PNOZ m ES CC-Link with Mitsubishi Q-Series



Product

Type: Name: Manufacturer:

PNOZ m ES CC-Link PNOZmulti 2 series Pilz GmbH & Co. KG, Safe Automation

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Release	Date	Changes	Chapter
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Validity of Application Note

This present Application Note is valid until a new version of the document is published. This and other Application Notes can be downloaded in the latest version and for free from <u>www.pilz.com</u>.

For a simple search, use our <u>content document (1002400)</u> or the <u>direct search function</u> in the download area.

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We are grateful for any feedback on the contents.

October 2016

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1. Useful documentation

Reading the documentation listed below is necessary for understanding this application note. The availability of the indicated tools and safe handling are also presupposed with the user.

1.1. Documentation from Pilz GmbH & Co. KG

No.	Description	Item No.
1	Pilz international homepage, download section	www.pilz.com
2	PNOZmulti 2 Communication Interfaces	1002971-EN-XX
3	Technical Catalogue PNOZmulti	1001153-EN-XX
4	Operating Manual PNOZ m B0	1002660-EN-XX
5	Operating Manual PNOZ m ES CC-Link	1003817-EN-XX

2. Hardware configuration

2.1. Pilz products

No.	Descriptions	Order number	Version	Number
1	PNOZ m B0	772100	1.2	1
2	PNOZ m ES CC-Link	772135	1.0	1

2.2. Mitsubishi products

No.	Descriptions	Order number	Version	Number
1	Mitsubishi MELSEC Q00JCPU	Q00JCPU	-	1
2	Mitsubishi MELSEC QJ61BT11	QJ61BT11	-	1

2.3. Hardware configuration

2.3.1. Pilz products



Fig 1: PNOZmulti Configurator – Hardware Configuration

2.3.2. Mitsubishi products

MELSOFT Series GX Works2				
<u>Project</u> <u>E</u> dit <u>F</u> ind/Replace	<u>C</u> ompile <u>V</u> iew <u>O</u> nline	Debug Diagnostics	<u>T</u> ool <u>W</u> indow	<u>H</u> elp
🕒 🖻 🖪 🕘 🕘	• • • • • • • • • •	M 🕅 🖏 🗠 I 🗯	🖉 🗟 🗟 🖉	비타 많! 문 백 문! 또
1 🔁 🔳 🔛 🚟 🚟 🐯	* to* ② 册		*	- 3
Navigation 7 ×				
Project				
C 13 13 16 21 16-	New Project			ו
	Project Type:		ОК	
	Simple Project		Cancel	-
		Use <u>L</u> abel		
	PLC Series:			
	QCPU (Q mode)		-	
	PLC Type:			
	Q003		-	
	Language:			
	Ladder		•	

Fig 2: GX Works2 – Hardware Configuration

3. Used Software

3.1. Pilz products

No.	Descriptions	Version
1	PNOZmulti Configurator	9.6.0 Build 20

3.2. Mitsubishi products

No.	Descriptions	Version
1	GXWorks2	1.98C

4. Application Task

Create a CC-Link connection between PNOZ m ES CC-Link and Mitsubishi Q-serie with GXWorks2.

The Module PNOZ m ES CC-Link is a remote device which supports Version 1.1 of CC-Link and occupied 3 Stations.

CC-Link Address of PNOZ m ES CC-Link Module is set to 1 with a baud rate of 500 kb/s.

4.1. Mitsubishi PLC

4.1.1. Hardware Configuration

- Create a new project
- Select the PLC series and PLC Type

4.1.2. CC-Link Configuration

- Open the CC-Link Network Parameter (1)
- Select the Number of Modules (2)
- Assign the addresses Remote input / output and register (3)
- Edit the Station Information (4)

Project	mber of Modules		the CC
		+	uie cc
Parameter	Short T/O No	1 0000	
Network Parameter	Operation Setting	Operation Setting	1
	Type	Master Station	1
	Nastar Station Data Link Turca	PLC Parameter Auto Start -	
- Permete Descriverd	Master Station Data Link Type	Perote Net(Ver, 1 Mode)	-
Tratellineast Function Made	Mode Tatal Madula Casaastad		
December Function Modu	Presete instal (DV)	×100	
H M Program Setting	Remote input(RX)	×100	3
	Remote output(RY)	100	· · · · ·
Program	Remote register(RWr)	D1000	
MAIN	Remote register(RWw)	D2000	/
E Cocal Device Commen	Ver.2 Remote input(RX)		
🗄 🙋 Device Memory	Ver.2 Remote output(RY)		
- 🚾 Device Initial Value	Ver.2 Remote register(RWr)		
	Ver. 2 Remote register (RWw)		
	Special relay(SB)	SBO	6
	Special register(SW)	SWO	í.
	Retry Count	3	1
	Automatic Reconnection Station Count	1	
	Standby Master Station No.		
	PLC Down Select	Stop	
	Scan Mode Setting	Asynchronous 🗸	
1.4	Delay Time Setting	0	
100	Station Information Setting	4 Station Information	
	Remote Device Station Initial Setting	Initial Setting	
	Interrupt Settings	Interrupt Settings	

Fig 3: GX Works2 – Network Parameter

- > Configure the number of occupied stations, the PNOZ m ES CC-Link Occupied Stations 3 (1)
- Click to Check (2)
- Click to End (3)

	Constant man	Expanded Cyclic	Number of	Remote Station		Reserve/Invalid		Intel	igent Buff	fer Select(Word)		
Station No.	Station Type	Setting	Occupied Stations	Points		Station Select		Send	Receive	Automatic	atic	
1/1	Remote I/O Station 👻	Single 🔫	Occupied Stations 🗄 🔫	96Points	*	No Setting	-					
			Occupied Station 1 Occupied Stations 2 Occupied Stations 3 Occupied Stations 4	1								
	Intelligent device stati	on at station type al:	so includes local station	and standby ma	ste	station.						
			2		3							

Fig 4: GX Works2 – Network Parameter – Station Information

4.1.3. Download

- Build (1)
- Download (2)

MELSO	FT Seri	es GX Works2	emp\0_Mits	ubishi_P	rogramm	n\PNOZ_r	n_ES_CC-Link.	gxw - [0	ilobal Label	Setting	Global_Var	5]
<u>Project</u>	<u>E</u> dit	<u>Find/Replace</u>	<u>C</u> ompile	<u>V</u> iew	Online	De <u>b</u> ug	<u>D</u> iagnostics	Tool	Window	<u>H</u> elp		
1 🗅 🖻 F	96	0		:X 🗈		M 🕅	🕎 🗠 🚚	20		3 🎎 F	R 🛃 📫	t 🚑 🖳
			• 1a• 0	曲			2	-			1	- 9 -

Fig 5: GX Works2 – Build and Download

- Select the data transferred to the PLC (1)
- Execute (Start Download) (2)



Fig 6: GX Works2 – Download

			System Q
Register	Content		Address in Sample
RY 000F	virtual Input 015		Y100Y10F
RY 101F	virtual Input 1631		Y110Y11F
RY 202F	virtual Input 3247		Y120Y12F
RY 303F	virtual Input 4863		Y130Y13F
RY 404F	virtual Input 6479		Y140Y14F
RY 505F		virtual Input 8087	Y150Y15F
RWw00	virtual Input 96103	virtual Input 8895	D2000
RWw01	virtual Input 119112	virtual Input 111104	D2001
RWw02	-	virtual Input 120127	D2002
RX 000F	virtual Output 015		X100X10F
RX 101F	virtual Output 1631		X110X11F
RX 202F	virtual Output 3247		X120X12F
RX 303F	virtual Output 4863		X130X13F
RX 404F	virtual Output 6479		X140X14F
RX 505F		virtual Output 8087	X150X15F
RWr00	virtual Output 96103	virtual Output 8895	D1000
RWr01	virtual Output 119112	virtual Output 111104	D1001
RWr02	LED Status Base Module	virtual Output 120127	D1002
	Bit 0: OFAULT LED is ON		
	Bit 1: IFAULT LED is ON		
	Bit 2: FAULT LED is ON		
	Bit 3: DIAG LED is ON		
	Bit 4: RUN FS LED is ON		
	Bit 5: Reserved		
	Bit 6: Reserved		
	Bit 7: RUN ST LED is ON		
	(only for PNOZ m B1)		
	Request	Request	
RWw03	Segment number	Table number	D2003
	Boply	Poply	
RWr03	Керіу	Керіу	D1003
1111100	Segment number	Segment number	51000
RWr04	Fayloau Sagmant huta 1	Compart huto 0	D1004
	Pavload	Payload	
RWr05	Segment byte 3	Segment byte 2	D1005
	Pavload	Pavload	
RWr06	Seament byte 5	Segment byte 4	D1006
	Payload	Payload	
RWr07	Segment byte 7	Segment byte 6	D1007
	Payload	Payload	
RWr08	Segment byte 9	Segment byte 8	D1008
	Payload	Payload	
RWr09	Segment byte 11	Segment byte 10	D1009
		Payload	
RWr0A	-	Segment byte 12	D100A

4.1.4. PNOZ m ES CC-Link address assignment

Fig 7: PNOZ m ES CC-Link address assignment

4.1.5. Request of Table and Segments

If you need more information from the PNOZmulti System you can use the Table and Segments. The content of the data in the Table and Segments are explained in the document "PNOZmulti 2 Communication Interfaces".

We want to read out the Version of the Fieldbus Module. This information is stored in the Table 93, Segment 0 in Byte 10 and 11. In this example it is D1009 and shows the Version 1.1.



Fig 8: Request Table 93 Segment 0

4.2. PNOZmulti

4.2.1. PNOZmulti Configuration

- Create a new project
- Select Modules



Fig 9: PNOZmulti Configurator – Select Modules

Select the used Hardware



Fig 10: PNOZmulti Configurator - Select the used Hardware

Notice: To test the communication between the PNOZmulti and the Ethernet/IP Scanner you need at least one safety function in the PNOZmulti program.

Insert a safety function, e.x. E-STOP

🗿 Hardware Configuration 👘	User Program	
🔮 Project Manager 🔞 [/O List	📋 (Page 1) 🕱 🌵	🤕 🚜 🔪 🔹
Untitled2		Function Elements
(Page 1)		Se-stop
	NC2-	Safet, Gate
		Light Curtain
		🤏 Two-Hand Button
		Enable Switch

Fig 11: PNOZmulti Configurator – Insert E-Stop

Insert an output and connect it with the E-STOP

Bardware Configuration	User Program	
● P [≫] 1 (Page 1) ⊠	(+)	
⊿ 🔮 Unt		00
5. 		

Fig 12: PNOZmulti Configurator – Insert Output

Insert a virtual Output

H a1.00	Function Elements E-STOP Safety Gate
Double Click	Light Curtain
 Sectivate Input/Output	
Filter time 00 Pilter time 01 Pilter time 01 Pilter time 06 Pilter time 07 Pilter time 08 Pilter time 09 Pilter time 09 </td <td> uses: Test Pulse 0 * n the input circuit Select a virtual output Period (range 0-3000): 40 ms. </td>	 uses: Test Pulse 0 * n the input circuit Select a virtual output Period (range 0-3000): 40 ms.
Equipment ID 010 Enter equipment ID 011 012 013 014 Enter location description: 015 016 017 018 019 020 021 021 021	DK Cancel Help
022 023 024	EQUGate

Fig 13: PNOZmulti Configurator – Insert a virtual Output

Connect the virtual Output with the E-STOP to get the status of the E-STOP



Fig 14: PNOZmulti Configurator – virtual Output is connected with E-Stop

4.2.2. PNOZmulti Download

Select Interface

ndows Macro Diagnostics Help		
Q, Q, I 🖏 🕲 🙆 🗝 Q) EN ≠ (A) I II II 🙆 🌰	COM4 (USB)	1
	Not connected COM3	13
	COM4 (USB) 169.254.60.1 (Default)	

Fig 15: PNOZmulti Configurator – Select the Interface

- 🚮 🔾
0nline
Online

Fig 16: PNOZmulti Configurator – Download to PNOZmulti (1)



Fig 17: PNOZmulti Configurator – Download to PNOZmulti (2)

Password:	*	
Confirmation:	*	
.evel 2		
Password:	*	
Confirmation:	*	
.evel 3		
Password:	*	
Confirmation:	*	

Fig 18: PNOZmulti Configurator – Download to PNOZmulti (3)

Download Data	
Program size:	120 byte(s)
Total program size on chip ca	d: 778 byte(s) of 32768 byte(s)
Optional	
Equipment identifier	12 byte(s)
🔽 <u>E</u> lement user text	0 byte(s)
☑ I/ <u>O</u> user text	0 byte(s)
🔽 Page <u>u</u> ser text	0 byte(s)
Location description	4 byte(s)
📝 Display Messages	0 byte(s)
🕢 Macro Properties Data	0 byte(s) 🔓
Do not show again	

Fig 19: PNOZmulti Configurator – Download to PNOZmulti (4)

gnostics Help		
👌 🛹 🍪 EN -	• 🖓 🌆 🖓 🛍 🛍 COM4 (USB)	- 19 🔳
	PNO7multi Configurator	
		-
(Υ I	
	Downloading	

Fig 20: PNOZmulti Configurator – Download to PNOZmulti (5)

Diagnostics Help	n n → (~ 113 113 (113 113 113 113 113 113 113 11	- 🛐 🔾 🔳
	Se PNOZmulti Configurator	
	Download successful. Do you want to start PNOZmulti?	
	Yes No	

Fig 21: PNOZmulti Configurator – Download to PNOZmulti (6)

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