

Manual | EN

TX1200

TwinCAT 2 | PLC Library: PlcSystemBC

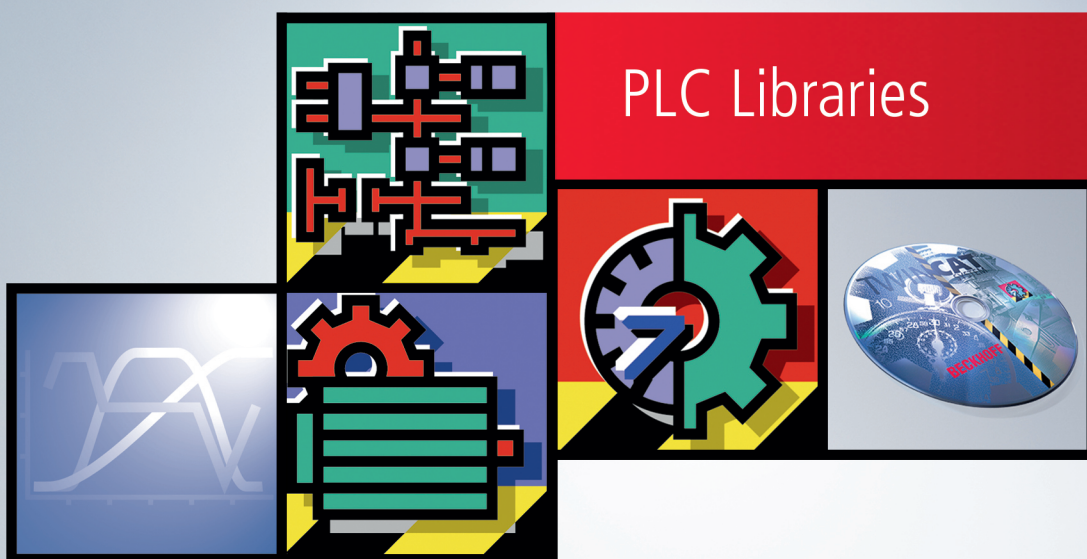


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1 Foreword

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.

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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
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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

The library contains function blocks for the access to system functions of the PLC Controller (BCxxxx Controller).

Requirements

Newer firmware version of the PLC Controller:

BC2000 version : B5 and upwards

BC3100 version : BF and upwards

BC4000 version : B3 and upwards

BC7300 version : B3 and upwards

BC8x00 version : B2 and upwards

BC9000 version: B4 and upwards

Some of the functions have dummy input parameter (bDummy : BOOL). The compiler requires at least one input parameter for functions. You can set this parameter to TRUE or FALSE.

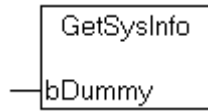
Contents of the library:

Function block

Name	Description
GetSysInfo [► 9]	Reads the system information of the PLC Controller
GetSysTick [► 10]	Reads the the internal system tick of the PLC Controller
PresetSysTick [► 10]	Sets the internal system tick of the PLC Controller
GetFBusStatus [► 11]	Reads the fieldbus state of the PLC Controller
GetTBusStatus [► 12]	Reads the terminal bus state
TrigTBusCycle [► 13]	Triggers the terminal bus state
Reboot [► 13]	Reset of the PLC Controller

3 Functions

3.1 GetSysInfo



The "GetSysInfo" function allows system information relating to the PLC Controller to be read.

FUNCTION GetSysInfo : WORD

VAR_INPUT

```
VAR_INPUT
    bDummy : BOOL
END_VAR
```

At least one input is required for functions.

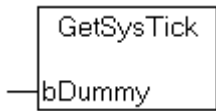
The system information is encoded in the return parameter of the function as follows:

Return value	Description
Bit 0 set	The fieldbus and terminal bus status information is available
Bit 1 set	The system tick is present (controllers with older firmware do not support this feature).
Bit 2 set	The PLC cycle time watchdog monitoring is active.
Bit 3 - 15	reserved

Requirements

Development environment	Target platform	PLC libraries to include
TwinCAT v2.7.0 and above	BCxxxx (165)	PlcSystemBC.Lb6

3.2 GetSysTick



The "GetSysTick" function can read the value of the internal system tick. The PLC Controller's system tick is a 32 bit counter that is incremented every millisecond. The counter is cleared by a reset or when the controller is powered down, but can be set to a particular value by means of the [PresetSysTick \[► 10\]](#) function.

FUNCTION GetSysTick : DWORD

VAR_INPUT

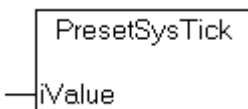
```
VAR_INPUT
    bDummy : BOOL
END_VAR
```

At least one input is required for functions.

Requirements

Development environment	Target platform	PLC libraries to include
TwinCAT v2.7.0 and above	BCxxxx (165)	PlcSystemBC.Lb6

3.3 PresetSysTick



The "PresetSysTick" function can set the value of the internal system tick. The PLC Controller's system tick is a 32 bit counter that is incremented every millisecond. When successful, the function supplies the new value of the system tick as its return parameter.

FUNCTION PresetSysTick : DWORD

VAR_INPUT

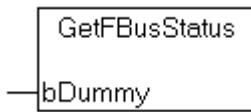
```
VAR_INPUT
    iValue : DWORD;
END_VAR
```

iValue: The new value of the system tick.

Requirements

Development environment	Target system type	PLC libraries to include
TwinCAT v2.7.0 and above	BCxxxx (165)	PlcSystemBC.Lb6

3.4 GetFBusStatus



The PLC Controller can be connected to a fieldbus as a participating device. The status of the fieldbus can be determined with the function "GetFBusStatus".

FUNCTION GetFBusStatus : WORD

VAR_INPUT

```
VAR_INPUT
    bDummy : BOOL
END_VAR
```

At least one input is required for functions.

The fieldbus status is encoded in the return parameter as follows:

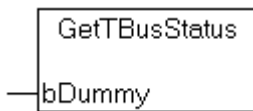
Controller type	Value	Description
BC2000	0	Fieldbus OK
	Bit 0 set	Fieldbus errors
	Bit 1 - 15	reserved
BC3100	0	Fieldbus OK
	Bit 0 set	Fieldbus errors
	Bit 1 - 3	reserved
	Bit 4 - 5	DP-State: 0: Slave in WAIT-PRM (no connection to master) 1: Slave in WAIT-CFG (start-up) 2: Slave in DATA-EXCH (OK)
	Bit 6 - 7	WD-State: 0: Baud rate is searched 1: Baud rate found 2: Communication monitoring activated
	Bit 8 - 11	Baud rate: 0: 12 Mbaud 1: 6 Mbaud 2: 3 Mbaud 3: 1.5 Mbaud 4: 500 kbaud 5: 187.5 kbaud 6: 93.75 kbaud 7: 45.45 kbaud 8: 19.2 kbaud 9: 9.6 kbaud
BC9000	Bit 12 - 15	reserved
	Bit 0 set	Error in AMS/ADS communication
	Bit 1 set	Error MODBUS/TCP
	Bit 2 - 14	reserved

Controller type	Value	Description
	Bit 15 set	No LINK (no communication with the fieldbus)

Requirements

Development environment	Target platform	PLC libraries to include
TwinCAT v2.7.0 and above	BCxxxx (165)	PlcSystemBC.Lb6

3.5 GetTBusStatus



The terminal bus status can be read by the function "GetTBusStatus".

FUNCTION GetTBusStatus : WORD

VAR_INPUT

```
VAR_INPUT
    bDummy : BOOL
END_VAR
```

At least one input is required for functions.

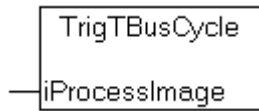
The return parameter has the following significance:

Return value	Description
Bit 0 set	General K-bus error
Bit 1 set	General configuration error
Bit 2 - 3	reserved
Bit 4 set	PLC cycle time monitoring
Bit 5 - 15	reserved

Requirements

Development environment	Target platform	PLC libraries to include
TwinCAT v2.7.0 and above	BCxxxx (165)	PlcSystemBC.Lb6

3.6 TrigTBusCycle



The "TrigTBusCycle" can be used to trigger an additional terminal bus cycle from the PLC task.

FUNCTION TrigTBusCycle : INT

VAR_INPUT

```

VAR_INPUT
    iProcessImage    : UINT;
END_VAR
    
```

iProcessImage: the number of the process image. Permitted values 0-3.

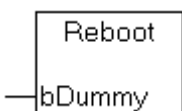
The error codes are encoded in the return parameter of the function as follows:

Return value	Description
0	No error
1	Terminal bus error
2	Access was refused. Terminal bus is active.
3	Process Image not initialized
-2	Invalid number for the process image. The permitted range is 0 - 3

Requirements

Development environment	Target platform	PLC libraries to include
TwinCAT v2.7.0 and above	BCxxxx (165)	PlcSystemBC.Lb6

3.7 Reboot



The function performs a reset of the PLC controller.

FUNCTION Reboot : WORD**VAR_INPUT**

```
VAR_INPUT
    bDummy : BOOL
END_VAR
```

At least one input is required for functions.

Requirements

Development environment	Target platform	PLC libraries to include
TwinCAT v2.7.0 and above	BCxxx (165)	PlcSystemBC.Lb6

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