Connecting to a WAGO Controller via Modbus (TCP)

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Hardware

- 1x WAGO fieldbus coupler 750-352/000-001
- 1x digital input terminal 750-401
- 1x digital output terminal 750-504
- 1x end terminal 750-600

Requirements for the WAGO controller

- Assign the IP address (for example with the tool WAGO Ethernet Settings).
- Activate Modbus protocol (TCP) (for example with the tool WAGO Ethernet Settings Protocol).
- Get the manual for the fieldbus coupler.

Requirements for CODESYS

• Create a standard project and define your device (for example CODESYS Control Win V3).

Scan the network and select the device.

Modbus.project* - CODESYS	ţ		
Elle Edit View Project Build Online Debug Tools Wir	indow <u>H</u> elp ‱ + ⊡ ima i os ∞ ⊾ = अ		
Devices v 🗸 🛪 🖌	Device X		
🗏 🎒 Modbus 🔳 📄		\sim	
Device (CODESYS Control Win V3)	Communication Settings	Scan Network Gateway • Device •	
B B PLC Logic			
C Application	Applications		
Library Manager Iliprary Manager Iliprary PAC PRG (PRG)	Backup and Restore		
□ - 🙀 Task Configuration □ - 🥸 MainTask	Files		
니션] PLC_PRG	Log	Gateway	
	PLC Settings	IP-Address: localhost	Device Name: KERNTPC
	PLC Shell	Ports	Device Address:
	Users and Groups	1217	0301.4000.0358
	Task Deployment		Target ID: 0000 0001
	rask Deproyment		Target Type:
	Status		4096
1	Information		Target Vendor: 35 - Smart Software Solutions GmbH
			Target Version: 3.5.11.0

• In the device tree, add an Ethernet adapter, a Modbus_TCP_Master, and a Modbus_TCP_Slave.



Settings on the Ethernet adapter

• Tab General

Define the network interface to be used.

A If a target system is not defined yet, then the error message "Gateway not configured" is displayed.



Settings on Modbus_TCP_Master

• Tab General

Activate the automatic establishment of a connection after interruption.

Devices - 4 ×	Device PLC_PRG	Ethernet Modbus_TCP_Master X	6
🖃 🗐 ModbusWagoPLC 💽			
🖹 🕤 Device (CODESYS Control Win V3)	General	Modbus-TCP	
⊟		Response Timeout (mo) 1000	WUDBO2
	ModbusTCPMaster I/O Mapping	Response filleout (ins) 1000	
Library Manager		Socket Timeout (ms) 10 🚔	
	ModbusTCPMaster Parameters		
		Auto-reconnect	
ask Configuration	Status		
🖃 💝 MainTask			
PLC_PRG	Information		
🖻 🕤 👔 Ethernet (Ethernet)			
🚊 💮 Modbus_TCP_Master (Modbus TCP Master)			
Modbus_TCP_Slave (Modbus TCP Slave)			

Settings on Modbus_TCP_Slave

• Tab General

Specify the *IP address* of the WAGO controller and leave the *Unit ID* blank. For Modbus via TCP/IP, the slave is identified by means of the IP address.

Devices 🗸 🗸 🕂	×	Device PLC_PRG	💮 Ethernet 🛛 🔐 Modbus_T	CP_Master Modbus_TCP_	Slave X
ModbusWagoPLC					
🖃 🏢 Device (CODESYS Control Win V3)		General	Modbus-TCP		
🖹 🗐 PLC Logic					MODBUS
🖹 🧔 Application		Modbus Slave Channel	Slave IP Address:	192 . 168 . 99 . 179	
👘 📶 Library Manager			Unit-ID [1247]		
PLC_PRG (PRG)		Modbus Slave Init	December Trees (rec)	1000	
🖮 🎆 Task Configuration		ModbuoTCDElavia Darametera	Response limeout (ms)	1000	
🖹 🍪 MainTask		Moubus replaye parameters	Port	502	
PLC_PRG		ModbusTCPSlave I/O Mapping			
🖮 📺 Ethernet (Ethernet)		incosofic start you apply			
🖮 折 Modbus_TCP_Master (Modbus TCP Mast	er)	Status			
Modbus_TCP_Slave (Modbus TCP Slave	ave)				
		Information			
	- II.				

• Tab Modbus Slave Channel

Create a channel for reading the input adapter:

ModbusChannel	
Channel	
Name	Channel 0
Access Type	Read Colls (Function Code 1)
Trigger	Cycle Time (ms) 100
Comment	
READ Register	
Offset	•
Length	1
Error Handling	Keep last Value
WRITE Register	
Offset	
Length	1
	<u>QK</u> <u>Cancel</u>
Comment READ Register Offset Length Error Handling WRITE Register Offset Length	I Keep last Value ▼ I I

Create a channel for switching the contacts of the output adapter:

ModbusChannel	X
Channel	R
Name	Channel 1
Access Type	Write Multiple Registers (Function Code 16)
Trigger	Rising edge Cycle Time (ms) 100
Comment	
READ Register	
Offset	0x0000 👻
Length	0
Error Handling	Keep last Value 👻
-WRITE Register -	
Offset	0x0000 -
Length	1
	<u>O</u> K <u>C</u> ancel



• Tab Modbus TCP Slave I/O Mapping

So that the Modbus addresses are updated even without variable mapping, you have to activate this explicitly:

Devices v A X	Device PLC_PRG	🕤 Ethernet 🕤 Mod	bus_TCP_Master	Modbus_TCP_S	lave X					
E- ModbusWagoPLC		e	6 14							
B- M Device (CODESYS Control Win V3)	General	Find	Filter Sho	v all			•			
PLC Logic	Madhua Claus Chanad	Variable	Mapping Channel	Address	Туре	Unit	Description			
= O Application	Modbus Slave Channel	**	Channel 0	%DX0.0	BIT		0x0000			
Library Manager	Modbus Slave Init	- **	Channel 1	%QX0.0	BIT		Trigger Variable			
PLC_PRG (PRG)		<u> <u> </u> <u></u></u>	Channel 1	%QW1	WORD		0x0000			
Task Configuration	ModbusTCPSlave Parameters									
III (35 MainTask										
C C C C C C C C C C C C C C C C C C C	ModbusTCPSlave I/O Mapping									
III Ethernet (Ethernet)										
Modeus TCP_Master (Modeus TCP Master)	Status									
[]] Houses_rep_save (Houses for slave)	Information									
	Inormation									
								Reset mapping	Always update variables: Enabled 2 (always in bus cycle task)
		IEC Objects								
		Variable	Manning Type							
			Made uT	OCI200						
		+	w Modbusite							
		👒 = Create new variable	🎲 = Map to existin	g variable						
		1.								

Download the project to the controller and start it

Devices - A X	Device PLC_PRG	Ethernet	Modbus_TCP_Master	/ 🗃 M	lodbus_TCP_Sl	avex					
ModpuswagoPLC Device [connected] (CODESYS Control Win V3)	General	Find	Filter Show all								
PLC Logic	Madhan Chanada	Variable	Mapping	Channel Channel 0	nnel Address	s Type	Current Value	Prepared Value	e Unit	Description 0x0000	
- O Application [run]	Modbus Slave Channel	* >					TRUE				
Library Manager	Modbus Slave Init	- *		Channel 1	%QX0.0	BIT	FALSE			Trigger Variable	
PLC_PRG (PRG)		÷		Channel 1	%QW1	WORD	2			0x0000	
I ask Configuration	ModbusTCPSlave Parameters	*>		Bit 0	%QX2.0	BOOL	FALSE				
- Maintask		* ø		Bit 1	%QX2.1	BOOL	TRUE				
Ethernet (Ethernet)	ModbusTCPSlave I/O Mapping	*>		Bit 2	%QX2.2	BOOL	FALSE				
Competence (contenet)		* ø		Bit 3	%QX2.3	BOOL	FALSE				
Modbus TCP Slave (Modbus TCP Slave)	Status	- *>		Bit 4	%QX2.4	BOOL	FALSE				
I Houbus_ICP_slave (Houbus ICP slave)	Information	*>		Bit 5	%QX2.5	BOOL	FALSE				
		- 50		Bit 6	%QX2.6	BOOL	FALSE				
		···· **		Bit 7	%QX2.7	BOOL	FALSE				
		A 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1		Bit 8	%QX3.0	BOOL	FALSE				
		····· *		Bit 9	%QX3.1	BOOL	FALSE				
		• •		Bit 10	%QX3.2	BOOL	FALSE				
		····· *		Bit 11	%QX3.3	BOOL	FALSE				
				Bit 12	%QX3.4	BOOL	FALSE				
		· · · · · · · · · · · · · · · · · · ·		Bit 13	%QX3.5	BOOL	FALSE				
		2		Bit 14	%QX3.6	BOOL	FALSE				
		····· **		Bit 15	%QX3.7	BOOL	FALSE				