

Application Note

Kuhnke Vico 404, 704, 1004

Modbus RTU

Modbus TCP

E 854 EN

28.03.2019

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1 Vorwort

1.1 Imprint

1.1.1 Contact details

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1.1.2 Versionshistorie

Handbuchhistorie

Date	Comments / Changes
28.03.2022	first version

2 General

2.1 Scope of validity

Kendrion PLCs ab CODESYS Version 3.5 SP16 Patch40

2.2 System requirements

Modbus RTU: RS485 Interface

Modbus TCP: Ethernet- Interface

2.3 Description

Kendrion controllers as Modbus masters.

Many units on the market have a Modbus interface integrated as standard. No special bus hardware is required for implementation, which makes integration inexpensive.


Modbus is an open communication protocol developed by Modicon. It is based on a master/slave or client/server architecture.

RTU stands for Remote Terminal Unit. Communication takes place via RS485 or RS232.

TCP is based on Ethernet TCP/IP client-server communication.

3 Quick Start Guide

3.1 Modbus RTU

	<p>Information</p> <p><i>There were two bugs in CODESYS that have been fixed.</i></p> <ul style="list-style-type: none"> • <i>CDS-54579 (Modbus Configurator - Com-Port: Parameter Flow Control)</i> • <i>CDS-14320 (SysCom: wrong datatype for bRTSControl and bDtrControl, has to be BYTE)</i> <p><i>In the Kendrion controllers from CODESYS version 3.5 SP16 Patch40 the bugfixes have been implemented. For RS485 communication, use the KICS Modbus COM, as this sets the RTS settings of the serial interface correctly.</i></p>
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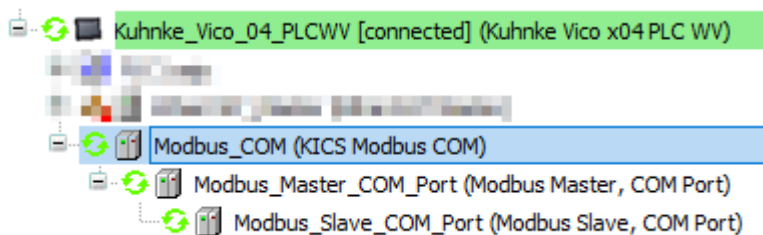
In this example, a Modbus IO is to be connected to a Kuhnke Vico 04 PLC.

The device tree is built up as follows:

- Control system (Kuhnke Vico 04 PLC WV)
 - KICS Modbus COM
 - Modbus Master
 - Modbus Slave

You will find the unit description files for each unit in our product finder under

[Touchpanel SPS \(kendrion.com\)](http://kendrion.com)



3.1.1 Configuration

After you have inserted the units in the unit tree, open the respective configuration page of the unit with a double click.

3.1.1.1 Modbus_COM (KICS Modbus COM)

The settings for the serial interface are made in the "General" tab.

The screenshot shows the configuration window for 'Modbus_COM'. The left sidebar contains a tree view with the following items: PCI-Bus IEC Objects, General (selected), SerialPort Parameters, Status, and Information. The main area is titled 'Serial Port Configuration' and contains the following settings:

COM port	1
Baud rate	9600
Parity	NONE
Data bits	8
Stop bits	1

For the number of the COM port, please refer to the operating instructions of the control unit used.

3.1.1.2 Modbus_Master_COM_Port (Modbus Master, COM Port)

The protocol and the timing for the Modbus communication are set in the "General" tab.

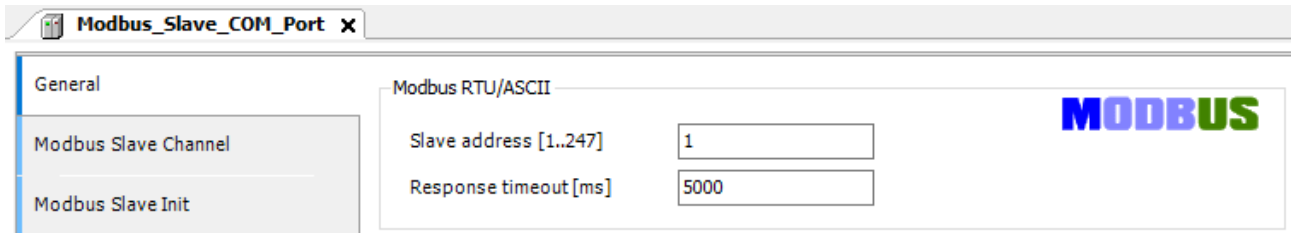
The screenshot shows the configuration window for 'Modbus_Master_COM_Port'. The left sidebar contains a tree view with the following items: General (selected), ModbusGenericSerialMaster I/O Mapping, ModbusGenericSerialMaster IEC Objects, and Status. The main area is titled 'Modbus RTU/ASCII' and contains the following settings:

Transmission mode	<input checked="" type="radio"/> RTU <input type="radio"/> ASCII
Response timeout (ms)	5000
Time between frames (ms)	100
<input type="checkbox"/> Auto-restart communication	

The 'MODBUS' logo is visible in the top right corner of the main area.

3.1.1.3 Modbus_Slave_COM_Port (Modbus Slave, COM Port)

The slave address and the timing for the slave are set in the "General" tab.

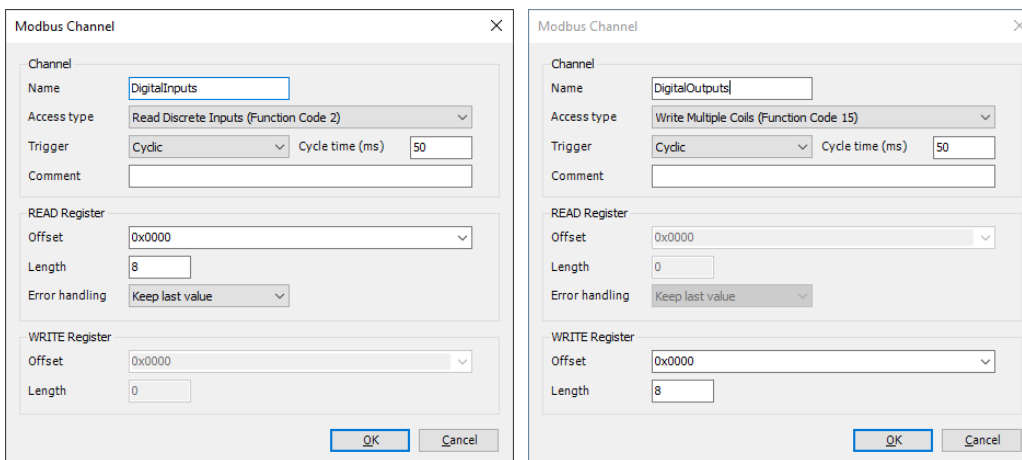


The process data channels are defined in the "Modbus Slave Channel" tab. For the available process data, please refer to the operating instructions of the Modbus slave used.

In this example, a device with 8 digital inputs and 8 digital outputs was used. The operating instructions of the Modbus slave contain the following information:

- Read Digital Input Value
 - Function Code: 0x02 (Read Discrete Inputs)
 - Starting Channel: 0x0000-0x0007
 - Input Channel Numbers: 0x0001-0x0008
- Write Digital Output Value
 - Function Code: 0x0F (Write Multiple Coils)
 - Starting Channel: 0x0000-0x0007
 - Input Channel Numbers: 0x0001-0x0008

The "Add Channel" button is used to add a channel.



The following channels are now available:

Channel	Name	Access Type	Trigger	READ Offset	Length	Error Handling	WRITE Offset	Length	Comment
0	DigitalInputs	Read Discrete Inputs (Function Code 02)	Cyclic, t#50ms	16#0000	8	Keep last value			
1	DigitalOutputs	Write Multiple Coils (Function Code 15)	Cyclic, t#50ms				16#0000	8	

From this, the corresponding I/O mapping is generated for the slave:

Variable	Mapping	Channel	Address	Type	Unit	Description
		DigitalInputs	%IB0	ARRAY [0..0] OF BYTE		Read Discrete Inputs
		DigitalInputs[0]	%IB0	BYTE		Read Discrete Inputs
xSlave1DI0		Bit0	%IX0.0	BOOL		0x0000
xSlave1DI1		Bit1	%IX0.1	BOOL		0x0001
xSlave1DI2		Bit2	%IX0.2	BOOL		0x0002
xSlave1DI3		Bit3	%IX0.3	BOOL		0x0003
xSlave1DI4		Bit4	%IX0.4	BOOL		0x0004
xSlave1DI5		Bit5	%IX0.5	BOOL		0x0005
xSlave1DI6		Bit6	%IX0.6	BOOL		0x0006
xSlave1DI7		Bit7	%IX0.7	BOOL		0x0007
		DigitalOutputs	%QB0	ARRAY [0..0] OF BYTE		Write Multiple Coils
		DigitalOutputs[0]	%QB0	BYTE		Write Multiple Coils
xSlave1DO0		Bit0	%QX0.0	BOOL		0x0000
xSlave1DO1		Bit1	%QX0.1	BOOL		0x0001
xSlave1DO2		Bit2	%QX0.2	BOOL		0x0002
xSlave1DO3		Bit3	%QX0.3	BOOL		0x0003
xSlave1DO4		Bit4	%QX0.4	BOOL		0x0004
xSlave1DO5		Bit5	%QX0.5	BOOL		0x0005
xSlave1DO6		Bit6	%QX0.6	BOOL		0x0006
xSlave1DO7		Bit7	%QX0.7	BOOL		0x0007

3.2 Modbus TCP

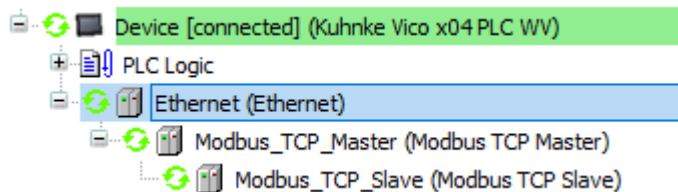
In this example, a Modbus IO is to be connected to a Kuhnke Vico 04 PLC.

The device tree is built up as follows:

- Control system (Kuhnke Vico 04 PLC WV)
 - Ethernet
 - Modbus TCP Master
 - Modbus TCP Slave

You will find the unit description files for each unit in our product finder under


[Touchpanel SPS \(kendrion.com\)](https://www.kendrion.com)

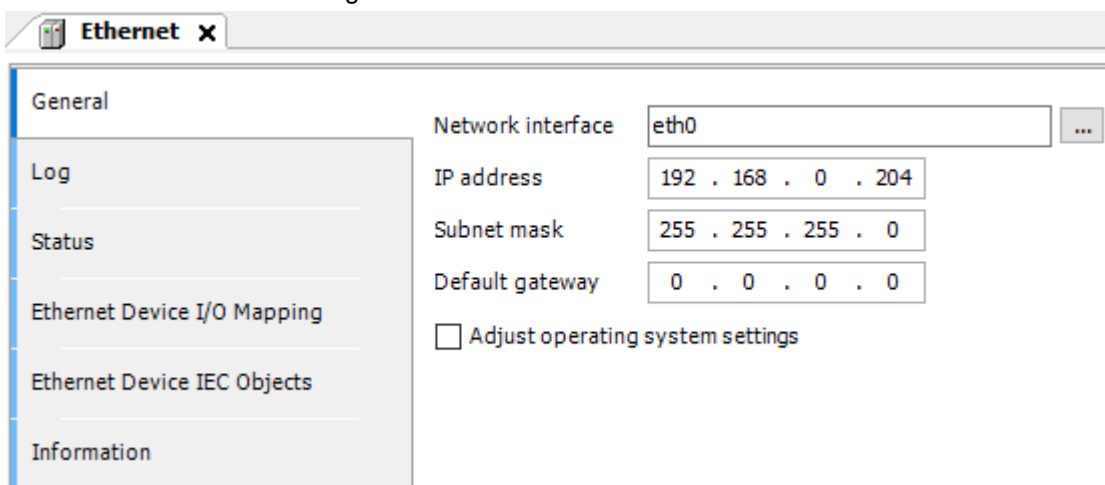


3.2.1 Configuration

After you have inserted the units in the unit tree, open the respective configuration page of the unit with a double click.

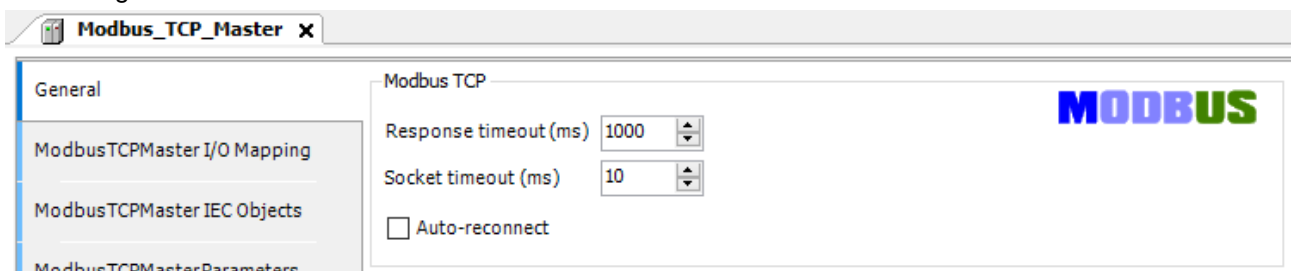
3.2.1.1 Ethernet (Ethernet)

The settings for the Ethernet interface are made in the "General" tab. The settings can also be adopted from a connected control unit using the button .



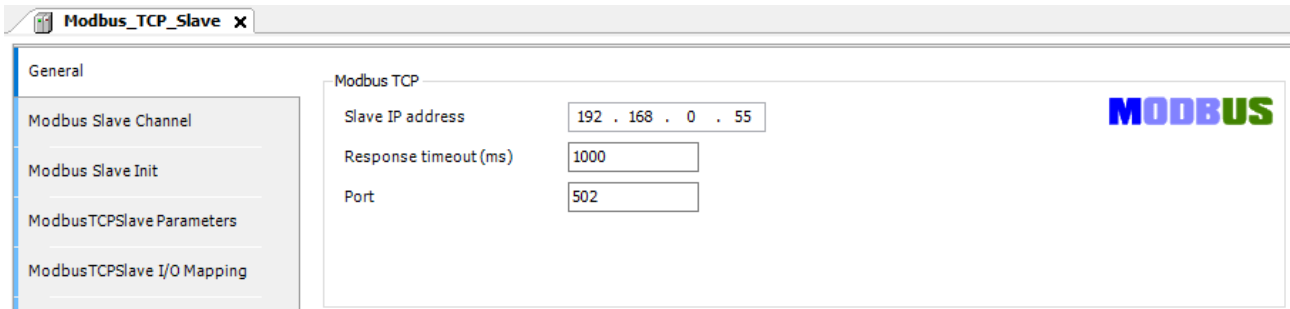
3.2.1.2 Modbus_TCP_Master (Modbus TCP Master)

The timing for the Modbus communication is set in the "General" tab.



3.2.1.3 Modbus_TCP_Slave (Modbus TCP Slave)

The slave address and the timing for the slave are set in the "General" tab.

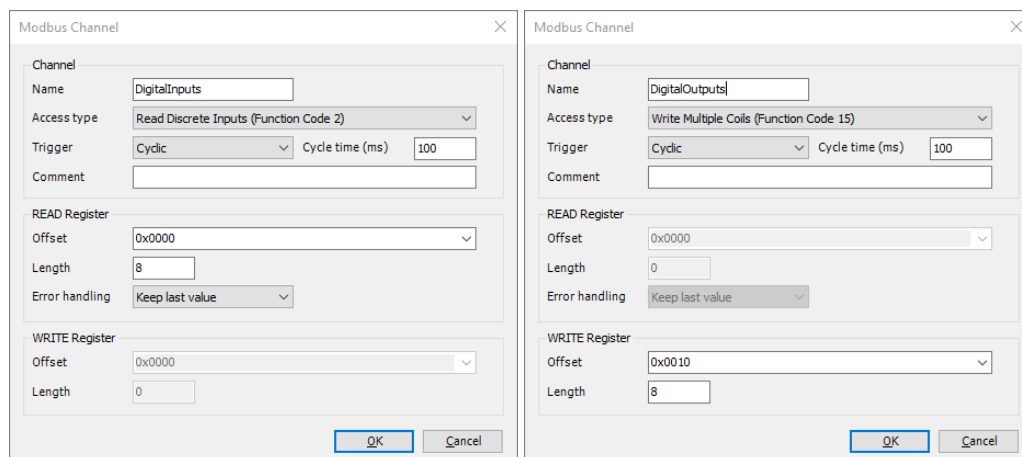


The process data channels are defined in the "Modbus Slave Channel" tab. For the available process data, please refer to the operating instructions of the Modbus slave used.

In this example, a device with 8 digital inputs and 8 digital outputs was used. The operating instructions of the Modbus slave contain the following information:

- Read Digital Input Value
 - Function Code: 0x02 (Read Discrete Inputs)
 - Starting Channel: 0x0000-0x0007
 - Input Channel Numbers: 0x0001-0x0008
- Write Digital Output Value
 - Function Code: 0x0F (Write Multiple Coils)
 - Starting Channel: 0x0010-0x0017
 - Input Channel Numbers: 0x0001-0x0008

The "Add Channel" button is used to add a channel.



The slave used in this example has been configured as follows:

Channel	Name	Access type	Trigger	READ Offset	Length	Error Handling	WRITE Offset	Length	Comment
0	DigitalInputs	Read Discrete Inputs (Function Code 02)	Cyclic, t#100ms	16#0000	8	Keep last value			
1	DigitalOutputs	Write Multiple Coils (Function Code 15)	Cyclic, t#100ms				16#0010	8	

From this, the corresponding I/O mapping is generated for the slave:

Modbus_TCP_Slave x							
Find Filter Show all Add FB for IO Channel... Go to							
Variable	Mapping	Channel	Address	Type	Unit	Description	
		DigitalInputs	%IB0	ARRAY [0..0] OF BYTE		Read Discrete Inputs	
		DigitalInputs[0]	%IB0	BYTE		Read Discrete Inputs	
xSlave1DI0		Bit0	%IX0.0	BOOL		0x0000	
xSlave1DI1		Bit1	%IX0.1	BOOL		0x0001	
xSlave1DI2		Bit2	%IX0.2	BOOL		0x0002	
xSlave1DI3		Bit3	%IX0.3	BOOL		0x0003	
xSlave1DI4		Bit4	%IX0.4	BOOL		0x0004	
xSlave1DI5		Bit5	%IX0.5	BOOL		0x0005	
xSlave1DI6		Bit6	%IX0.6	BOOL		0x0006	
xSlave1DI7		Bit7	%IX0.7	BOOL		0x0007	
		DigitalOutputs	%QB0	ARRAY [0..0] OF BYTE		Write Multiple Coils	
		DigitalOutputs[0]	%QB0	BYTE		Write Multiple Coils	
xSlave1DO0		Bit0	%QX0.0	BOOL		0x0010	
xSlave1DO1		Bit1	%QX0.1	BOOL		0x0011	
xSlave1DO2		Bit2	%QX0.2	BOOL		0x0012	
xSlave1DO3		Bit3	%QX0.3	BOOL		0x0013	
xSlave1DO4		Bit4	%QX0.4	BOOL		0x0014	
xSlave1DO5		Bit5	%QX0.5	BOOL		0x0015	
xSlave1DO6		Bit6	%QX0.6	BOOL		0x0016	
xSlave1DO7		Bit7	%QX0.7	BOOL		0x0017	

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