Platform MX6 Software option S115 CODESYS Profinet Controller

1 Identification

Identification	
Option ID	S115
Order number	S-05000306-0000
Short name	CODESYS Profinet Controller
Brief description	With this software option it is possible to operate the PLC as a Profinet Controller in a Profinet network.
Revision ID document	V1.0

2 System requirements and restrictions

System requirements and restrictions							
Supported platforms and devices	Berghof PLC devices of the MX6 platform (e.g.: MCs, CCs, DCs). Additional information regarding availability and compatibility can be found in options sec- tion of the product catalog.						
Firmware	MX6-PLC from Version 1.22.4, CODESYS from 3.5 SP14 Patch 4						
Additional requirements	 IP Networkconnection to Profinet Devices CODESYS IDE >= 3.5.14.40 						
Restrictions	_						



3 Product description

With this expansion it is possible to run the PLC as a Profinet Controller in an IP-Network wth Profinet devices according to Profinet specification V2.3 and Conformance Class A.

PROFINET (Process Field Network) is an open standard for realtime industrial Ethernet systems in automation technology. It is promoted by the user organization PI (PROFIBUS & PROFINET International as an umbrella group of the PROFIBUS user organization PNO) and is regarded as the successor of PROFIBUS. PROFINET uses IEEE 802.3 (Standard Ethernet) based Profinet RT protocol for realtime cyclic IO data exchange and UDP/IP for acyclic services.

The fully integrated CODESYS PROFINET Solution provides a uniform configurator for different variants of underlying PROFINET Controller communication stacks:

- CODESYS PROFINET Controller (IEC)
- Protocol stack in the form of a CODESYS library (in IEC 61131-3 code), operates on standard network
- interface cards.
- For CODESYS Control RTE high performance ethernet adapter drivers are available (see requirements).
- The ethernet adapter is not used exclusively, it's still available for all other applications using TCP/IP on
- this adapter (e.g. CODESYS Visualisation, Web Browser).

CODESYS PROFINET Configurator

- configurator for settings of PROFINET Controller
- configuration of as slaves (single AR to PROFINET field device) with communications settings
- configuration of device/module specific parameters, in- and output-mapping
- status page with detailed view of currently pendig diagnostics and previously received alarms
- scan dialog with device-import function, online/offline compare, I&M data
- topology configurator (for device exchange, IRT-planning)

Without valid license the Profinet Controller runs for 30 minutes without restrictions in the demo mode. After the installation of the software license it is possible to use the Profinet Controller on the PLC without temporal limitation. The licensing takes places per PLC.

For full documentation of the different Profinet-Controller and Device configuration menus please check the CODESYS Online help under:

https://help.codesys.com/webapp/ pnio f profinet io configuration;product=core ProfinetIO Configuration Editor;version=3.5.15.0

4 Quick Start Guide

With this illustrated quick start guide it is possible to create a functional Profinet Controller within a few minutes.

4.1 Preparatory tasks

In the web configuration of the PLC the "Static" mode for the ETH1 interface in the "Network Configuration menu" has to be selected. The ETH0 interface can't be in the same subnet while using Profinet. Save the configuration and reboot the PLC to activate the settings.

	Network Configuration						
Configuration	COMMON						
CAN Time and Date	Hostname	270011200-00035					
FTP-Server	DNS Server 1	0.0.0.0					
<u>SSH-Server</u> WEB-Server	DNS Server 2	0.0.0.0					
Users SVC Config	ETH0						
Config Protection Reset Config	Mode:	static 🗸					
System	IPAddress	169.254.255.35					
Licenseinfo	NetMask	255.255.255.0					
<u>Update</u> Reboot	Gateway	0.0.0.0					
PLC-Manager	ETH0:1						
Control Config Application Info Application Files	Mode:	inactive 👻					
Font Files	ETH1						
Diagnostics							
<u>PLC Log</u> System Log	Mode:	static 👻					
<u>Ethernet</u> CAN	IPAddress	192.168.1.1					
Storage	NetMask	255.255.255.0					
System Dump	Gateway	0.0.0.0					
	FT114.4						

4.2 Addition of the ethernet adapter

At first an ethernet adapter has to be integrated into the CODESYS project, through the CODESYS function "Add Device" by right clicking on the PLC-Device in the devices window in CODESYS.

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			1	Add Device					
evices		→ Ț X							
Untitled 1				vame:					
🖻 👚 Device	(Bera	nof MX6 Control)	l r	Action:					
🖮 🗐 PLC	Ж	Cut		Append device) Plug d	evice 🔘 U	pdate device		
÷ ()	e de la comencia de l	Сору							
	e	Paste		String for a fulltext search		Vendor:	<all vendors=""></all>		
_	\times	Delete		Name	Vendo	r		Version	Description
	ħ	Properties		 Miscellaneous Fieldbuses 					
	*:::	Add Object 🔸		CANbus					
	\bigcirc	Add Folder		🗄 📴 🔐 EtherCAT					
		Add Device		Ethernet Adapter					
		Update Device		Ethernet	3S - Sm	art Software	Solutions GmbH	3.5.15.0	Ethernet Link.
	Ô	Edit Object		EtherNet/IP					
		Edit Object With		E Modbus					

4.3 Configuration of the ethernet adapter

With a double click on the newly added Ethernet adapter you can open the configuration. Set the Ethernet interface and IP settings same as configured in the webinterface.

Devices 👻 🗸 🗶	🖬 Ethernet 🗙		
🖃 🎒 Untitled 1			
🖻 🔟 Device (Berghof MX6 Control)	General	Tabafasa atki	
⊨ 🗐 PLC Logic		Intenace: eni	
🖹 💮 Application	Ethernet Device Parameters	IP Address 192 . 168 . 1 . 1	
Library Manager 	Status	Subnet Mask 255 . 255 . 255 . 0	
🖮 🎆 Task Configuration 🖃 🍪 MainTask	Ethernet Device I/O Mapping	Default Gateway 0 . 0 . 0 . 0]
Ethernet (Ethernet)	Ethernet Device IEC Objects		
	Information		

4.4 Addition of the Profinet Controller

After that the Profinet Controller can be added under the ethernet adapter.

			(1	Add Device						
Devices		▼ ₽ X								
🖃 👘 Untitled 1		-		Name: PN_C	ontroller					
🖮 📆 Device (Berg	nof MX	6 Control)		Antinas						
E PLC Logi				Action:						
🖹 🍈 Арр	licatio	n		Append d	evice 🔘 Insert device 🥚) Plug de	evice 🔘 U	pdate device		
- 🎁 I	.ibrary	Manager		String for a fu	Illtext search		Vendor:	<all vendors=""></all>		
	PLC_PF	RG (PRG)						L		B 1.2
	Fask C	onfiguration		Name		Vendor	r		Version	Description
⊟ ş	🍃 Ma	inTask		🛛 🖃 📆 Fieldt	buses					
	- B	PLC_PRG		📗 😟 🖶 E	EtherNet/IP					
👔 Ethernet	(Ethe	met)		ll 🗄 🚮 F	Home&Building Automation					
	Ж	Cut			Aodhus					
		Сору		B ### P	Profinet IO					
	Paste			😟 🛲 Profinet IO Device	## Profinet IO Device					
	\times	Delete		⊟ <i>}</i>	# Profinet IO Master					
				-	PN-Controller	3S - Sma	art Software	Solutions GmbH	3.5.15.10	Profinet IO Controller
		Refactoring	÷							
	e	Properties								
	1000	Add Object								
	\bigcirc	Add Folder								
		Add Device								

4.5 Configuration of the Profinet Controller

With a double click on the newly added Profinet Controller, you can open the configuration. Check that the IP range for the Profinet devices are correct and match the network of the ethernet adapter.

Devices - 4 X	PN_Controller 🗙	
Untitled 1 Device (Berghof MX6 Control)	General	Station Name controller
Application	Overview	Default Slave IP Parameter
Library Manager	Topology	First IP Address 192 . 168 . 1 . 2
🖻 🌃 Task Configuration 🖨 🕸 MainTask	PNIO I/O Mapping	Last IPAddress 192 . 168 . 1 . 254 Subnet Mask 255 . 255 . 0
	PNIO IEC Objects	Default Gateway 0 . 0 . 0 . 0
PN_Controller.CommCyde	PNIO Parameters	IO Provider / Consumer Status
Ethernet (Ethernet)	Status	Application Stop> Substitute Values
	Information	Add to I/O Mapping
		Port Data
		Port-001 Peer-Station/Port 🗨
		Cable Length

4.6 Addition of the Profinet device

By using the "Add Device" function on the Profinet Controller it is now possible to add your Profinet devices. Please be aware that your Profinet device will only be shown in the device list the hardware description file (GDSML, XML) has been installed in CODESYS.



4.7 Configuration of the Profinet devices

With a double click on the newly added Profinet device, you can open the configuration. Check that the IP of the Profinet device is inside the range set in the Profinet Controller and check the communication settings.

Devices 👻 🗸 🗙	SINAMICS_G120C_PN_V4_5	×					
🖃 📋 Untitled1 💽							
Device (Berghof MX6 Control)	General	Station Name	SINAMICS-G	5120C-PN			
PLC Logic Application	Options	Station Status					
PLC_PRG (PRG)	I0x5	I0x5					
i≡-189 Task Configuration i=- S MainTask	PNIO Parameters	IP Address					
PLC_PRG	PNIO I/O Mapping	Subnet Mask					
PN_Controller.CommCyde	PNIO IEC Objects	PNIO IEC Objects Default Gateway 0 . 0 . 0 .		0.0			
Ethernet (Ethernet)	Status	Send Clock (ms) 1 Vatchdog (ms) 3					
SINAMICS_G120C_PN_V4_5 (SINAMICS G1	Information	Reduction Ratio	1	•	VLAN	ID	0 🜩
		Phase	-	•			
		RT Class	RT Cla	ass 1		•	
		Settings					
		🖍 Set all defau	ılt values		Read all v	alues	™∰Write all values
		Parameters	V	/alue	Datatype	Allowed values	Description
		General settings					
		Activate diagn	nostics Ir	nactive	Integer8		

Repeat the adding and configuration of Profinet devices until the device configuration in CODESYS matches the real hardware configuration which is connected to the PLC. When this is done download the project onto the PLC and start the application.

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