Modbus TCP – Slave protocol

Driver documentation

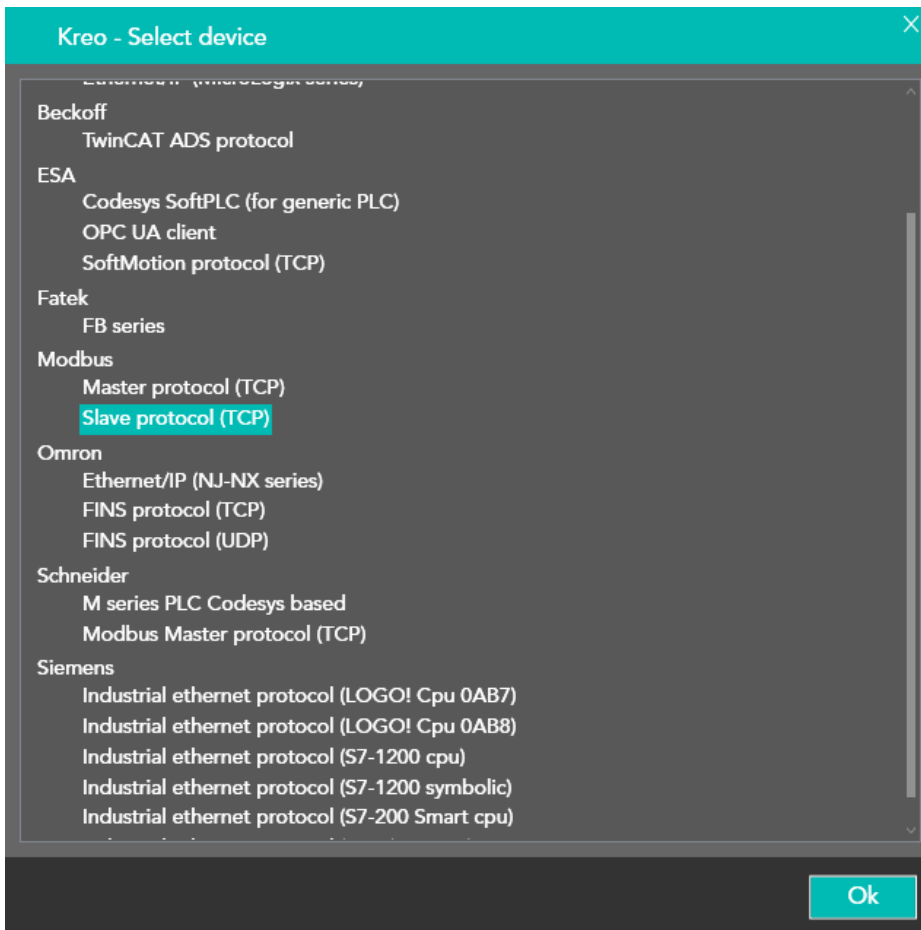Connect Ideas. Shape solutions.

Table of contents

Document description

This document is dedicated to the programming and functionality of the Modbus slave driver.
In this configuration, the operator panel behaves as a Modbus Slave (SERVER) and responds to read-write requests from the master.

The panel responds to requests sent to a single slave address and therefore it makes no sense to expect to load multiple instances of the driver.

Driver selection

Select Modbus – Slave protocol (TCP) in the Kreo driver portfolio.
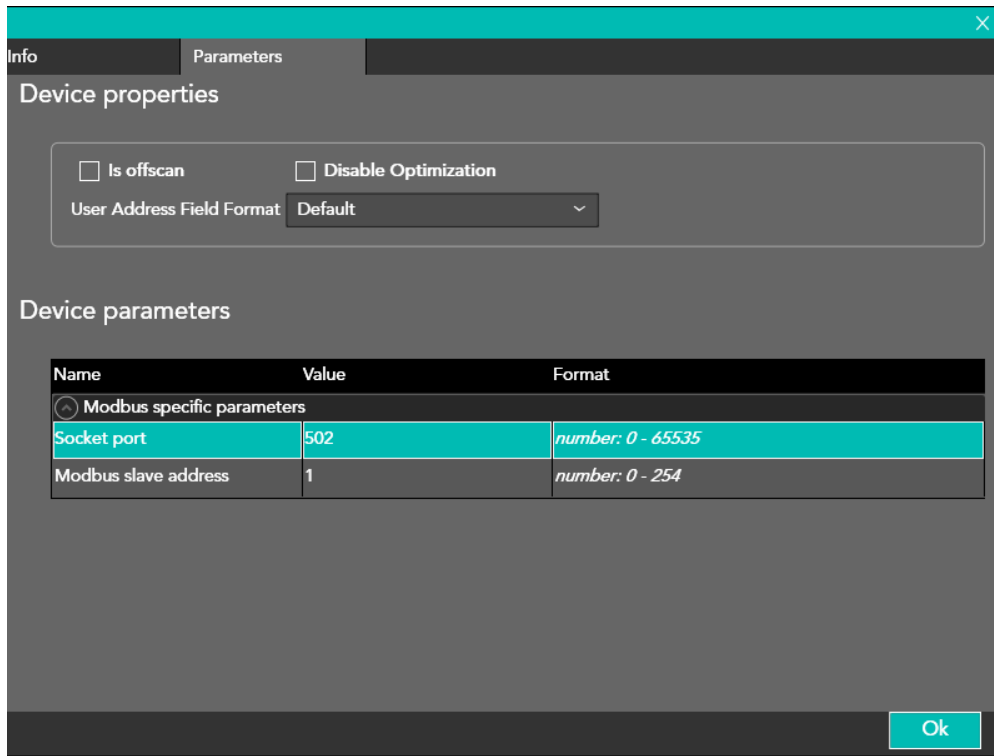
Communication parameters

The page below is displayed by double clicking on the HMI ethernet ports:

IP address	Ip address of the HMI port
Subnet mask	Subnet mask of the HMI port
Ping timeout	The PING command is sent in order to check the connection stability
Life time (msec)	The HMI do expect to receive the next message from the master inside this timeout window. This time out management is mandatory in case the user wants the ???? to be displayed in case the master is disconnected. By setting 0 in this parameter the timeout management will be disabled and the user will not have any error in case the master will be disconnected.

The page below will be displayed by double clicking on the Modbus slave driver.

Is Offscan	The driver is defined in the project but will not be scheduled.
	In order to enable the driver it is mandatory to use the ST script function:
	TAG_SETOFFSCANDEV (device, state)
	TAG_SETOFFSCAN (Tag, state)
Disable the optimization	Disable the data optimization.
	Each tag will be refreshed with a separate communication message.
User Address Field Format	Tag address format.
	The default format is defined in the driver description but the user can select the desired format (DECIMAL or HEXADECIMAL)
Socket port	Connection port.
	The default value is 502
Modbus slave address	Slave address inside the Modbus Network

IsOffscan

Is offscan management can be used in case a specific machine module will be part of the Kreo HMI project but will not be physically connected.

A NOT CONNECTED and ONSCAN device will reduce dramatically the performance of the page refresh due to the communication timeout.
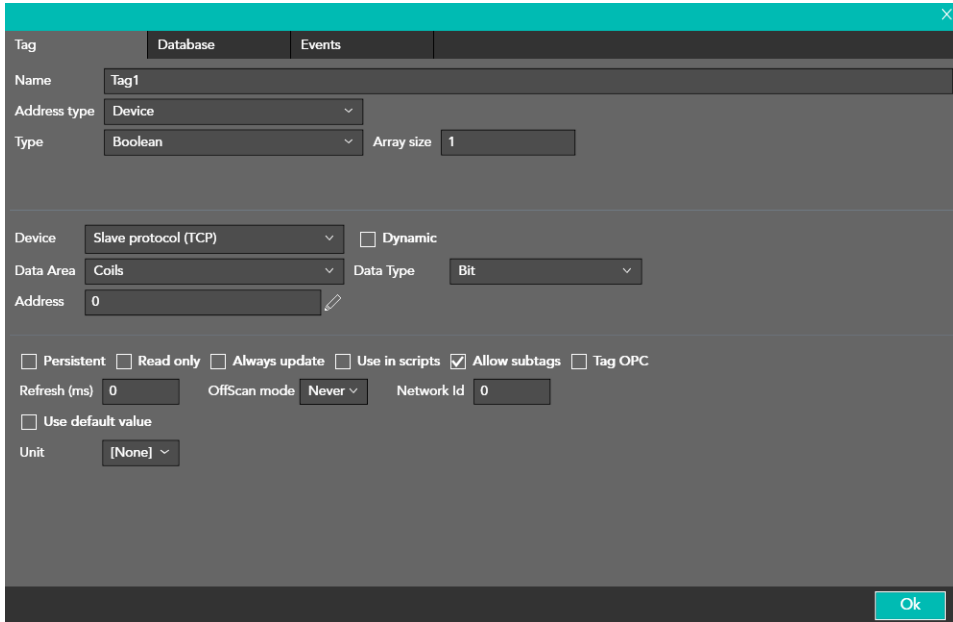
Disable Optimization:

This option can be used in order to identify wich of the data displayed on a specific page is causing the communication error.

The value will not be displayed but a series of ????? will let the user identify the faulty tag to be fixed.
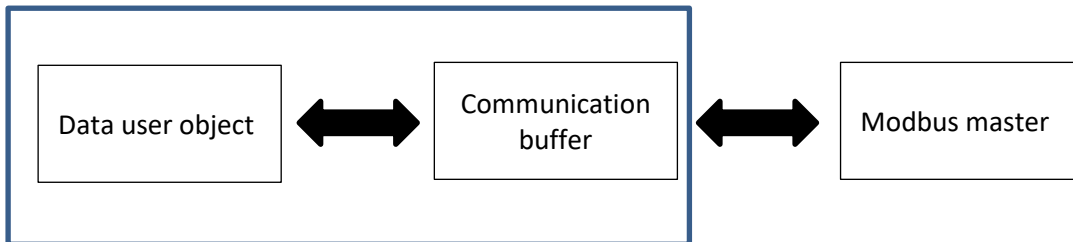
Tag definition

Modbus slave variables are variables available for the Master which has to read and write them. The HMI panel never takes the initiative and responds to requests from the master.

The use of variables (display, alarms, scripts) is asynchronous with the communication services.

Memory areas

AREA	TIPO	DIM.	R/W	DESCRIZIONE
Coils	Bit	1	R/W	Read/Write the boolean data named Coil mapped inside the Modbus slave driver memory area
Registers	Bit	1	R/W	Read/Write a single bit of the Holding registers area.
Registers	Word Dword Real Qword Double String	16	R/W	Read/Write a complete Holding register mapped inside the Modbus slave driver memory area.

Supported Modbus Function Codes

- FC [03], Single element of the register area. Read service.
- FC [06], Single element of the register area. Write service
- FC [16], Block of continuous register belonging to the register area. Write service (max 32 Word)
- FC [01], Block of continuous registers of the Coils area. Reading service. (max 32 Bit)
- FC [05], Single register of the Coils area. Write service
- FC [08], Diagnostic message

For additional details please goto the official website of the Modbus organization.

https://modbus.org/

Error codes

CODE	DESCRIPTION
PROTOCOL ERROR	Generic error
PROTOCOL TIMEOUT	The Modbus master is not transmitting any request before the Time Out window will expire
SOCKET ERROR	The ethernet socket cannot be created
PING ERROR	The Modbus master is not replying the PING command
TRANSMISSION ERROR	The TCP message cannot be created
ERROR	Unknown error

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