Platform MX6 Software option S000 Counter Encoder Interface

1 Identification

Identification	
Option ID	S000
Order number	S-05000201-0000
Short name	Counter Encoder Interface
Brief description	With this software option, it is possible to operate a local input of the device as fast counter or encoder.
Revision ID document	V3.0

2 System requirements and restrictions

System requirements and restrictions				
Supported platforms and devices	Berghof PLC devices of the MX6 platform (e.g.: CCs, DCs). Additional information regarding availability and compatibility can be found in options sec- tion of the product catalog.			
Firmware	MX6-PLC from version 1.7.1, CODESYS ab 3.5 SP7 Patch 4			
Additional requirements	 Hardware support for counter/encoder function by the device. For detailed information on availability, number and other technical details of the counter and encoder functions, please consult the device's manual. 			
Restrictions	 Differenatial Encoder not supported RS422 (TTL, 5V) not supported 			



3 Product description

With this software option it is possible to enable dedicated inputs of MX6 series PLC devices as counter or encoder inputs.

Depending on the hardware, up to two counter and two encoder inputs are supported with one capture. Various operating modes and combinations can be selected for these. The counter/encoder functionality is parameterized directly in CODESYS via the IO description of the devices. Furthermore, the operating modes can be parameterized via the Berghof Extension Bus Library from the PLC application.

Modes of operation					
CODESYS	Operating mode	Counter IN (C1)	Counter IN (C2)	Counter IN (C3)	Counter IN (C4)
Counter/Encoder 0	Counter Up	UP	-	-	[CAPTURE]
Counter/Encoder 0	Counter UpDown	UP	DOWN	-	[CAPTURE]
Counter/Encoder 0	Pulse Direction	PULSE	DIRECTION		[CAPTURE]
Counter/Encoder 0	Encoder	A	В	-	[CAPTURE]
Counter/Encoder 1	Counter Up	-	-	UP	
Counter/Encoder 1	Counter UpDown	-	-	UP	DOWN
Counter/Encoder 1	Pulse Direction	-	-	PULSE	DIRECTION
Counter/Encoder 1	Encoder	-	-	A	В

For example, the following constellations can be selected:

Note: Only Counter/Encoder 0 has the capture functionality. The capture input is combined with the Counter/Encoder 1 inputs. When using the capture functionality Counter/Encoder 1 function is limited.

4 Technical data

Technical data	
Functions	Counter Up, UpDown, Pulse Direction, Encoder, Capture
Signal voltage	(1): DC 1528 V (0): DC -33V
Signal frequency	Up to 500kHz
Min. pulse width	1 μs

5 Quick Start Guide

The following describes briefly how to parameterize the counter/encoder functionality under CODESYS and how to access it.

5.1 Adding the IO description

First, the slot for the internal IO cards must be added to the device tree with the CODESYS function 'Add Device':

CounterDemo				
Counted Denice (Berghof MX6 Control) Counted Denice (Berghof MX6 Con	Nation: Add Device Name: IO_Slot_1 Action: A	reaction - Dotaile 511 Placebo	vice	iken onekor
■ ∭ IO_Slot (IO Slot) ↓ <empty> (<empty>)</empty></empty>	Enter a string for a fulltext search in	all devices Vendor: Berghof	Automation (GmbH Description
	Miscellaneous	us Berghof Automation GmbH	1.1.0.0	Berghof EBUS internal bus
	Bergnor Internal 10	Berghor Automation GmbH	1.1.0.0	Internal Inputs and Outputs of Bergnor SPS Devices

The appropriate IO description is now plugged into the first slot via the 'Plug Device' function. In this case we choose the maximum description:

Devices 👻 👎	X Library Manager X Device							
CounterDemo	Add library V Delete library S Droportion	Details Discobolder	Librane .	anacitan/				
🖹 🔟 Device (Berghof MX6 Control)	Plug Device							
🖃 🗐 PLC Logic	Na			Commence and an an and an an and an an and an				
Application	Name: XBIO_DI40_DO40_AI12_AO8_CNT4							
Library Manager	Actions							
PLC_PRG (PRG)								
Task Configuration	Task Configuration							
IO_Slot (IO Slot)	Enter a string for a fulltext search in all devices	Enter a string for a fulltext search in all devices Vendor: Renchof Automation GmbH						
XBIO_DI40_DO40_AI12_AO8_CNT4 (XBIC	DI							
<pre>< <empty> (<empty>)</empty></empty></pre>	Name	Vendor	Version	Description				
	🗏 👘 Miscellaneous							
	XBIO Berghof IO	Berghof Automation GmbH	1.2.0.3	XBIO max IO - Berghof PLC Devices				
	XBIO DC20XX-Basic	Berghof Automation GmbH	1.2.0.3	XBIO DC2000-IO for Berghof PLC				
	XBIO DI40/DO40/AI12/AO8/CNT4	Berghof Automation GmbH	1.2.0.3	XBIO DI40/DO40/AI12/AO8/CNT4 - Berghof PLC Devices				
	XBIO DI40/DO40/CNT4	Berghof Automation GmbH	1.2.0.3	XBIO DI40/DO40/CNT4 - Berghof PLC Devices				
	XBIO DI8/DO8/AIU4/CNT2	Berghof Automation GmbH	1.2.0.3	XBIO DI8/DO8/AIU4/CNT2 - Berghof PLC Devices				

Note: The IO descriptions of the XBIO modules are so compatible with each other that IO descriptions can also be used on devices that have more functionality than the underlying hardware really offers. IOs that are not present are not changed during operation and remain in their initial state. This means that the same PLC application can be used with different expansion levels without changing the IO configuration on hardware.

A smaller IO description can also be selected for a device.

5.2 Setting the operating modes

To configure the parameters for operation, select the 'BGH Slot Bus Parameters' tab in the device description. There, scroll to the 'Counter/Encoder Settings' folder and select the desired function for the counter:



The desired counters or encoder values can then be called up during operation via the IO image:

BGH Slot BUS Parameters	Find	Find Filter Show all							
BCH Slot BUS I/O Mapping	Variable	Mapping	Channel	Address	Туре	Default Value	Unit	Descript	
Jan Slot Dos t/o Mapping	💷 🗀 Digital In								
tatus	😟 🚞 Digital Out								
	🖲 🧰 Analog In								
formation	😟 🛄 Analog Out								
	Counter/Encoder						_		
	🖨 - 🍫		Counter/Encoder 0	%ID62					
			Counter Value	%ID62	DINT	0			
	- **		Capture Value	%ID63	DINT	0			
	* @		Capture Event Counter	%ID64	UDINT	0			
	😟 - 🏘		Status	%IB260	BYTE	0			
	· · · · · · · · · · · · · · · · · · ·		Counter/Encoder 1	%ID66					
	🖶 - 🍫		Differential Counter/Encoder (0+1)	%ID70					
	🚊 🍫		Counter/Encoder 2	%ID74					
	😟 🐴		Counter/Encoder 3	%ID78					
			Differential Counter/Encoder (2+3)	%ID82					
			Reset mapping Always updat	e variables: Us	e parent devi	ce settina			
	 Bus cycle options Bus cycle task 	arent bus cycle se	ap to existing variable						

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5.3 Further operating instructions

When operating the counters/encoders, the following must be observed:

- The IOs should also be updated in Stop (CODESYS option in the device settings) to correctly process counting pulses generated in Stop mode.
- After a reset COLD, WARM or ORIGIN the counter values are 0 and the counter registers of the hardware are reset to default values.
- If the bus cycle task is slower than 2*8ms, the first bit (update time violation) in the status of the respective counter/encoder is set to 1. In this case, counting pulses may have been lost. This bit can only be deleted by a reset of the PLC application or a boot process.