ISU bubbler project tasks

Soeren Prell / ISU KLM meeting / Oct 20, 2022

Bubbler set up (Jim/Wes/Adrian)

- Test all 32 channels (LED/photo sensor circuits) on KLM bubbler panel with metal rod

- If no channel on KLM bubbler panel shows a signal, built a single-tube bubbler read out with new LED/photo sensor circuit

- Measure oscilloscope traces of passing bubbles

SBC software (Sayan)

- Develop code to detect (irregular) input on PI (on GPIO channels)
- Develop code to integrate (count) pulses in a given time interval
- Define contents of data object for bubbler monitoring info, e.g.
  - Channel #, pulse rate (or # pulses and time interval), time stamp
- Develop code to store data objects in local memory
- Develop code tests
  - Continuous running of code (24h+)
  - Maximum pulse rate at nominal # channels and pulse shape

SBC software (Noah)

- Develop scheme to communicate between computer and SBCs via two (4:1) Ethernet switches using LAN IP addresses
- Develop scheme to download and store monitoring data objects on PC
  - Does the SBC have to stop monitoring while data objects are being downloaded?
  - How long does downloading take? How often should we download?
- Develop code tests
  - Use mock data objects to test system (10k cycles)

Monitoring and archival (Avinash)

- Develop a GUI to monitor KLM bubble rates
  - Display average flow for group of channels (e.g. half-octants)
    - Allow to display individual channels on demand
  - Provide alarms (in GUI for now) if rate is out of predefined range
  - Allow for dead channels not to be included in averages and alarms