

ICC/Hub Software Overview

Requirements

- Monitor and control the instrument's robotics.
- Acquire and save camera data.
- Create the logical representation of an instrument that plugs into the APO observing control system.
- Telemetry data interfaces to APO monitoring system.

Design

- Computer and software is in the computer room, named the ICC, which means Instrument Control Computer.
- Instrument's robotics and telemetry uses smart Ethernet I/O devices.

Instrument Control Computer Requirements

- PCI fiber interface card for the camera.
- CCD readout is 1 MHz, 4 amplifiers, and reads out at 4 megapixels/sec
- Software for simple windowing and binning and acquisition.
- Software to operate the imager instrument with APO's instrument protocol, http://www.apo.nmsu.edu/35m_operations/ICCDesign/.
- Software to interface to APO's telemetry archive, http://www.apo.nmsu.edu/35m_operations/35m_Telemetry.html.

Instrument Control Computer Design

- Scientific Linux on a 3U server with a suitable PCI slot.
- Latest Leach Linux drivers and library that work with the camera.
- Modest computer loading - can be implemented on a computer shared with other ICCs.

Imager Control Computer Features

- Configurable gain and clocking for three readout speeds: 100 KHz, 450 KHz, and 900 KHz.
- Windowing - single window binning and subframes
- Exposures with feedback on flush, integration and readout status.
- Ability to pause and abort exposures.
- Filter wheel changes for a variety of different wheel types (mix of filter sizes and number of filters in a wheel).
- Shutter control (open/close).

Imager Robotics and Telemetry Requirements

- Stepper motor for filter wheel.
- Digital I/O.
- RS232 for Lakeshore.
- Analog input for airline pressure.
- Temperature range -25C to 70C.
- Low power - 20W.

Imager Robotics and Telemetry Solutions

- Ethernet modules for each function, or
- USB modules and an embedded linux system, or
- An embedded PC104 with interface cards - necessary for time-critical response.

For now, no decision has been made on this.