WFS software

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ABSTRACT

This document describe the components of the WFS software.

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Abbreviations, acronyms and symbols

Symbol	Description
LBT	Large Binocular Telesecope
WFS	WaveFront Sensing unit of the LBT AO system

Contents

1. Introduction

The WFS software is divided into a number of components in a roughly two-layers structure: low-level hardware controllers and high-level coordination scripts and interfaces.

2. Low-level hardware controllers

Most low-level hardware controllers are written in C++. They all derive from the AOApp C++ class and are controlled via MsgD-RTDB variables and, in some cases, simple messages.

1.1.1 Power management

- RelayCtrl – handles the main power board and the temperature reading for W unit #1
- RelayCtrlW2 – handles the main power board and the temperature reading for W unit #2
- PowerCtrl – handles the power switches on the BCU39 on W unit #1
- PicCtrl: handles the power switches on the flowerpot PIC board on W unit #1
- PicCtrlW2: handles the power switches on the flowerpot PIC board on W unit #2

1.1.2 CCD controllers

- JoeCtrl: two instances control the ccd39 and ccd47.

1.1.3 Motor controllers

- CopleyCtrl: three instances control the three-axes Bayside stages
- SimpleMotorCtrl: seven instances control the two filter wheels, the two ADC motors, the pupil rerotator, the cube rotator and translation stage.

1.1.4 BCU controllers

- SlopeCompCtrl: manages the slope computer BCU39
- TechViewerCtrl manages the frame grabber BCU47, which also includes the tip-tilt and camera lens waveform generator

1.1.5 Piezo controllers

- TTCtrl.: controls the tip-tilt mirror via the BCU47
- CameraLensCtrl: controls the camera lens stage via the BCU47

3. Telemetry system and auxiliary loops

- MasterDiagnostic: collects realtime telemetry data from the BCUs and writes them into local shared memory
- housekeeperWFS: collects non-realtime telemetry information (e.g. temperatures) from BCUs
- OptLoopDiagnostic: performs various housekeeping tasks (dark following loop, intensity check) and writes telemetry data on disk when requested.
- pupilcheck.py: checks the pupil position on the Pyramid CCD (ccd39)
- ccd47read.py: continuously reads the ccd47 and sends the image to the AOS
- DBFiller: collects data for Zabbix telemetry system
- TrueSense: performs truth-sensing: collects data from ccd39 and calculates current low-order aberrations.
- gopt.py : realtime optical gain calculation and correction

4. High level coordination

- WfsArbitrator: state machine controlling the overall WFS state