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TwinCAT Library for
Delay Line

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of the LIGO Laboratory.

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| **Library** |
| Title | DelayLinePhaseShifter |
| Version | 1 |
| TwinCAT version | 2.11 |
| Name space | – |
| Author | Alexa Staley, Daniel Sigg |
| Description | The delay line shifter delays an input signal by a selectable amount. This amount can be controlled by a step or phase slider. The delay can be between 0ns and 30.762ns.  |
| Error Codes | 0x01 – Invalid frequency |
| Library dependencies | Error |

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| **Hardware Output Type**TYPE DelayLogicOutStruct :STRUCT DelayStep: INT;LacthEn: BOOL; END\_STRUCTEND\_TYPE |
| Type name | DelayLogicOutStruct |
| Description | Structure of the hardware output that are wired up for the delay line |
| Definition | STRUCT |
| Element | Name: DelayStepType: INTDescription: The delay line step slider |
| Element | Name: LatchEnType: BOOLDescription: Enables latch |

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| **User Interface Type**TYPE DelayLogicStruct :STRUCTFreqMhz: LREAL;PhaseDeg: LREAL;DelayNs: LREAL;DelayStep: INT;Error: ErrorStruct;END\_STRUCTEND\_TYPE |
| Type name | DelayLogicStruct |
| Description | Structure of the user interface tags that are used to control the delay line |
| Definition | STRUCT |
| Output Tag | Name: ErrorType: ErrorStructDescription: For error handling |
| Input Tag | Name: FreqMhzType: LREALDescription: Input frequency in MHz |
| In/out Tag | Name: PhaseDegType: LREALDescription: Input phase in degrees |
| In/out Tag | Name: DelayNsType: LREALDescription: Delay of input signal in nanoseconds |
| In/out Tag | Name: DelayStepType: INTDescription: Delay between 0ns and 31.9375ns can be added in steps |

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| **Function Block**FUNCTION\_BLOCK DelayLogicFBVAR\_INPUT Request: SaveRestoreEnum;END\_VARVAR\_OUTPUTDelayLogicOut: DelayLogicOutStruct;END\_VARVAR\_IN\_OUT DelayLogicInit: DelayLogicStruct; DelayLogic: DelayLogicStruct;END\_VAR |
| Name | DelayLogicFB |
| Description | Controls the delay line  |
| Input argument | Name: RequestType: SaveRestoreEnumDescription: Request save/restore/safemode or noop |
| Output argument | Name: DelayLogicOutType: DelayLogicOutStructDescription: Output hardware structure |
| In/out argument | Name: DelayLogicInitType: DelayLogicStructDescription: Save/restore variable in persistent memory |
| In/out argument | Name: DelayLogicType: DelayLogicStructDescription: User Interface structure |

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| **Visual** |
| Name | DelayLogicVis |
| Description | Displays phase, steps, and delay |
| Placeholder | Name: DelayLogicType: DelayLogicStructDescription: Delay Line structure |