*LIGO Laboratory / LIGO Scientific Collaboration*

LIGO- E1200039-v3 *ADVANCED LIGO* 04 June 2012

Pre-Stabilized Laser Subsystem Acceptance documentation

- L1 PSL-

Benno Willke and the PSL team

Distribution of this document:

LIGO Science Collaboration

This is an internal working note

of the LIGO Project.

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http://www.ligo.caltech.edu/

Purpose and general description

This document provides links to the acceptance documentation package (as defined in [M1100282-v1](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=75560). (some acronyms are defined at the end of this document)

# Requirements documentation:

*The design requirements document must be brought up to date, and pointers to background material, analyses, etc. added to the Requirements document. Pointers to prototyping endeavors should be included here.*

* + 1. **Design Requirements Document (DRD)** [T050036](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=971)
  1. **Supporting documents (models, analyses, …)**

# Design overview and detailed design documentation:

*The Final Design Document must be brought up to date, and the detailed design made available via a tree structure pointing to the DCC and design vaults. Lower-level software (control laws, basic machine state and reporting) should be documented in this way, pointing to a software version control system.*

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| --- | --- |
| document | DCC number |
| **main documents** |  |
| final design document | [T0900649](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=8127) |
| FD presentation | [L1000084](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=9481) |
| FD committee report (accepted) | [L1000084](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=9481) |
| **optical layout** |  |
| PSL table layout | [T0900610](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=7787) |
| PSL component list (shape data generated from Visio file, optics, mounts, DCC numbers, etc ) | [T0900633](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=8000) |
| list of optics and their data sheets | [T1200041](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=86379) |
| **control** |  |
| PSL control and DAQ layout | [T1200085](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=87527) |
| electronic infrastructure document (power supplies, racks, crades) | [T0900650](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=8132) |
| function and interface document: injection locking (ILS) and PMC servo | [T0900578](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=7320) |
| ILS / PMC circuit board documentation | [T0900577](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=7318) |
| function and interface document ISS inner loop | [T0900630](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=7997) |
| ISS inner loop circuit board documentation | [T0900631](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=7998)  [D1001985](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=14013) |
| PSL monitoring fieldbox circuit board documentation | [T0900632](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=7999)  [D1002292](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=14920) |
| aLIGO PSL FSS Modifications | [T1100119](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=39232) |
| aLIGO PSL TTFSS fieldbox | [D1100367](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=39206) |
| aLIGO PSL VCO fieldbox | [D1100369](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=39224) |
| PSL photodiodes design document | [T0900618](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=7844) |
| aLIGO PSL PD mechanical drawings | [D1200121](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=85985) |
| PSL rf electronic components | [T0900589](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=7470) |
| interfaces |  |
| interface document | [T0900644](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=8085) |
| **rooms and infrastructure** |  |
| laser room design document | [T1000028](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=8563) |
| laser diode room design document | [T070195](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=1539) |
| L1 and H1 PSL/IO optical table and Laser Area Enclosure layout drawing | [D1003076](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=25809) |
| Mechanical Sections and Details - H1 Laser Area Enclosure Acoustic Shell | [D1002388](https://dcc.ligo.org/cgi-bin/DocDB/ShowDocument?docid=15318) |
| **electro-optical components** |  |
| aLIGO bow-tie Pre-Mode Cleaner document | [T0900616](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=7842) |
| PMC tecnhnical drawings | [T1000088](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=9371) |
| PMC construction manual | [T1000430-x0](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=13663) |
| **manuals and descriptions** |  |
| user manual 35W laser | [T0900646](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=8088) |
| user manual 200W laser | [T0900641](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=8080) |
| Advanced LIGO PSL Diagnostic Breadboard Instruction Manual | [T0900133](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=1541) |
| Advanced LIGO PSL Diagnostic Breadboard Computer Control Manual | [T0900579](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=7321) |
| PSL EPICS user interfaces | [T0900634](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=8001) |
| Coolant system operating & maintenance manual | [T1100373](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=67340) |
| CDS channel list with short descriptions | [T1200092](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=87608) |
| **miscellaneous** |  |
| Coolant distribution system schematic | [T1100372](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=67278) |
| drawing list |  |
| spare concept | [T0900645](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=8086) |
| Advanced LIGO PSL Installation Plan | [T0900568](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=7086) |
| aLIGO PSL Safety Plan | [T0900614](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=7837) |
| aLIGO PSL Interlock Concept | [T1000005](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=8313) |
| failure mode document | [T080247](http://www.ligo.caltech.edu/docs/T/T080247-00.pdf) |
| Slow\_Ethercad\_PSL\_Control\_Chasis | [T1100326](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=63162) |

Laser Area Enclosure - Cleanroom

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| --- | --- |
| DCC # | Description |
| [C1002229](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=25105)-v1 | PSL Laser Area Enclosure Cleanrooms - Specifications, Requirements, and Design Considerations |
| [D1002633](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=21994)-v2 | Ante-room Plan, H1 Laser Area Enclosure |
| [D1002634](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=21995)-v1 | Ante-room Elevations, H1 Laser Area Enclosure |
| [D1002781](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=22519)-v2 | Ante-room Plan, H2 Laser Area Enclosure |
| [D1002786](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=22524)-v2 | Ante-room Elevations, H2 Laser Area Enclosure |
| [D1002787](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=22525)-v2 | Ante-room Plan, L1 Laser Area Enclosure |
| [D1002789](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=22527)-v2 | Ante-room Elevations, L1 Laser Area Enclosure |

Acoustic Shell Drawings :

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| DCC # | Description |
| [D1002386](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=15316)-v3 | Mechanical Plan, H1 Laser Area Enclosure Acoustic Shell |
| [D1002387](https://dcc.ligo.org/cgi-bin/DocDB/ShowDocument?docid=15317)-v2 | Mechanical Plan and schedules, H1 Laser Area Enclosure Acoustic |
| [D1002388](https://dcc.ligo.org/cgi-bin/DocDB/ShowDocument?docid=15318)-v3 | Mechanical Sections and Details, H1 Laser Area Enclosure Acoustic Shell |
| [D1002389](https://dcc.ligo.org/cgi-bin/DocDB/ShowDocument?docid=15319)-v2 | Room Layout/Framing Plan, H1 Laser Area Enclosure Acoustic Shell |
| [D1002390](https://dcc.ligo.org/cgi-bin/DocDB/ShowDocument?docid=15317)-v2 | Framing Plans and Elevations, H1 Laser Area Enclosure Acoustic Shell |
| [D1002396](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=15326)-v2 | Mechanical Plan, H2 Laser Area Enclosure Acoustic Shell |
| [D1002397](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=15327)-v2 | Mechanical Plan and schedules, H2 Laser Area Enclosure Acoustic Shell |
| [D1002398](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=15328)-v2 | Mechanical Sections and Details, H2 Laser Area Enclosure Acoustic Shell |
| [D1002399](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=15329)-v2 | Room Layout/Framing Plan, H2 Laser Area Enclosure Acoustic Shell |
| [D1002411](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=20779)-v2 | Framing Plans and Elevations, H2 Laser Area Enclosure Acoustic Shell |
| [D1002391](https://dcc.ligo.org/cgi-bin/DocDB/ShowDocument?docid=15321)-v3 | Mechanical Plan, L1 Laser Area Enclosure Acoustic Shell |
| [D1002392](https://dcc.ligo.org/cgi-bin/DocDB/ShowDocument?docid=15322)-v2 | Mechanical Plan and schedules,L1 Laser Area Enclosure Acoustic Shell |
| [D1002393](https://dcc.ligo.org/cgi-bin/DocDB/ShowDocument?docid=15323)-v2 | Mechanical Sections and Details, L1 Laser Area Enclosure Acoustic Shell |
| [D1002394](https://dcc.ligo.org/cgi-bin/DocDB/ShowDocument?docid=15324)-v2 | Room Layout/Framing Plan, L1 Laser Area Enclosure Acoustic Shell |
| [D1002395](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=15325)-v2 | Framing Plans and Elevations, L1 Laser Area Enclosure Acoustic Shell |

drawings of PSL components

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|  |  | **35W Laser Container** |
| available at LZH |  | mechanical design |
| available at LZH |  | electrical design |
| [T1100372](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=67278) |  | cooling water design |
|  |  |  |
|  |  | **200W High Power Laser Oscillator Container** |
| available at LZH |  | mechanical design (LZH) |
| available at neoLASE |  | mechanical design (NeoLase) |
| available at neoLASE |  | electrical design |
| [T1100372](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=67278) |  | cooling water design |
| [D1200121](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=85985) |  | OSC monitoring photodiodes mechanical design |
| [D1002164](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=14412) |  | OSC monitoring photodiodes schematic |
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|  |  | **Diagnostic Breadboard Container** |
| [T0900133](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=1541) |  | cabeling reference |
| [T0900133](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=1541) |  | Breadboard optical layout |
| [T0900133](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=1541) |  | Simplified schematic of the whole electronics. |
| [T1200078](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=87249) |  | HV Amplifier module front |
| T1200078 |  | HV Amplifier module schematic |
| T1200078 |  | Demodulator front |
| T1200078 |  | Demodulator schematic |
| T1200078 |  | Controller 1 module front |
| T1200078 |  | Controller 1 module schematic |
| T1200078 |  | Controller 2 module front |
| T1200078 |  | Controller 2 module schematic |
| T1200078 |  | Miscelleneaus module front |
| T1200078 |  | Miscelleneaus module schematic |
| T1200078 |  | DBB interface adapter (at DBB box) |
| T1200078 |  | DBB RIN PD schematic |
| T1200078 |  | DBB RIN PD mechanical design |
| T1200078 |  | DBB quadrant PD schematic |
| T1200078 |  | DBB quadrant PD mechanical design |
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|  |  | **PreModecleaner Container** |
| [D1001618](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=12832) |  | PMC servo module schematic |
| [T0900577](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=7318) |  | PMC servo module front |
| [D1001619](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=12833) |  | PMC field box module schematic |
| [T0900577](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=7318) |  | PMC field box module front |
| [D1001955](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=13962) |  | PMC spacer |
| [D1001955](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=13962) |  | PMC tank |
| [D1002163](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=14411) |  | PMC photodiode schematic |
| [D1200121](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=85985) |  | PMC photodiode mechanical design |
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|  |  | **Injection Locking Container** |
| [D1001618](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=12832) |  | ILS servo module schematic |
| [T0900577](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=7318) |  | ILS servo module front |
| [D1001619](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=12833) |  | ILS field box module schematic |
| [T0900577](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=7318) |  | ILS field box module front |
| [D1002163](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=14411) |  | ILS photodiode schematic |
| [D1200121](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=85985) |  | ILS photodiode mechanical design |
| [D1001811](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=13574) |  | Heat sink for aLIGO PSL Servo PCB |
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|  |  | **Frequency Stabilization Container** |
| [D040105-B](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=4922) |  | FSS table top servo schematic |
| [D040424-A](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=5165) |  | FSS daughter board |
| [D040469-00](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=4065) |  | FSS rf summation box |
| [T1100119](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=39232) |  | TTFSS modification electronic components |
| [D1100371](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=39228) |  | TTFSS Daughterboard |
| [D1100367](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=39206) |  | TTFSS field box module schematic |
| [D1100367](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=39206) |  | TTFSS field box module front |
| [D1100369](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=39224) |  | VCO field box module schematic |
| [D1100369](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=39224) |  | VCO field box module front |
| [D980670-00-D](https://dcc.ligo.org/cgi-bin/DocDB/ShowDocument?docid=20194) |  | FSS reference cavity |
| [D980676-00-D](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=20200) |  | FSS tank |
| [D1200164](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=86388) |  | FSS reference cavity mount |
| [D000214-00-C](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=15433) |  | FSS reference cavity temperature stabilization schematic |
| [D980454-00-C](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=20084) |  | FSS rf-photodiode schematic |
| D989677-00-D |  | FSS rf-photodiode mechanical design |
| [D1100677](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=59203) |  | FSS RPD 4inch mount |
| [D1002164](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=14412) |  | FSS trans-photodiode schematic |
| [D1200121](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=85985) |  | FSS trans-photodiode mechanical design |
| [D1002841](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=22754) |  | aLIGO PSL FSS periscope adapter |
| [D1100031](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=30843) |  | aLIGO PSL FSS periscope adapter angled |
| [D1100676](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=59202) |  | FSS EOM/AOM mount |
|  |  |  |
|  |  | **Power Stabilization Container (first loop)** |
| [D1001985](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=14013) |  | ISS servo module inner loop, schematic |
| [D1001986](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=14014) |  | ISS servo module inner loop, front |
| [D1001998](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=14042) |  | ISS photodiode schematic |
| [D1200121](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=85985) |  | ISS photodiode mechanical design |
| [D1002280](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=14887) |  | Quadrant photodiode for aLIGO PSL ISS |
| [D1003121](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=25988) |  | ISS inner loop photodiode box |
| [D1002707](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=22205) |  | aLIGO PSL AOM driver |
| [D1100587](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=58180) |  | aLIGO PSL AOM Base mechanical drawing |
| [D1100588](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=58181) |  | aLIGO PSL ISS tube adapter for PMC |
| [D1100589](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=58182) |  | aLIGO PSL ISS tube mirror base |
| [D1100590](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=58183) |  | aLIGO PSL ISS tube base |
| [D1100591](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=58184) |  | aLIGO PSL ISS tube apertures |
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|  |  | **Laser Room Container** |
| D1002633-v2 |  | Ante-room Plan, H1 Laser Area Enclosure |
| D1002634-v1 |  | Ante-room Elevations, H1 Laser Area Enclosure |
| D1002781-v2 |  | Ante-room Plan, H2 Laser Area Enclosure |
| D1002786-v2 |  | Ante-room Elevations, H2 Laser Area Enclosure |
| D1002787-v2 |  | Ante-room Plan, L1 Laser Area Enclosure |
| D1002789-v2 |  | Ante-room Elevations, L1 Laser Area Enclosure |
| D1002386-v3 |  | Mechanical Plan, H1 Laser Area Enclosure Acoustic Shell |
| D1002387-v2 |  | Mechanical Plan and schedules, H1 Laser Area Enclosure Acoustic |
| D1002388-v3 |  | Mechanical Sections and Details, H1 Laser Area Enclosure Acoustic Shell |
| D1002389-v2 |  | Room Layout/Framing Plan, H1 Laser Area Enclosure Acoustic Shell |
| D1002390-v2 |  | Framing Plans and Elevations, H1 Laser Area Enclosure Acoustic Shell |
| D1002396-v2 |  | Mechanical Plan, H2 Laser Area Enclosure Acoustic Shell |
| D1002397-v2 |  | Mechanical Plan and schedules, H2 Laser Area Enclosure Acoustic Shell |
| D1002398-v2 |  | Mechanical Sections and Details, H2 Laser Area Enclosure Acoustic Shell |
| D1002399-v2 |  | Room Layout/Framing Plan, H2 Laser Area Enclosure Acoustic Shell |
| D1002411-v2 |  | Framing Plans and Elevations, H2 Laser Area Enclosure Acoustic Shell |
| D1002391-v3 |  | Mechanical Plan, L1 Laser Area Enclosure Acoustic Shell |
| D1002392-v2 |  | Mechanical Plan and schedules,L1 Laser Area Enclosure Acoustic Shell |
| D1002393-v2 |  | Mechanical Sections and Details, L1 Laser Area Enclosure Acoustic Shell |
| D1002394-v2 |  | Room Layout/Framing Plan, L1 Laser Area Enclosure Acoustic Shell |
| D1002395-v2 |  | Framing Plans and Elevations, L1 Laser Area Enclosure Acoustic Shell |
|  |  |  |
|  |  | **Laser Diode Room Container** |
| [T070195](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=1539) |  | Laser Diode Room design |
|  |  |  |
| [D1002292](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=14920) |  | PSL monitoring fieldbox, schematic |
| [D1002293](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=14921) |  | PSL monitoring fieldbox, front |
| [D050339](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=16824) |  | Delay Lines |
| [D1100115](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=32694) |  | PSL CCD breakout panel |
| [T1200085](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=87527) |  | PSL top level control design, rack location, rack partition, wiring |
|  |  |  |
|  |  | **Laser Table Container** |
| [T0900610](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=7787) |  | PSL table layout |
| [D1002708](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=22212) |  | aLIGO PSL table power distributor |
| [D1002929](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=25106) |  | aLIGO PSL Power monitoring PD, schematics |
| [D1200121](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=85985) |  | aLIGO PSL Power monitoring PD, mechanical design |
| [D1002657](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=22081) |  | aLIGO PSL standard mirror mount base |
| [D1002659](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=22083) |  | aLIGO PSL off-grid mirror mount base, variant 1 |
| [D1002660](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=22084) |  | aLIGO PSL off-grid mirror mount base, variant 2 |
| [D1002662](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=22087) |  | aLIGO PSL beam dump holder for mirror mount base |
| [D1002658](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=22082) |  | aLIGO PSL 0deg mirror mount base |
| [D1100580](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=58173) |  | aLIGO PSL mirror base AOM diffracted beam |
| [D1100582](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=58175) |  | aLIGO PSL PBS mount |
| [D1100631](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=58631) |  | aLIGO PSL beam dump holder for PBS mount |
| [D1100583](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=58176) |  | aLIGO PSL low power attenuator |
| [D1100584](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=58177) |  | aLIGO PSL high power attenuator |
| [D1100585](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=58178) |  | aLIGO PSL waveplate base |
| [D1100586](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=58179) |  | aLIGO PSL power meter mount |
| [D1100592](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=58185) |  | aLIGO PSL lens mount rail (SDS 40) |
| [D1100593](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=58186) |  | aLIGO PSL lens mount (SDS 40) |
| [D1100594](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=58187) |  | aLIGO PSL lens mount rail |
| [D1100595](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=58188) |  | aLIGO PSL lens mount, option 1 |
| [D1100596](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=58189) |  | aLIGO PSL lens mount, option 2 |
| [D1100597](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=58190) |  | aLIGO PSL lens mount adapter (SDS 40) |
| [D1100120](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=32731) |  | aLIGO PSL CCD post |

# Materials and Fabrication specifications:

*Any special materials, or treatment of materials including preparation for in-vacuum use; this may be integrated into the Design documentation.*

# Parts and spares

*Parts and spares inventoried: All elements of aLIGO must be recorded in the ICS or in the DCC using the S-number scheme. As-built modifications for parts or assemblies should be found here.*

* see tables in: *L1 Pre-Stabilized Laser Subsystem Testing and Acceptance* [E1100716](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=68165)
* see ICS for US components
* components shipped from Germany (will be added to ICS after transfer of title)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **detailed shipping list for Livingston** |  |  |  |  |  |
|  |  |  |  |  |  |
| **Component** | **DCC-number** | **Amount** | **Spares** | **Total** |  |
| **200W high power laser (HPL)** |  |  |  |  |  |
| High power laser "2010/11/LLO1" |  | 1 |  | 1 |  |
| Front-End Laser Head |  | 0 | 1 | 1 |  |
|  |  | 0 |  |  |  |
| Cables NeoLase |  | 4 |  | 4 |  |
| Laser diode boxes (NeoLASE) |  | 4 |  | 4 |  |
| Control Box |  | 1 |  | 1 |  |
| Interlock Box |  | 1 |  | 1 |  |
| Front End Diode Box |  | 1 |  | 1 |  |
| NPRO Driver |  | 1 |  | 1 |  |
| PC NeoLase |  | 1 |  | 1 |  |
| Power supply NeoLase |  | 6 |  | 6 |  |
|  |  | 0 |  |  |  |
| Fiberbundle, 75m, 4 fibers |  | 4 |  | 4 |  |
| Fiberbundle, 75m, 4 fibers |  | 0 | 6 | 6 |  |
| Stress reliefs (fixes fiber bundles at housing) |  | 4 |  | 4 |  |
| Counternuts (fixes fiber bundles in Be-Ri mount) |  | 4 | 3 | 7 |  |
|  |  | 0 |  |  |  |
| Ocean Optics HR4c4042 (spectrometer) |  | 0 | 1 | 1 |  |
| spectrometer driver |  | 0 | 1 | 1 |  |
| 100m patch control fiber |  | 1 | 1 | 2 |  |
| Ext.Powermeter |  | 1 |  | 1 |  |
|  |  | 0 |  |  |  |
| Cable for Long range actuator (LRA) |  | 1 |  | 1 |  |
| LRA, including driver |  | 0 | 1 | 1 |  |
| Fiberswitch |  | 0 | 1 | 1 |  |
| **HPL Water** |  |  |  |  |  |
| Water manifold LZH (underneath optical table) |  | 1 | 1 | 2 |  |
| Watermanifold Shutter/PowerHeads (small one at housing) |  | 1 |  | 1 |  |
| Watermanifold Pumpchambers (above pump chambers) |  | 0 | 4 | 4 |  |
| Water manifold (IO and laser external components) |  | 1 |  | 1 |  |
| Pressure valve (connected to diode chiller for "table water") |  | 1 |  | 1 |  |
| Water manifold x-Tal + LH (big one at housing) |  | 0 | 1 | 1 |  |
| Water connectors |  | 0 |  |  |  |
| Flow sensors |  | 0 | 4 | 4 |  |
| PUN hoses |  | 0 |  |  |  |
| Silicone hoses (Red) |  | 0 |  |  |  |
|  |  | 0 |  |  |  |
| **HPL Mechanics** |  |  |  |  |  |
| Faraday Isolator |  | 0 | 1 | 1 |  |
| Laserhead |  | 0 | 4 | 4 |  |
| external shutter |  | 0 | 1 | 1 |  |
| internal shutter |  | 0 | 1 | 1 |  |
| Piezo |  | 0 | 1 | 1 |  |
| Flowsensor-POM |  | 0 | 1 | 1 |  |
| Pump chamber |  | 0 | 4 | 4 |  |
| Beri X-Y-mount |  | 0 | 5 | 5 |  |
| Halo aperture, including several insets |  | 0 | 1 | 1 |  |
| 4f- aperture for alignment |  | 4 |  | 4 |  |
| Piezo-Stage |  | 0 | 1 | 1 |  |
| Modematching Holder |  | 0 | 2 | 2 |  |
| Beam dump brewster plate |  | 1 |  | 1 |  |
| Beam dump TFP |  | 1 |  | 1 |  |
| Entrance/output windows |  | 0 | 2 | 2 |  |
| Brewster mount |  | 0 | 1 | 1 |  |
| Iris apertures |  | 3 |  | 3 |  |
| Mount for testing fiberbundles |  | 1 |  | 1 |  |
| Thorlabs parts |  | 0 |  |  |  |
|  |  | 0 |  |  |  |
| **HPL Optics** |  |  |  |  |  |
| Homogenizer in laser head |  | 0 | 4 | 4 |  |
| Homogenizer |  | 0 | 4 | 4 |  |
| Xtals in laser head |  | 0 | 4 | 4 |  |
| Xtals |  | 0 | 5 | 5 |  |
| Dichroic mirrors |  | 0 | 4 | 4 |  |
| 50% output coupler |  | 0 | 5 | 5 |  |
| 45° mirrors 10ppm |  | 0 | 5 | 5 |  |
| 45° mirrors HR |  | 0 | 5 | 5 |  |
| TFP |  | 0 | 5 | 5 |  |
| Calcite wedges |  | 0 | 2 | 2 |  |
| DKDP crystals |  | 0 | 2 | 2 |  |
| AR windows |  | 0 | 3 | 3 |  |
| Brewster plate |  | 0 | 5 | 5 |  |
| 1,5" mirror |  | 0 | 1 | 1 |  |
| Mode-matching-set |  | 1 |  | 1 |  |
|  |  | 0 |  |  |  |
| **HPL Tools** |  |  |  |  |  |
| Parts of housing 2010/11/LLO1 |  | 2 |  | 2 |  |
| Toolbox LZH |  | 1 |  | 1 |  |
| Metric Screw Box |  | 1 |  | 1 |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
| **PMC** | D1001955 | 1 | 1 | **2** |  |
|  |  |  |  |  |  |
| **ISS-Box** | D1003121 | 1 | 1 | **2** |  |
|  |  |  |  |  |  |
| **Periscope Rod** |  | 2 | 0 | **2** |  |
| Periscope Mounts |  | 4 | 1 | **5** |  |
| Periscope Adapter normal | D1002841 | 3 | 0 | **3** |  |
| Periscope Adapter special | D1100031 | 1 | 0 | **1** |  |
|  |  |  |  |  |  |
| **Shutter** |  | 2 | 1 | **3** |  |
| Shutter Mounts | D1100581 | 2 | 0 | **2** |  |
|  |  |  |  |  |  |
| **Mirrors** |  |  |  |  |  |
| Mirror Bases (Standard Design) | D1002657 | 20 | 10 | **30** |  |
| Mirror Bases (Offgrid Design oP) | D1002659 | 7 | 2 | **9** |  |
| Mirror Bases (Offgrid Design mP) | D1002660 | 1 | 1 | **2** |  |
| Plates for Mirror Bases (Offgrid Design mP) | D1002660 | 1 | 1 | **2** |  |
| Mirror Bases Dump Holder | D1002662 |  |  |  |  |
| Mirror Bases (0deg Design) | D1002658 | 1 | 0 | **1** |  |
| Mirror Base AOM Diffracted Beam | D1100580 | 1 | 1 | **2** |  |
| Mirror HR |  | 27 | 8 | **35** |  |
| Mirror Ts=1% |  | 3 | 4 | **7** |  |
| Mirror Tp=50% |  | 1 | 2 | **3** |  |
| Mirror Tp=0.20% |  | 3 | 5 | **8** |  |
| Mirror 0deg |  | 1 | 2 | **3** |  |
| Mirror Tp=200ppm |  | 1 | 2 | **3** |  |
| Mirror Mount U100-A-2H-LH |  | 18 | 8 | **26** |  |
| Mirror Mount U100-A-2H |  | 18 | 8 | **26** |  |
| distance plate for mirror mounts |  |  |  |  |  |
|  |  |  |  |  |  |
| **PBS** |  | 5 | 2 | **7** |  |
| PBS Mount | D1100582 | 5 | 1 | **6** |  |
| Dump Holder | D1100631 |  |  |  |  |
|  |  |  |  |  |  |
| Low Power **Attenuator** | D1100583 | 1 | 2 | **3** |  |
| High Power Attenuator | D1100584 | 1 | 1 | **2** |  |
|  |  |  |  |  |  |
| **Wave Plate** Mount Base | D1100585 | 7 | 1 | **8** |  |
| precision Rotationmount |  | 1 | 1 | **2** |  |
| Half-wave plates HP |  | 1 | 1 | **2** |  |
| Rotationmount |  | 6 | 1 | **7** |  |
| Half-wave plates |  | 3 | 1 | **4** |  |
| Quarter-wave plates |  | 3 | 1 | **4** |  |
|  |  |  |  |  |  |
| Low Power **Dumps** (Thorlabs) |  |  |  |  |  |
| Mounts (Throlabs) |  |  |  |  |  |
| Medium Power Dumps |  | 1 | 1 | **2** |  |
| High Power Dumps |  | 1 | 2 | **3** |  |
|  |  |  |  |  |  |
| **Power Meter (08.0468, 08.0469)** |  | 1 | 1 | **2** |  |
| Power Meter Mounts | D1100586 | 1 | 1 | **2** |  |
|  |  |  |  |  |  |
| **Photo diodes** |  |  |  |  |  |
| Power Mon PD (PD1) | D1002929 | 1 | 1 | **2** |  |
| PMC Locking PD (PD2) | D1002163 | 1 | 1 | **2** |  |
| FSS refl. (PD3) |  | 1 | 1 | **2** |  |
| FSS trans. (PD4) | D1002164 | 1 | 1 | **2** |  |
| ILS Locking PD | D1002163 | 0 | 1 | **1** |  |
| OSC PD AMP | D1002164 | 0 | 1 | **1** |  |
| OSC PD INT | D1002164 | 0 | 1 | **1** |  |
| OSC PD BP | D1002164 | 0 | 1 | **1** |  |
| OSC PD ISO | D1002164 | 0 | 1 | **1** |  |
|  |  |  |  |  |  |
| **AOM** |  | 1 | 1 | **2** |  |
| AOM Base | D1100587 | 1 | 1 | **2** |  |
| AOM Driver | D1002707 | 1 | 1 | **2** |  |
| AOM Slider |  | 1 | 1 | **2** |  |
| AOM Mount 9071 |  | 1 | 1 | **2** |  |
|  |  |  |  |  |  |
| **ISS Tube Adapter PMC** | D1100588 | 1 | 0 | **1** |  |
| Mirror Mount (KCB1) |  | 2 | 0 | **2** |  |
| Base Tube Mirror | D1100589 | 2 | 0 | **2** |  |
| Base Tube | D1100590 | 1 | 0 | **1** |  |
| SM1RC |  | 1 | 1 | **2** |  |
| SM1T2 |  | 2 | 2 | **4** |  |
| SM1T10 |  | 2 | 0 | **2** |  |
| SM1L03 |  | 0 | 2 | **2** |  |
| SM1L05 |  | 0 | 2 | **2** |  |
| SM1L10 |  | 2 | 0 | **2** |  |
| SM1L20 |  | 2 | 0 | **2** |  |
| SM1L30 |  | 0 | 2 | **2** |  |
| SM1M30 |  | 1 | 0 | **1** |  |
| SM1V10 |  | 4 | 2 | **6** |  |
| Tube Aperatures | D1100591 | 10 | 0 | **10** |  |
|  |  |  |  |  |  |
| **Rail** 1m |  | 1 | 1 | **2** |  |
| Rail 0.4m |  | 1 | 0 | **1** |  |
| Rail 0.2m |  | 2 | 0 | **2** |  |
| Rail slider |  | 9 | 4 | **13** |  |
| SDS 40 |  | 6 | 1 | **7** |  |
| Alignment Adapters |  | 2 | 0 | **2** |  |
| Alignment Adapters inner part |  | 4 | 0 | **4** |  |
|  |  |  |  |  |  |
| **Lenses** |  |  |  |  |  |
| FS f=-50 Quioptiq |  | 2 | 1 | **3** |  |
| FS f=300 Quioptiq |  | 2 | 1 | **3** |  |
| FS f=400 Quioptiq |  | 1 | 1 | **2** |  |
| BK7 f=50 (PDs) |  | 2 | 0 | **2** |  |
| BK7 f=80 (DBB) |  | 1 | 0 | **1** |  |
| BK7 f=100 (FE to DBB, PD) |  | 2 | 0 | **2** |  |
| BK7 f=150 (FE to DBB, DBB, FSS) |  | 3 | 0 | **3** |  |
| BK7 f=200 (FSS) |  | 3 | 0 | **3** |  |
| Lens Mounts on Rail with SDS 40 | D1100592 | 4 | 1 | **5** |  |
| Lens Mounts no Rail with SDS 40 | D1100593 | 2 | 0 | **2** |  |
| Lens Mounts on Rail no SDS 40 | D1100594 | 2 | 0 | **2** |  |
| Lens Mounts simple | D1100595 | 1 | 1 | **2** |  |
| Lens Mount no Holder needed | D1100596 | 5 | 1 | **6** |  |
| SDS Adapter | D1100597 | 8 | 1 | **9** |  |
| Lens Holder X-Y |  | 1 | 1 | **2** |  |
| Lens Holder |  | 8 | 2 | **10** |  |
|  |  |  |  |  |  |
| **TFP** |  | 2 | 2 | **4** |  |
|  |  |  |  |  |  |
| **Tool Box** |  | 2 | 0 | **2** |  |
|  |  |  |  |  |  |
| **screws** |  |  |  |  |  |
|  |  |  |  |  |  |
| **Cables** |  |  |  |  |  |
| 13m LEMO 00 cables |  | 55 | 0 | **55** |  |
| 0.5m LEMO 5pin cables |  | 2 | 1 | **3** |  |
| 2m LEMO 5pin cables |  | 3 | 1 | **4** |  |
| 13m SMA to LEMO |  | 2 | 2 | **4** |  |
| 13m LEMO 0S to LEMO 0S |  | 1 | 1 | **2** |  |
| 2m SMA to BNC |  | 3 | 1 | **4** |  |
| 13m 4-pin LEMO |  | 1 | 1 | **2** |  |
| 13m LEMO 0S to LEMO 2-pin |  | 1 | 1 | **2** |  |
| 13m BNC to LEMO 00 |  | 1 | 1 | **2** |  |
| 13m SMB to BNC |  | 1 | 1 | **2** |  |
| 13m LEMO 5pin to LIGO |  | 4 | 2 | **6** |  |
| 13m BNC auf SMA (1 gewinkelt) |  | 2 | 1 | **3** |  |
| GEO male to GEO male |  | 1 | 1 | **2** |  |
| Adapter Power Meter |  | 1 | 1 | **2** |  |
| 13m Shutter cable |  | 2 | 1 | **3** |  |
| labeling stuff |  |  |  |  |  |
| 9-pin Sub-D 50m |  | 35 | 2 | **37** |  |
| 25-pin Sub-D 50m |  | 5 | 2 | **7** |  |
|  |  |  |  |  |  |
| **Electronics** |  |  |  |  |  |
| Monitoring Fieldbox | D1002292 | 1 | 1 | **2** |  |
| ILS/PMC fieldbox | D1001619 | 2 | 2 | **4** |  |
| ILS Servo | D1001618 | 1 | 1 | **2** |  |
| PMC Servo | D1001618 | 1 | 1 | **2** |  |
| ISS | D1001985 | 1 | 1 | **2** |  |
| Delay Lines | D050339 | 2 | 2 | **4** |  |
| TTFSS Fieldbox | D1100367 | 1 | 1 | **2** |  |
| VCO Fieldbox | D1100369 | 1 | 1 | **2** |  |
| TTFSS Daughterboard | D1100371 | 1 | 1 | **2** |  |
| TTFSS modifaction electronic components | T1100119 | 1 | 1 | **2** |  |
|  |  |  |  |  |  |
| **Power Distributor** | D1002708 | 2 | 1 | **3** |  |
|  |  |  |  |  |  |
| **CCD** |  | 6 | 1 | **7** |  |
| Adapter C-Mount-SM1 (SM1A10) |  | 6 | 1 | **7** |  |
| CCD Mounts | D1100120 + NP | 6 | 1 | **7** |  |
| Brakeoutpanel | D1100115 | 1 | 0 | **1** |  |
| power cables |  | 6 | 1 | **7** |  |
| signal cables |  | 6 | 1 | **7** |  |
|  |  |  |  |  |  |
| **LEMO** |  |  |  |  |  |
| 1m LEMO 00 |  |  |  |  |  |
| 2m LEMO 00 |  |  |  |  |  |
| 5m LEMO 00 |  |  |  |  |  |
| ABF.00.250.CTA LEMO BNC Adapter |  | 10 | 0 | **10** |  |
| ABA.00.250.NTL BNC LEMO Adapter |  | 10 | 0 | **10** |  |
| ASA.00.250.NTL LEMO SMA Adapter |  | 10 | 0 | **10** |  |
| ASF.00.250.NTA SMA LEMO Adapter |  | 10 | 0 | **10** |  |
| FRT.00.250.CTA00 shorted |  | 5 | 0 | **5** |  |
| FRT.00.250.CTA50 50 Ohm Resistor |  | 10 | 0 | **10** |  |
| FTR.00.250.CTA Winkel |  | 5 | 0 | **5** |  |
| RMA.00.250.CTM female-female Adapter |  | 20 | 0 | **20** |  |
| FTL.00.250.CTF T-Connectors |  | 20 | 0 | **20** |  |
| FTY.00.250.CTF Y-Connectors |  | 10 | 0 | **10** |  |
| FFS.00.250.CTCE31 single connector |  | 20 | 0 | **20** |  |
| DPE.99.123.8K Crimping tool |  | 1 | 0 | **1** |  |
|  |  |  |  |  |  |
| Gewindeschneider M2 |  |  |  |  |  |
| Gewindeschneider M3 |  |  |  |  |  |
| Gewindeschneider M4 |  |  |  |  |  |
| Gewindeschneider M6 |  |  |  |  |  |
| Gewindeschneider 6-32 |  |  |  |  |  |
| Gewindeschneider 8-32 |  |  |  |  |  |
|  |  |  |  |  |  |
| NG3 **filter** 1mm |  |  |  | **3** |  |
| NG3 filter 2mm |  |  |  | **3** |  |
| NG3 filter 3mm |  |  |  | **3** |  |
| NG4 filter 1mm |  |  |  | **3** |  |
| NG4 filter 2mm |  |  |  | **3** |  |
| NG4 filter 3mm |  |  |  | **3** |  |
| NG5 filter 2mm |  |  |  | **3** |  |
| NG5 filter 3mm |  |  |  | **3** |  |
| NG9 filter 1mm |  |  |  | **3** |  |
| NG11 filter 1mm |  |  |  | **3** |  |
| NG11 filter 2mm |  |  |  | **3** |  |
| NG11 filter 3mm |  |  |  | **3** |  |
| RG850 filter 3mm |  |  |  | **5** |  |
|  |  |  |  |  |  |
| Hosts 50m |  |  |  | **1** |  |
|  |  |  |  |  |  |
| **Laserdiodes (Neolase)** |  |  | 5 | 5 |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
| **DBB** |  |  |  |  |  |
| Breadboard with side and top plates |  | 1 | 0 | **1** | 1 |
| Small cover plate |  | 1 | 0 | **1** | 1 |
| Electronic crate |  | 1 | 1 | **2** | 2 |
| HV |  | 1 | 1 | **2** | 2 |
| demod |  | 1 | 1 | **2** | 2 |
| misc |  | 1 | 1 | **2** | 2 |
| fieldbox |  | 1 | 1 | **2** | 2 |
| cali |  | 1 | 0 | **1** | 1 |
| HV power supply |  | 1 | 0 | **1** | 1 |
| CCD power supply |  | 1 | 0 | **1** | 1 |
| Lemo 00 cable, 13m |  | 7 | 1 | **8** | 8 |
| Lemo 3pin, 13m |  | 2 | 1 | **3** | 3 |
| Lemo 4pin, 13m |  | 5 | 1 | **6** | 6 |
| Lemo 0S, 13m |  | 1 | 1 | **2** | 2 |
| Shutter cable, 13m |  | 1 | 1 | **2** | 2 |
| Geo 4pin, 13m |  | 1 | 1 | **2** | 2 |
| Geo 5pin-Sub-D, 13m |  | 1 | 1 | **2** | 2 |
| Geo 5pin-Sub-D, 5m |  | 1 | 1 | **2** | 2 |
| US power cable |  | 1 | 0 | **1** | 1 |
| CCD cable, 13m |  | 1 | 0 | **1** | 1 |
| CD-ROM with documents |  | 1 | 0 | **1** | 1 |
| Adapter fieldbox |  | 3 | 0 | **3** | 3 |
| spare shutter |  | 2 | 0 | **2** | 2 |
| spare QPD |  | 2 | 0 | **2** | 2 |
| heat cond. foil and washer for QPD |  | 1 | 0 | **1** | 1 |
| spare TPD |  | 1 | 0 | **1** | 1 |
| spare RPD |  | 1 | 0 | **1** | 1 |
| spare CCD |  | 2 | 0 | **2** | 2 |
| spare PZT |  | 2 | 0 | **2** | 2 |
| spare servo for ML |  | 2 | 0 | **2** | 2 |
| gap pad for shutter |  | 1 | 0 | **1** | 1 |

# Assembly procedures:

*All assembly procedures must be in the DCC and annotated or updated for lessons learned. Storage, if used, should be described here along with procedures to maintain the equipment in good condition (e.g., purge frequency). Transportation procedures and cautions must be noted.*  
Assembly procedures for the larger sub-assemblies like the high power laser, 35W front-end laser, DBB are available from LZH, neoLASE or AEI.

**Installation** procedures: *All installation procedures must be in the DCC and annotated or updated for lessons learned.*

* + Advanced LIGO PSL Installation Plan [T0900568](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=7086)

# Test documents

*Test rationale, plans, and data for each unit must be documented as described in M1000211. That tree structure should be pointed to by the overall tree structure laid out in this Acceptance prescription. The top-level objective is to make clear how the measurements performed, which often will not directly measure a required performance parameter, give confidence that the subsystem will fulfill the requirements*.

aLIGO PSL Testing and Commissioning Documentation [E1000443-x0](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=21083)

* 1. aLIGO PSL Testing- Phase 1: Testing prior to integration[E1000703-x0](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=25657)
     1. PSL Testing: High-Power-Laser (HPL)[E1000722-x0](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=25720)
        1. PSL Testing: HPL sub-assembly component tests[E1000728-x0](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=25726)
           1. HPL electronic (Control-Box, Frontend Diode-Box, Interlock-Box, PSL-Computer)

High Power Laser (HPL) electronic test procedure [E1000444](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=21085)

High Power Laser (HPL) electronic test report - OBS1 [E1000445](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=21086)

High Power Laser (HPL) electronic test report - OBS2 [E1100116](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=39019)

High Power Laser (HPL) electronic test report - OBS3 [E1200190](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=87168)

High Power Laser (HPL) electronic test report - spares [E1200191](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=87169)

* + - * 1. HPL Diode-Box

High Power Laser (HPL) laser diode box test procedure [E1000446](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=21088)

High Power Laser (HPL) laser diode box test report - OBS1 [E1000447](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=21090)

High Power Laser (HPL) laser diode box test report - OBS2 [E1100117](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=39020)

High Power Laser (HPL) laser diode box test report - OBS3 [E1200190](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=87168)

High Power Laser (HPL) laser diode box test report - spares [E1200191](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=87169)

* + - * 1. HPL front end laser (in paper form at AEI)
        2. HPL pump light fiber [E1100214](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=39452), [E1100444](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=61119), [E1200193](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=87171)
        3. HPL chiller (in paper form at AEI)
        4. HPL injection locking electronics

Locking photodiodes

Locking photodiodes test procedure [T1000479](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=14409)

testplan for ILS PDs installed in L1 is in [S1103594](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=62657)

Locking photodiodes test report [S1107859](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=76978)

Locking photodiodes test report [S1107852](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=76971)

Locking photodiodes test report [S1107851](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=76970)

* + injection locking modules

Injection Locking and PMC Locking Fieldbox Module Test Plan [T1000343](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=12885)

injection locking modules test report [S1103536](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=62433) LLO

injection locking modules test report

injection locking modules test report

injection locking modules test report

injection locking modules test report

* + HPL monitoring diodes

Monitor photodiodes test procedure [T1000478](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=14408)

L1 monitor photodiodes

Monitor photodiodes test report [S1103592](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=62613) (L1 ref. cav. trans)

Monitor photodiodes test report[S1103593](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=62614) (L1 ref. cav. trans, spare)

testplans for all mon. PDs installed in L1 are in [S1103594](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=62657)

Hanford monitor photodiodes

testplans for all mon. PDs installed in H2 HPL are in [S1107826](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=76945)

Monitor photodiodes test report [S1107849](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=76968)

Monitor photodiodes test report [S1107853](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=76972)

Monitor photodiodes test report [S1107854](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=76973)

Monitor photodiodes test report [S1107861](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=76980)

Monitor photodiodes test report [S1107862](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=76981)

Monitor photodiodes test report [S1107855](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=76974)

Monitor photodiodes test report [S1107863](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=76982)

Monitor photodiodes test report [S1107865](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=76984)

Power monitor photodiode test procedure[T1000668](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=25107)

L1 monitor photodiodes

Power monitor photodiode test report [S1107864](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=76983)

Power monitor photodiode test report [S1107860](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=76979)

Power monitor photodiode test report [S1107858](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=76977) (L1 spare)

Power monitor photodiode test report [S1107857](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=76976)

Power monitor photodiode test report [S1107856](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=76975)

Power monitor photodiode test report [S1103590](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=62611) (L1 installed)

* 1. PSL Testing: HPL test procedure (LZH after assembly of sub-components)
     1. PSL Testing: HPL OBS1 test protocol [E1100213](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=39451)
     2. PSL Testing: HPL OBS2 test protocol [E1100955](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=71203)
     3. PSL Testing: HPL OBS3 test protocol [E1200192](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=87170)
  2. PSL Testing: pre-modecleaner (PMC)[E1000723-x0](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=25721)
     1. PMC testing
        1. PMC test procedure [T1000429](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=13662)
        2. PMC OBS1 test protocol [E1100123](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=39052) [S1102964](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=59413)
        3. PMC OBS2 test protocol [S1107832](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=76951)
        4. PMC OBS3 test protocol: test plan in GIT wait for S-number to put into DCC
        5. PMC spares LLO test protocol [E1100124](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=39053) [S1102965](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=59414)
        6. PMC spares LHO test protocol [S1107833](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=76952)
        7. PMC spares LHO test protocol: test plan in GIT wait for S-number to put into DCC
     2. PMC locking photodiode
        1. PMC locking photodiode test procedure [T1000479](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=14409)
        2. PMC locking photodiode test report [S1107847](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=76966)SN35 PMC H2
        3. PMC locking photodiode test report [S1107850](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=76969) SN37
        4. PMC locking photodiode test report [S1107848](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=76967) SN44
        5. PMC locking photodiode test report [S1103588](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=62609) SN26 PMC LLO
        6. PMC locking photodiode test report [S1103589](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=62610) SN27 PMC LLO spare
     3. PMC locking electronic module
        1. Injection Locking and PMC Locking Fieldbox Module Test Plan [T1000343](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=12885)
        2. PMC locking electronic module test report [S1107798](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=76915)
        3. PMC locking electronic module test report [S1107814](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=76932)
        4. PMC locking electronic module test report [S1103538](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=62491)
        5. PMC locking electronic module test report [S1103539](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=62492)
        6. PMC locking electronic module test report: test plan in GIT wait for S-number to put into DCC
        7. PMC locking electronic module test report: test plan in GIT wait for S-number to put into DCC
  3. PSL Testing: diagnostic breadboard (DBB)[E1000724-x0](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=25722)
     1. DBB OBS1 test protocol [E1100120](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=39028)
     2. DBB OBS2 test protocol [S1107846](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=76965)
        1. OBS2 DBB calibration module [S1107840](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=76959)
        2. OBS2 DBB fieldbox [S1107842](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=76961)
        3. OBS2 DBB misc module [S1107838](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=76957)
        4. OBS2 DBB demodulator module [S1107835](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=76954)
        5. OBS2 HV module [S1107834](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=76953)
     3. DBB OBS3 test protocol : wait for S-number to put into DCC
     4. DBB spares LLO test protocol [E1100121](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=39030)
        1. OBS2 DBB fieldbox [S1107837](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=76956)
        2. OBS2 DBB misc module [S1107839](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=76958)
        3. OBS2 DBB demodulator module [S1107836](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=76955)
        4. OBS2 HV module [S1107802](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=76919)
  4. PSL Testing: power stabilization (ISS)[E1000725-x0](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=25723)
     1. aLIGO PSL ISS sensing box test plans

PSL ISS-Box Test Plan template [E1000748](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=25989)

PSL ISS inner-loop photodiode testplan template [E1000473](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=14165)

PSL ISS inner-loop quadrant photodiode testplan template [E1000467](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=21296)

PSL ISS OBS1 and spares LLO test plan portfolio [E1100125](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=39054)

PSL ISS OBS2 test plan portfolio [E1200187](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=87165)

PSL ISS OBS3 test plan portfolio [E1200188](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=87166)

PSL ISS LHO spare test plan portfolio [E1200189](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=87167)

* 1. aLIGO PSL ISS servo module test plans

ISS servo module test plan - OBS 1 [S1103557](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=62510)

ISS servo module test plan - LLO spare [S1103556](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=62509)

ISS servo module test plan - OBS2 [S1107804](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=76921)

ISS servo module test plan- LHO spare - [S1107805](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=76922)

ISS servo module test plan- OBS3

* 1. PSL Testing: frequency stabilization (FSS)[E1000726-x0](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=25724)
  2. table top frequency stabilization servo - field box

TTFSS fieldbox [S1107816-x0](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=76934)

TTFSS fieldbox [S1107844-x0](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=76963)

TTFSS fieldbox [S1103554-x0](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=62507)

TTFSS fieldbox [S1103905-x0](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=67206)

* 1. table top frequency stabilization servo - field box

VCO fieldbox [S1107815-x0](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=76933)

VCO fieldbox [S1107845-x0](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=76964)

VCO fieldbox [S1103555-x0](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=62508)

VCO fieldbox [S1103906-x0](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=67207)

* 1. PSL Testing: miscellaneous components[E1000727-x0](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=25725)
     1. monitoring field box

monitoring field boxOBS1 and spare LLO [E1100127](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=39056)

monitoring field boxOBS2\_3 and spare LHO [E1100126](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=39055)

* 1. Injection Locking and PMC Locking Fieldbox Module

Injection Locking and PMC Locking Fieldbox Module test report [S1103541](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=62494)

Injection Locking and PMC Locking Fieldbox Module test report [S1103540](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=62493)

Injection Locking and PMC Locking Fieldbox Module test report [S1103542](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=62495)

Injection Locking and PMC Locking Fieldbox Module test report [S1103543](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=62496)

Injection Locking and PMC Locking Fieldbox Module test report [S1107806](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=76923)

Injection Locking and PMC Locking Fieldbox Module test report [S1107809](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=76926)

Injection Locking and PMC Locking Fieldbox Module test report [S1107808](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=76925)

Injection Locking and PMC Locking Fieldbox Module test report [S1107808](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=76925)

Injection Locking and PMC Locking Fieldbox Module test report: test plan in GIT wait for S-number to put into DCC

Injection Locking and PMC Locking Fieldbox Module test report: test plan in GIT wait for S-number to put into DCC

1. aLIGO PSL Testing-Phase 2: After shipment before installation[E1000704-x0](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=25659)

only visual inspections were done before installation

* 1. aLIGO PSL Testing-Phase 3: stand-alone PSL testing after installation[E1000705-x0](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=25660)

1. neoLase test document (Laser Diodes, computer control,interlock)

OBS1 [E1100539](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=62894)

OBS2 [E1100540](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=62895)

OBS3 [E1100541](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=62896)

1. PSL performance and acceptance document

OBS1 [E1100716](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=68165)

OBS2

OBS3

1. enclosure, table legs, etc
   1. table leg testing
      1. L1 table leg installation and test document [T1200172](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=90087)
      2. H2 table leg installation and test document
      3. H1 table leg installation and test document
   2. acoustic testing H2 enclosure [T1200171-v1](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=90054)  
      (Robert Schoefield thinks results are representative for H1 and L1 too)
   3. miscellaneous relevant environmental tests
      1. [magnetic fields from chiller](https://alog.ligo-wa.caltech.edu/aLOG/index.php?callRep=2830)
   4. aLIGO PSL Testing-Phase 4: PSL part of integrated PSL/IO testing [E1000706-x0](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=25661)

# User interface software

*User interface software, and the test routines indicating proper functioning of the software, must be described in words and have code under configuration control (SVN). Watchdog and Guardian routines must also be treated in this way.*

* + 1. four PSL related RT control modules (ISS, DBB, PMC, FSS) under version control <https://redoubt.ligo-wa.caltech.edu/svn/cds_user_apps/trunk/psl>
       - the models are in the ../psl/l1/models tree
       - the c-code used in the models is in the ../psl/l1/scr tree
       - once H1 and H2 PSLs are installed the plan is to have all PSL related RT models, MEDM screens and scripts in the ../psl/common area
    2. several EPICS MEDM user interfaces exist, all are under version control in <https://redoubt.ligo-wa.caltech.edu/svn/cds_user_apps/trunk/psl>
       - as of Jan 2011 all LLO files are in the ../psl/LLO directory ,
       - once H1 and H2 PSLs are installed the plan is to have all PSL related RT models, MEDM screens and scripts in the ../psl/common area
    3. several scripts exist to perform DBB measurements and generate noise reports, the scripts are under version control in <https://redoubt.ligo-wa.caltech.edu/svn/cds_user_apps/trunk/psl>
    4. there are no PSL related watchdog and guardian routines

# User’s manual:

*A manual appropriate for operators, covering alignment/adjustments and normal operations, must be available (and in the DCC). It must describe what not to do as well, and give clear guidance and cross-pointers to activities which require safety considerations. It must be accessible from standard user screens.*

|  |  |
| --- | --- |
| **manuals and descriptions** |  |
| user manual 35W laser | [T0900646](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=8088) |
| user manual 200W laser | [T0900641](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=8080) |
| table layout with component list (incl. DCC of optics and mounts etc.) | [T0900610](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=7787) |
| control and DAQ topology and rack layout | [T1200085](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=87527) |
| Advanced LIGO PSL Diagnostic Breadboard Instruction Manual | [T0900133](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=1541) |
| Advanced LIGO PSL Diagnostic Breadboard Computer Control Manual | [T0900579](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=7321) |
| PSL EPICS user interfaces | [T0900634](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=8001) |
| LLO PSL training session | [G1100837](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=67598) |
| HPL quick start guide | [T1100383](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=67595) |
| How-to change between high and low power mode ofthe PSL | [T1200025](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=85366) |

# Troubleshooting:

*A guide must be developed that helps understand common error messages and events, and provides guidance for recovery and repair procedures as appropriate. Safety issues must be flagged.*

* + currently there is no Troubleshooting guideline as no *typical* errors occurred in the operation of the reference system, we have. however, started a troubleshooting section on the PSL wiki and will update this list
  + we are testing a regular maintenance procedure to compensate for the aging of the PSL laser diodes, once this procedure is finalized a document will be put into the DCC
  + **Safety** documentation  
    *Safety documentation must be in the DCC for all phases of the subsystem development, including any needed for normal use or foreseen maintenance/repair scenarios.*

|  |  |
| --- | --- |
| aLIGO PSL Safety Plan | [T0900614](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=7837) |
| aLIGO PSL Interlock Concept | [T1000005](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=8313) |
| LLO 200 W PSL Installation SOP | [M1100038](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=38513) |
| Hazard Analysis | [T1000160](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=10383) |

Acronyms

AOM Acousto-Optic Modulator

CB Control Box

CCD Charge Coupled Device (camera)

DB Diode Box

DBB Diagnostic Bread Board

DCC Document Control Center

EPICS Experimental Physics and Industrial Control System: a set of Open Source software tools, libraries and applications developed collaboratively and used worldwide to create distributed soft real-time control systems for scientific instruments

FE Front End

FSR Free Spectral Range

FSS Frequency Stabilization Servo

IL Interlock Box

LAE Laser Area Enclosure

LED Light Emitting Diode

LD Laser Diode

LDR Laser Diode Room

LH Laser Head

LHO LIGO Hanford Observatory

LLO LIGO Livingston Observatory

HPFI High Power Faraday Isolator

HPO High Power Oscillator?

ISS Intensity Stabilization Servo

LVEA Laser Vacuum Equipment Area

medm a Motif graphical user interface for designing and implementing control screens, called displays, that consist of a collection of graphical objects that display and/or change the values of EPICS process variables

NPRO Non-Planer Ring Oscillator

OPC Open Process Control is a software application that acts as an API (Application Programming Interface) or protocol converter

PD photodiode

PMC Pre-Mode Cleaner

PS Power Supply?

PSL Pre-Stabilized Laser

PZT Lead zirconate titanate, a piezo-electric actuator

RSD remote shut down

RIN Relative Intensity Noise

RPN Relative Power Noise

rt real time

TEC Thermo-Electric Cooler Power Supply

UG unity gain

VNC Virtual Network Computing (VNC) is a platform-independent, graphical desktop sharing system that uses the RFB protocol to remotely control another computer

WinCAM CCD camera for beam shape analysis