*LIGO Laboratory / LIGO Scientific Collaboration*

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TwinCAT Library for EOM Driver

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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-range16#02 — RF power readback out-of-range16#04 — RF set point readback out-of-range16#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: Bias1Type: INTDescription: Monitors in-loop bias |
| Input Tag | Name: Bias2Type: INTDescription: Monitors out-of-loop bias |
| Input Tag | Name: SlowControlType: INTDescription: Monitors in-loop control signal |
| Input Tag | Name: SP0Type: INTDescription: Monitors spare bit 0 |
| Input Tag | Name: ExcEnabledType: BOOLDescription: Monitors the state of the excitation input switch |
| Input Tag | Name: RfOnType: BOOLDescription: Monitors the state of the RF amp power supply switch |
| Input Tag | Name: IntExtType: BOOLDescription: Monitors the state of the remote control switch |
| Input Tag | Name: PowerOkType: BOOLDescription: 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: ValueType: WORDDescription: power set point value |
| Output Tag | Name: ValEnableType: BOOLDescription: Latch for value |
| Output Tag | Name: ExcSwitchType: BOOLDescription: Enables the excitation input |
| Output Tag | Name: SP1Type: BOOLDescription: Controls spare bit 1 |
| Output Tag | Name: SP2Type: BOOLDescription: 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: EomDriverMedPowerDescription: Describes an EOM driver with 4dBm to 27dBm output driver capability |
| Enum 2 | Name: EomDriverHighPowerDescription: 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: ErrorType: ErrorStructDescription: Error indicator |
| Ouput Tag | Name: HardwareType: EomDriverTypeDescription: Hardware type |
| Ouput Tag | Name: RfOutType: LREALDescription: Monitors the RF power after the amp in dBm |
| Input Tag | Name: RfSetType: LREALDescription: Set point for the output power in dBm |
| Output Tag | Name: RfSetMonType: LREALDescription: Monitors the set point readback in dBm |
| Output Tag | Name: RfOnType: BOOLDescription: Status of RF power supply switch  |
| Output Tag | Name: RemoteCtrlType: BOOLDescription: Status of remote control switch |
| Output Tag | Name: ExcitationSwitchType: BOOLDescription: Status of excitation input |
| Output Tag | Name: ExcitationEnType: BOOLDescription: Enables the excitation input |
| Output Tag | Name: PowerOkType: BOOLDescription: Voltage monitor readback |

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