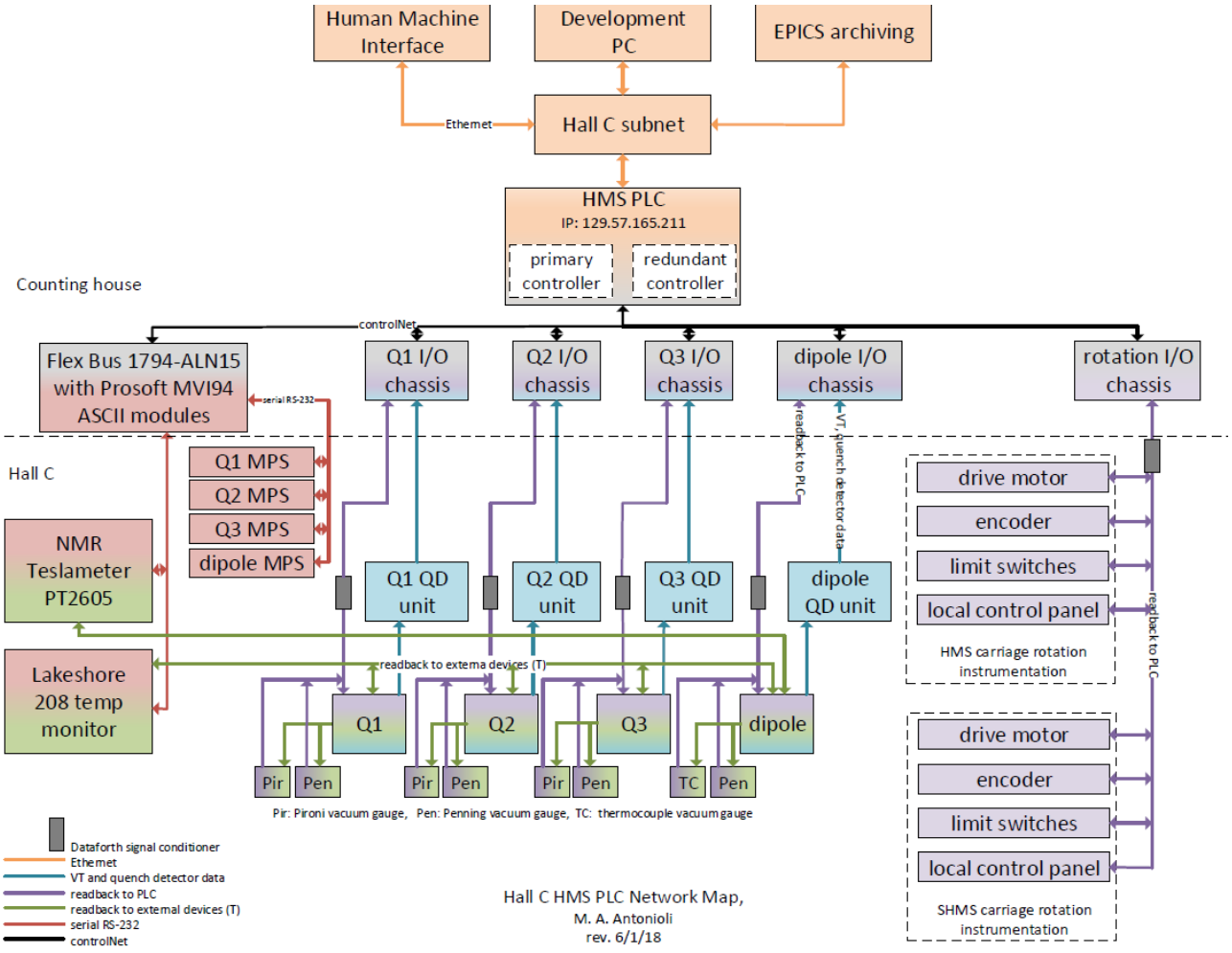
HALL C PLC TASKS REPORT (05/23/2018 - 05/30/2018)

Hall C

- Generated Networking spreadsheet for Hall C PLCs and devices connected to the Hall C and Hall C Dev Subnet.
  - ✶ Spreadsheet contains information about the IP addresses, MAC addresses, serial numbers, Host names and physical locations of each PLC and device.
- Updated HMS networking map to include vacuum system.



First version of Hall C Network topology

- Worked on NMR PT2026 Tesla Meter communication with PLC.
  - ✶ Debugged Ethernet communication with PT2026 Tesla Meter.
    - Configured DNS and Domain to set up PT2026 Tesla Meter on the Hall C Dev subnet.
    - Created Ethernet VISA TCP/IP resources to connect PT2026 Tesla Meter via its Ethernet port.
    - Tested LabVIEW Ethernet communication with LabVIEW drivers.
    - Tested Ethernet communications by sending SCPI commands, verified proper responses.
  - ✶ Upgraded firmware for 490 NBX module.
  - ✶ Configure and connected 490 NBX modules to talk with DSG-PLC and PT2026 Tesla Meter.
    - Configured TCP Port number and IP address.
    - Connected 490 NBX modules with PT2026 Tesla Meter.

        - Found problems sending commands and reading responses from the PT2026. Debugging in progress.
    - Assigned new IP address for the 1756-L72 ControlLogix PLC (dsg-plc) to connect with Hall C Dev Subnet.
        - Dsg-PLC is intended to be used for the NMR communication test.
        - Configured and updated firmware for 1756 –EN2T module.
        - Configured Ethernet/IP drivers on RS-Link Classis to communicate PLC in Hall C Dev Subnet.
    - Wrote PLC test program to send and receive command from PT2026 Tesla Meter through 490NBX module.
        - Test program sent commands to 490 NBX modules without problem.
        - Debugging reading data from the PT2026 Tesla Meter.
- Acquired two RS-Logix5000 licenses Full edition
    - Generated CCPR to run licenses on Computer Center server.
    - Server computer will be supported by computer center
    - Requested limited access for users to use the licenses.
- Generated first version of PLC layouts spreadsheet for HMS PLCs
    - Spreadsheets show detailed information about the type and locations of PLC controllers and all I/O modules distributed on eight PLC chassis.
    - Spreadsheets show for each module the channel description and the # of available channel spares.
    - Documentation based on HMS PLC program, drawing will be required to verify channel description.
- Generated spreadsheet containing all vacuum-related tags in HMS PLC program.
    - Existing vacuum monitoring for HMS magnets use two gauges:
        - Pirani gauge if vacuum is between 10^{-2} torr – 760 torr.
        - Penning (cold-cathode) gauge if vacuum is between 10^{-10} torr – 10^{-2} torr
- Researched Edwards vacuum gauge that will be added in HMS spectrometer vacuum controls.
    - Edwards vacuum gauge measures vacuum from 7.5×10^{-10} torr – 750 torr.
        - Normal voltage signal from Edwards gauge is 2 – 10 V.
        - Gauge has built-in error reporting using voltages from 1 – 1.3 V.
    - Output of Edwards gauge will go through signal conditioner to PLC analog input.
        - I/O chassis and analog input module are yet to be determined.
- Researched Hall C's UPS for UPS-to-PLC interface.
    - Hall C uses an APC UPS model SMT1500RM2U.
    - UPS has RJ-45 serial port on back to use with proprietary monitoring program.
    - UPS can use expansion cards to give Modbus or relay interface.
    - Contacted APC to request more information on built-in serial port, Modbus interface, and relay interface and whether either one could be used for monitoring the UPS via PLC.