*LIGO Laboratory / LIGO Scientific Collaboration*

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TwinCAT Library for Summing Node

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| **Library** |
| Title | SummingNode |
| Version | 1 |
| TwinCAT version | V2.11.0 |
| Name space |  |
| Author | Daniel Sigg |
| Description | Information about the summing node |
| Error Code | 16#01 — Power supply voltages out-of-range |
| Library Dependencies | Error, ReadADC, WriteADC, SaveRestore |

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| **User Interface Type**TYPE SummingNodeInStruct : STRUCT In1Mon: INT; In2Mon: INT; SumMon: INT; Ok: BOOL;END\_STRUCT;END\_TYPE; |
| Type Name | SummingNodeInStruct |
| Description | Input structure |
| Definition | STRUCT |
| Output Tag | Name: In1MonType: INTDescription: Input monitor channel 1 |
| Output Tag | Name: In2MonType: INTDescription: Input monitor channel 2 |
| Output Tag | Name: SumMonType: INTDescription: Sum monitor |
| Output Tag | Name: OkType: BOOLDescription: Voltages are within range |

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| **User Interface Type**TYPE SummingNodeOutStruct : STRUCT Ofs: INT; In1Pol: BOOL; In2Pol: BOOL; In1En: BOOL; In2En: BOOL; In1Gain: INT; In2Gain: INT; OutSw: BOOL; Boost: BOOL; Comp: BOOL; Opt: BOOL;END\_STRUCT;END\_TYPE; |
| Type Name | SummingNodeOutStruct |
| Description | Out structure |
| Definition | STRUCT |
| Input Tag | Name: OfsType: INTDescription: Common path offset adjust |
| Output Tag | Name: In1PolType: BOOLDescription: Input 1 polarity |
| Output Tag | Name: In2PolType: BOOLDescription: Input 2 polarity |
| Output Tag | Name: In1EnType: BOOLDescription: Input 1 enable |
| Output Tag | Name: In2EnType: BOOLDescription: Input 2 enable |
| Output Tag | Name: In1GainType: INTDescription: Input 1 gain |
| Output Tag | Name: In2GainType: INTDescription: Input 2 gain |
| Output Tag | Name: OutSwType: BOOLDescription: Output 1 switch |
| Input Tag | Name: BoostType: BOOLDescription: Enable boost switch |
| Input Tag | Name: CompType: BOOLDescription: Compensation enable |
| Input Tag | Name: OptType: BOOLDescription: Option enable |

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| **User Interface Type**TYPE SummingNodeStruct :STRUCT Error: ErrorStruct; In1Mon: LREAL; In2Mon: LREAL; SumMon: LREAL; Ok: BOOL; Ofs: LREAL; In1Pol: BOOL; In2Pol: BOOL; In1En: BOOL; In2En: BOOL; In1Gain: INT; In2Gain: INT; OutSw: BOOL; Boost: BOOL; Comp: BOOL; Opt: BOOL;END\_STRUCT;END\_TYPE; |
| Type Name | SummingNodeStruct |
| Description | Structure used in the user interface |
| Definition | STRUCT |
| In/Out Tag | Name: ErrorType: ErrorStructDescription: Calls error handler |
| Output Tag | Name: In1MonType: LREALDescription: Input monitor channel 1 |
| Output Tag | Name: In2MonType: LREALDescription: Input monitor channel 2 |
| Output Tag | Name: SumMonType: LREALDescription: Sum monitor |
| Output Tag | Name: OkType: BOOLDescription: Voltages are within range |
| Input Tag | Name: OfsType: LREALDescription: Common path offset adjust |
| Output Tag | Name: In1PolType: BOOLDescription: Input 1 polarity |
| Output Tag | Name: In2PolType: BOOLDescription: Input 2 polarity |
| Output Tag | Name: In1EnType: BOOLDescription: Input 1 enable |
| Output Tag | Name: In2EnType: BOOLDescription: Input 2 enable |
| Output Tag | Name: In1GainType: INTDescription: Input 1 gain |
| Output Tag | Name: In2GainType: INTDescription: Input 2 gain |
| Output Tag | Name: OutSwType: BOOLDescription: Output 1 switch |
| Input Tag | Name: BoostType: BOOLDescription: Enable boost switch |
| Input Tag | Name: CompType: BOOLDescription: Compensation enable |
| Input Tag | Name: OptType: BOOLDescription: Option enable |

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| **Function Block**TYPE SummingNodeFB:VAR\_INPUT Request: SaveRestoreEnum; SummingNodeIn: SummingNodeInStruct;END\_VAR;VAR\_OUTPUT SummingNodeOut: SummingNodeOutStruct;END\_VAR;VAR\_IN\_OUT SummingNodeInit: SummingNodeStruct; SummingNode: SummingNodeStruct;END\_VAR:END\_TYPE; |
| Type Name | SummingNodeFB |
| Description | Function block used to monitor the PSL environment  |
| Definition | Function Block |
| Input Argument | Name: RequestType: SaveRestoreEnumDescription: Request for save/restore/safe mode or noop |
| Input Argument | Name: SummingNodeInType: SummingNodeInStructDescription: Input structure |
| Output Argument | Name: SummingNodeOutType: SummingNodeOutStructDescription: Output Structure |
| In/out Argument | Name: SummingNodeInitType: SummingNodeStructDescription: Save/restore variable in persistent memory |
| In/out Argument | Name: SummingNodeType: SummingNodeStructDescription: User interface structure |