# The Phasing and Diagnostic Station of the ELT

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**Abstract**

The Phasing and Diagnostic Station (PDS) provides optical sensing functionality to help commissioning and diagnostics of the (optical mirror characteristics and performances in the) ELT, including phasing of the 39 meter diameter segmented primary mirror throughout the telescope's lifetime. The PDS is designed, developed, and currently manufactured internally at ESO. Its size just fits inside the Pre Focal Station (PFS) on the Nasmyth platform, having external dimensions of approximately 4 m x 1.7 m x 2 m and a total mass of approximately 2.8 tonnes. It receives the optical light from the 5-element telescope mirror train, and further vertically downwards directed from the PFS M6 Coudé mirror. The focal plane is located inside the PDS system, 85 cm above the platform. The PDS helps to bring the telescope after the installation of its mirrors to diffraction limited performance and into operational configuration for science by verifying telescope performance with respect to the high level specifications. We report its final design on all technical aspects, describe the current status during manufacturing and implementation and discuss the expected performance and further plans for the assembly, integration, and test phase of the system.

**Keywords:** elt, phasing, diagnostics

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