



LIGO Laboratory / LIGO Scientific Collaboration

LIGO-E1500157-v1

Advanced LIGO

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TwinCAT Library for EOM Driver

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LIGO Scientific Collaboration

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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

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

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

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

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

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Output 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

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