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**TwinCAT Library for Photodetectors**

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of the LIGO Laboratory.

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<b>Library</b>	
Title	Photodetectors
Version	1
TwinCAT version	V2.11.0
Name space	
Author	Daniel Sigg
Description	Information about the photodetectors
Error Code	(Qpd) 1 — Whiten (Wfs) 1 — Dc (Wfs) 2 — Demod (Wfs) 3 — Whiten (WfsSimple) 1 — Demod (WfsSimple) 2 — Whiten (LsDc) 1 — Dc (LsDcWhiten) 1 — Dc (LsDcWhiten) 4 — Whiten (LsDemod) 2 — Demod (LsDemodPhase) 2 — Demod (LsDemodPhase) 8 — Phase (LsDemodPhaseWhiten) 2 — Demod (LsDemodPhaseWhiten) 4 — Whiten (LsDemodPhaseWhiten) 8 — Phase (LsDemodWhiten) 2 — Demod (LsDemodWhiten) 4 — Whiten (LsError) 1 — Dc (LsError) 2 — Demod (LsError) 8 — Phase (LsSimpleError) 1 — Dc (LsSimpleError) 2 — Demod (LsSimpleWhiten) 1 — Dc (LsSimpleWhiten) 2 — Demod (LsSimpleWhiten) 4 — Whiten (LsWhiten) 1 — Dc (LsWhiten) 2 — Demod (LsWhiten) 4 — Whiten (LsWhiten) 8 — Phase
Library Dependencies	Error, ReadADC, WriteADC, SaveRestore, DCPower, DelayLogic, IscWhitening

<b>User Interface Type</b> TYPE QpdStruct : STRUCT Error:        ErrorStruct; Whiten:      IscWhiteningSimpeQpdStruct; END_STRUCT; END_TYPE;	
Type Name	QpdStruct
Description	User interface structure
Definition	STRUCT
In/out Tag	Name: Error Type: ErrorStruct Description: Calls error handler
Output Tag	Name: Whiten Type: IscWhiteningSimpleQpdStruct Description: Whitening

<b>User Interface Type</b> TYPE WfsStruct : STRUCT Error:        ErrorStruct; Dc:          QuadDCPowerStruct; Demod:       werStructorAscStruct; Whiten:      IscWhiteningSimpeDemodWfsStruct; END_STRUCT; END_TYPE;	
Type Name	WfsStruct
Description	User interface structure
Definition	STRUCT
In/out Tag	Name: Error Type: ErrorStruct Description: Calls error handler
Output tag	Name: Dc Type: QuadDCPowerStruct Description:
Output tag	Name: Demod Type: werStructorAscStruct Description:

Output Tag	Name: Whiten Type: IscWhiteningSimpleDemodWfsStruct Description: Whitening
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<b>User Interface Type</b>	
TYPE WfsSimpleStruct :	
STRUCT	
Error:        ErrorStruct;	
Demod:       DemodulatorAscStruct;	
Whiten:      IscWhiteningSimpeWfsSimpleStruct;	
END_STRUCT;	
END_TYPE;	
Type Name	WfsSimpleStruct
Description	User interface structure
Definition	STRUCT
In/out Tag	Name: Error Type: ErrorStruct Description: Calls error handler
Output Tag	Name: Demod Type: DemodulatorAscStruct Description:
Output Tag	Name: Whiten Type: IscWhiteningSimpleWfsSimpleStruct Description: Whitening

<b>User Interface Type</b>	
TYPE LsDcStruct :	
STRUCT	
Error:        ErrorStruct;	
Dc:           DCPowerStruct;	
END_STRUCT;	
END_TYPE;	
Type Name	LsDcStruct
Description	User interface structure
Definition	STRUCT
In/out Tag	Name: Error Type: ErrorStruct Description: Calls error handler
Output Tag	Name: Dc

	Type: DCPowerStruct Description: DC Power
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<b>User Interface Type</b>	
TYPE LsDcWhitenStruct :	
STRUCT	
Error:        ErrorStruct;	
Dc:          DCPowerStruct;	
Whiten:      IscWhiteningChannelStruct;	
END_STRUCT;	
END_TYPE;	
Type Name	LsDcWhitenStruct
Description	User interface structure
Definition	STRUCT
In/out Tag	Name: Error Type: ErrorStruct Description: Calls error handler
Output Tag	Name: Dc Type: DCPowerStruct Description: DC Power
Output Tag	Name: Whiten Type: IscWhiteningChannelStruct Description: Whitening

<b>User Interface Type</b>	
TYPE LsDemodPhaseStruct :	
STRUCT	
Error:        ErrorStruct;	
Demod:       icStructtorLscStruct;	
Phase:       DelayLogicStruct;	
END_STRUCT;	
END_TYPE;	
Type Name	LsDemodPhaseStruct
Description	User interface structure
Definition	STRUCT
In/out Tag	Name: Error Type: ErrorStruct Description: Calls error handler
Output Tag	Name: Phase Type: DelayLogicStruct

	Description:
Output Tag	Name: Demod Type: icStructorLscStruc Description:

<b>User Interface Type</b>	
TYPE LsDemodPhaseWhitenStruct :	
STRUCT	
Error:        ErrorStruct;	
Demod:       DemodulatorLscStruct;	
Phase:       DelayLogicStruct;	
Whiten:      IscWhiteningSimpleDemodIQStruct;	
END_STRUCT;	
END_TYPE;	
Type Name	LsDemodPhaseWhitenStruct
Description	User interface structure
Definition	STRUCT
In/out Tag	Name: Error Type: ErrorStruct Description: Calls error handler
Output Tag	Name: Phase Type: DelayLogicStruct Description:
Output Tag	Name: Demod Type: DemodulatorLscStruct Description:
Output Tag	Name: Whiten Type: IscWhiteningSimpleDemodIQStruct Description:

<b>User Interface Type</b>	
TYPE LsDemodStruct :	
STRUCT	
Error:        ErrorStruct;	
Demod:       DemodulatorLscStruct;	
END_STRUCT;	
END_TYPE;	
Type Name	LsDemodStruct
Description	User interface structure
Definition	STRUCT

In/out Tag	Name: Error Type: ErrorStruct Description: Calls error handler
Output Tag	Name: Demod Type: DemodulatorLscStruct Description:

<b>User Interface Type</b> TYPE LsDemodWhitenStruct : STRUCT Error:        ErrorStruct; Demod:        DemodulatorLscStruct; Whiten:       IscWhiteningSimpleDemodIQStruct; END_STRUCT; END_TYPE;	
Type Name	LsDemodWhitenStruct
Description	User interface structure
Definition	STRUCT
In/out Tag	Name: Error Type: ErrorStruct Description: Calls error handler
Output Tag	Name: Demod Type: DemodulatorLscStruct Description:
Output Tag	Name: Whiten Type: IscWhiteningSimpleDemodIQStruct Description:

<b>User Interface Type</b> TYPE LsSimpleStruct : STRUCT Error:        ErrorStruct; Dc:           DCPowerStruct; Demod:        DemodulatorLscStruct; END_STRUCT; END_TYPE;	
Type Name	LsSimpleStruct
Description	User interface structure
Definition	STRUCT

In/out Tag	Name: Error Type: ErrorStruct Description: Calls error handler
Output Tag	Name: Dc Type: DCPowerStruct Description:
Output Tag	Name: Demod Type: DemodulatorLscStruct Description:

<b>User Interface Type</b>	
TYPE LsSimpleWhitenStruct :	
STRUCT	
Error:        ErrorStruct;	
Dc:          DCPowerStruct;	
Demod:      DemodulatorLscStruct;	
Whiten:     IscWhiteningSimpleDemodIQStruct;	
END_STRUCT;	
END_TYPE;	
Type Name	LsSimpleWhitenStruct
Description	User interface structure
Definition	STRUCT
In/out Tag	Name: Error Type: ErrorStruct Description: Calls error handler
Output Tag	Name: Dc Type: DCPowerStruct Description:
Output Tag	Name: Demod Type: DemodulatorLscStruct Description:
Output Tag	Name: Whiten Type: IscWhiteningSimpleDemodIQStruct Description:

<b>User Interface Type</b>	
TYPE LsStruct :	
STRUCT	
Error:        ErrorStruct;	
Dc:          DCPowerStruct;	



Demod: DemodulatorLscStruct; Phase: DelayLogicStruct; END_STRUCT; END_TYPE;	
Type Name	LsStruct
Description	User interface structure
Definition	STRUCT
In/out Tag	Name: Error Type: ErrorStruct Description: Calls error handler
Output Tag	Name: Dc Type: DCPowerStruct Description:
Output Tag	Name: Demod Type: DemodulatorLscStruct Description:
Output Tag	Name: Phase Type: DelayLogicStruct Description:

<b>User Interface Type</b> TYPE LsWhitenStruct : STRUCT Error: ErrorStruct; Dc: DCPowerStruct; Demod: DemodulatorLscStruct; Phase: DelayLogicStruct; Whiten: IscWhiteningSimpleDemodIQStruct; END_STRUCT; END_TYPE;	
Type Name	LsWhitenStruct
Description	User interface structure
Definition	STRUCT
In/out Tag	Name: Error Type: ErrorStruct Description: Calls error handler
Output Tag	Name: Dc Type: DCPowerStruct Description:
Output Tag	Name: Demod

	Type: DemodulatorLscStruct Description:
Output Tag	Name: Phase Type: DelayLogicStruct Description:
Output Tag	Name: Whiten Type: IscWhiteningSimpleDemodIQStruct Description:

<b>User Interface Type</b> TYPE LsDcWhitenOnlyStruct : STRUCT Error:          ErrorStruct; Whiten:         IscWhiteningChannelStruct; END_STRUCT; END_TYPE;	
Type Name	LsDcWhitenOnlyStruct
Description	User interface structure
Definition	STRUCT
In/out Tag	Name: Error Type: ErrorStruct Description: Calls error handler
Output Tag	Name: Whiten Type: IscWhiteningChannelStruct Description: Whitening

<b>Function Block</b> TYPE QpdErrorHandlerFB: VAR_IN_OUT Qpd:              QpdStruct; END_VAR; END_TYPE;	
Type Name	QpdErrorHandlerFB
Description	Function block used to monitor Qpds
Definition	Function Block
In/out Argument	Name: Qpd Type: QpdStruct

	Description: User interface structure
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<b>Function Block</b> TYPE WfsErrorHandlerFB: VAR_IN_OUT Wfs                      WfsStruct; END_VAR: END_TYPE;	
Type Name	WfsErrorHandlerFB
Description	Function block used to monitor Wfs
Definition	Function Block
In/out Argument	Name: Wfs Type: WfsStruct Description: User interface structure

<b>Function Block</b> TYPE WfsSimpleErrorHandlerFB: VAR_IN_OUT WfsSimple                WfsSimpleStruct; END_VAR: END_TYPE;	
Type Name	WfsSimpleErrorHandlerFB
Description	Function block used to monitor Wfs simple
Definition	Function Block
In/out Argument	Name: WfsSimple Type: WfsSimpleStruct Description: User interface structure

<b>Function Block</b> TYPE LsDcErrorHandlerFB: VAR_IN_OUT LsDc    LsDcStruct; END_VAR: END_TYPE;	
Type Name	LsDcErrorHandlerFB
Description	Function block used to monitor LsDc
Definition	Function Block
In/out Argument	Name: LsDc Type: LsDcStruct

	Description: User interface structure
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<b>Function Block</b>	
TYPE WfsErrorHandlerFB:	
VAR_IN_OUT	
Wfs    WfsStruct;	
END_VAR:	
END_TYPE;	
Type Name	LsDcWhitenErrorHandlerFB
Description	Function block used to monitor LsDcWhiten
Definition	Function Block
In/out Argument	Name: LsDcWhiten Type: LsDcWhitenStruct Description: User interface structure

<b>Function Block</b>	
TYPE LsDcWhitenOnlyErrorHandlerFB:	
VAR_IN_OUT	
LsDcWhitenOnly    LsDcWhitenOnlyStruct;	
END_VAR:	
END_TYPE;	
Type Name	LsDcWhitenOnlyErrorHandlerFB
Description	Function block used to monitor LsDcWhitenOnly
Definition	Function Block
In/out Argument	Name: LsDcWhitenOnly Type: LsDcWhitenOnlyStruct Description: User interface structure

<b>Function Block</b>	
TYPE LsDemodErrorHandlerFB:	
VAR_IN_OUT	
LsDemod    LsDemodStruct;	
END_VAR:	
END_TYPE;	
Type Name	LsDemodErrorHandlerFB
Description	Function block used to monitor LsDemod
Definition	Function Block
In/out Argument	Name: LsDemod Type: LsDemodStruct

	Description: User interface structure
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<b>Function Block</b>	
TYPE LsDemodPhaseErrorHandlerFB:	
VAR_IN_OUT	
LsDemodPhase	LsDemodPhaseStruct;
END_VAR:	
END_TYPE;	
Type Name	LsDemodPhaseErrorHandlerFB
Description	Function block used to monitor LsDemodPhase
Definition	Function Block
In/out Argument	Name: LsDemodPhase Type: LsDemodPhaseStruct Description: User interface structure

<b>Function Block</b>	
TYPE LsDemodPhaseWhitenErrorHandlerFB:	
VAR_IN_OUT	
LsDemodPhaseWhiten	LsDemodPhaseWhitenStruct;
END_VAR:	
END_TYPE;	
Type Name	LsDemodPhaseWhitenErrorHandlerFB
Description	Function block used to monitor LsDemodPhaseWhiten
Definition	Function Block
In/out Argument	Name: LsDemodPhaseWhiten Type: LsDemodPhaseWhitenStruct Description: User interface structure

<b>Function Block</b>	
TYPE LsDemodWhitenErrorHandlerFB:	
VAR_IN_OUT	
LsDemodWhiten	LsDemodWhitenStruct;
END_VAR:	
END_TYPE;	
Type Name	LsDemodWhitenErrorHandlerFB
Description	Function block used to monitor LsDemodWhiten
Definition	Function Block
In/out Argument	Name: LsDemodWhiten Type: LsDemodWhitenStruct

	Description: User interface structure
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<b>Function Block</b> TYPE LsErrorHandlerFB: VAR_IN_OUT Ls    LsStruct; END_VAR: END_TYPE;	
Type Name	LsErrorHandlerFB
Description	Function block used to monitor Ls
Definition	Function Block
In/out Argument	Name: Ls Type: LsStruct Description: User interface structure

<b>Function Block</b> TYPE LsSimpleErrorHandlerFB: VAR_IN_OUT LsSimple    LsSimpleStruct; END_VAR: END_TYPE;	
Type Name	LsSimpleErrorHandlerFB
Description	Function block used to monitor LsSimple
Definition	Function Block
In/out Argument	Name: LsSimple Type: LsSimpleStruct Description: User interface structure

<b>Function Block</b> TYPE LsSimpleWhitenErrorHandlerFB: VAR_IN_OUT LsSimpleWhiten    LsSimpleWhitenStruct; END_VAR: END_TYPE;	
Type Name	LsSimpleWhitenErrorHandlerFB
Description	Function block used to monitor LsSimpleWhiten
Definition	Function Block
In/out Argument	Name: LsSimpleWhiten Type: LsSimpleWhitenStruct

	Description: User interface structure
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<b>Function Block</b> TYPE LsWhitenErrorHandlerFB: VAR_IN_OUT LsWhiten      LsWhitenStruct; END_VAR; END_TYPE;	
Type Name	LsWhitenErrorHandlerFB
Description	Function block used to monitor LsWhiten
Definition	Function Block
In/out Argument	Name: LsWhiten Type: LsWhitenStruct Description: User interface structure