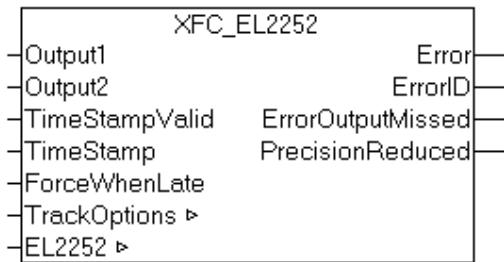


TwinCAT PLC Library: TcMC2 XFC

XFC_EL2252



XFC_EL2252 handles the output of a digital cam with the XFC time stamp terminal EL2252.

Notes:

Data output at the terminal takes place only shortly before the *TimeStamp* is reached. Three PLC cycles are required for activation and acknowledgement of the outputs. Only then can a further edge change take place. The minimum time between two edge changes of the output signal is therefore three, better four PLC cycles, in order to prevent errors or loss of precision. If the output signal is generated by a cam controller, a minimum cam width can be calculated from the maximum velocity and the PLC cycle time.

Output1 and Output2 cannot be used completely independent because only one timestamp is available to activate both outputs. If both channels are used, the rising or falling signal edges of both channels must have a minimum distance in time. In this case the nearest timestamp of both channels can be passed to the block.

Inputs

```
VAR_INPUT
    Output1      : BOOL;
    Output2      : BOOL;
    TimeStampValid : BOOL;
    TimeStamp     : T\_DCTIME32;
    ForceWhenLate : BOOL;
END_VAR
```

- Output1** Next initial state for channel 1 of the terminal that will be activated at *TimeStamp*.
If the output signal is generated by a cam controller, it should be noted that the output is inverted. The cam controller provides the current signal state. However, the next state from the parameterised *TimeStamp* must be transferred to *Output1*.
- Output2** Next initial state for channel 2 of the terminal that will be activated at *TimeStamp*.
If the output signal is generated by a cam controller, it should be noted that the output is inverted. The cam controller provides the current signal state. However, the next state from the parameterised *TimeStamp* must be transferred to *Output2*.
- TimeStampValid** *TimeStampValid* is TRUE if the parameterised *TimeStamp* is valid.
- TimeStamp** Time stamp (*distributed clock system time*)
The EL2252 terminal supports only one time stamp for both outputs. At this time both outputs *Output1* and *Output2* are updated together.
Output to the terminal takes place three cycles before the time stamp is reached. If this time is exceeded, the output *ErrorOutputMissed* or *PrecisionReduced* is set, depending on the state of *ForceWhenLate*.
- ForceWhenLate** If *ForceWhenLate* is TRUE, the output is activated even if the time stamp is already exceeded. It is recommended to set *ForceWhenLate* to avoid missing signal edges in case of timing jitter.

Outputs

```
VAR_OUTPUT
    Error          : BOOL;
    ErrorID        : UDINT;
    ErrorOutputMissed : BOOL;
END_VAR
```

- Error** Becomes TRUE if an error occurs.
- ErrorID** If an error output is set, this parameter supplies an [error number](#).
- ErrorOutputMissed** The exact switching point defined by *TimeStamp* could not be adhered to and the initial state remains unchanged.
If *ForceWhenLate* is TRUE, the initial state is always output and *ErrorOutputMissed* does not

become TRUE.

PrecisionReduced The exact switching point defined by *TimeStamp* could not be adhered to; the initial state was output with a delay.
PrecisionReduced should be regarded as a warning. It can only become TRUE if *ForceWhenLate* is TRUE.

Inputs/outputs

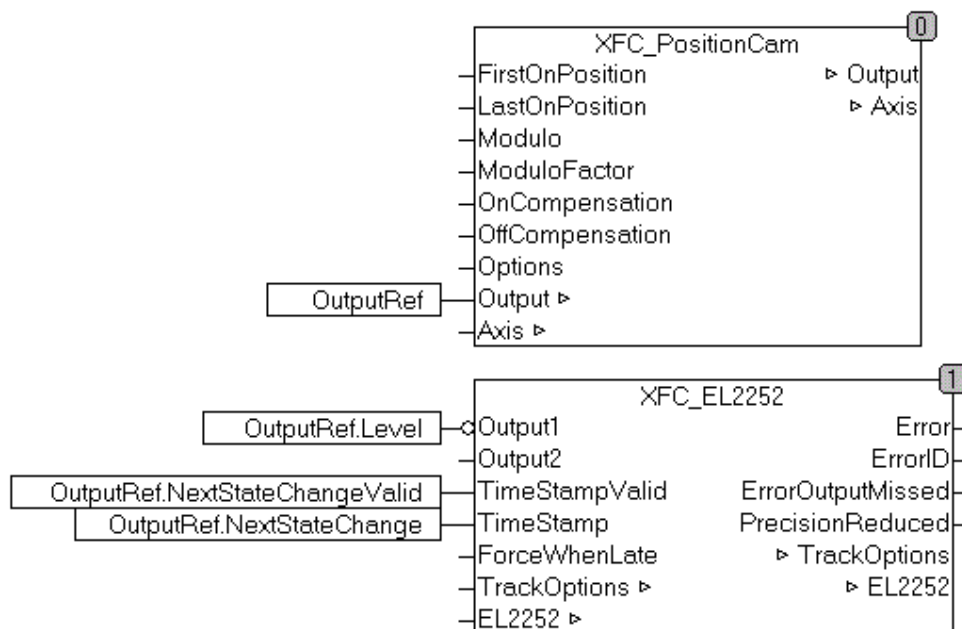
```
VAR_IN_OUT
    TrackOptions      : TRACK\_REF;
    EL2252            : EL2252_IoInterface;
END_VAR
```

TrackOptions The data structure *TrackOptions* contains the parameterisation for the cam track.

EL2252 Process image of the terminal

Example for a position cam output

The following example illustrates how the output from a cam controller [XFC_PositionCam](#) should be transferred to the function block *XFC_EL2252*. An important element is the inversion of the signal state *Level*, since the signal state will change at time *NextStateChange*.



Example for two position cam outputs at a single terminal

Output1 and Output2 cannot be used completely independent because only one timestamp is available to activate both outputs. If both channels are used, the rising or falling signal edges of both channels must have a minimum distance in time (4 PLC cycles). In this case the nearest timestamp of both channels can be passed to the block. It is important to invert only the output that corresponds to the timestamp that is passed to the block. Just this output will change the state and the other output is passed with its current state.

```
PROGRAM EL2252_TwoChannels
VAR
    PosCam1 : XFC_PositionCam;
    Output1 : OUTPUT_REF;

    PosCam2 : XFC_PositionCam;
    Output2 : OUTPUT_REF;

    EL2252 : XFC_EL2252;
END_VAR

IF Output1.NextStateChange > 0 AND Output1.NextStateChange < Output2.NextStateChange THEN
    EL2252.TimeStampValid := Output1.NextStateChangeValid;
    EL2252.TimeStamp := Output1.NextStateChange;
    EL2252.Output1 := NOT Output1.Level; (* toggle *)
```

```

      EL2252.Output2           := Output2.Level; (* keep *)
ELSE
      EL2252.TimeStampValid    := Output2.NextStateChangeValid;
      EL2252.TimeStamp         := Output2.NextStateChange;
      EL2252.Output1          := Output1.Level; (* keep *)
      EL2252.Output2          := NOT Output2.Level; (* toggle *)
END_IF
```