LCLS Machine Protection System

- System Overview
- Completed Work
- Remaining Work
- Schedule
LCLS MPS Overview

Timing System

MPS Link Processor

EPICS

Gb Ethernet over Cat6 on Dedicated MPS Network

Gb Ethernet over Fiber on Dedicated MPS Network

Dedicated 1000BASE-X Switch

MPS Link Node

MPS Link Node

MPS Link Node

MPS Link Node

MPS Link Node

MPS Link Node

Digital I/O over Copper

Device

Device

Device

Device

Device

Device

Mitigation Device

Mitigation Device

Mitigation Device

Mitigation Device

Mitigation Device

Nov 11, 2008
FAC MPS
MPS Link Node

- IP Card
- L-Board
- Output Card
- Input Card
MPS Software

Four software projects

- Link Processor
  - MVME 6100 IOC software
- Link Node
  - FPGA firmware
  - ColdFire IOC software
- MPS User Interface
  - Desktop computer
- MPS Database
  - Database
MPS Software

- Link Processor
  - S Norum
- Link Node
  - J Olsen
  - J Olsen
- MPS User Interface
  - B Hall
  - S Chevtsov
- ColdFire IOC Software
  - D Kotturi
- MPS Database
  - A Chan
  - E Grunhaus
  - S Norum
Link Processor

- Remaining
  - Testing
  - BLM/PIC Integration
  - Final Algorithm
Link Node

- Remaining
  - John Dusatko
    - PIC/BLM QINT ADC
  - Jeff Olsen
    - BYKIK Faults
    - QADC System Integration
MPS Database

![MPS Database Image]

- Name: POWER_SUPPLY
- Device Area: Area
- PV Device: SRNTEST
- PV Area: DESK
- PV Position: 0
- Type: Link Node Channel
- Link Node Channel: POWER_SUPPLY
- Link Node Card: POWER_SUPPLY
- Link Node Device: SRNTEST/DESK-0
- Z Position: 0
- Device Area: Area
MPS Database
Link Node ColdFire User Interface
Testing and Production

- Beam Test
- Laser Heater Shutter
Beam Test

MPS Link Processor (MCC) → MPS Link Node LKG-15 (Sector 20) → Pockels Cell (Laser Room)

MPS Link Node KA20-03 (Sector 20)

Device → Device → Device → Device

YAG → YAG → YAG → YAG
Beam Test
Beam Test
10 Hz Beam Limit

1553 MPS limits beam rate to 30 Hz.

LCLS MPS then limits rate to 10 Hz.

The “beam–no beam” pattern seen by the BPMs.
Transition from 10 Hz to 1 Hz
1 Hz Rate Limit
Laser Heater Shutter

Link Node 11 Status

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<tr>
<th>Card</th>
<th>Channel</th>
<th>Device Name</th>
<th>Fault Name</th>
<th>Current State</th>
<th>Bypass Value</th>
<th>Bypass Status</th>
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