Modbus TCP – Master protocol

Driver documentation

Connect
Ideas.
Shape
solutions.

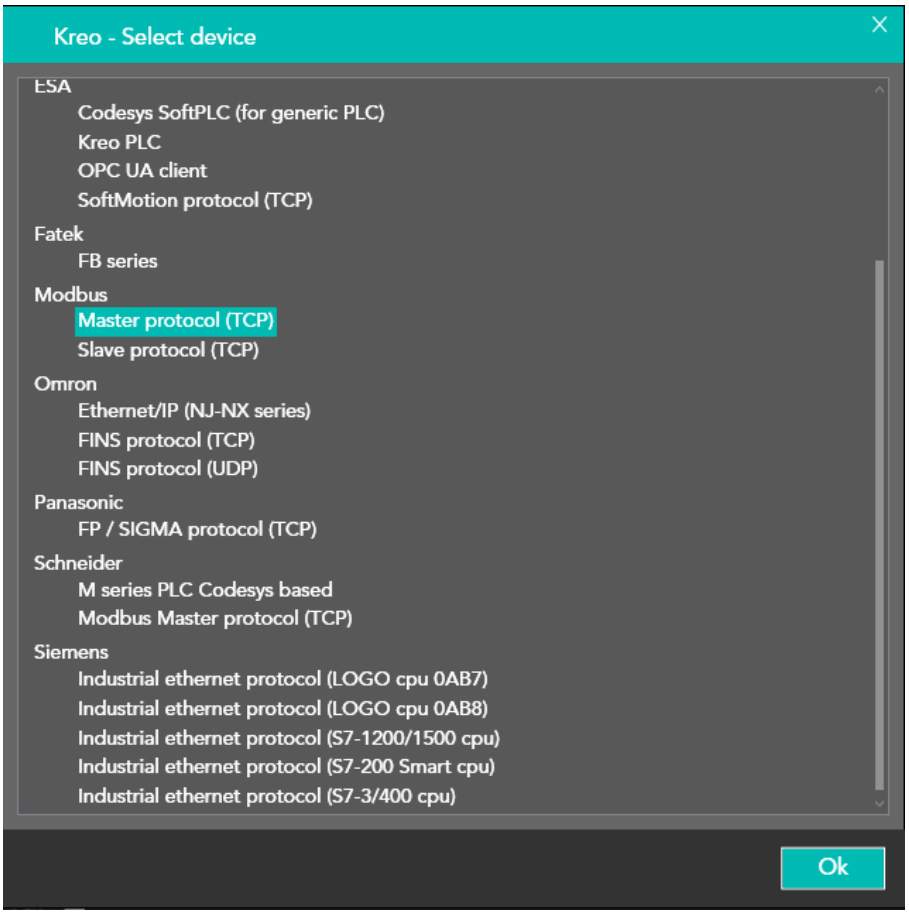
Table of contents

Document description

This document is dedicated to the programming and functionality of the Modbus master driver.
The operator panel in this configuration acts as a Modbus Master (CLIENT) and sends read-write requests to the predefined slaves.

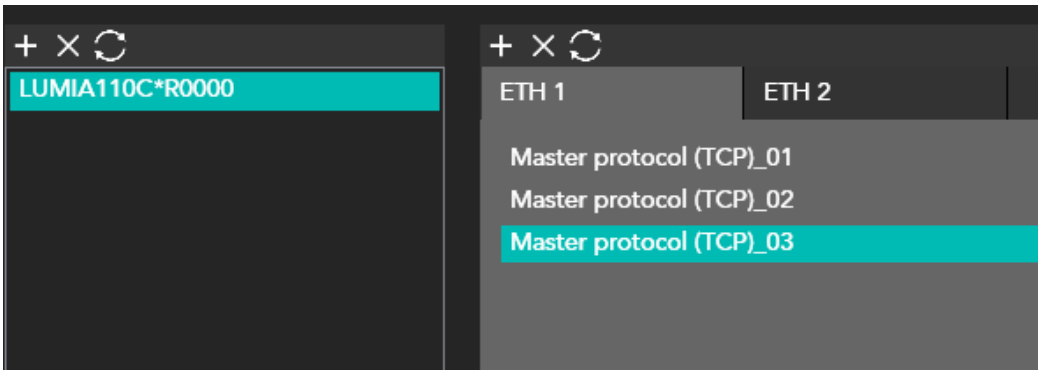
It is possible to define a configuration with multiple slaves adding multiple instances of the Modbus master driver.
Each instance represents the connection with a slave.

Driver selection



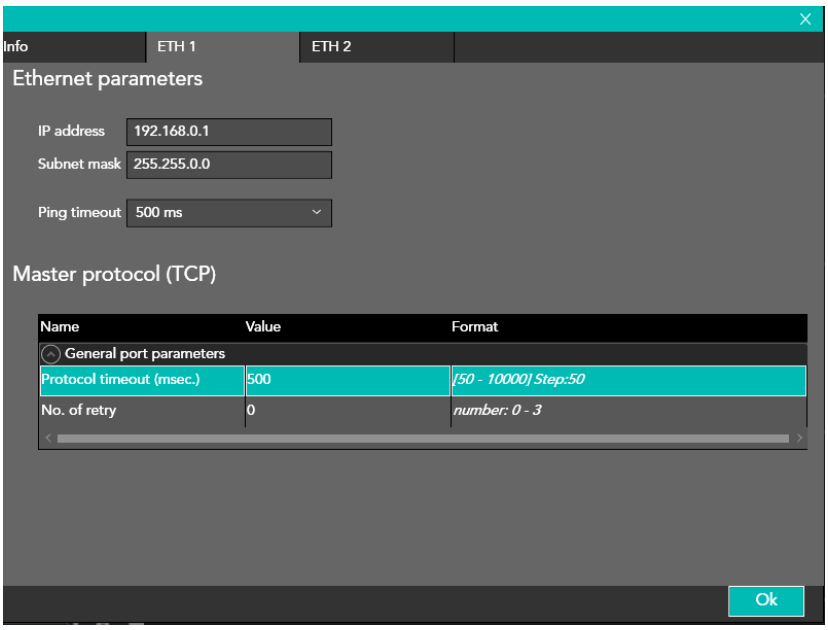
In the Kreo HMI driver portfolio select Modbus – Master protocol (TCP).

The + icon let the user add several instances of the driver in case of a multi slave connection.
Each instance is for the communication to one of the slaves.
The configuration below, for example, is in case 3 slaves are connected.



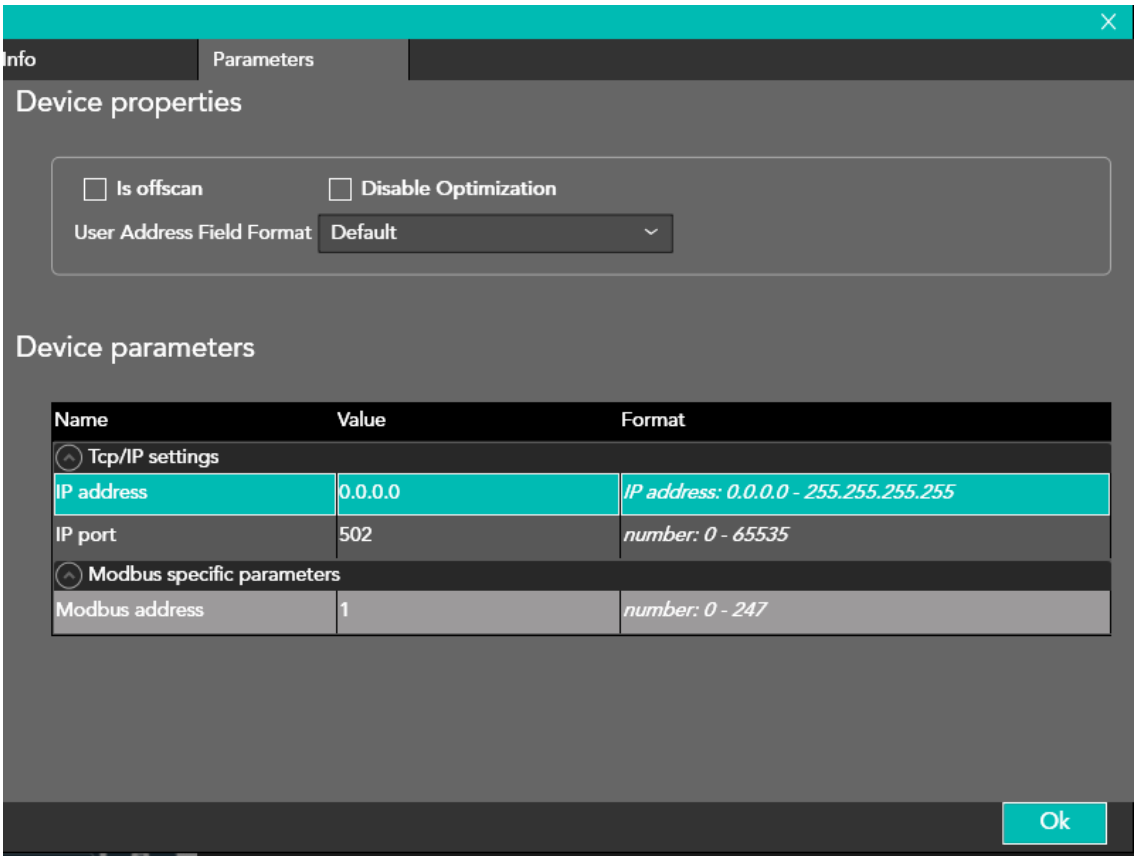
Communication parameters

Via the double click on the HMI model the below page is displayed.



IP address	Ip address of the port connected to the Modbus slave network
Subnet mask	Subnet mask
Ping timeout	The PING command is sent in order to test the connection stability.
Protocol Timeout	The replay from the slave device has to come before this timeout will expire
No. Of retry	The total amount of request necessary in order to raise the communication error

Via the double click over the driver id the below page will be displayed.



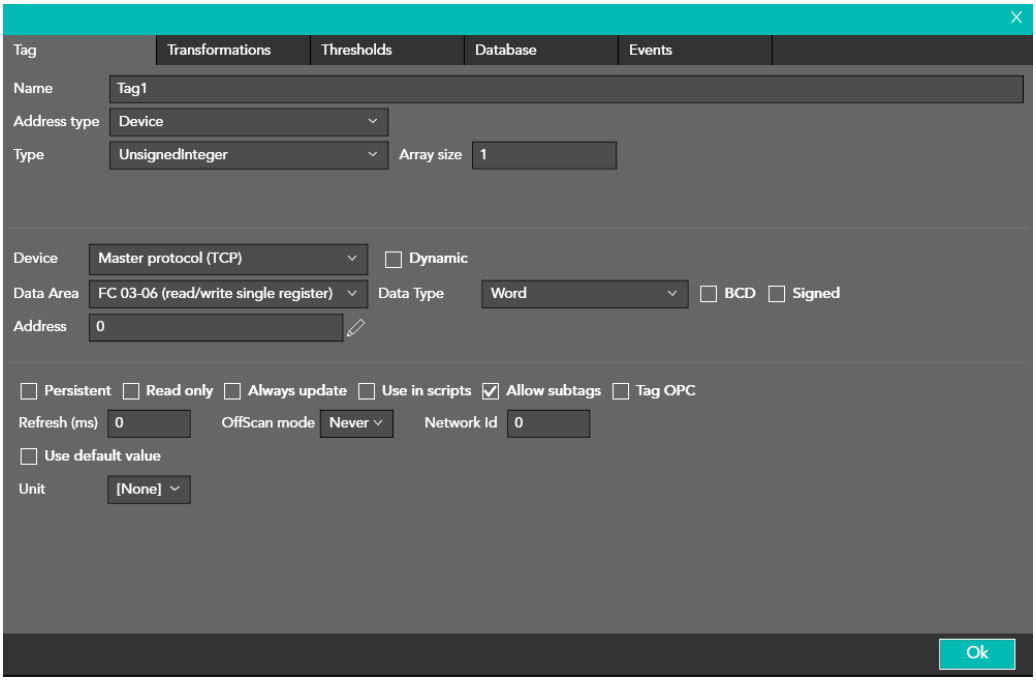
Is offscan	The driver is defined in the project but will not be scheduled. In order to enable the driver it is mandatory to use the ST script function: TAG_SETOFFSCANDEV (device, state) TAG_SETOFFSCAN (Tag, state)
Disable Optimization	Disable the data optimization. Each tag will be refreshed with a separate 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)
Address prefix	Prefix that will be added at the beginning of the Tag addressing string.
IP address	IP address of the PLC port
IP port	Ethernet communication port. The default value 502 is the standard port to be used with Modbus communication.
Modbus address	Slave address for this specific slave

Offscan
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



The addressing is based on the device memory mapping and on the Modbus Function Codes to be used in order to read and write the registers.

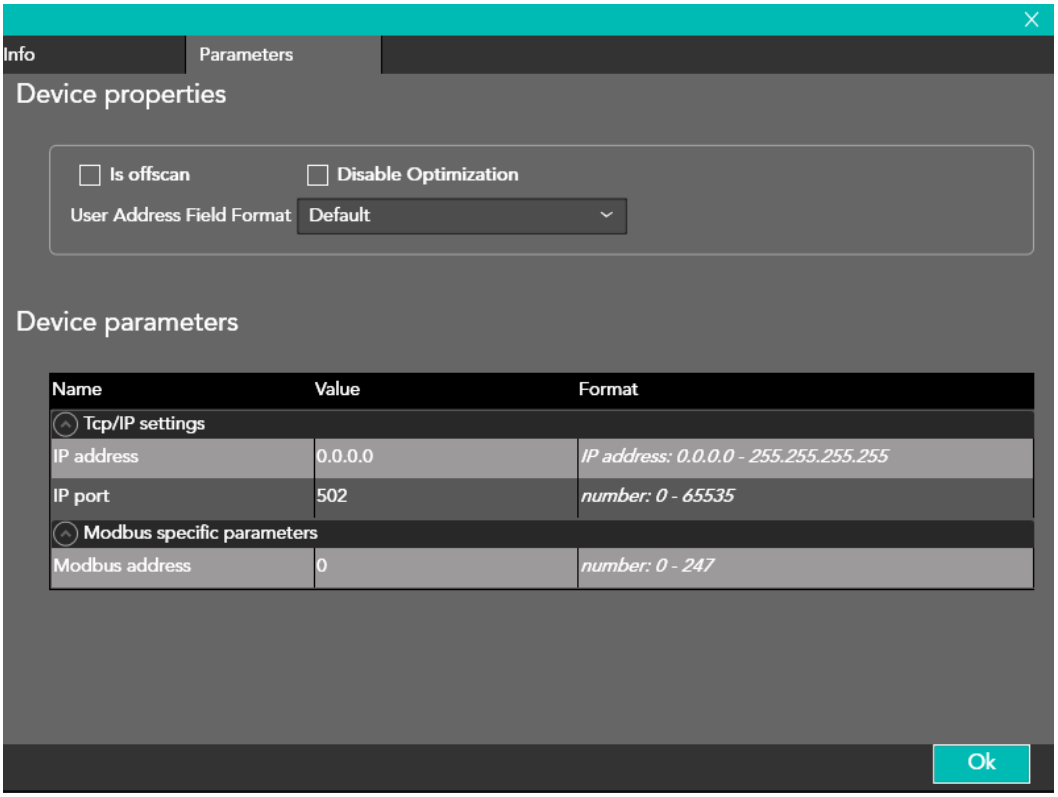
FC 03-06 stands for Function Codes that will be used for reading and writing the object.

Memory areas

AREA	TIPO	DIM.	R/W	DESCRIZIONE
FC03-06 (Read / write single register)	Word Dword Real String	16 32 32 16 (2 char)	R/W	Read / Write a single register
FC03-16 (Read / write multiple registers)	Word Dword Real String	16 32 32 16 (2 char)	R/W	Read / Write of an area made of registers having consecutive addresses
FC03-16 (Read / write long registers)	Dword Real	32 32	R/W	Read / Write of an area made of long (32 bits) registers having consecutive addresses
FC04 (read multiple input registers)	Word Dword	16 32	R/-	Read multiple input registers having consecutive addresses
FC01-05 (read/write single coil)	Bit	1	R/W	Read / Write of a single coil (Boolean object)
FC01-15 (read/write multiple coils)	Bit	1	R/W	Read / Write of an area made of multiple coils having consecutive addresses
FC02 (read multiple input status)	Bit	1	R/-	Read / Write of an area made of multiple inputs having consecutive addresses

Broadcast message

The slave address 0 identify the Broadcast message; a message wich is sent to all the slaves in the network.
This broadcast message do not require any reply.



The read functions on the variables mapped on this device are not performed.
The write functions are performed (the broadcast message is then sent) and the driver closes the data exchange without waiting for the response from the device to be received.

Error codes

CODE	*DESCRIPTION*
PROTOCOL ERROR	Generic error
PROTOCOL TIMEOUT	The slave did not replay to the master request
SOCKET ERROR	The ethernet socket cannot be created
PING ERROR	The device is not replying the PING command
TRANSMISSION ERROR	The TCP message cannot be created
ERROR	Unknown error

Connect
ideas.
shape
solutions.