this Shared Variables, became empty. Therefore, it was impossible to modify the array and send new limits to the second PXI.

## Solution

- Removed buffer from the configuration of Shared Variable to avoid empty array and always keep the last set value,

- Used Shared Variables only to exchange data between PXIs
  - LVDT positions
  - Custom and Inner Limits

- Replaced Shared Variables by local variables to manipulate arrays in each PXIs

# Conclusion

The SW fixes done on Thursday 11/6 have stabilized the system

- We believe there is no intrinsic technology limitation
- The PXI software will be saved and archived in TOTEM svn zone :

  \\svn.cern.ch\reps\totem\trunk\rp_pxi_software