

PD Electronics Meeting

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Previous structure of WBS list for electronics WG.

- 1 Read-Out Electronics Modules
- 2 SiPM Ganging/Mounting
- 3 Cables
- 4 PD Electronics Power Supplies
- 5 Grounding scheme for PD electronics/cables/power supplies
- 6 PDS Monitoring/Calibration System
- 7 Signal Cable Feedthrough \leftarrow Added after discussion last week

New structure of WBS list

- Management (includes milestones & review dates)
- Physics & Simulations
- Design, Engineering, and R&D (includes subsystem test facilities & QA)
- Production Setup (includes tooling)
- Production (includes component production, assembly, testing, & QC)
- Integration (contributions to activities at global integration facility)
- Installation (contributions to activities at SURF)

Electronics/Cables/Calibration WG Production

1.3.5.3.1	Readout Electronics
1.3.5.3.1.1	Readout Electronics Fabrication
1.3.5.3.1.2	Readout Electronics Testing
1.3.5.3.2	SiPM Mounting/Gangung
1.3.5.3.2.1	SiPM Mounting/Gangung Fabrication
1.3.5.3.2.2	SiPM Mounting/Gangung testing
1.3.3.3.3	Photon Detector Cable Fabrication/testing
1.3.5.3.3.1	Cold Signal Cable
1.3.5.3.3.1.1	Cold Signal Cable Fabrication
1.3.5.3.3.1.2	Cold Signal Cable Testing
1.3.5.3.3.2	Cold active gangung power cable
1.3.5.3.3.2.1	Cold active gangung power cable Fabrication
1.3.5.3.3.2.2	Cold active gangung power cable Testing
1.3.5.3.3.3	Warm signal cable
1.3.5.3.3.3.1	Warm signal cable Fabrication
1.3.5.3.3.3.2	Warm signal cable Testing
1.3.5.3.3.4	Warm active gangung power cable
1.3.5.3.3.4.1	Warm active gangung power cable Fabrication
1.3.5.3.3.4.2	Warm active gangung power cable Testing
1.3.5.3.4	Photon Detector Power Supply Procurement/Testing
1.3.5.3.4.1	Non-bias voltage power supply
1.3.5.3.4.1.1	Non-bias voltage power supply Procurement
1.3.5.3.4.1.2	Non-bias voltage power supply testing
1.3.5.3.4.2	Bias power supply
1.3.5.3.4.2.1	Bias power supply Procurement
1.3.5.3.4.2.2	Bias power supply Testing
1.3.5.3.5	Grounding Materials PD electronics/cables/power supplies Procurement
1.3.5.3.6	PDS Monitoring/Calibration System
1.3.5.3.6.1	Monitoring system procurement/Fabrication
1.3.5.3.6.2	Monitoring system Testing
1.3.5.3.7	Signal cable feedthru
1.3.5.3.7.1	Signal cable feedthru Fabrication/Procurement
1.3.5.3.7.2	Signal cable feedthru testing

- 1 Production is an intermediate step
- 2 Before we need to take decisions based on Physics Simulations, Cost/Performance (R&D)
- 3 After Production, Integration and installation is required.
- 4 One important first step is the Aspirational Responsibilities.

Some topics need to start to be worked

- 1 Ganging: passive has a great limit due to the parasitic capacitance that is added, the bandwidth decreases dramatically, the cable length must be considered; active requires cold electronics and considerations about power budget in the cold environment; in each case uniformity of PD breakdown voltages must be considered.
- 2 Processing: it is possible to process the output signal from the PD but this has large bandwidth so it requires a more expensive electronics; it is possible to process PD integrated output signal (charge); the choice requires to know which are the data (charge, time) to acquire from PD with the relevant resolution and the ranges; the choice can require also considerations on feasibility in cold environment, integrating PD signals can be performed in a cold environment, digitizing the signals (direct outputs or charge) is more difficult in a cold environment

Aspirational Interests

How to proceed

- 1 Please send us your feedback about WBS. What is missing, what needs to be added, etc.
- 2 Send a slide providing a list of aspirational interest per institution.
- 3 You can send the comments and slide to:
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Physics and Simulation Part of Electronics WG WBS

WBS	Description	WBS Dictionary
1.3.2	Physics and Simulation	
1.3.2.3	Electronics/Cables/Calibration WG Physics/Simulations	
1.3.2.3.1	Electronics, DAQ, Trigger Simulation	Simulate the behavior of electronics/DAQ/trigger strategy. Iterate with simulation to optimize performance.
1.3.2.3.2	Trigger/filter Development	Strategies for mitigating total data rate from the photon detection system.

Design, Engineering, R&D Part of Electronics WG WBS

WBS	Description	WBS Dictionary
1.3.3	Design, Engineering and R&D	
1.3.3.3	Electronics/Cables/Calibration WG Design, Engineering and R&D	
1.3.3.3.1	Readout Electronics Design	
1.3.3.3.2	Design SiPM Mounting	
1.3.3.3.3	Photon Detector Cable Selection/Validation	
1.3.3.3.3.1	Cold Signal Cable Selection/Validation	
1.3.3.3.3.2	Cold active ganging power cable Selection/Validation	
1.3.3.3.3.3	Warm signal cable Selection/Validation	
1.3.3.3.3.4	Warm active ganging power cable Selection/Validation	
1.3.3.3.4	Photon Detector Power Supply Selection/Validation	
1.3.3.3.4.1	Non-bias voltage power supply Selection/Validation	
1.3.3.3.4.2	Bias power supply Selection/Validation	

Design, Engineering, R&D Part of Electronics WG WBS (continued)

1.3.3.3.5 Grounding scheme for PD electronics/cables/power supplies

1.3.3.3.6 PDS Monitoring/Calibration System

1.3.3.3.6.1 Pre-production monitoring design

1.3.3.3.6.2 Monitoring system Materials Selection

1.3.3.3.6.3 Monitoring system Prototyping

1.3.3.3.7 Signal cable feedthru selection/validation

Production Setup Part of Electronics WG WBS

WBS	Description	WBS Dictionary
1.3.4	Production Setup	
1.3.4.3	Electronics/Cables/Calibration WG Production Setup	
1.3.4.3.1	Design/Fabricate readout Electronics Test Stand	
1.3.4.3.2	Design/fabricate SiPM mounting test stand	
1.3.4.3.3	Design/fabricate Photon Detector Cable test stand	
1.3.4.3.4	Photon Detector Power Supply test stations	
1.3.4.3.4.1	Non-bias voltage power supply test station	
1.3.4.3.4.2	Bias power supply test station	
1.3.4.3.5	PDS Monitoring/Calibration test station	
1.3.4.3.6	Signal cable feedthru Test Station	

Production Part of Electronics WG WBS

WBS	Description	WBS Dictionary
1.3.5	Production	
1.3.5.3	Electronics/Cables/Calibration WG Production	
1.3.5.3.1	Readout Electronics	
1.3.5.3.1.1	Readout Electronics Fabrication	
1.3.5.3.1.2	Readout Electronics Testing	
1.3.5.3.2	SiPM Mounting/Ganging	
1.3.5.3.2.1	SiPM Mounting/Ganging Fabrication	
1.3.5.3.2.2	SiPM Mounting/Ganging testing	

Production Part of Electronics WG WBS (continued)

1.3.3.3.3 Photon Detector Cable Fabrication/testing

1.3.5.3.3.1 Cold Signal Cable

1.3.5.3.3.1.1 Cold Signal Cable Fabrication

1.3.5.3.3.1.2 Cold Signal Cable Testing

1.3.5.3.3.2 Cold active ganging power cable

1.3.5.3.3.2.1 Cold active ganging power cable Fabrication

1.3.5.3.3.2.2 Cold active ganging power cable Testing

1.3.5.3.3.3 Warm signal cable

1.3.5.3.3.3.1 Warm signal cable Fabrication

1.3.5.3.3.3.2 Warm signal cable Testing

1.3.5.3.3.4 Warm active ganging power cable

1.3.5.3.3.4.1 Warm active ganging power cable Fabrication

1.3.5.3.3.4.2 Warm active ganging power cable Testing

Production Part of Electronics WG WBS (continued)

1.3.5.3.4 Photon Detector Power Supply Procurement/Testing

1.3.5.3.4.1 Non-bias voltage power supply

1.3.5.3.4.1.1 Non-bias voltage power supply Procurement

1.3.5.3.4.1.2 Non-bias voltage power supply testing

1.3.5.3.4.2 Bias power supply

1.3.5.3.4.2.1 Bias power supply Procurement

1.3.5.3.4.2.2 Bias power supply Testing

1.3.5.3.5 Grounding Materials PD electronics/cables/power supplies Procurement

1.3.5.3.6 PDS Monitoring/Calibration System

1.3.5.3.6.1 Monitoring system procurement/Fabrication

1.3.5.3.6.2 Monitoring system Testing

1.3.5.3.7 Signal cable feedthru

1.3.5.3.7.1 Signal cable feedthru Fabrication/Procurement

1.3.5.3.7.2 Signal cable feedthru testing

Integration Part of Electronics WG WBS (continued)

WBS	Description	WBS Dictionary
1.3.6	Integration	
1.3.6.3	Electronics/Cables/Calibration WG Integration (Global Integration Facility)	

Installation Part of Electronics WG WBS (continued)

WBS	Description	WBS Dictionary
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1.3.7	Installation	
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1.3.7.3	Electronics/Cables/Calibration WG Installation (Activity at SURF)	
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