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Naming and Interface Definition for ASC Wavefront/Centering

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Detector Group

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1 NAMING CONVENTION

We describe here the naming conventions for the ASC Wavefront and Centering Subsystem Components. These two ASC subsystems are closely linked, and will be documented together. Figure 1, below, gives the significant items and their names. All names in the drawing are proceeded by ‘ASC Wavefront/Centering Subsystem’; those in the optical table are additionally prefixed by ‘Antisymmetric Wavefront Sensing Installation’ or ‘Symmetric...’ according to the actual application. The objects in shaded boxes are not part of the ASC.

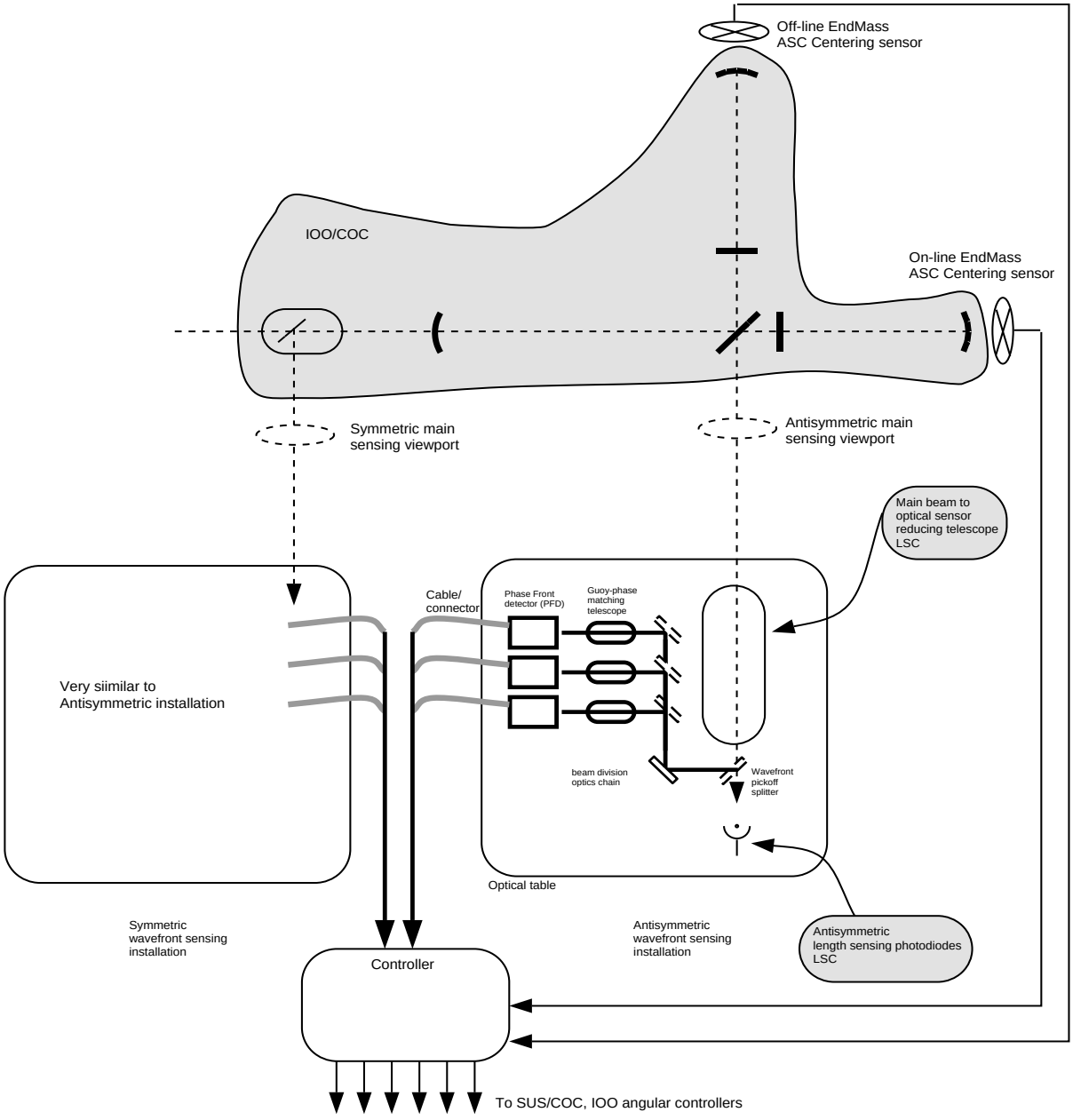

Figure 1: ASC Wavefront/Centering subsystem

2 MECHANICAL INTERFACES

Refer to Figure 1 in Section 1: Naming Convention.

Mechanical Mounting Interfaces			***Drawing/ Doc #***
ASC Wavefront and Centering Mounting Surface	***Other Subsys Mounting Surface***	***Interface and its Characteristics***	
Bottom of kinematic mounting feet of optical table	FAC Floor of LVEA	Bolts/screws • bolt hole pattern	
Optical table surface	IOO Reducing telescope	Bolts/screws • bolt hole pattern	
Optical table surface	LSC Length sensing photodiode	Bolts/screws • bolt hole pattern	
Viewports	VacEq HAM body	Bolts/screws • bolt hole pattern	
Centering sensor mounting tab	SEI Stack optical table	Bolts/screws • bolt hole pattern	
Critical Dimension/Size			***Drawing/ Doc #***
d_1: Height of the beam centers on the optical table relative to the beam center of the LSC Reducing Telescope output (small) beam d_2: Height of the Optical Table to bring the IOO Reducing Telescope to the correct height to intercept the IOO output beams			

Table 1: Mechanical interfaces between ASC Wavefront/Centering and other Detector subsystems

3 SIGNAL INTERFACES

Please refer to Figure 1 in Section 1.

ASC Wavefront/Centering Control Signals
Signal Inputs • Length error and control signals (LSC) • RF modulation references (IOO) • Calibrated misalignment/de-centering/diagnostic offset • Intensity monitor photodiodes • Laser power State Inputs • Length servos locked, all other LSC state information • Gains • Instructions to Wavefront/centering state (acquire, release, Initial alignment) Signal Outputs • angular control signals to suspended masses (including initial beam injection angle) • Diagnostics (error, control signals) State Outputs • Operational alignment achieved • Control signals approaching saturation • Wavefront/centering state (acquired, errors, overloads)

Table 2: Control Signal interfaces between ASC Wavefront and other detector subsystems

4 OPTICAL INTERFACES

See Figure 1. We call out interfaces with the GW-sensing beam.

ASC Wavefront/ centering Interface	*Other Subsys Interface*	*Interface and Its Characteristics*	*Drawing/ Doc #*
Wavefront pick-off splitter	IOO Main beam to optical sensor reducing telescope	• beam gaussian parameters • phase flatness • power	
Centering sensor	COC end test mass (transmitted light)	• beam gaussian parameters • phase flatness • power	

Table 3: Optical interfaces between ASC Wavefront/Centering and other Detector Subsystems

5 INTERFACES EXTERNAL TO THE DETECTOR

These fall naturally into the description of interfaces above, and therefore no separate accounting of them has been made.