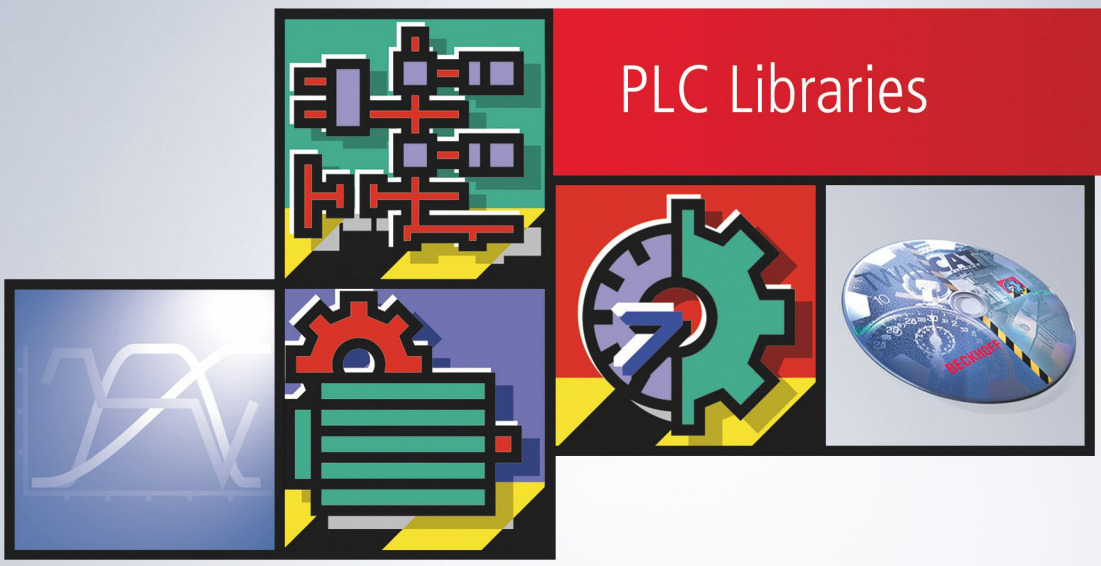
BECKHOFF New Automation Technology

Manual | EN

TX1200

TwinCAT 2 | PLC Library: TcSystemCP66xx



2022-11-07 | Version: 1.1

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1 Foreword

1.1 Notes on the documentation

This description is only intended for the use of trained specialists in control and automation engineering who are familiar with applicable national standards.
It is essential that the documentation and the following notes and explanations are followed when installing and commissioning the components.
It is the duty of the technical personnel to use the documentation published at the respective time of each installation and commissioning.

The responsible staff must ensure that the application or use of the products described satisfy all the requirements for safety, including all the relevant laws, regulations, guidelines and standards.

Disclaimer

The documentation has been prepared with care. The products described are, however, constantly under development.
We reserve the right to revise and change the documentation at any time and without prior announcement.
No claims for the modification of products that have already been supplied may be made on the basis of the data, diagrams and descriptions in this documentation.

Trademarks

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Patent Pending

The EtherCAT Technology is covered, including but not limited to the following patent applications and patents:
EP1590927, EP1789857, EP1456722, EP2137893, DE102015105702
with corresponding applications or registrations in various other countries.

EtherCAT® is a registered trademark and patented technology, licensed by Beckhoff Automation GmbH, Germany

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1.2 Safety instructions

Safety regulations

Please note the following safety instructions and explanations!
Product-specific safety instructions can be found on following pages or in the areas mounting, wiring, commissioning etc.

Exclusion of liability

All the components are supplied in particular hardware and software configurations appropriate for the application. Modifications to hardware or software configurations other than those described in the documentation are not permitted, and nullify the liability of Beckhoff Automation GmbH & Co. KG.

Personnel qualification

This description is only intended for trained specialists in control, automation and drive engineering who are familiar with the applicable national standards.

Description of symbols

In this documentation the following symbols are used with an accompanying safety instruction or note. The safety instructions must be read carefully and followed without fail!

⚠ DANGER

Serious risk of injury!

Failure to follow the safety instructions associated with this symbol directly endangers the life and health of persons.

⚠ WARNING

Risk of injury!

Failure to follow the safety instructions associated with this symbol endangers the life and health of persons.

⚠ CAUTION

Personal injuries!

Failure to follow the safety instructions associated with this symbol can lead to injuries to persons.

NOTE

Damage to the environment or devices

Failure to follow the instructions associated with this symbol can lead to damage to the environment or equipment.

Tip or pointer

This symbol indicates information that contributes to better understanding.

1.3 Notes on information security

The products of Beckhoff Automation GmbH & Co. KG (Beckhoff), insofar as they can be accessed online, are equipped with security functions that support the secure operation of plants, systems, machines and networks. Despite the security functions, the creation, implementation and constant updating of a holistic security concept for the operation are necessary to protect the respective plant, system, machine and networks against cyber threats. The products sold by Beckhoff are only part of the overall security concept. The customer is responsible for preventing unauthorized access by third parties to its equipment, systems, machines and networks. The latter should be connected to the corporate network or the Internet only if appropriate protective measures have been set up.

In addition, the recommendations from Beckhoff regarding appropriate protective measures should be observed. Further information regarding information security and industrial security can be found in our https://www.beckhoff.com/secguide.

Beckhoff products and solutions undergo continuous further development. This also applies to security functions. In light of this continuous further development, Beckhoff expressly recommends that the products are kept up to date at all times and that updates are installed for the products once they have been made available. Using outdated or unsupported product versions can increase the risk of cyber threats.

To stay informed about information security for Beckhoff products, subscribe to the RSS feed at https://www.beckhoff.com/secinfo.

2 Overview

This library contains functions and function blocks which are using special features of the Control Panel PC CP66xx.

With new targets like CX1000, CX1020, CX9000, CX9010 libraries TcSystemCX1000, TcSystemCX1020, TcSystemCX9000, TcSystemCX9010 should be used respectively instead of the TcSystemCP66xx.lib.

Functions

Name	Description
F_CP66xxSetWatchDog [▶ 9]	activates/deactivates hardware watchdog (auto-reboot of CP66xx in case of PLC problems)
F_GetVersionTcSystemCP66xx [▶ 9]	The function returns library version info.

Function Blocks

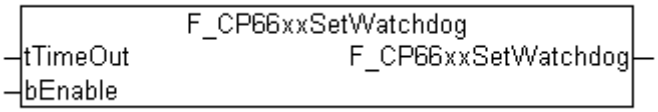
Name	Description
FB_CP66xxTemperatureSensor [▶ 11]	The function returns the temperature value measured by sensor PT100, PT1000 or NI1000.

Requirements

Component	Version
TwinCAT on the development PC	2.10 Build 1329 or higher
CP66xx-Windows CE-Image	2.20b or higher

3 Functions

3.1 F_CP66xxSetWatchdog



The function F_CP66xxSetWatchdog activates a hardware watchdog on the CP66xx-xxxx-0000. The watchdog is enabled with bEnable = TRUE and a timeout time. The minimum timeout time is a few times the cycle time in which the function F_CP66xxSetWatchdog is called, the maximum timeout time is 64sec and 431 millisec.

Once the watchdog is activated, the function has to be called cyclically, because if the tTimeOut-time expires then the CP66xx-xxxx-0000 automatically reboots. The watchdog can be used to reboot the system if the PLC gets stuck (i.e. in an endless loop).

The watchdog can be disabled by bEnable = FALSE.

The Watchdog has to be disabled before using breakpoints, before a PLC reset or PLC reset all, before a TwinCAT Stop, a change to Config Mode or before activating the configuration, otherwise the CP66xx-xxxx-0000 reboots immediately after the timeout time has expired!

FUNCTION F_CP66xxSetWatchdog : BOOL

VAR_INPUT

```
VAR_INPUT
    tTimeout        : TIME;
    bEnable         : BOOL;
END_VAR
```

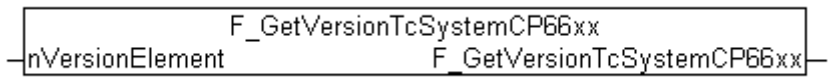
tTimeOut : Watchdog time, if expired a reboot is automatically executed.

bEnable : Activate or deactivate the watchdog.

Requirements

Development environment	Target platform	PLC Libraries to include
TwinCAT v2.10.0	CP66xx-xxxx-0000 (ARM)	TcSystemCP66xx.Lib

3.2 F_GetVersionTcSystemCP66xx



The function returns library version info.

FUNCTION F_GetVersionTcSystemCP66xx : UINT

```
VAR_INPUT
    nVersionElement : INT;
END_VAR
```

nVersionElement : Version element:

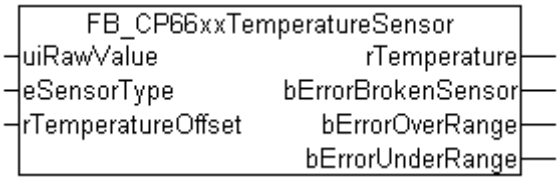
- 1 : major number;
- 2 : minor number;
- 3 : revision number;

Requirements

Development environment	Target platform	PLC Libraries to include
TwinCAT v2.10.0	CP66xx (ARM)	TcSystemCP66xx.Lib

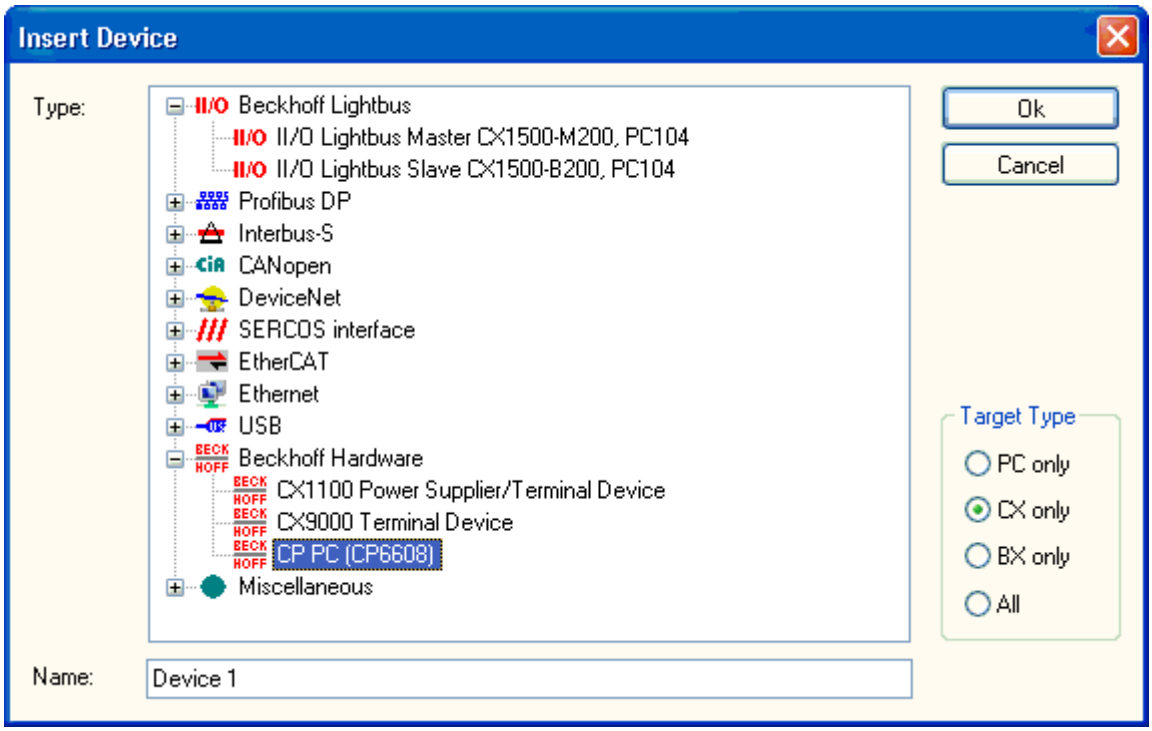
4 Function Blocks

4.1 FB_CP66xxTemperatureSensor

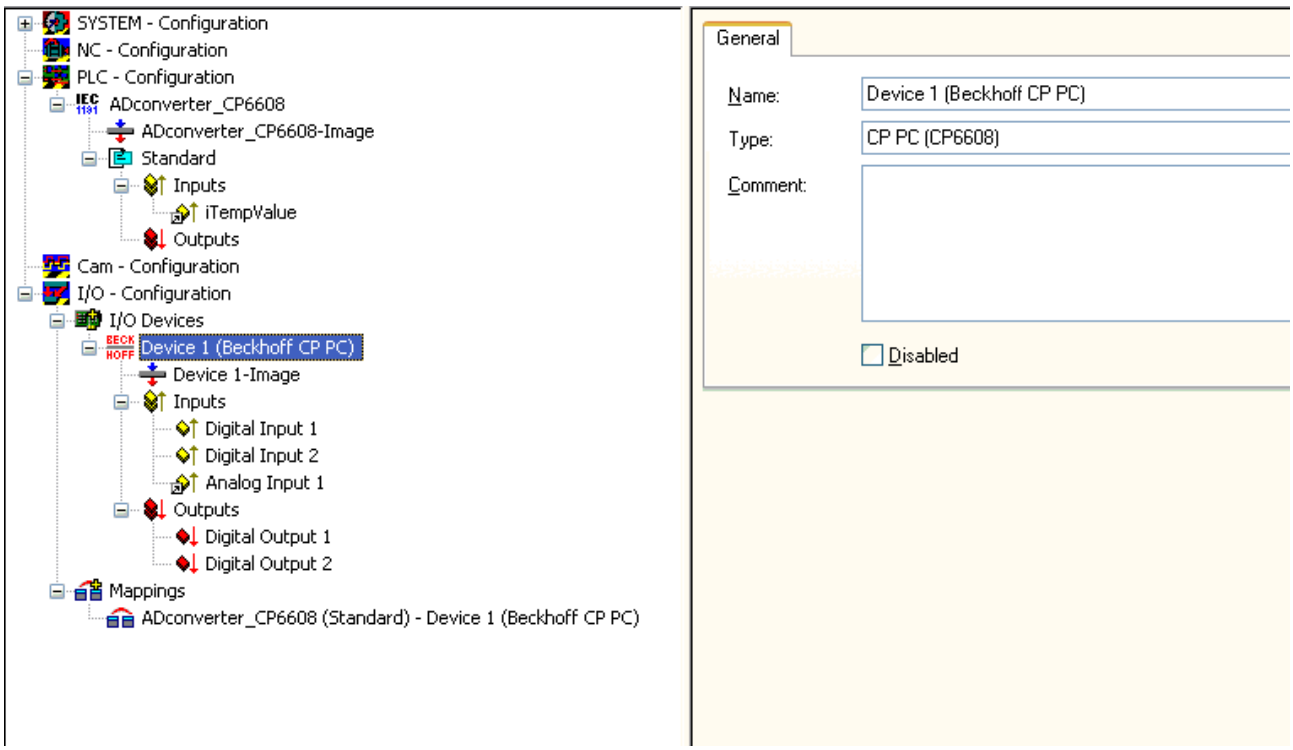


This functional block serves the purpose of delivering the temperature value in degree Celsius (°C) measured by temperature sensors PT100, PT1000 or NI1000 connected to the Building Automation control panel PC CP6608. The temperature sensor is connected directly to the 12 pole I/O connector available on the control panel exterior. The temperature value supported is -50°C to 200°C only.

Insert the device named 'CP PC (CP6608)' under I/O Devices.



Further on, the variable 'Analog Input 1' is to be mapped to the PLC input variable.



FUNCTION BLOCK FB_CP66xxTemperatureSensor

VAR_INPUT

```
VAR_INPUT
    uiRawValue          : UINT;
   eSensorType          : E_SensorType;
   rTemperatureOffset   : REAL;
END_VAR
```

uiRawValue : Analog Input 1 read from System Manager device CP PC(CP6608) is assigned to this variable.

eSensorType : Enum, including the sensor types supported.

```
TYPE E_SensorType :
(
    eSensorType_PT100        := 0,
    eSensorType_PT1000       := 1,
    eSensorType_Ni1000TK     := 2,
    eSensorType_Ni1000DIN    := 3
);
END_TYPE
```

rTemperatureOffset : Offset due to cable impedance or temperature offset can be given here.

VAR_OUTPUT

```
VAR_OUTPUT
    rTemperature        : REAL;
   bErrorBrokenSensor   : BOOL;
   bErrorOverRange      : BOOL;
   bErrorUnderRange     : BOOL;
END_VAR
```

rTemperture : The Temperature value calculated is shown here.

bErrorBrokenSensor : In case of broken sensor, short circuit or open circuit, error message is delivered.

bErrorOverRange : This variable is set to TRUE if rTemperature variable is greater than 200°C.

bErrorUnderRange : This variable is set to TRUE if rTemperature variable is less than -50°C.

Requirements

Development environment	Target platform	PLC Libraries to include
TwinCAT v2.10.0	CP6608 (ARM)	TcSystemCP66xx.Lib

More Information:
www.beckhoff.com/tx1200

Beckhoff Automation GmbH & Co. KG
Hülshorstweg 20
33415 Verl
Germany
Phone: +49 5246 9630
info@beckhoff.com
www.beckhoff.com