

| | INTERNAL NGAO | | | | | | | | | | EXTERNAL NGAO | | | | | | | |
|---|---------------|-------|-------|---|-----|---|---|---|---|------------------------------|---------------|-----|-------|-----|-------------------------|-----|-----|---|
| | M,E | M,E,S | M,E | | | | | | | | M,E | M,E | M | M,E | M,E | M,E | M,E | |
| AO enclosure | M,E | M,E,S | M,E | | | | | | | | M,E | M,E | M | M,E | M,E | M,E | M,E | |
| AO opto-mechanical | M,E,S | E,S | E,S | | | | | | | | O,M | O,M | O | | O,M, (E?) | | | |
| AO Controls | S | | | S | | S | | S | | S | S | S | S | M,E | S | S | | |
| Real-time controller | | | | | | | | | | S | | | | M,E | | | | |
| Laser enclosure | M,E | M,E | M,E,S | | E,S | | | | | | | | M,E | M,E | | | | |
| Laser system | O,M | S | | S | | | | | | | | | | | | | | |
| Beam transport system | S | | S | | S | | | | | | | | M,E | M,E | | | | |
| LGS control | S | S | S | | S | | S | S | S | S | S | S | S | M,E | S | | | |
| Laser traffic control system | | | | | | | | | | | | | S? | M,E | | | | |
| LGS facility safety systems | | | | | | | | | | | | | | M,E | | | | |
| Proposed Interface control documents | | | | | | | | | | Multi-sys. command sequencer | S | S | S | | M,E | S | S | |
| Science Instruments ICD | | | | | | | | | | Pre observing tools | S | S | | | | | | S |
| AO (Opt, Mech., & EE) <-> Telescope | | | | | | | | | | Observing tools | S | S | S | S | | S | S | |
| Observing tools <-> LGS controls | | | | | | | | | | Post observing tools | S | | | | | | S | |
| Observing tools <-> AO controls | | | | | | | | | | Data server | S | S | S | M,E | S | S | S | |
| Observing tools <-> Telescope | | | | | | | | | | NIR-IFU | | S | | | | | | |
| Multi-sys. command sequencer to <-> AO controls | | | | | | | | | | NIR-imager | S | | | | | | | |
| Multi-sys. command sequencer to <-> LGS controls | | | | | | | | | | Telescope | | | M,E,S | | | | | |
| Data Server telemetry interface <-> NGAO subsystems | | | | | | | | | | Facility infrastructure | | M,E | | | Interferometer | | | |
| Data Server diagnostic interface (real time) <-> AO (RTR) | | | | | | | | | | MK atmospheric profiler | | | | | MK atmospheric profiler | | | |
| AO controls <-> LGS controls (mostly for up tip-tilt offloads) | | | | | | | | | | Remote Observing Facilities | | | | | | | | |
| LGS facility (Mech. & EE) <-> Telescope | | | | | | | | | | | | | | | | | | |
| LGS Traffic Control (Software) <-> Telescope Control Software (DCS) | | | | | | | | | | | | | | | | | | |
| Facilities Interfaces (Mech. & EE) <-> NGAO | | | | | | | | | | | | | | | | | | |
| Legacy Interfaces Interferometry <-> AO, Telescope, Facilities | | | | | | | | | | | | | | | | | | |
| MK atmospheric profiler Interfaces <-> NGAO | | | | | | | | | | | | | | | | | | |

[dotted pattern] AO Internal interface <-> Software

[dotted pattern] AO internal interface <-> Mech., EE, & Opt

[blue dotted pattern] LGS facility internal interface <-> Software

[blue dotted pattern] LGS facility internal interface <-> Mech., EE, & Opt

[purple dotted pattern] Science Operation Tool internal interface

| | | | | | | | | | | INTERNAL NGAO | | EXTERNAL NGAO | | | | | |
|------------------------------|-----|-------|-------|---|-----|---|---|-------|-----|---------------|-----|---------------|-----|-----|-----|-----------|--|
| AO enclosure | M,E | M,E,S | M,E | | | | | | | | | M,E | M,E | M | M,E | M,E | |
| AO opto-mechanical | E,S | E, S | | | | | | | | | | O,M | O,M | O | | O,M, (E?) | |
| AO Controls | S | | | S | | | S | | S | S | S | S | M,E | S | S | | |
| Real-time controller | | | | | | | | | | S | | | | M,E | | | |
| Laser enclosure | M,E | M, E | M,E,S | | E,S | | | | | | | | | M,E | M,E | | |
| Laser system | O,M | S | | S | | | | | | | | | | | | | |
| Beam transport system | S | | S | | | | | | | | | | M,E | M,E | | | |
| LGS control | S | S | S | | S | | | S | S | S | S | S | M,E | S | | | |
| Laser traffic control system | | | | | | | | | | | | | S? | M,E | | | |
| LGS facility safety systems | | | | | | | | | | | | | | M,E | | | |
| Multi-sys. command sequencer | S | S | S | S | S | S | S | S | S | | | | M,E | S | S | S | |
| Pre observing tools | S | | | S | S | | | | | | | | | | S | S | |
| Observing tools | | S | S | S | S | S | S | S | S | | | | S | S | S | S | |
| Post observing tools | S | | | S | | | | | | | | | | | S | S | |
| Data server | | | | | S | | | S | S | S | M,E | S | S | S | S | S | |
| NIR-IFU | | | | | | S | | | | S | | | | | | | |
| NIR-imager | | | | | | | S | | | | | | | | | | |
| Telescope | | | | | | | | M,E,S | | | | | | | | | |
| Facility infrastructure | | | | | | | | | M,E | | | | | | | | |
| Interferometer | | | | | | | | | | | | | | | | | |
| MK atmospheric profiler | | | | | | | | | | | | | | | | | |
| Remote Observing Facilities | | | | | | | | | | | | | | | | | |

Systems are on the diagonal

Adaptive Optics System
Laser Guide Star Facility
Science Operations Tools
Data Server
Instruments
Observatory
Atmospheric Profiler
Remote Observing Facilities

Letters represent interfaces

| |
|--------------|
| O optical |
| M mechanical |
| E electrical |
| S software |

| | | | | | | | | | |
|------------------------------|-----|-----|-----|---|---|---|-----|-----|-----|
| Laser enclosure | M,E | M,E | | | S | | E,S | E,S | E,S |
| Laser units | M,E | E,S | O | | | | | | |
| Laser unit support Hardware | | | M,E | S | | | | | |
| Laser unit support software | | S | S | | | S | S | S | |
| Beam Transport system | | S | | | | S | S | S | |
| LGS control system | | | S | | S | S | S | S | |
| Laser traffic control system | | | | | | | | | |
| Laser safety system | | | | | | | | | |
| Satellite safety system | | | | | | | | | |
| Aircraft safety system | | | | | | | | | |

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|--|------------------------------|
| | Laser enclosure |
| | Laser system |
| | Beam transport system |
| | LGS control |
| | Laser Traffic Control system |
| | LGS facility safety system |

Proposed Interface control documents

Laser unit and support system <--> LGS Facility

LGS facility safety systems <--> Laser enclosure, Beam transport, LGS control

LGS control system <--> Enclosure, &, Beam transport

Laser traffic control system <--> LGS control system