

Control System Design

ACIGA

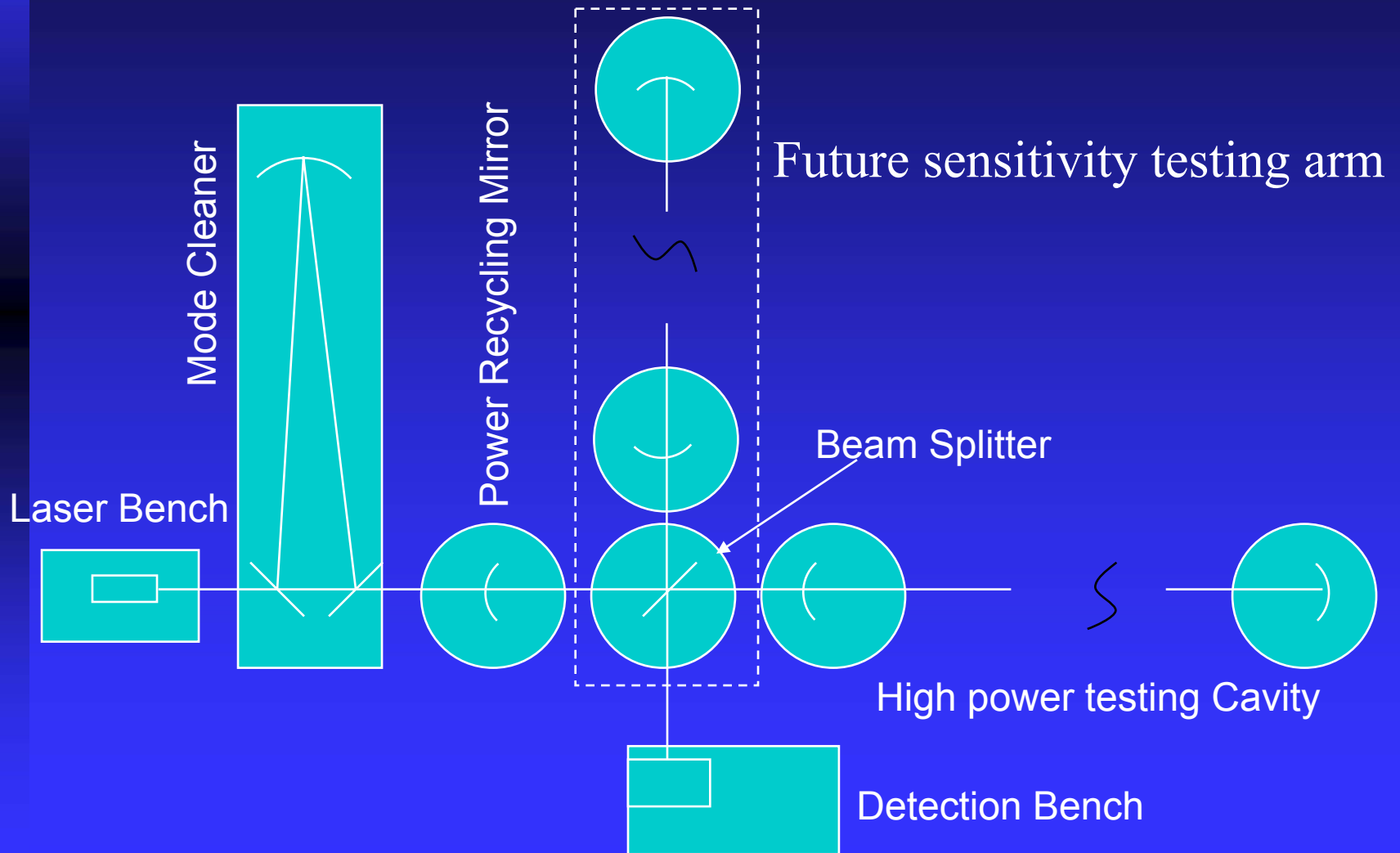
Research Presentation

by Chunnong Zhao

Control System Design

- Overview
- Local control
- Global control
- Data acquisition
- Summary

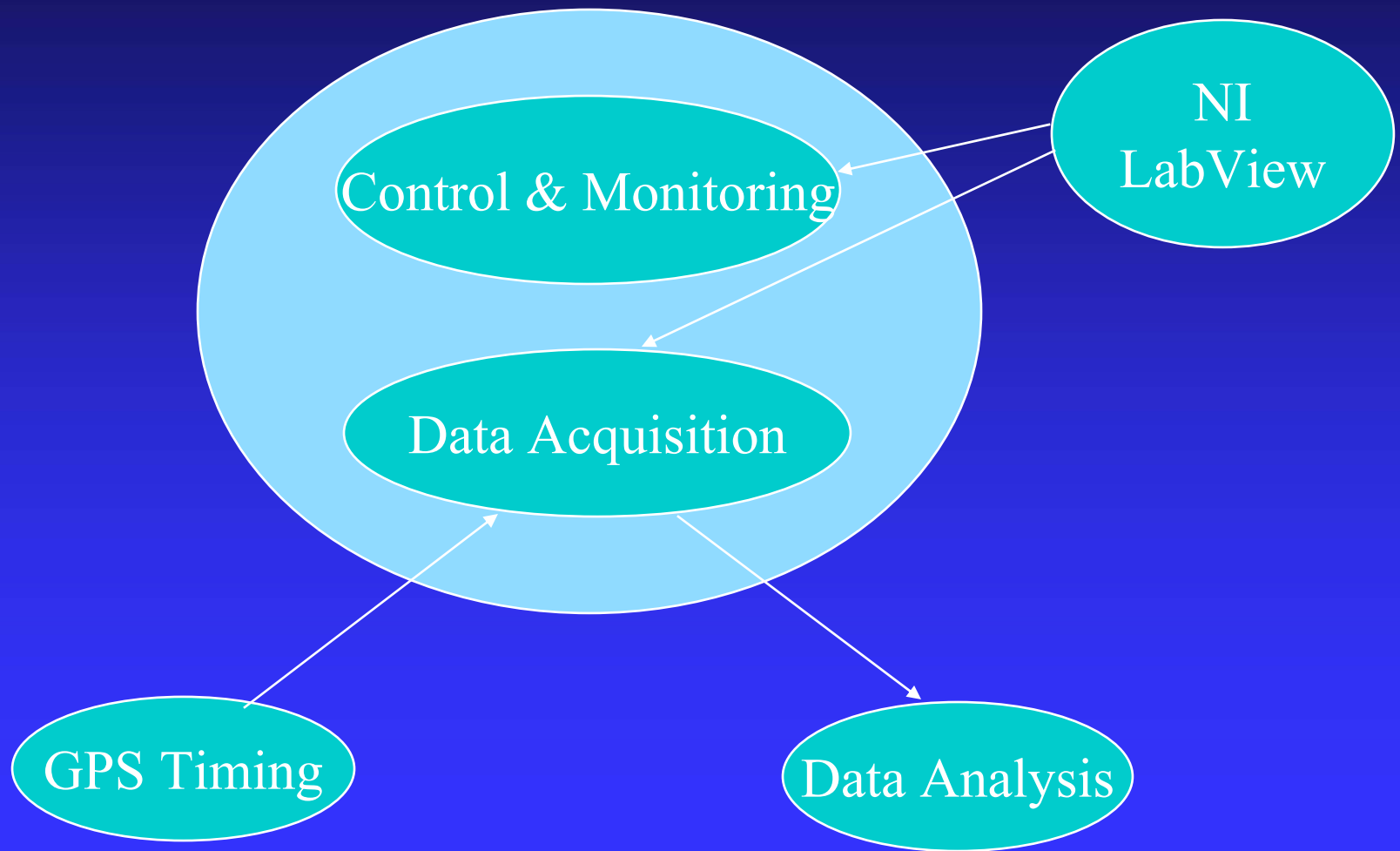
Control System Overview



Control System Overview

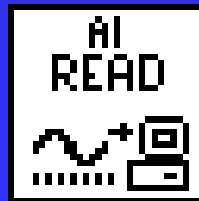
- Laser
 - ◆ Frequency stabilization
 - ◆ Intensity stabilization
 - ◆ Monitoring
- Local control
 - ◆ Real-time digital control
 - ◆ Monitoring
- Global control
 - ◆ Alignment
 - ◆ Locking
 - ◆ Monitoring
- Data Acquisition

Control System Overview



LabView Realtime Platform

- Labview: Laboratory Instrumentation and Engineering Workingbench
- Realtime: Time critical applications
 - ◆ Real time DSP
 - ◆ Real time control
- VI – LabView programming unit

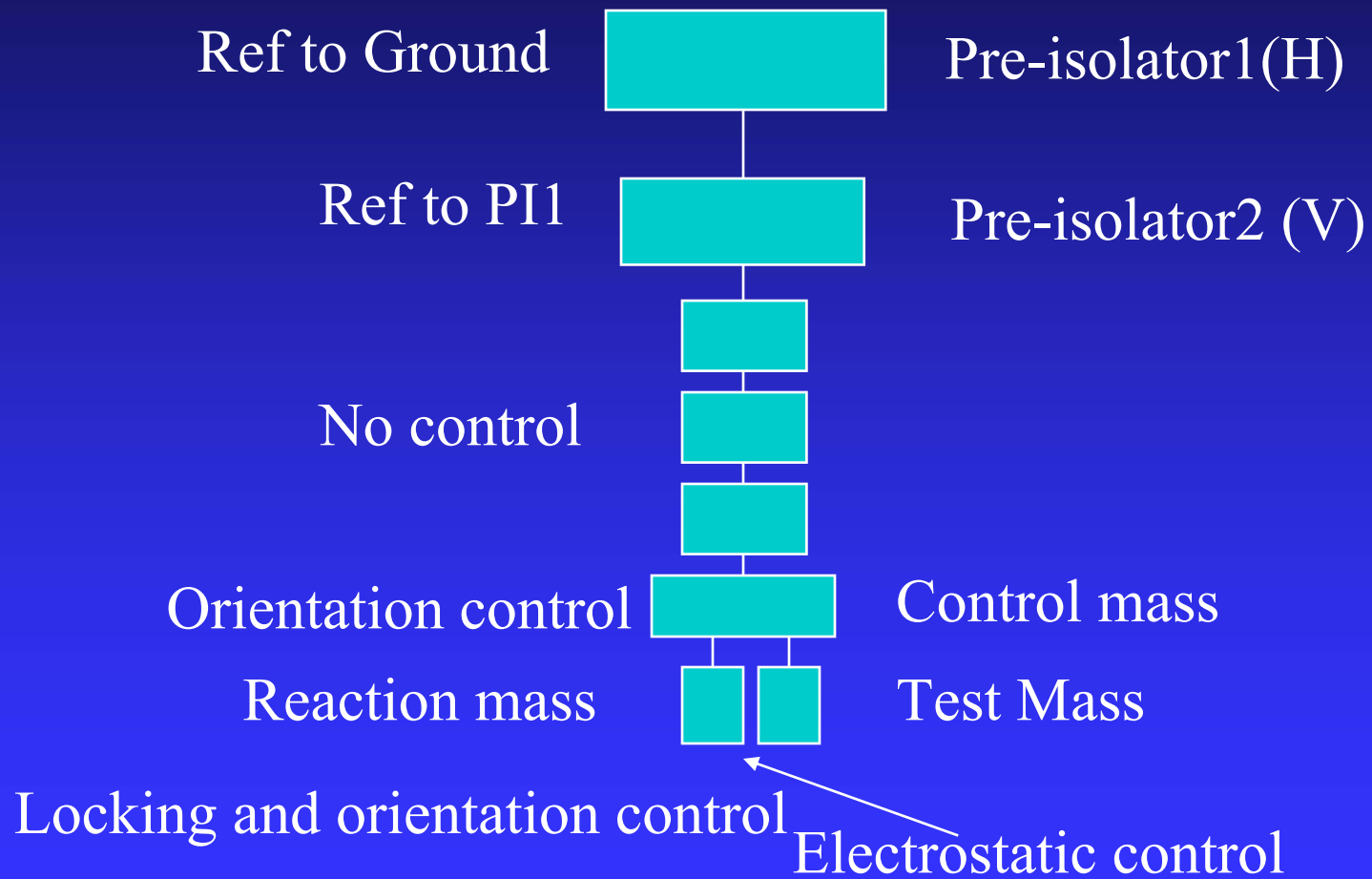


Field Point

Contains:

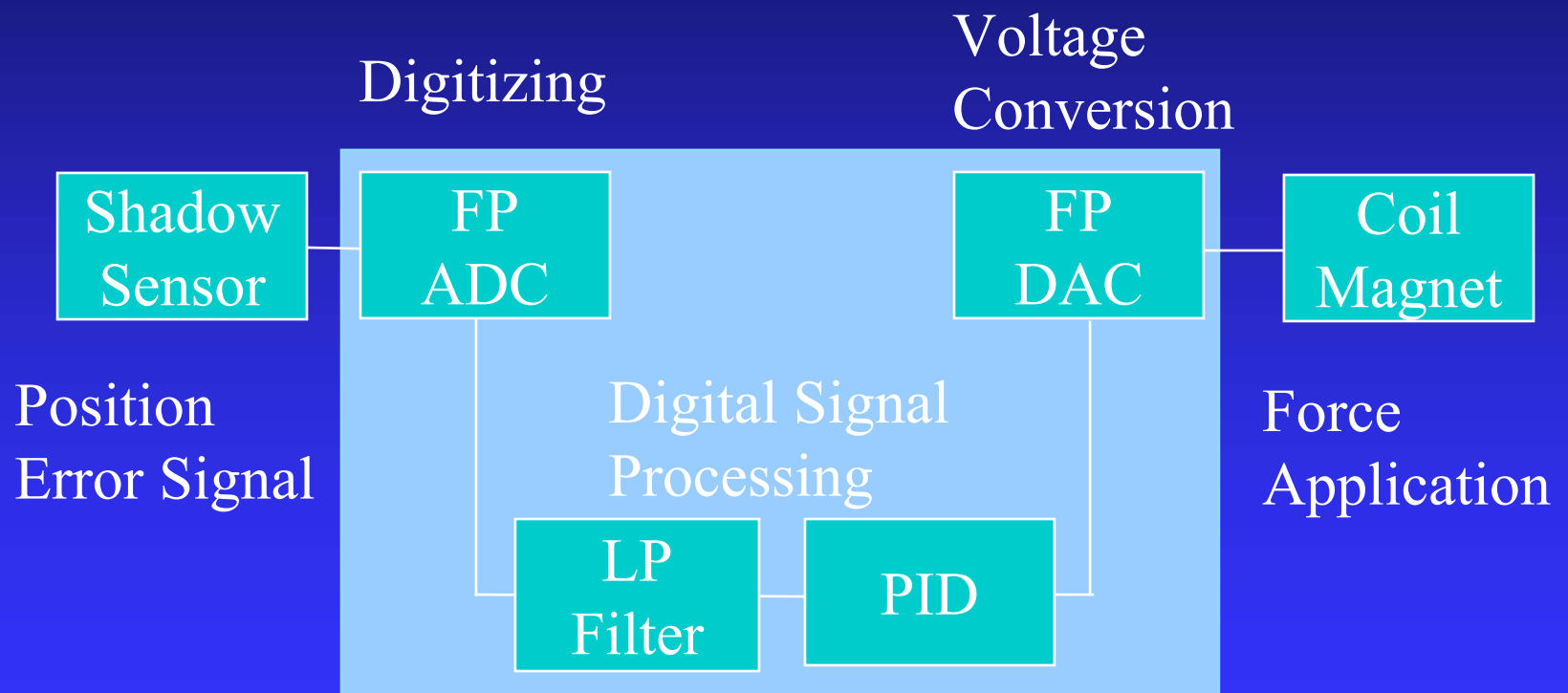
- ◆ LabView Realtime engine
- ◆ 8 channel ADCs (input module)
 - ◆ 12-bit
 - ◆ Input range: -15 V to +15V
 - ◆ Updating rate: 2.8ms
- ◆ 8 channel DACs (output module)
 - ◆ 12-bit
 - ◆ Output range: 0V to 10V
 - ◆ Updating rate: 200Hz

Simplified Full Isolator Model

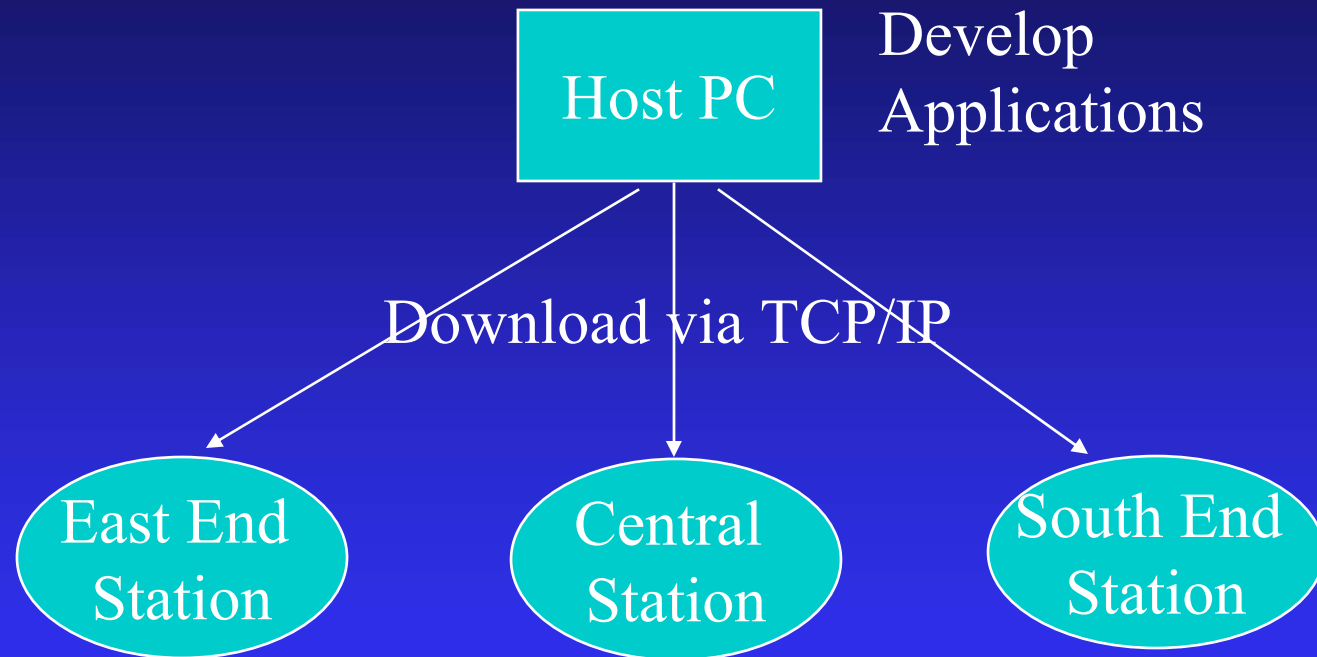


Local Control

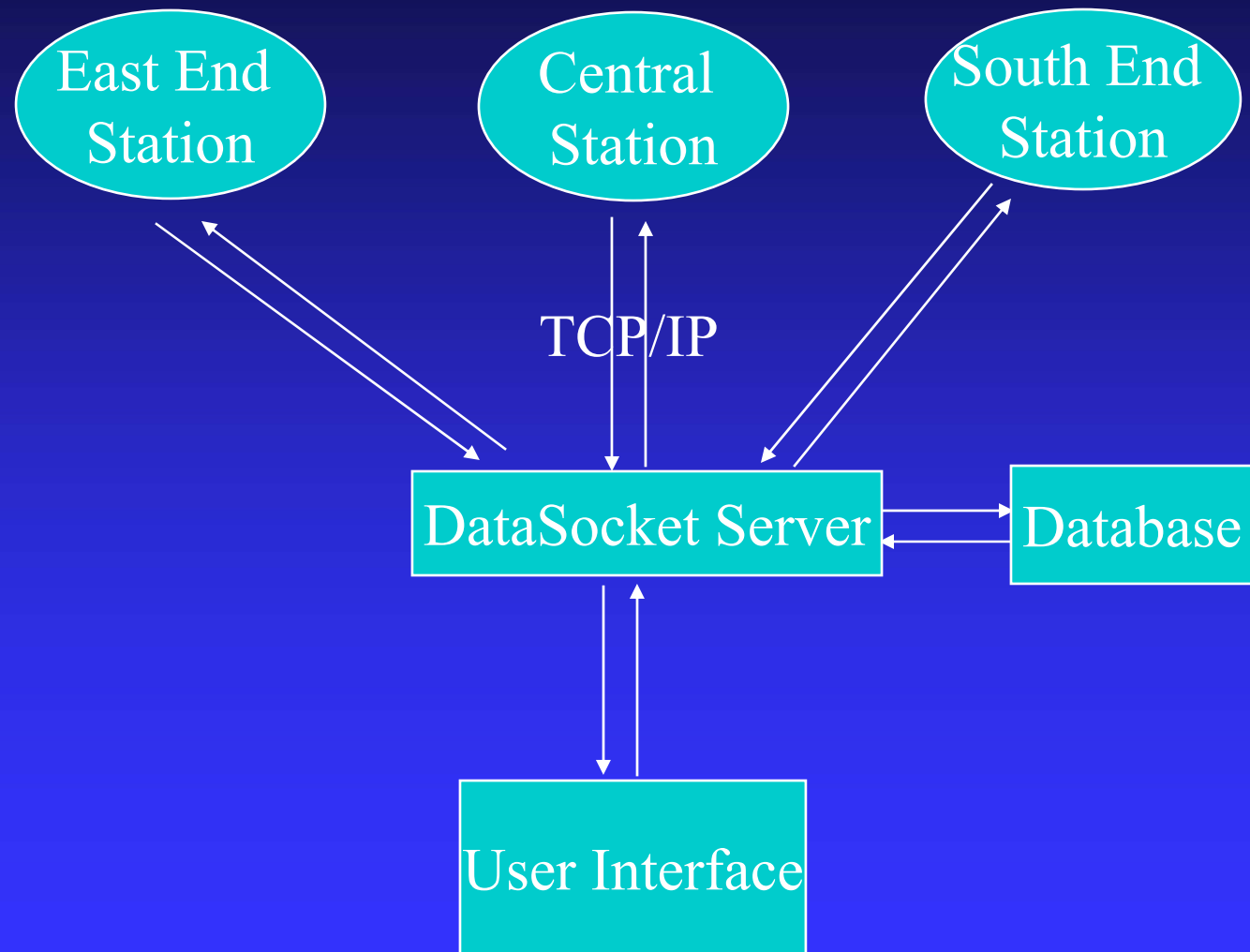
- Real-time digital control



Local Control



Local Control - Monitoring



Global Control

- Locking – Analog control
- Auto-alignment – Analog control



Monitor status



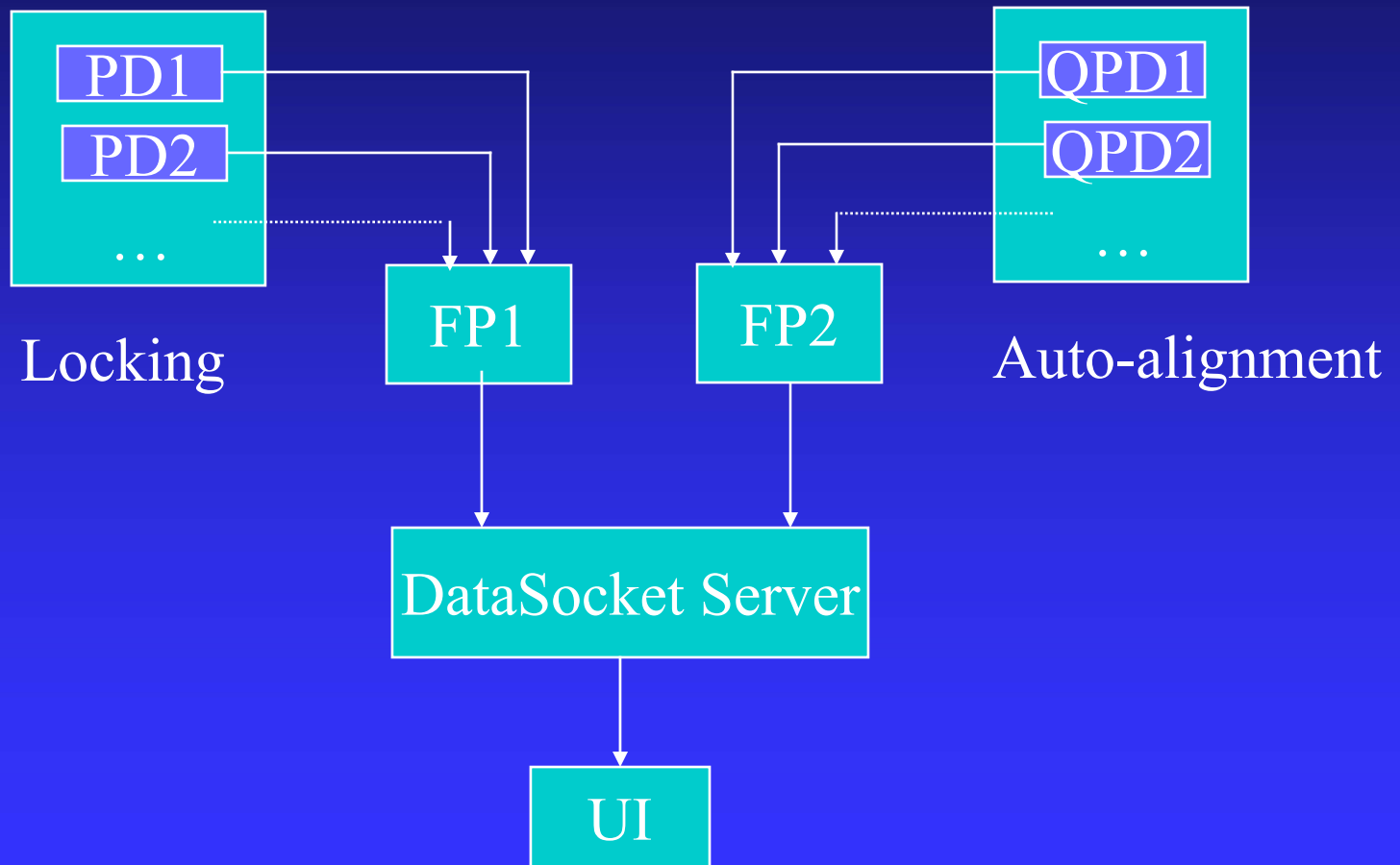
Low updating rate



Field Point



Global Control - Monitoring



Data Acquisition

- Refer to yesterday's talk
 - ◆ GPS timing
 - ◆ 20 kHz sampling rate
- Data storage and transmission?

Summary

- Local control is in progress, vertical control of the pre-isolator has been successful. More work need to be done on other dimension
- Global control is in design
- Need more work on data storing and transmission