

The LST High Voltage System

LST Readiness Review

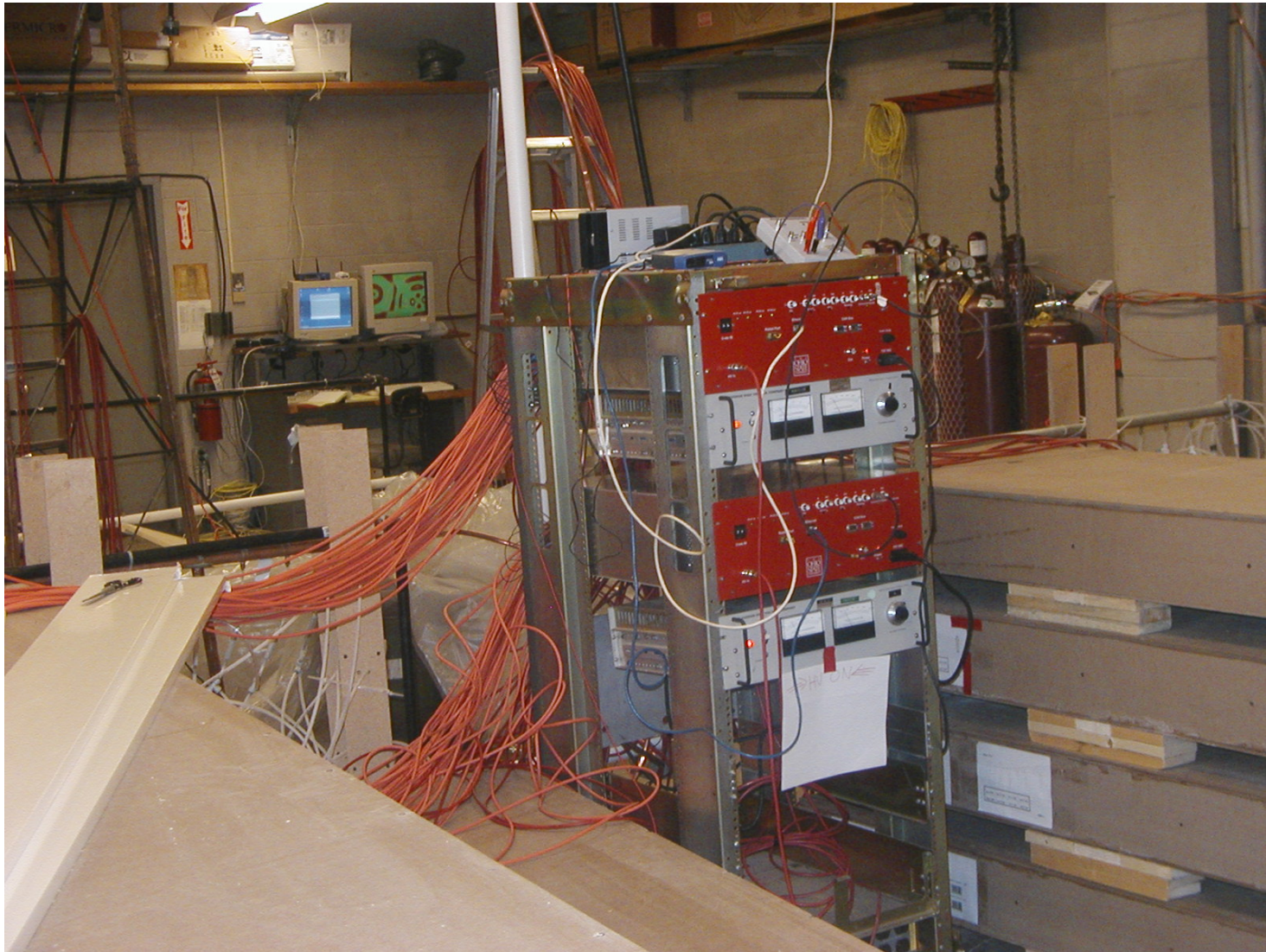
May 5, 2004

Klaus Honscheid
Ohio State University

This presentation will cover

- High Voltage Power Supply
- High Voltage Cable
- HV Connector
- HV Box (tube end)
- HV Board (HV capacitor, wire signals)

LST High Voltage Power Supplies



K. Honscheid, Ohio State University, LST Readiness Review May 2004

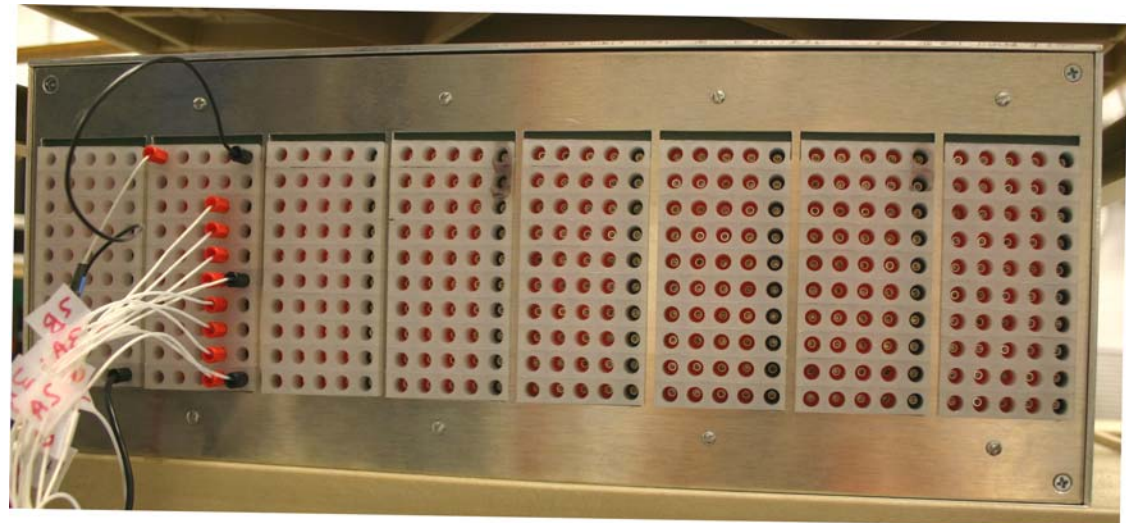
High Voltage Power Supplies



4 HV channels
80 Current Monitor Channels
320 Outputs (80 LST tubes)

CANbus Interface
Ethernet Interface

External Signals & Interlocks



Requirements

- 3 HV supplies per sextants
 - 6 for 2004
 - 18 total (+ spares)
- “Hospital” to re-condition bad LST tubes

Status

Mechanics

25 units ready

Digital Board

25 units ready

HV Mother board

20 units ready

30 assembled

Current monitor

800 units ready

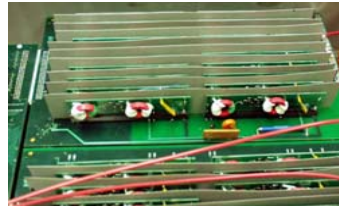
1200 assembled

Backpanel

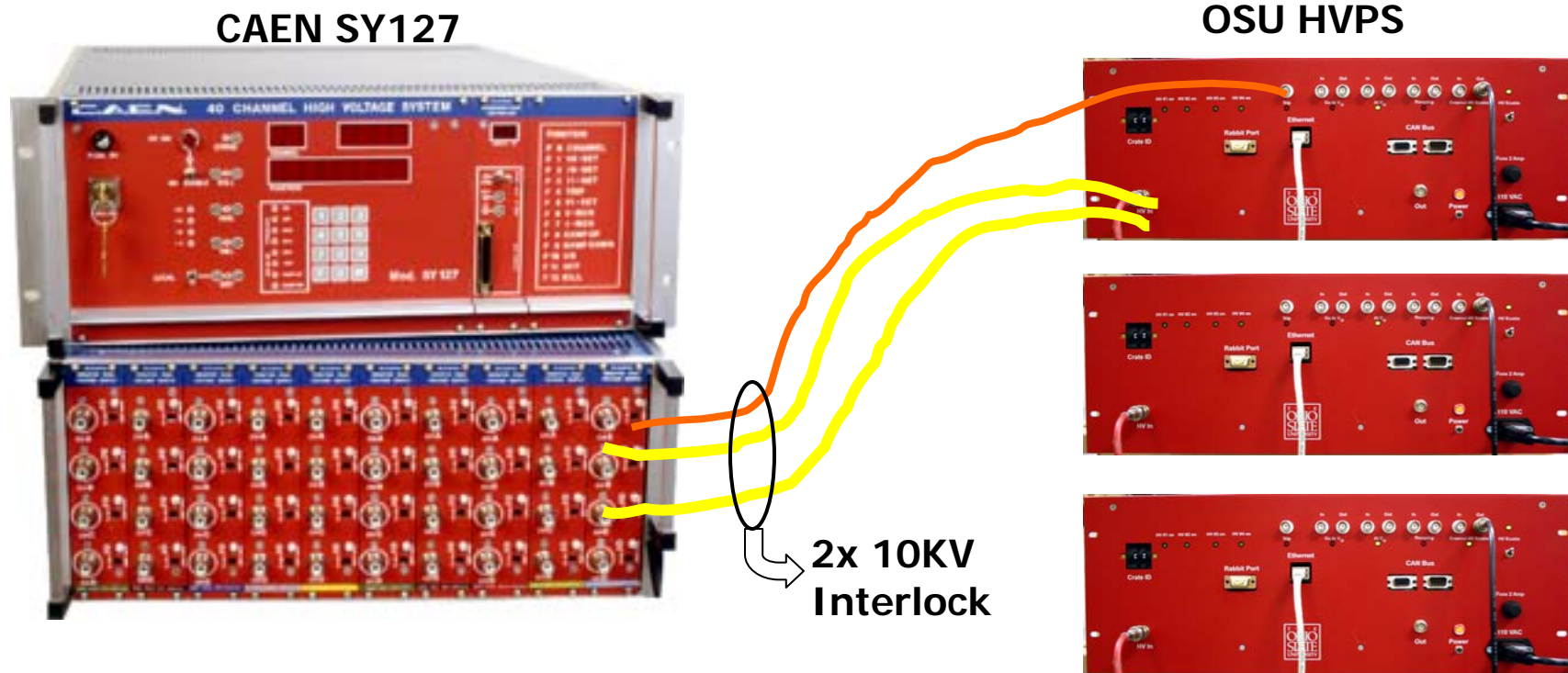
23 units assembled

Complete HV
Power Supplies

7



System Architecture (BaBar)



Re-use RPC CAEN 127 System

- 1 A328 (10 KV, 2 mA, dual channel) pod per OSU HVPS
- RPC uses 3 A328 modules per sextant
- We will use 3 OSU HVPS per sextant
- Interlock allows HVPS box to disable corresponding A328 module

High Voltage Cable

- Purchased multi-wire HV cable from Kerpen
- First shipment (2 sextants) at Colorado State (CSU)
- 2nd Shipment arrived in Oakland
- Cable assembly at CSU
 - Banana plugs on power supply end (available)
 - In-line HV connector (prototype)
 - HV PC board (available)



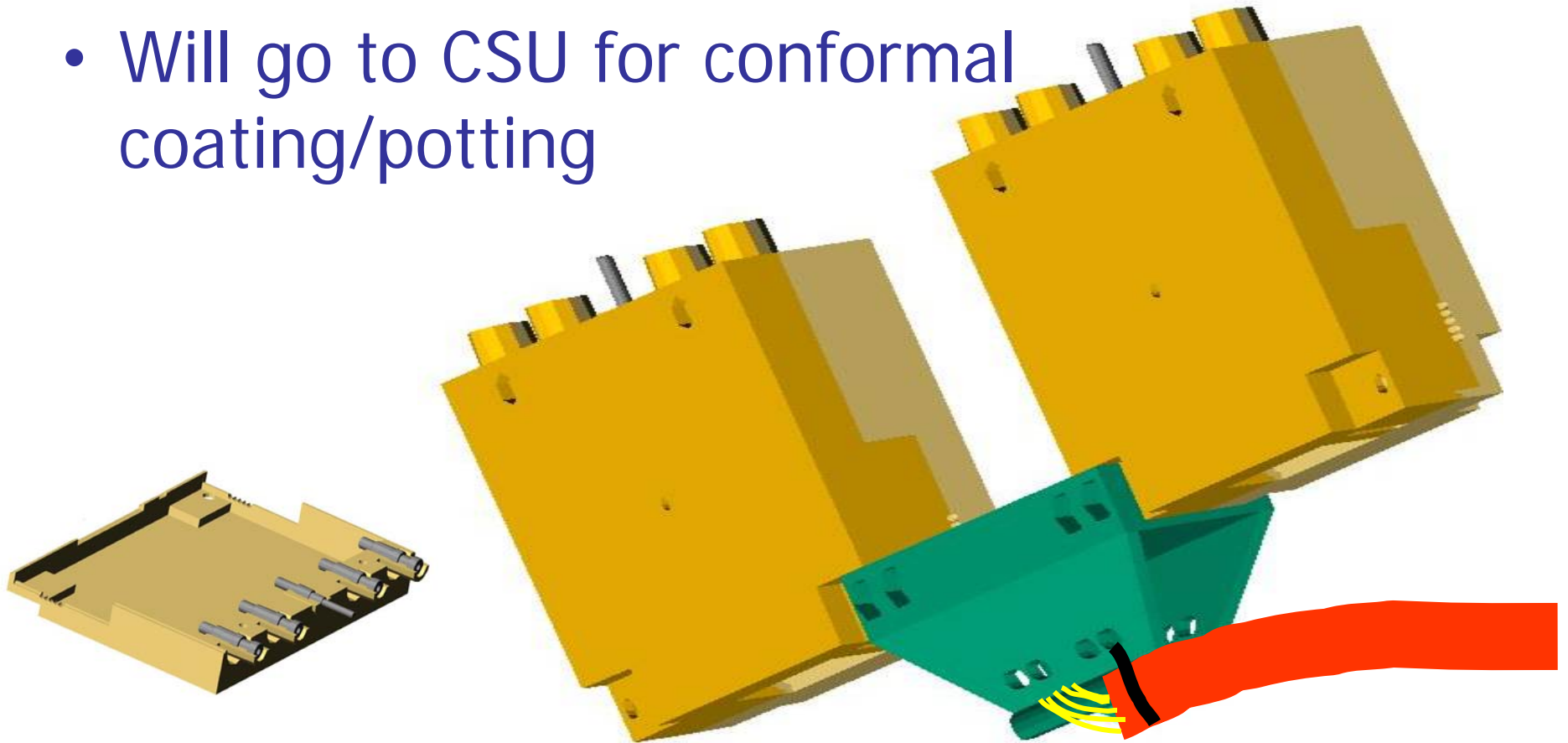
HV Connector (Dave Warner at CSU)

- Injection Mold designed, samples available
- Passed electric safety committee
- Final mold complete

- ~10 cable assemblies by mid-may
- Cable production will follow module arrival schedule
 - ½ sextant June 1st
 - ½ sextant mid-June
 - 1 sextant July 1st

HV Box

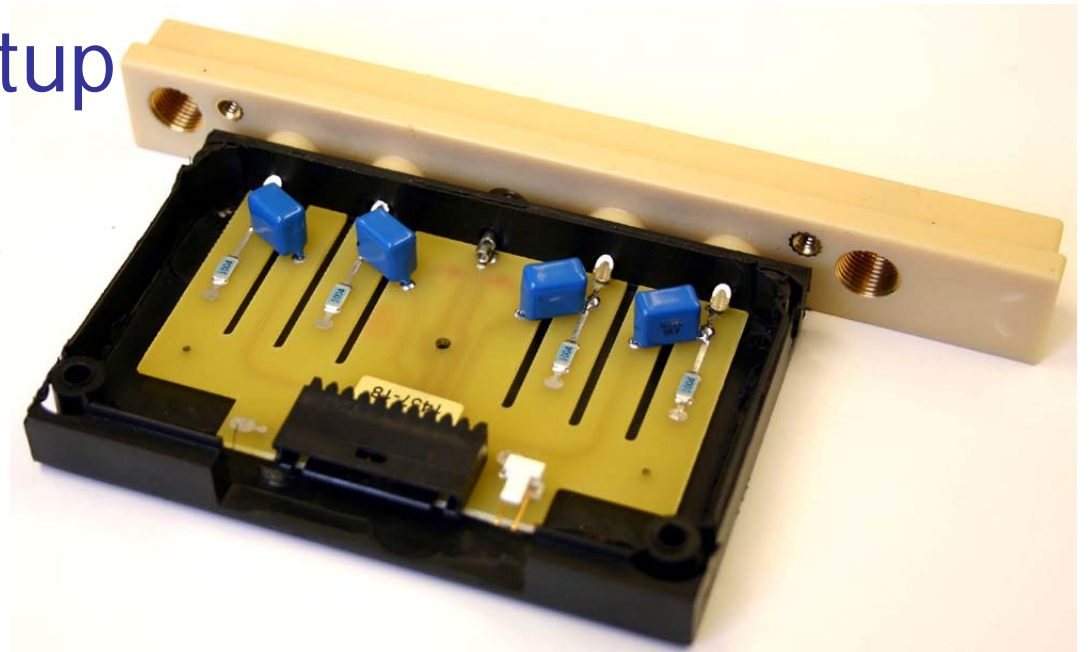
- Injection mold designed and parts ordered
- Expected to arrive at Ohio State May 5
- Will go to CSU for conformal coating/potting



K. Honsch

HV PC Board

- HV Capacitors in hand
- 1500 PC boards in hand
- 400 PC boards assembled
- 100 PC boards tested
- automatic test setup ready
- will go to CSU for potting and final assembly



HV Software

- Complete HV application implemented
 - server for built in microcontroller
 - Qt and Ethernet/TCPIP based User Interface
 - Built in support for QC operation
 - database
 - LST tube conditioning
 - long term test
- CANbus interface tested
 - works with BaBar IOC
 - sufficient bandwidth (50ms to readout one HV supply)
- To do:
 - replace tcpip interface in server with CANbus
 - EPICS panels, User Interface

HV Win Screen Shots

The screenshot displays the HV Win software interface. The main window is titled "rabbit1.mps.ohio-state.edu... disconnected". It features four columns for HV 1, HV 2, HV 3, and HV 4. Each column contains controls for HV Set Point, HV Current Value, Ramp Up Rate, and Ramp Down Rate, along with "Ramp to HV" and "Ramp to VD" buttons. Below these are "Currents(nA)" displays showing a 2x10 grid of zeros. A "Status" bar at the bottom indicates "Box 0" is selected and lists various system statuses like "Current Trip" and "Software Disabled". A "Data Format" section at the bottom left allows selecting "Physical Units" and setting an "Averaging Window" of 10000 ms. A "Long Term Test" dialog box is overlaid on the right, containing a test procedure: "Ramp to HV of 5600 V on All", "Do nothing for 30 minutes", "If Current < 1000", and "Ramp to HV of 5700 V on All". The dialog also includes a "Repeat" checkbox and buttons for "Add", "Remove", "Save Procedure", "Load Procedure", "Start", "Stop", and "Close".

Long Term Test

Ramp to HV of 5600 V on All
Do nothing for 30 minutes
If Current < 1000
Ramp to HV of 5700 V on All

Repeat

Add
Remove
Save Procedure
Load Procedure
Start
Stop
Close

Status

Box 0

Current Trip
External Hardware Disabled

Ramp Indicator
Frontpanel HV Disabled

at VD
HV Off

Software Disabled
External Request to ramp VD

Open Settings Enable HV Ramp All to HV Turn All Off Reset Trip Set Tube ID

Read Data Disable HV Ramp All to VD Auto Calibrate Quit Help

Data Format

Raw Data
 Physical Units
 Averaging On

Averaging Window 10000 ms

Set Test Procedure

2004

Summary

- All components of the High Voltage system are in production
- All components will be tested in CEH as part of the ongoing QC effort
- Ready for installation in August