*LIGO Laboratory / LIGO Scientific Collaboration*

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TwinCAT Library for EOM Driver

Daniel Sigg

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| **California Institute of Technology**  **LIGO Project – MS 18-34**  **1200 E. California Blvd.**  **Pasadena, CA 91125**  Phone (626) 395-2129  Fax (626) 304-9834  E-mail: info@ligo.caltech.edu | **Massachusetts Institute of Technology**  **LIGO Project – NW22-295**  **185 Albany St**  **Cambridge, MA 02139**  Phone (617) 253-4824  Fax (617) 253-7014  E-mail: info@ligo.mit.edu |
| **LIGO Hanford Observatory**  **P.O. Box 159**  **Richland WA 99352**  Phone 509-372-8106  Fax 509-372-8137 | **LIGO Livingston Observatory**  **P.O. Box 940**  **Livingston, LA 70754**  Phone 225-686-3100  Fax 225-686-7189 |

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| **Library** | |
| Title | EOM Driver |
| Version | 1 |
| TwinCAT version | V2.11.0 |
| Name space |  |
| Author | Daniel Sigg |
| Description | Controls the EOM Driver |
| Error Code | 16#01 — Power supply voltages out-of-range  16#02 — RF power readback out-of-range  16#04 — RF set point readback out-of-range  16#08 — RF ON switch (no supply for RF amp)  16#10 — No remote control (driver set on local controls)  16#20 — Excitation switch (excitation is enabled) |
| Library Dependencies | SaveRestore, Error, ReadADC, WriteDAC |

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| **Input Interface Type**  TYPE EomDriverInStruct:  STRUCT  Bias1: INT;  Bias2: INT;  SlowControl: INT;  SPO: INT;  ExcEnabled: BOOL;  RfOn: BOOL;  IntExt: BOOL;  PowerOk: BOOL;  END\_STRUCT;END\_TYPE; | |
| Type Name | EomDriverInStruct |
| Description | Input Structure used interface the hardware |
| Definition | STRUCT |
| Input Tag | Name: Bias1  Type: INT  Description: Monitors in-loop bias |
| Input Tag | Name: Bias2  Type: INT  Description: Monitors out-of-loop bias |
| Input Tag | Name: SlowControl  Type: INT  Description: Monitors in-loop control signal |
| Input Tag | Name: SP0  Type: INT  Description: Monitors spare bit 0 |
| Input Tag | Name: ExcEnabled  Type: BOOL  Description: Monitors the state of the excitation input switch |
| Input Tag | Name: RfOn  Type: BOOL  Description: Monitors the state of the RF amp power supply switch |
| Input Tag | Name: IntExt  Type: BOOL  Description: Monitors the state of the remote control switch |
| Input Tag | Name: PowerOk  Type: BOOL  Description: Monitors the power ok signal |

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| **Output Interface Type**  TYPE EomDriverOutStruct:  STRUCT  Value: WORD;  ValEnable: BOOL;  ExcSwitch: BOOL;  SP1: BOOL;  SP2: BOOL;  END\_STRUCT;  END\_TYPE; | |
| Type Name | EomDriverInStruct |
| Description | Input Structure used interface the hardware |
| Definition | STRUCT |
| Output Tag | Name: Value  Type: WORD  Description: power set point value |
| Output Tag | Name: ValEnable  Type: BOOL  Description: Latch for value |
| Output Tag | Name: ExcSwitch  Type: BOOL  Description: Enables the excitation input |
| Output Tag | Name: SP1  Type: BOOL  Description: Controls spare bit 1 |
| Output Tag | Name: SP2  Type: BOOL  Description: Controls spare bit 2 |

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| EOM Driver **Type**  TYPE EomDriverTypeEnum: (EomDriverMedPower, EomDriverHighPower);  END\_TYPE; | |
| Type Name | EomDriverTypeEnum |
| Description | Enumerated type used to describe the hardware hardware |
| Definition | ENUM |
| Enum 1 | Name: EomDriverMedPower  Description: Describes an EOM driver with 4dBm to 27dBm output driver capability |
| Enum 2 | Name: EomDriverHighPower  Description: Describes an AOM driver with 10dBm to 34dBm output driver capability |

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| **User Interface Type**  TYPE EomDriverStruct:  STRUCT  Error: ErrorStruct;  Hardware: EomDriverType;  RfOut: LREAL;  RfSet: LREAL;  RfSetMon: LREAL;  RfControl: LREAL;  RfOn: BOOL;  RemoteCtrl: BOOL;  ExcitationSwitch: BOOL;  ExcitationEn: BOOL;  PowerOk: BOOL;  END\_STRUCT;  END\_TYPE; | |
| Type Name | EomDriverStruct |
| Description | Structure used in the user interface |
| Definition | STRUCT |
| Ouput Tag | Name: Error  Type: ErrorStruct  Description: Error indicator |
| Ouput Tag | Name: Hardware  Type: EomDriverType  Description: Hardware type |
| Ouput Tag | Name: RfOut  Type: LREAL  Description: Monitors the RF power after the amp in dBm |
| Input Tag | Name: RfSet  Type: LREAL  Description: Set point for the output power in dBm |
| Output Tag | Name: RfSetMon  Type: LREAL  Description: Monitors the set point readback in dBm |
| Output Tag | Name: RfOn  Type: BOOL  Description: Status of RF power supply switch |
| Output Tag | Name: RemoteCtrl  Type: BOOL  Description: Status of remote control switch |
| Output Tag | Name: ExcitationSwitch  Type: BOOL  Description: Status of excitation input |
| Output Tag | Name: ExcitationEn  Type: BOOL  Description: Enables the excitation input |
| Output Tag | Name: PowerOk  Type: BOOL  Description: Voltage monitor readback |

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| **Function Block**  FUNCTION\_BLOCK EomDriverFB  VAR\_INPUT  Request: SaveRestoreEnum;  EomDriverType: EomDriverTypeEnum := EomDriverMedPower;  EomDriverFrequency: LREAL := 50; (\* MHz \*)  EomDriverIn: EomDriverInStruct; (\* Input structure \*)  END\_VAR  VAR\_OUTPUT  EomDriverOut: EomDriverOutStruct; (\* Output structure \*)  END\_VAR  VAR\_IN\_OUT  EomDriverInit: EomDriverStruct;  EomDriver: EomDriverStruct; (\* Interface structure \*)  END\_VAR | |
| Name | EomDriverFB |
| Description | Controls an EOM or an AOM driver. |
| Input argument | Name: Request  Type: SaveRestoreEnum  Description: Request for save/restore/safemode or noop |
| Input argument | Name: EomDriverHardware  Type: EomDriverTypeEnum  Description: Defines the used EOM driver type |
| Input argument | Name: EomDriverFrequency  Type: LREAL  Description: Defines the nominal driving frequency in MHz |
| Input argument | Name: EomDriverIn  Type: EomDriverInStruct  Description: Input hardware structure |
| Output argument | Name: EomDriverOut  Type: EomDriverOutStruct  Description: Output hardware structure |
| In/out argument | Name: EomDriverInit  Type: EomDriverStruct  Description: Save/restore variable in persistent memory |
| In/out argument | Name: EomDriver  Type: EomDriverStruct  Description: User Interface structure |