Interface description of

CHB-C-N Telnet Communication Function Block for Siemens TIA

Function-block is free to use. No liability for any mistakes!

Tested and approved with Siematic S7-1200 Fw 4.2

TIA Version 14

The CHB-C-B function block function provides the option to control the Festo Checkbox via Telnet communication.

It is stored in a full functional example project. All necessary software elements are stored in the folders "0001_CHB-C-B_Control".

To use the CHB function block in an existing TIA project, you can copy the folder "0001_CHB-C-N_Control" into your project via Drag and Drop.



Tag	Туре	description
EN	Binary input	By TIA defined input. By default True! No need to apply any
		value.
bConnect	Binary input	Initialises the function block and opens the communication
		path
bStart	Binary input	Puts the Checkbox into Run mode
bStop	Binary input	Puts the Checkbox into Stop mode
bVersion	Binary input	Shows the actual firmware Version of the Checkbox
bReset	Binary input	Resets the command line and feedback string
bShowPrg	Binary input	Shows the selected checkprogram of the Checkbox
bChangePrg	Binary input	Changes the check program to the value defined by iPrgNum
iPrgNum	Integer input	Defines the program number to be written by bChnagePrg
bRFW	Binary input	Reads the value of the flagword defined by strFlagword
bWFW	Binary input	Writes a value defined by strValue to the flagword defined
		by strFlagword
strFlagword	String Input	Defines the Flagword to be addressed by bRFW or bWFW
strValue	String Input	Value to be set with the WFW command
bDisconnect	Binary input	Closes the communication channel
strDataRec	String output	Output of the result data as a string
ENO	Binary input	By TIA defined input. By default True! No need to apply any
		value.

The function block is equipped with the following interface signals:



Important Note!

The binary signals are triggered with the rising edge. The function block is **busy** as long as any binary input stays HIGH.

Data can only be transmitted, when the Checkbox is in STOP mode! Otherwise there will be an Error message at result output "strDataRec".

Remark:

The online change of communication parameters, like IP address, will cause Errors in communication.

Remedy by download PLC program and reset PLC.

Requirements and Preparations

IP address range of PLC and Checkbox CHB-C-N must fit together.

The IP address of the Checkbox can be adjusted using the FestoFieldDeviceTool. This is available at <u>www.festo.com/sp</u>.

Example:

		Festo Field Device Tool		- = X
Aktionen Extras Hilfe				FESTO
Suche Firmware Repairen Favori	therm Netzwerk Diagnose Sicherm Wied	derherstellen Identifikation Versionen Bo	Teinet	
Listendarstellung Grafische Darstellung	Servic	e	Web	▼ X 🖾
Gerätename	IP Adresse	Gerätetyn	MAC	Eirmware
* * CECC-X-M1-MV-S1	192.168.4.2	CECC-X-M1-MV-S1	00:0E:F0:4D:3C:4B	3.4.7+f5f88e0a3800M.20170823.11857
🚖 🤨 🥴 BE-CT_TEMP_BAR	10.101.65.105	CPX-CEC-C1-V3	00:0E:F0:4C:BD:2C	2.0.12.0.9221 (7b80011ba009)
🚖 🙅 🔹 CHB-Pool-Device	192.168.2.20	CHB-C-N	00:0E:F0:49:3F:3D	3.6.1.0.9808 (f86328a0a483)
📄 🎓 🙅 ⊗ EMCA_EtherNetIP_Entw	10.168.2.20	EMCA	00:0E:F0:4A:9C:33	1.2.0.8 after
	Gerätenane 🗐 Adaußie Netzwehr IP-Adresse: Subnetzmaske: Standardgateway DNS-Server: IP-Adresse ad @ Folgende IP-A IP-Adresse: Subnetzmaske: Standardgateway DNS-Server:	Sizes Concer rformationer: 192,168,2,20 255,255,0,0 :: 0,0,0,0 tomatisch beziehen: dresse verwender: 192,168,2,20 255,255,0,0 r: 0,0,0,0	ι 2α	@ → ∧ \ # ♥ [@ • , @ • V2621.60762 .::

Search for the device and mark it. Then press on "Network". Following you can change Checkbox settings in the editing window.

Required settings of system parameters of the Checkbox by software CheckKon. Use version 4.3 or higher. This is available at <u>www.festo.com/sp</u>.

Establish connection and access system parameter window:

5 - CheckKon -	unnamed					A. B. ST. ST. ST. ST. ST. B.
File Edit Vi	ew Acti	on Mode Navigat	te Extra Win	ndow Help		
🗎 🗃 🖬	Systen	n state	Alt+S	🛛 🕱 🕱 🔰 😽		
	Systen	n information	Alt+Y			
	Systen	n parameter	Alt+P ┥	—		
	Part co	ontour	Alt+K			
	Grey s	cale line	Alt+L			
	Live in	nage	Alt+I			
	Systen	n documentation	Alt+O			
	Featur	e graph	Alt+G			
	Part st	atistics	Alt+T			
	Check	program manager	Alt+M			
		System state			System parameter	
		Operating mode: A	uto mode			
		S	System started		H-T System	
		Mode: D	Diagnostic mode		E Camera and image	
		State: S	- System ready		Conveying system	
			,,,			
		State name	State			
		Checkprogr. name	Checkprogram			
		Part data transfer Send line	Features Off			
		Recorded parts in	no recorded par	rts		
					1 ¹	

Two important settings are necessary for a successful communication. "Telnet server = on (general operation)" and "Select check program by = CheckKon/Telnet".



Siemens PLC

Edit the IP address for the Checkbox in the communication block:

Project tree	0	1.	R2	PLC_42 [CPU 1215	FC DC/DC/RLY] > Pro	gram blocks 🕨	0001_CHE	B-C-N_Control	▶ 000 ⁻	1_Kom CHB	-C-N Telne	t ▶ 0001_DB_Telnet ▶ Software PLC_1_
Devices		Г										
B B			🛫 💱 🔩 🚒 📰 😤 Keep actual values 🔒 Snapshot 🦄 🧠 Copy snapshots to start values 😹 🕼 Load start values as actual values 💐 🖳									
			Soft	tware PLC_1_Connec	tion_DB_1							
🔥 Devices & networks		~	1	Name	Data type	Start value	Retain	Accessible f	Writa	Visible in	Setpoint	Comment
PLC_42 [CPU 1215FC DC/DC/RLY]		1	-01	▼ Static								
Device configuration		2	-01	InterfaceId	HW_ANY	64			V			HW-identifier of IE-interface submodule
😼 Online & diagnostics		3	-01	ID ID	CONN_OUC	4		v	 Image: A start of the start of			connection reference / identifier
🔻 🛃 Program blocks	•	4	-01	 ConnectionType 	Byte	16#0B			V			type of connection: 11=TCP/IP, 19=UDP (17=TCP
📑 Add new block		≡ 5	-01	 ActiveEstablished 	Bool	true			 Image: A start of the start of			active/passive connection establishment
GOO1_CHB-C-N_Control	•	6	-01	RemoteAddress	IP_V4				V			remote IP address (IPv4)
0001_Digital_Inputs [FC7]	•	7	-01	ADDR	Array[14] of Byte				V			IPv4 address
0001_Digital_Outputs [FC5]	•	8	-01	ADDR[1]	Byte	192			V			IPv4 address
0001_FB_CHB-C-N [FB1]	•	9	-01	ADDR[2]	Byte	168			V			IPv4 address
0001_CHB-C-N_Variables	•	1) -	ADDR[3]	Byte	2		V	V			IPv4 address
D001_Kom CHB-C-N Telnet	•	1		 ADDR[4] 	Byte	20		V	V			IPv4 address
FC_TeinetReset (FC8)	•	1	2 🕣	 RemotePort 	UInt	9999		V	V	 Image: A start of the start of		remote UDP/TCP port number
🐲 FB_TelnetCharToString [FB2]	•	1	3 -01 -	 LocalPort 	UInt	9999		V	V			local UDP/TCP port number
FB_TelnetCommunication [FB3]	•											
FB_TelnetConnection [FB4]	•											
0001_DB_Telnet	•											
DB_Telnet [DB5]	•											
FB_TelnetCharToString_DB [DB7]	•											
FB_TelnetComunication_DB [DB14]	•											
FB_TelnetConnection_DB (DB15)	•											
Software PLC_1_Connection_DB_1 [DB6]	•											
🔻 🛅 Main												
🜁 Main [OB1]	•											
MAIN_DB [DB1]	•	~										

Detailed view:

Project tree		
Devices		
20		
ᡖ Devic	es & networks	
👻 🚺 PLC_4	42 [CPU 1215FC DC/DC/RLY]	2
📑 De	evice configuration	
V. Or	nline & diagnostics	
🔻 🛃 Pr	ogram blocks	•
	Add new block	
-	0001_CHB-C-N_Control	•
	0001_Digital_Inputs [FC7]	•
	0001_Digital_Outputs [FC5]	•
	4 0001_FB_CHB-C-N [FB1]	•
•	🔚 0001_CHB-C-N_Variables	•
-	🔚 0001_Kom CHB-C-N Telnet	•
	FC_TelnetReset [FC8]	•
	FB_TelnetCharToString [FB2]	•
	FB_TelnetCommunication [FB3]	•
	FB_TelnetConnection [FB4]	•
	▼ 🔚 0001_DB_Telnet	•
	🥃 DB_Telnet [DB5]	•
	🥃 FB_TelnetCharToString_DB [DB7]	•
	FB_TelnetComunication_DB [DB14]	•
	FB_TelnetConnection_DB [DB15]	
	Software PLC_1_Connection_DB_1 [DB6]	•
-	Main	•
	📲 Main [OB1]	•
_	MAIN_DB [DB1]	•

	R2 > PLC_42 [CPU 1215FC DC/DC/RLY] > Program blocks > 0001_CHB-C-N_Control > 0001_Kom CHB-C-N Telnet > 0001_DB_Telnet > Software PLC_1_									
1										
3	📝 🛒 🐛 🛃 🧮 🥰 Keep actual values 🔒 Snapshot 🍬 🧠 Copy snapshots to start values 👢 🥵 Load start values as actual values 🏮									
L	Software PLC_1_Connection_DB_1									
	N	ame	Data type	Start value	Retain	Accessible f	Writa	Visible in	Setpoint	Comment
1		Static								
2		InterfaceId	HW_ANY	64		V	V			HW-identifier of IE-interface submodule
з		ID	CONN_OUC	4		V	V			connection reference / identifier
4		ConnectionType	Byte	16#0B		V	V	V		type of connection: 11=TCP/IP, 19=UDP (17=TCP
5		ActiveEstablished	Bool	true		V	V	\checkmark		active/passive connection establishment
6		 RemoteAddress 	IP_V4			V	V	V		remote IP address (IPv4)
7		ADDR	Array[14] of Byte			V	V	V		IPv4 address
8		ADDR[1]	Byte	192		V	V	V		IPv4 address
9		ADDR[2]	Byte	168		V	V	V		IPv4 address
1) 🕣	ADDR[3]	Byte	2		V	V	V		IPv4 address
1		 ADDR[4] 	Byte	20		V	V	V		IPv4 address
1.	. 🕣 🗖	RemotePort	UInt	9999			V	V		remote UDP/TCP port number
1		LocalPort	UInt	9999			V	V		local UDP/TCP port number

After all settings are finished the communication can be established.

Table of most common Checkbox flagwords

Flagword Basic Information		
Current Check Program No.	250	only Read Access!
System		
Check programs		
Selected Check Program	5008	Range: 1 256
Operating mode		
Lock Teach Button	5011	not locked(0) / locked(1)
Counter settings		
Counter Mode	5020	off(0) / on(1)
Counter Reached Position	5021	range: 1 5000 mm
Camera and Image		
Line Rate	5451	range: 10028539 (Hertz)
Encoder To Line Frequency Ratio	5452	range: 1 64
Greylevel Threshold	5455	range: 0 255
Upper Limit Viewing Area	5456	range: 8 2055 (on default Resolution)
Lower Limit Viewing Area	5457	range: 8 2055 (on default Resolution)
Advanced image parameters Forced stop of analysis		
Forced Stop of Analysis Mode	5600	off(0) / on(1)
Max. Part Length	5601	range: 10,0(100)1000,0 (10000) mm (real Value = digit /10)

Define viewing areas to be ignored Ignore Center Area of Part	5620	off(0) / on(1)
Conveying System		
Part feeding system		
Activate Feeding System in Teach Mode	5802	off(0) / on(1)
Test part transport-system		
Blow-Free Process	5830	off(0) / on(1)
Extension of Blow-Free Process	5831	range: 10 10000 mm
Minimum Distance between Good Parts	5840	range: 0 10000 mm
Minimum Distance; select orientations mode	5841	check only good parts in orientation_1(0) / check all good parts(1) / check only good parts in orientation 2 X(2) / check all good parts, optimized for turning station (3)

Actuators

Correlation between check results and actuator number

First Actuator Good Parts	5900	range: off(0) / 1 4
Second Actuator Good Parts	5901	range: off(0) / 1 4
Actuator Jamming Area Full	5902	range: 1 4
Actuator Counter Reached	5903	range: 1 4
Good Part is wrongly orientated as from orientation number = X	5904	range: 1 8
Actuator Wrong Orientation	5905	range: 1 4
Actuator Bad Part	5906	range: 1 4
Actuator Teach Parts	5907	range: 1 4
Actuator Parts by Forced Stop of Analysis	5909	range: 1 4
First Actuator Blow-Free Process	5910	range: 1 4
Second Actuator Blow-Free Process	5911	range: 1 4
Actuator for part is Inside of Minimum Distance	5912	range: 1 4
Length-Factor for activating time referring to part length	5950	range: 0,00 500 (real Value = digit /100)

For more flagword numbers please contact Festo service.