

MANUAL



RESI-MBUSxLVL-ETH



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1 History

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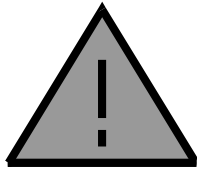
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3 IMPORTANT SECURITY NOTES



Danger to life through electrical current!

Only skilled personal trained in electro-engineering should perform the described steps in the following chapters. Please observe the country specific rules and standards. Do not perform any electrical work while the device is connected to power.

Pay attention to the following rules:

1. Disconnect the system from power
2. Secure the system against automatic power on
3. Check that the system is de-energized
4. Cover other energized parts of the system

IMPORTANT HINT: Before you start with the installation and the initial setup of the device, you have to read this document and the attached installation guide and the actual manual for the device very carefully. You have to follow all the herein given information very accurate!

- Only authorized and qualified personnel are allowed to install and setup the device!
- The connection of the device must be done in de-energized state!
- Do not perform any electrical work while the device is connected to power!
- Disable and secure the system against any automatic restart or power on procedure!
- The device must be operated with the defined voltage level!
- Supply voltage jitters must not exceed the technical specifications and tolerances given in the technical manuals for the product. If you do not obey this issue, the proper performance of the device cannot be guaranteed. This can lead to fail functions of the device and in worst case to a complete breakdown of the device!
- You have to obey the current EMC regulations for wiring!
- All signal, control and supply voltage cables must be wired in a way, that no inductive or capacitive interference or any other severe electrical noise disturbance may interfere with the device. Wrong wiring can lead to a malfunction of the device!
- For signal or sensor cables you have to use shielded cables, to avoid damages through induction!
- You have to obey and to apply the current safety regulations given by the ÖVE, VDE, the countries, their control authorities, the TÜV or the local energy supply company!
- Obey country-specific laws and standards!
- The device must be used for the intended purpose of the manufacturer!
- No warranties or liabilities will be accepted for defects and damages resulting from improper or incorrect usage of the device!
- Subsequent damages, which results from faults of this device, are excluded from warranty and liability!
- Only the technical data, wiring diagrams and operation instructions, which are part to the product shipment are valid!

- The information on our homepage, in our datasheets, in our manuals, in our catalogues or published by our partners can deviate from the product documentation and is not necessarily always actual, due to constant improvement of our products for technical progress!
- In case of modification of our devices made by the user, all warranty and liability claims are lost!
- The installation has to fulfill the technical conditions and specifications (e.g. operating temperatures, power supply, ...) given in the devices documentation!
- Operating our device close to equipment, which do not comply with EMC directives, can influence the functionality of our device, leading to malfunction or in worst case to a breakdown of our device!
- Our devices must not be used for monitoring applications, which solely serve the purpose of protecting persons against hazards or injury, or as an emergency stop switch for systems or machinery, or for any other similar safety-relevant purposes!
- Dimensions of the enclosures or enclosures accessories may show slight tolerances on the specifications provided in these instructions!
- Modifications of this documentation is not allowed!
- In case of a complaint, only complete devices returned in original packing will be accepted!

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4 General Information

The RESI-MBUSxLVL-ETH gateways are designed for integrating MBUS smart meters via Ethernet interface into an own building automation or industrial solution with a host system, which is able to interpret the MBUS standard protocol.

The converters offer the following features:

- RESI-MBUSxLVL-ETH: Serial communication with MBUS smart meters with 300-57600baud, even parity, 1 stop bit.
- Different versions of gateways for individual situations:
 - RESI-MBUS24LVL-ETH: Gateway for maximum of 24 MBUS meters
 - RESI-MBUS48LVL-ETH: Gateway for maximum of 48 MBUS meters
 - RESI-MBUS64LVL-ETH: Gateway for maximum of 64 MBUS meters
- Transparent mode: The incoming data on the socket is directly written to the serial line. The received serial characters are directly written to the socket
- MODBUS/TCP to MODBUS/RTU conversion: The incoming MODBUS/TCP frame is internally converted to a MODBUS/RTU frame and send to the serial line to the corresponding MODBUS/RTU slave device. The serial answer of the MODBUS/RTU slave device is received by the gateway, converted into a MODBUS/TCP frame and send to the socket.
- Gateway configuration via special MODBUS/RTU or MODBUS/TCP frames or special ASCII ocmmands.
- IP configuration via DIP switches and web page
- Serial interface is electrically isolated from the Ethernet interface
- Ethernet connection via 10/100Mbit Ethernet interface
- 12-48V= power supply

Type	Description	Voltage	Power	Weight
RESI-MBUS24LVL-ETH	Ethernet gateway MBUS-SOCKET, bidirectional transport of plain socket data to MBUS interface with automatic direction control, maximum of 24 meters, DIP switch for settings	12-48 V=	<8.4W	90 g
RESI-MBUS48LVL-ETH	Ethernet gateway MBUS-SOCKET, bidirectional transport of plain socket data to MBUS interface with automatic direction control, maximum of 48 meters, DIP switch for settings	12-48 V=	<8.4W	90 g
RESI-MBUS64LVL-ETH	Ethernet gateway MBUS-SOCKET, bidirectional transport of plain socket data to MBUS interface with automatic direction control, maximum of 64 meters, DIP switch for settings	12-48 V=	<8.4W	90 g

4.1 Technical data for RESI-MBUSxLVL-ETH

Technical Data	RESI-MBUSxLVL-ETH	
Power supply		
Supply voltage	12-48 V= +/-10%	Storage temperature
Power LED	Yes	Operating Temperature
		Humidity
Power consumption	<8.4W	Protection Class
		Dimensions LxWxH
Serial interface		Weight
Protocol	transparent	Mounting
Type	MBUS	
Baud rates	300,600,900,1200,2400,4800, 9600,19200,38400,57600	Factory settings
Parity	even	Modbus address for configuration
Data bits	8 bits	IP address
Stop bits	1 stop bit	
Cable Connection	Via clamps	
LED indicator	Yes	standard socket
DIP switches	Yes	standard user name
		standard password
Galvanic insulation to serial interface	Yes	MBUS serial speed
		MBUS data format
Clamps		MBUS parity
Clamp wire cross section	Max. 1,5 mm ²	
Tightening torque	Max. 0.5Nm	CE conformity

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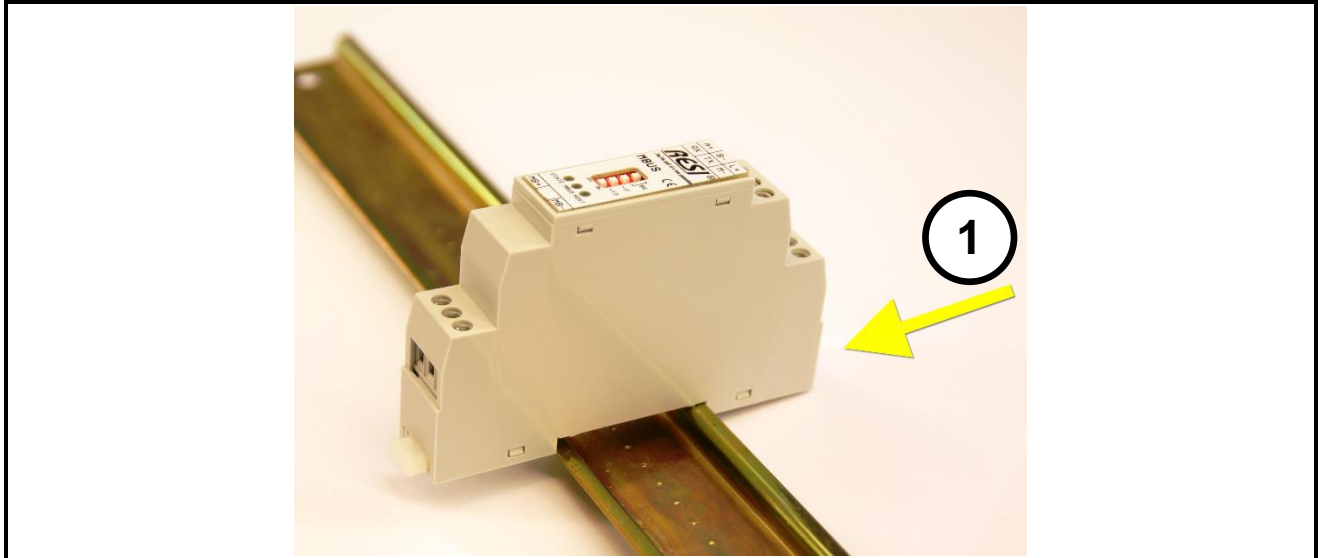
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5 Mounting and Connections

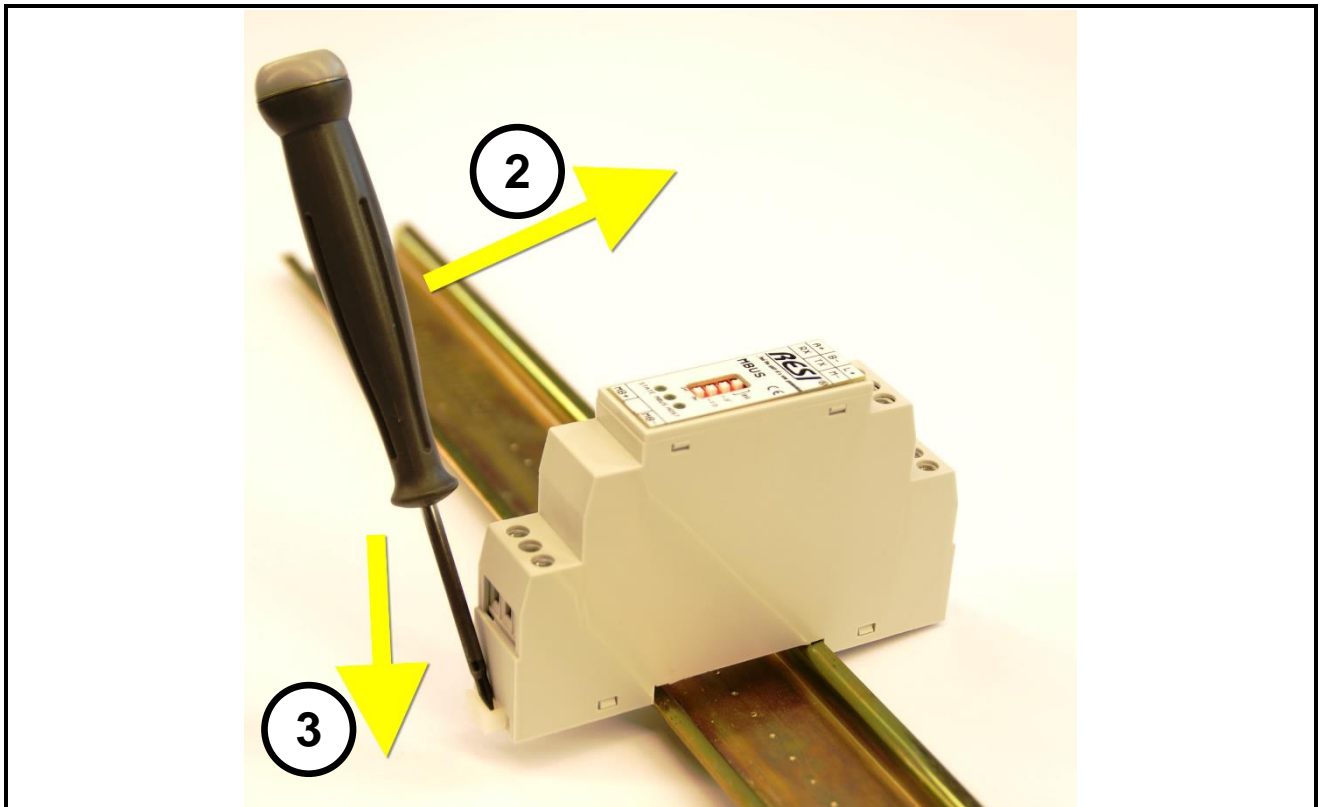
5.1 Assembling

Our RESI-MBUSxLVL-ETH converters are designed for mounting on a 35mm DIN-EN50022 rail. Please note, we use symbol pictures in our manual.

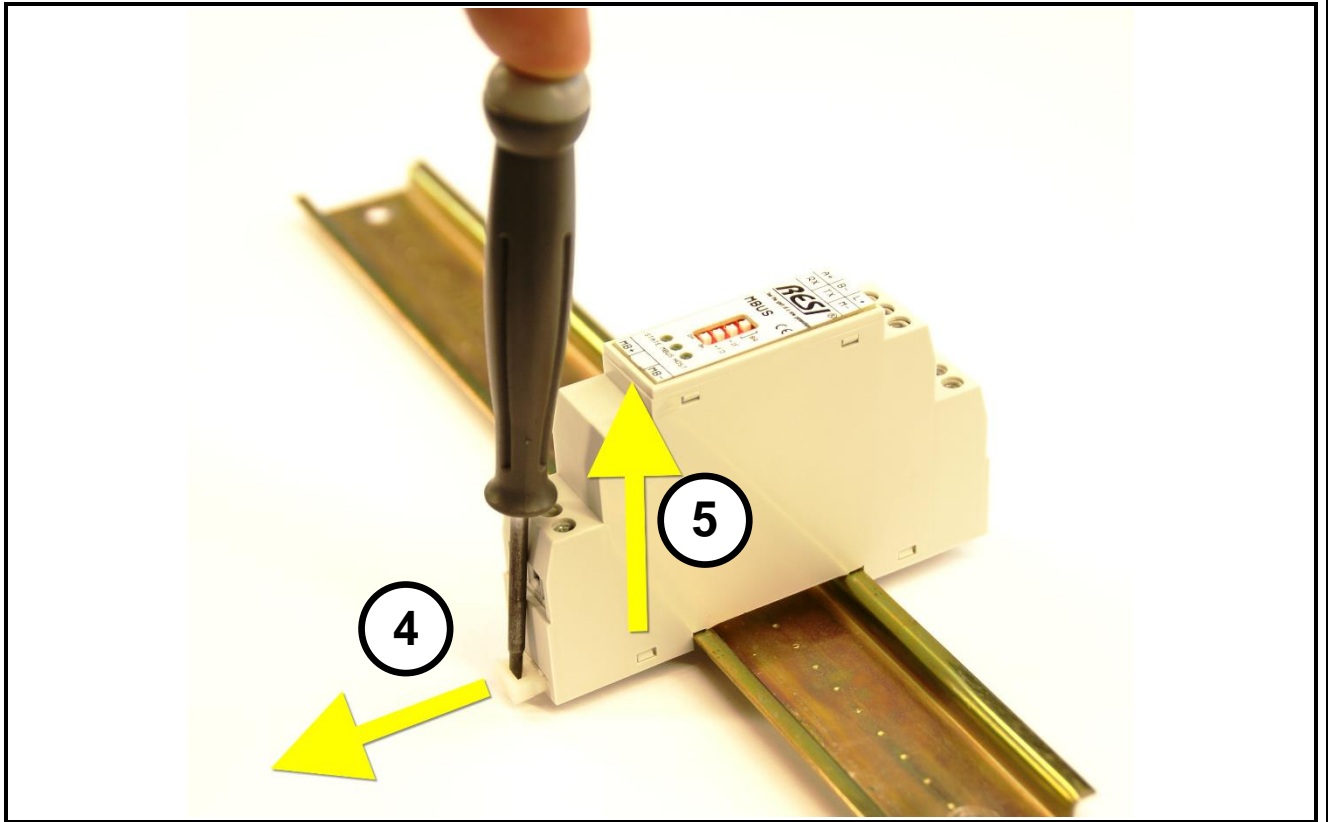
At first, put the converter with the top side on the DIN rail (1).



Then open the clamp lever on the bottom side with a screw driver (2) and press the device on the DIN rail (3). Release the clamp lever. The module is now placed correctly on the DIN rail.



To dismount the module from the DIN rail first open the clamp lever with a screwdriver on the bottom side (4). Hold the clamp lever opened while you lift the module from the DIN rail (5). Then remove the converter from the bar with while pulling it on the top side.



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5.3 DIP switch settings and terminals of RESI-MBUSxLVL-ETH

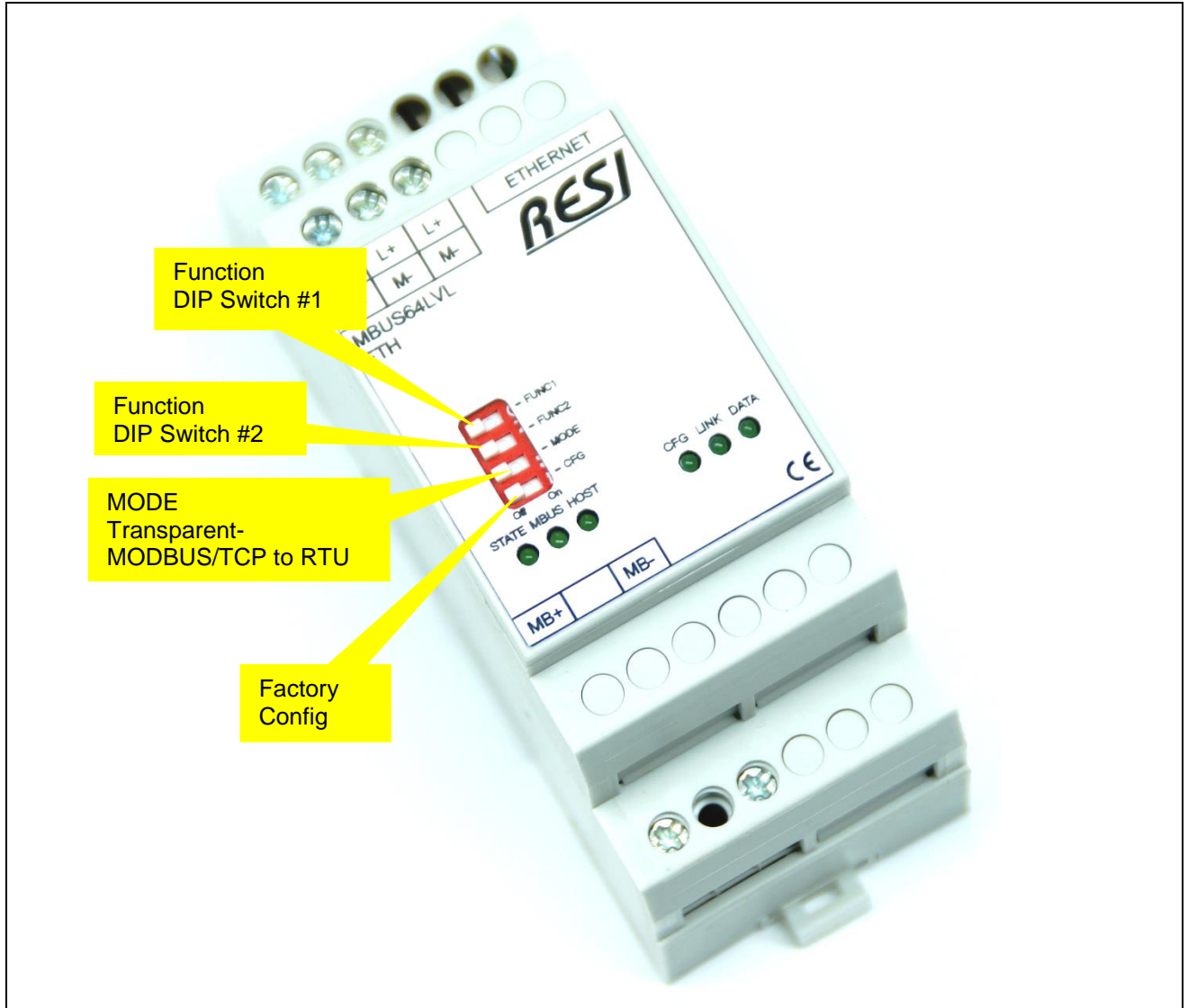


Illustration: DIP Switch settings for the RESI-MBUSxLVL-ETH converters

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DIP Switch	Description
Function FUNC1	=ON: while restarting the module, the module switches to STATIC IP configuration with the standard IP settings: IP address: 192.168.0.215 (RESI-MBUS24LVL-ETH) 192.168.0.216 (RESI-MBUS48LVL-ETH) 192.168.0.217 (RESI-MBUS64LVL-ETH) IP mask: 255.255.255.0 Gateway: 192.168.0.1 =OFF: the current configured IP settings are used
Function FUNC2	=ON: while restarting the module, the module switches to DHCP IP configuration. =OFF: the current configured IP settings are used
Mode MODE	Selects a operation mode for factory reset: =OFF: While factory reset, the unit is configured to transparent socket mode =ON: While factory reset, the unit is configured to MODBUS/TCP to MODBUS/RTU conversion mode
Factory config CFG	=ON: while restarting the module, the module restores the factory defaults for the system. Wait for approx. 30 seconds until the STATE+CFG LED flashes very fast. Then reset the DIP switch. The module will restart automatically and is ready for operation. =OFF: Normal start of module
HINT	After changing the DIP switches the converter reboots immediately, so no power off or on is necessary. After reboot all the LEDs are on for half a second to signal the power on sequence.

Table: Description of DIP Switch functions RESI-MBUSxLVL-ETH

CLAMPS/LEDS	RESI-MBUSxLVL-ETH
L+ M-	Power supply L+: 12-48Vdc M-: Ground
ETHERNET	Ethernet connection for transparent or MODBUS/TCP or internet access. 10M/100Mbit adaptive, support AUTO-MDIX
MB+ MB-	Interface to serial MBUS line MB+: MBUS signal #1 MB-: MBUS signal #2
STATE	State-LED, flashes, when converter is ok flash rhythm is 1s in normal mode and 0,1s in configuration mode
MBUS	Whenever there is a data flow on the serial MBUS line, this LED flashes for a short time
HOST	HOST-LED, flashes, when host sends/receive data over the socket
CFG	Factory config LED: In normal mode this LED flashes in the same way like the STATE LED. If CFG switch=ON while rebooting, the STATE LED is always ON and this LED flashes slowly. When this process is finished, both LED blink very fast.
LINK	This LED is on if Ethernet port is connected correctly to network
DATA	The LED shows the data flow on the Ethernet port

Table: Description of connectors and LEDs of RESI-MBUSxLVL-ETH

5.4 Wiring diagram RESI-MBUSxLVL-ETH

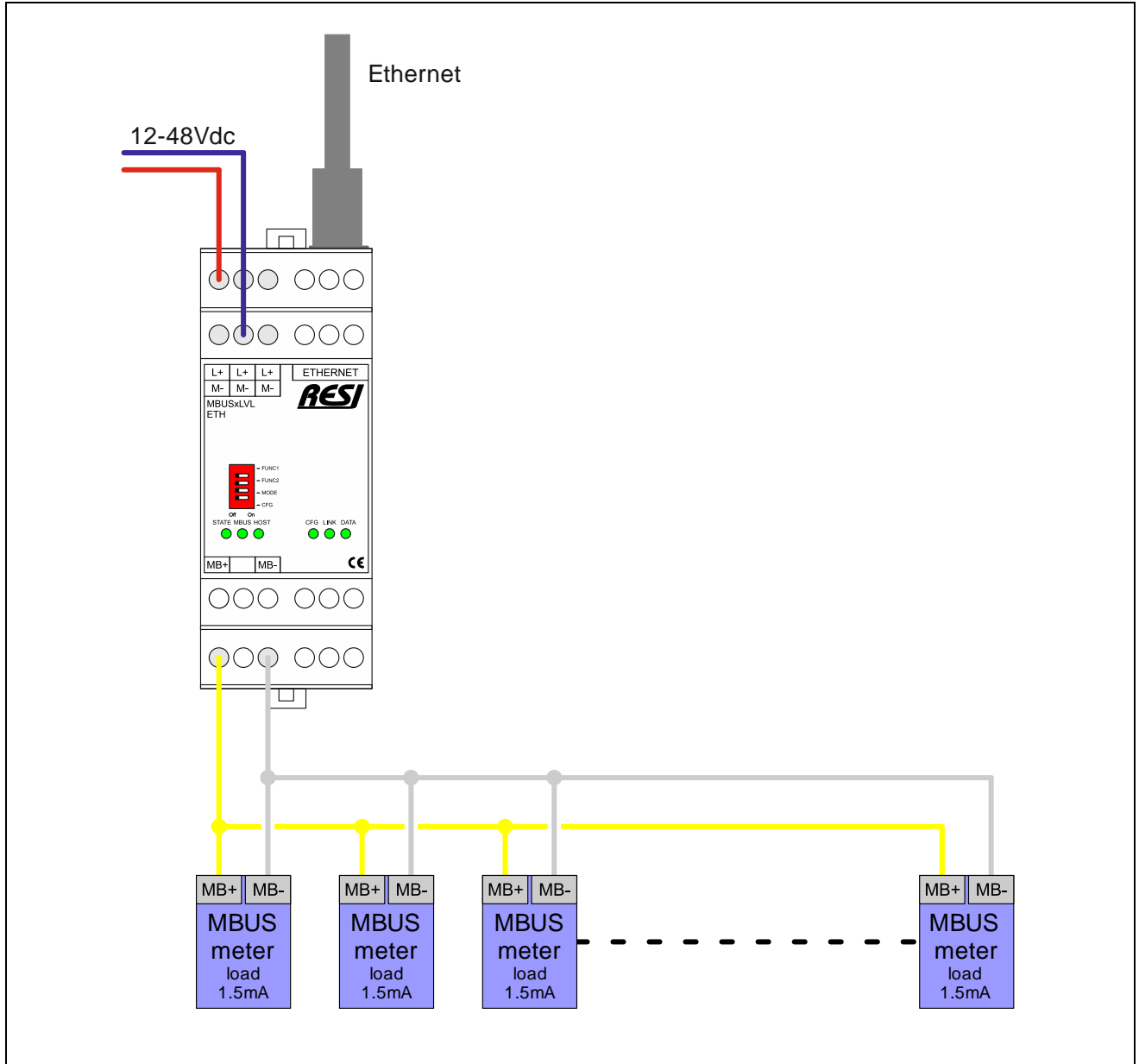


Illustration: wiring diagram for RESI-MBUSxLVL-ETH converter

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6 RESI-MBUSxLVL-ETH operation modes

The gateway supports basically two different operation modes:

- **TRANSPARENT MODE:** Bidirectional transparent gateway between Ethernet socket data and serial line. All incoming data on the Ethernet socket is directly forwarded to the serial line. All received data from the serial line is directly forwarded to the Ethernet socket.

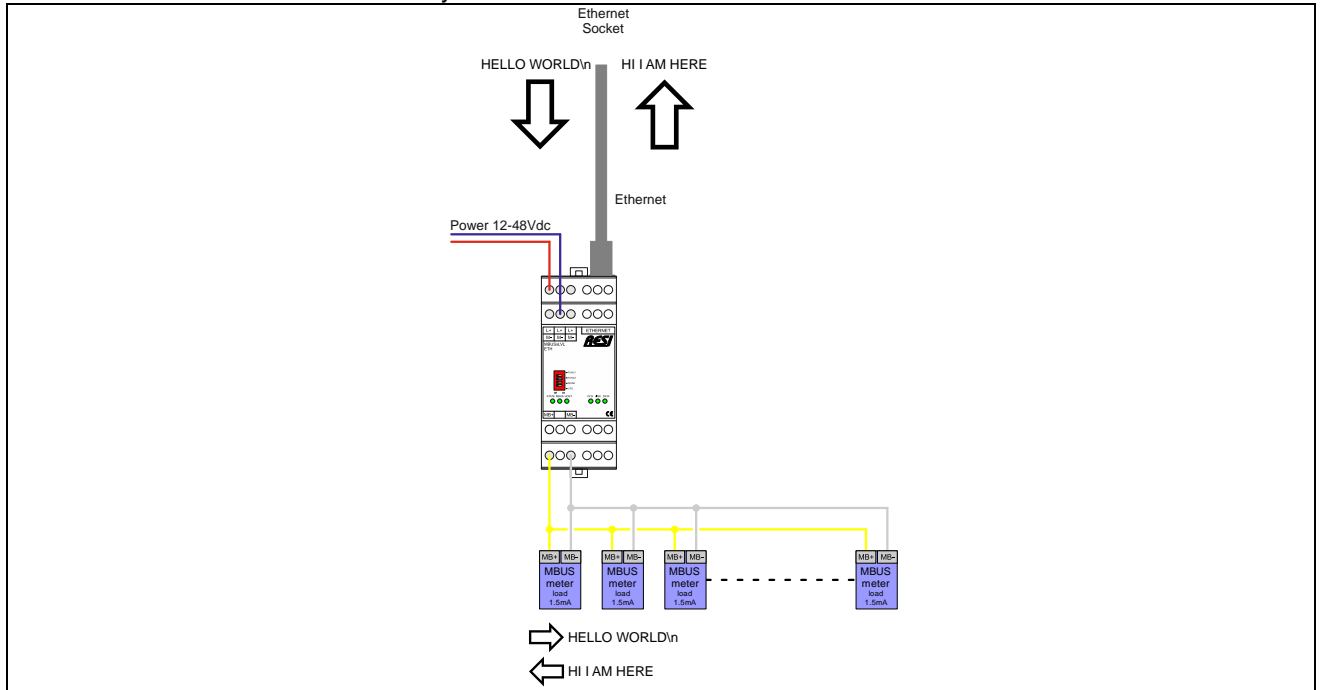


Illustration: TRANSPARENT MODE on RESI-MBUSxLVL-ETH converters

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7 RESI-MBUSxLVL-ETH web configuration

All our RESI-MBUSxLVL-ETH gateways have a build in web server to configure basic access to the Ethernet interface. Therefore open an Internet explorer and type in the configured IP address of the selected gateway.

The standard configuration for STATIC IP (See DIP switch selection of RESI-MBUSxLVL-ETH gateways) is:

RESI-MBUS24LVL-ETH: IP: 192.168.0.215 Mask: 255.255.255.0 Gateway: 192.168.0.1 Socket: 1024

RESI-MBUS48LVL-ETH: IP: 192.168.0.216 Mask: 255.255.255.0 Gateway: 192.168.0.1 Socket: 1024

RESI-MBUS64LVL-ETH: IP: 192.168.0.217 Mask: 255.255.255.0 Gateway: 192.168.0.1 Socket: 1024

The standard user name is RESI and the standard password is also RESI.

You should see the following page:

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7.1 HOWTO setup IP address

Choose page “Local IP Config”. Use the following mask to edit the IP settings:

The screenshot shows a web browser window with the URL 192.168.0.217. The page title is "RESI MBUS64LVL-ETH MBUS64LVL-ETH". The interface includes a navigation menu on the left with options like "Current Status", "Local IP Config", "TTL1", "Web to Serial", "Misc Config", and "Reboot". The main content area is titled "Current settings" and contains the following configuration fields:

- IP Type:** A dropdown menu set to "Static IP". Below it, text reads: "for RESI-xxx-ETH select DHCP for automatic IP addressing or STATIC for manual configuration of the IP settings".
- Static IP:** Four input fields containing "192", "168", "0", and "217". Below it, text reads: "for RESI-xxx-ETH enter your desired module IP address here".
- Submask:** Four input fields containing "255", "255", "255", and "0". Below it, text reads: "for RESI-xxx-ETH enter your desired Subnet mask here".
- Gateway:** Four input fields containing "192", "168", "0", and "1". Below it, text reads: "for RESI-xxx-ETH enter your desired gateway IP address here".
- DNS Server:** Four input fields containing "192", "168", "0", and "1". Below it, text reads: "for RESI-xxx-ETH enter your desired DNS server IP address here".

At the bottom of the form are "Save" and "Cancel" buttons. On the right side, there is a "help" sidebar with the following information:

- IP type:** StaticIP or DHCP
- StaticIP:** Module's static ip
- Submask:** usually 255.255.255.0
- Gateway:** Usually router's ip address

- **IP type:** Select between STATIC IP to use a own static IP or DHCP mode for automatic assignment of IP address
- **Static IP:** Select your desired IP address in IPv4 format
- **Submask:** Define you desired subnet mask in IPv4 format
- **Gateway:** Define your desired gateway IP address in IPv4 format
- **DNS Server:** Define your desired DNS Server IP address in IPv4 format

Click on save to store your data but don't forget to reboot the device, so that the new IP settings are effective. If you have problems, set the CFG DIP switch to ON and reboot the device. Wait for more than 30 seconds. The gateway will do a factory reset to the standard IP settings defined above. Don't forget to put the DIP switch to OFF position after successful factory reset.

7.2 HOWTO change socket number

Select the page TTL1 and you will see the below screen.

The screenshot shows the web interface for the RESI MBUS64LVL-ETH device. The browser address bar shows the IP address 192.168.0.217. The page title is 'V3015' and the URL is 'Visit RESI webpage...'. The main content area is titled 'Current settings' and contains the following configuration options:

- Baud Rate:** 115200 bps (for RESI-MBUSxLVL-ETH always 115200)
- Data Size:** 8 bit (for RESI-MBUSxLVL-ETH always 8 bit)
- Parity:** None (for RESI-MBUSxLVL-ETH always None)
- Stop Bits:** 1 bit (for RESI-MBUSxLVL-ETH always 1)
- Run Serial Mode:** RS232 (for RESI-MBUSxLVL-ETH always RS232)
- Flow Control:** NONE (for RESI-MBUSxLVL-ETH always None)
- UART Packet Time:** 2 (0~255)ms (for RESI-MBUSxLVL-ETH should be 0)
- UART Packet Length:** 0 (0~1460)chars (for RESI-MBUSxLVL-ETH should be 0)
- Sync Baudrate(RF2217 Similar):** OFF (for RESI-MBUSxLVL-ETH always OFF)
- Enable Uart Heartbeat Packet:** OFF (for RESI-MBUSxLVL-ETH always OFF)

Below these settings are two sections for socket parameters:

- Socket A Parameters:**
 - Work Mode:** TCP Server (for RESI-MBUSxLVL-ETH always TCPServer+Modbus TCP)
 - Socket Number:** 1024 (23) (1~65535) (for RESI-MBUSxLVL-ETH default is 502)
 - PRINT:** OFF (for RESI-MBUSxLVL-ETH always OFF)
 - ModbusTCP Poll:** Poll Timeout: 200 (200~9999) ms (for RESI-MBUSxLVL-ETH always OFF+200ms)
 - Enable Net Heartbeat Packet:** OFF (for RESI-MBUSxLVL-ETH always OFF)
 - Registry Type:** None (for RESI-MBUSxLVL-ETH always None)
- Socket B Parameters:**
 - Work Mode:** NONE (for RESI-MBUSxLVL-ETH always NONE)

At the bottom of the configuration area are 'Save' and 'Cancel' buttons. A help sidebar on the right contains the following information:

- local port:** 1~65535, when TCP Client, set this to 0 means use random local port
- remote port:** 1~65535
- packet time/length:** default 0/0, means automatic packet mechanism; you can modify it as a none-zero value

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HINT: Don't change the TTL communication parameters (eg Baudrate,...). You can lose the connection to the gateway!

- **Work mode:** Here you can select TCP Server/none if you want to communicate in transparent mode. All the incoming data on the socket is directly outputted to the serial line. If you want to use the internal MODBUS/TCP to MODBUS/RTU converter, you have to select TCP server/MODBUS TCP. If you select TCP Server/None, you can communicate also with MODBUS/RTU protocol over Ethernet.
- **Socket number:** Here you can select your desired socket number, you want to use for the Ethernet connection. Default for our converters is 1024, for MODBUS/TCP is 502

Please let the rest of the parameters unchanged. They are for expert usage only!

7.3 HOWTO change user name and password

If you select the page Misc config you will see the current configured username and password. Also you will see the current module name.

The screenshot shows a web browser window with the URL 192.168.0.217. The page title is 'V3015' and the main heading is 'RESI MBUS64LVL-ETH MBUS64LVL-ETH'. The left sidebar contains a menu with options: Current Status, Local IP Config, TTL1, Web to Serial, Misc Config (highlighted), and Reboot. The main content area is titled 'Additional settings' and contains the following fields:

- Module Name: MBUS64LVL-ETH (with a note: for RESI-xxx-ETH enter your own module name)
- Websocket Port: 6432 (with a note: for RESI-xxx-ETH default is 6432)
- Webserver Port: 80 (with a note: for RESI-xxx-ETH default is 80)
- MAC Address: a6-4c-5e-e3-d0-a8
- Username: RESI (with a note: for RESI-xxx-ETH default is RESI)
- Password: RESI (with a note: for RESI-xxx-ETH default is RESI)
- Buffer Data Before Connected: (with a note: for RESI-xxx-ETH always OFF)
- Reset Timeout: 3600 (60~65535) s (with a note: for RESI-xxx-ETH default is 3600s)

At the bottom of the settings area are 'Save' and 'Cancel' buttons. On the right side, there is a 'help' section with the following information:

- module name**: max length is 15 char
- Web port**: default 80
- ID and ID type**: we could use it for D2D
- Mac address**: user could modify this MAC address
- Buffer data**: default not checked, buffer data before tcp connection established
- reset timeout**: default 0, 0-60 mean no timeout, >60 mean when there is no data received during this time, the device will restart

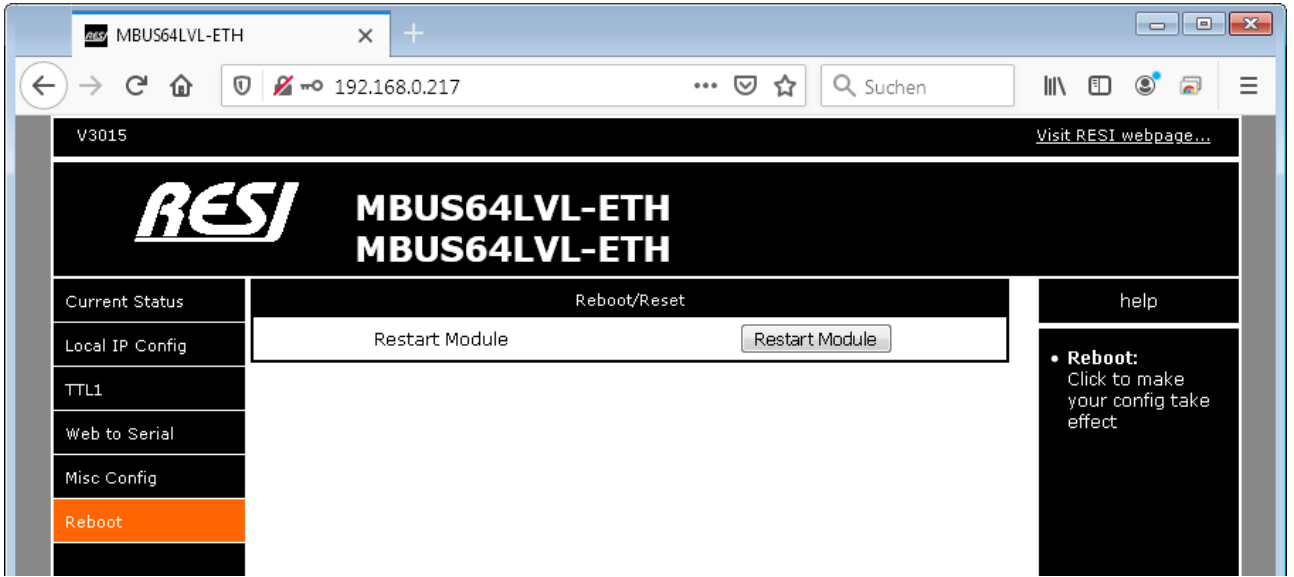
- **Module name:** Here you can enter a new module name. It's for better identification if you have more than one gateway in your network.
- **Username:** Here you can enter a new user name for accessing the web configuration.
- **Password:** here you can enter a new password for accessing the web configuration.

Don't forget to save the new settings with the button SAVE below!

Please let the rest of the parameters unchanged. They are for expert usage only!

7.4 HOWTO restart the module via Ethernet

First select page Reboot. Then select button Restart Module to perform a software reboot.



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8 HOWTO configure the serial MBUS interface

After you have successfully changed the IP parameters via Web page, you can configure the serial MBUS line parameters with this steps.

There are two ways to do so:

1. Use the MODBUS/RTU or MODBUS/TCP protocol to setup the serial MBUS parameters
2. Use ASCII commands on the socket to configure the serial MBUS parameters

8.1 ASCII commands for configuration

The following table show the ASCII commands for setup of the serial MBUS line.

Please note, that there must be at least 2s pause on the serial line to activate an ASCII command.

Send this ASCII string over the socket to the gateway and wait for the answer. Socket must be in transparent mode.

Direction	ASCII command
Host	#RESIVERSION_{CR} #RESIVER_{CR}
Answer	#RESIVERSION:<VersionHi>.<VersionLo>_{CR}
	Returns the version number of the module VersionHi: Version number high (1..255) VersionLo: Version number low (1..255)
Host	#RESITYPE_{CR} #RESITYP_{CR}
Answer	#RESITYPE:RESI-MBUS24LVL-ASCII_{CR} #RESITYPE:RESI-MBUS48LVL-ASCII_{CR} #RESITYPE:RESI-MBUS64LVL-ASCII_{CR}
	Returns the current type of the module
Host	#RESIBAUD_{CR} #RESIBD_{CR}
Answer	#RESIBAUD:<BAUDRATE>,8,E,1_{CR}
	Returns the current baud rate of the serial MBUS line. BAUDRATE: 300,600,900,1200,2400,4800,9600,19200,38400,57600 8 stands for 8 data bits E stands for even parity 1 stands for one stop bit
Host	#RESIADDRESS_{CR} #RESIADR_{CR}
Answer	#RESIADDRESS:<ADDRESS>_{CR}
	Returns the current UnitID for configuration, usually 254 ADDRESS: valid address between 0 and 255
Host	#RESIPROTOCOL_{CR} #RESIPROTO_{CR}
Answer	#RESIPROTO:<PROTOCOL>_{CR}
	Returns the current protocol for future use PROTOCOL: valid protocol type between 0 and 255

Direction	ASCII command
Host	#RESISETBAUD:<BAUDRATE>_CR #RESISB:<BAUDRATE>_CR
Answer	#RESIOK_CR
	Sets a new baud rate for the serial MBUS line. BAUDRATE: 300,600,900,1200,2400,4800,9600,19200,38400,57600 HINT: The new settings are valid after a reboot of the gateway
Host	#RESISETADDRESS:<ADDRESS>_CR #RESISADR:<ADDRESS>_CR
Answer	#RESIOK_CR
	Set a new address for MODBUS configuration, usually 254 ADDRESS: valid address between 0 and 255 HINT: The new settings are valid after a reboot of the gateway
Host	#RESISETPROTOCOL:<PROTOCOL>_CR #RESISPROTO:<PROTOCOL>_CR
Answer	#RESIOK_CR
	Set a new protocol for future use PROTOCOL: valid protocol type between 0 and 255 HINT: The new settings are valid after a reboot of the gateway
Host	#RESIRESET_CR #RESIRST_CR
Answer	none
	Performs a module reset
Host	#RESIFACTORYRESET_CR #RESIFRST_CR
Answer	none
	Performs a reset of all parameters to factory default values and afterwards a module reset

8.2 MODBUS holding register table for configuration

The following table show the registers for setup of the serial MBUS line.

The module holds internally a list of 16 bit wide holding register. Those registers can be read by the host with the function READ HOLDING REGISTER (function code: 3). If the register can also be modified by the host, the host can use the functions PRESET SINGLE REGISTER (function code: 6).

The MODBUS convention defines 65535 possible holding register with the notation 4x00001 to 4x65536. Please refer the software MODBUS POLL as a sample for this notation. Internally in the MODBUS/RTU frames an index notation is used, which starts with 0 and ends with 65535. So we decided to note in the following document a register with: 4x00100 for the holding register 100, and in addition also the real index of the protocol index 99 with the notation I:99. Also we have added the hexadecimal number of the real index with H:0xNNNN.

HINT: Standard unit ID for internal configuration is 254. You can change this unit ID with a special holding register!

Register	Description
4x65521 I:65520 H:0xFFFF0 R/W RESET SYSTEM	If the host writes the value 1 (0x0001) to this register, the module executes a soft reset (reboot). Reading this register will always return 0.
4x65522 I:65521 H:0xFFFF1 R/W STANDARD CONFIG	With this register you can select various standard configurations for the serial MBUS line: Reading this register will always return 0. Write the following value to select the serial MBUS configuration you want to use. The Unit ID for configuration is always set to 254 and the pause time before entering the configuration mode is set to 2000ms. 10: 300bd, even parity, 8 data bits, 1 stop bit 11: 600bd, even parity, 8 data bits, 1 stop bit 12: 900bd, even parity, 8 data bits, 1 stop bit 13: 1200bd, even parity, 8 data bits, 1 stop bit 14: 2400bd, even parity, 8 data bits, 1 stop bit 15: 4800bd, even parity, 8 data bits, 1 stop bit 16: 9600bd, even parity, 8 data bits, 1 stop bit 17: 19200bd, even parity, 8 data bits, 1 stop bit 18: 38400bd, even parity, 8 data bits, 1 stop bit 19: 57600bd, even parity, 8 data bits, 1 stop bit HINT: You have to perform a reset to activate the new serial configuration!

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Register	Description												
4x65523 I:65522 H:0xFFFF2 R/O MBUSxLVL-ETH TYPE	While reading, the return value defines the type of the module: 24: RESI-MBUS24LVL-ETH 48: RESI-MBUS48LVL-ETH 64: RESI-MBUS64LVL-ETH												
4x65524 I:65523 H:0xFFFF3 R/O SOFTWARE VERSION	While reading, the return value defines the current software version: 0xMMNN -> e.g. 0x100 means version 1.00												
4x65525 I:65524 H:0xFFFF4 R/W BAUD RATE	Read: The current configured baud rate for the serial line Write: In configuration mode: define the new baud rate for the serial line. The following values are accepted: <table style="width: 100%; border: none;"> <tr> <td style="width: 25%;">3: 300bd</td> <td style="width: 25%;">6: 600bd</td> <td style="width: 25%;">9: 900bd</td> <td style="width: 25%;">12: 1200bd</td> </tr> <tr> <td>24: 2400bd</td> <td>48: 4800bd</td> <td>96: 9600bd</td> <td>192: 19200bd</td> </tr> <tr> <td>384: 38400bd</td> <td>576: 57600bd</td> <td></td> <td></td> </tr> </table> HINT: You have to perform a reset to activate the new serial configuration!	3: 300bd	6: 600bd	9: 900bd	12: 1200bd	24: 2400bd	48: 4800bd	96: 9600bd	192: 19200bd	384: 38400bd	576: 57600bd		
3: 300bd	6: 600bd	9: 900bd	12: 1200bd										
24: 2400bd	48: 4800bd	96: 9600bd	192: 19200bd										
384: 38400bd	576: 57600bd												
4x65526 I:65525 H:0xFFFF5 R/W PARITY	Read: The current configured parity for the serial line Write: In configuration mode: define the new parity for the serial line. The following values are accepted: 1: even parity HINT: You have to perform a reset to activate the new serial configuration!												
4x65527 I:65526 H:0xFFFF6 R/W DATA BITS	Read: The current configured data bits for the serial line Write: In configuration mode: define the new data bits for the serial line. The following values are accepted: 8: 8 data bits HINT: You have to perform a reset to activate the new serial configuration!												
4x65528 I:65527 H:0xFFFF7 R/W STOP BITS	Read: The current configured stop bits for the serial line Write: In configuration mode: define the new stop bits for the serial line. The following values are accepted: 1: 1 stop bit HINT: You have to perform a reset to activate the new serial configuration!												
4x65529 I:65528 H:0xFFFF8 R/W PROTOCOL	Read: The current configured protocol for the serial line Write: In configuration mode: define the new protocol for the serial line. The following values are accepted: 0..65535 (0x0000-0xFFFF) For future applications reserved HINT: You have to perform a reset to activate the new serial configuration!												

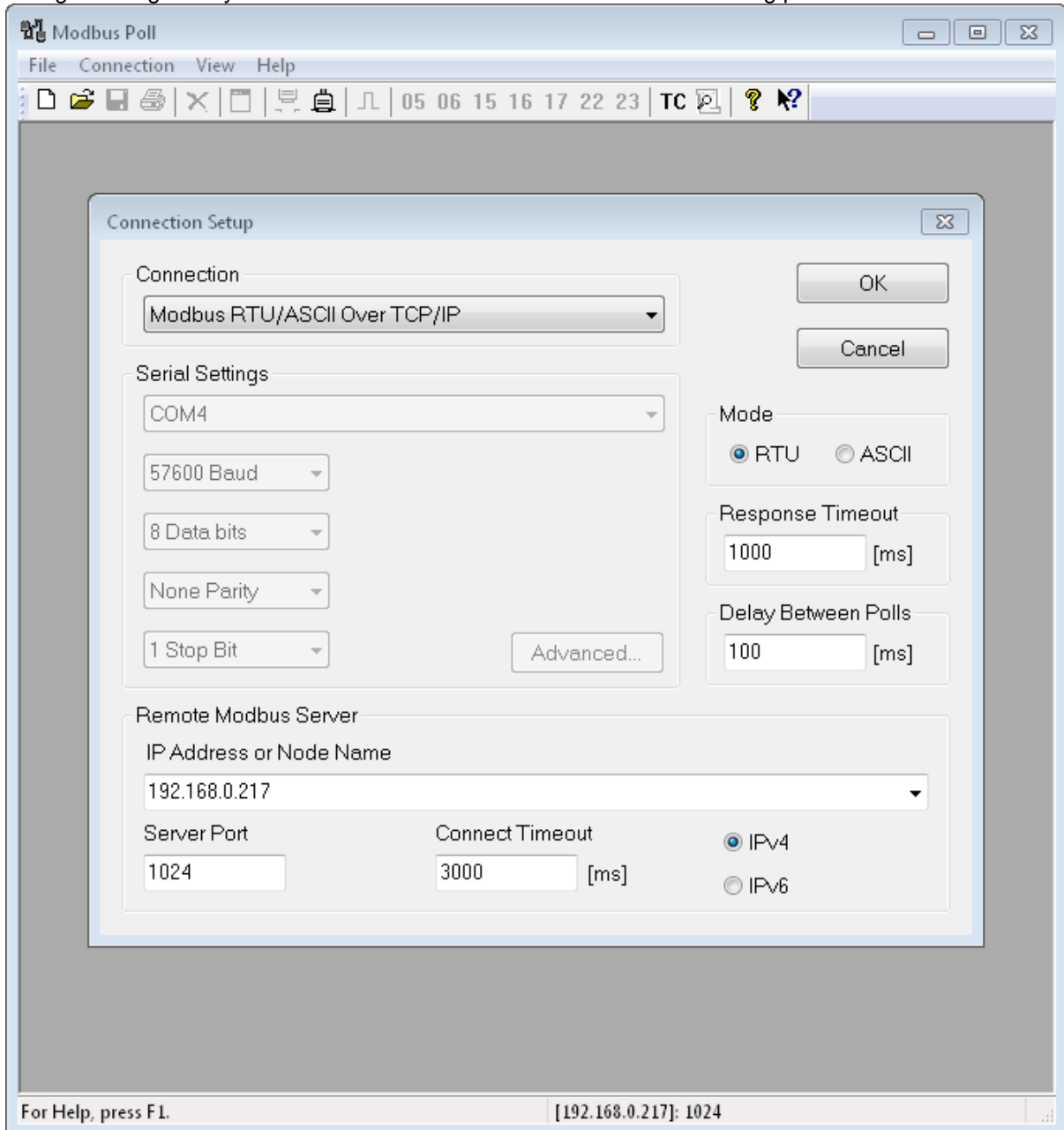
Register	Description
4x65530 I:65529 H:0xFFFF9 R/W CONFIG UNIT ID	<p>Read: The current configured unit id for the configuration mode Write: In configuration mode: define the new unit id for the configuration mode.</p> <p>Standard unit ID for configuration is 254. You can change this unit ID, if you have conflicts with connected Modbus devices on the serial line.</p> <p>Allowed values 0-255 (0x0000-0x00FF)</p> <p>HINT: You have to perform a reset to activate the new serial configuration!</p>
4x65531 I:65530 H:0xFFFFA R/W CONFIG PAUSE	<p>Read: The current configured pause in ms for the configuration mode Write: In configuration mode: define the new pause time in ms for entering the configuration mode.</p> <p>Standard pause time for configuration is 2000ms (2 seconds).</p> <p>Allowed values 0-65535 (0x0000-0xFFFF)</p> <p>HINT: You have to perform a reset to activate the new serial configuration!</p>
4x65532-35 I:65531-34 H:0xFFFFB-0xFFFFE R/W RESERVED	<p>Reserved for future use</p>
4x65536 I:65535 H:0xFFFF R/W ENTER CONFIG MODE	<p>Read: The current status for the configuration mode: =0: normal mode is active =1: configuration mode is active</p> <p>Write: write the magic number 21321 (0x5349) to this register to activate the configuration mode. Write the value 0 to deactivate the configuration mode. The STATUS LED will flash fast to indicate that the configuration mode is activated. In normal mode, the STATE LED flashes with a period of 1 second.</p> <p>HINT: Only in the configuration mode, you can write new parameters to the configuration register. Don't forget to reset the converter after configuration changes to make them active.</p>

8.3 Initial step: Select transparent or MODBUS/RTU over Ethernet mode

A gateway can be switched very fast to one of the following states:

1. Deactivate DIP switch 3: MODE
2. Activate DIP switch 4: CFG
3. Wait for approx.. 30s. The gateway will flash very fast
4. Deactivate all DIP switches

Now you have done a factory reset to the IP standard settings and you have selected transparent mode. To configure the gateway use the software MODBUS POLL with the following parameters:



Then select the function Setup/Read-Write Definition.. and configure the shown parameters. If successful you should see the following values:

Modbus Poll - Mbpoll2

File Edit Connection Setup Functions Display View Window Help

05 06 15 16 17 22 23 TC

Mbpoll2

Tx = 7: Err = 1: ID = 254: F = 03: SR = 5000ms

	Alias	65520	Alias	65530
0		0		2000
1		0		0
2		64		0
3		4096		0
4		24		0
5		1		0
6		8		
7		1		
8		0		
9		254		

Read/Write Definition

Slave ID: 254 [OK]

Function: 03 Read Holding Registers (4x) [Cancel]

Address: 65520 Protocol address. E.g. 40011 -> 10

Quantity: 16

Scan Rate: 5000 [ms] [Apply]

Disable

Read/Write Disabled

Disable on error [Read/Write Once]

View

Rows

10 20 50 100 Fit to Quantity

Hide Alias Columns PLC Addresses (Base 1)

Address in Cell Enron/Daniel Mode

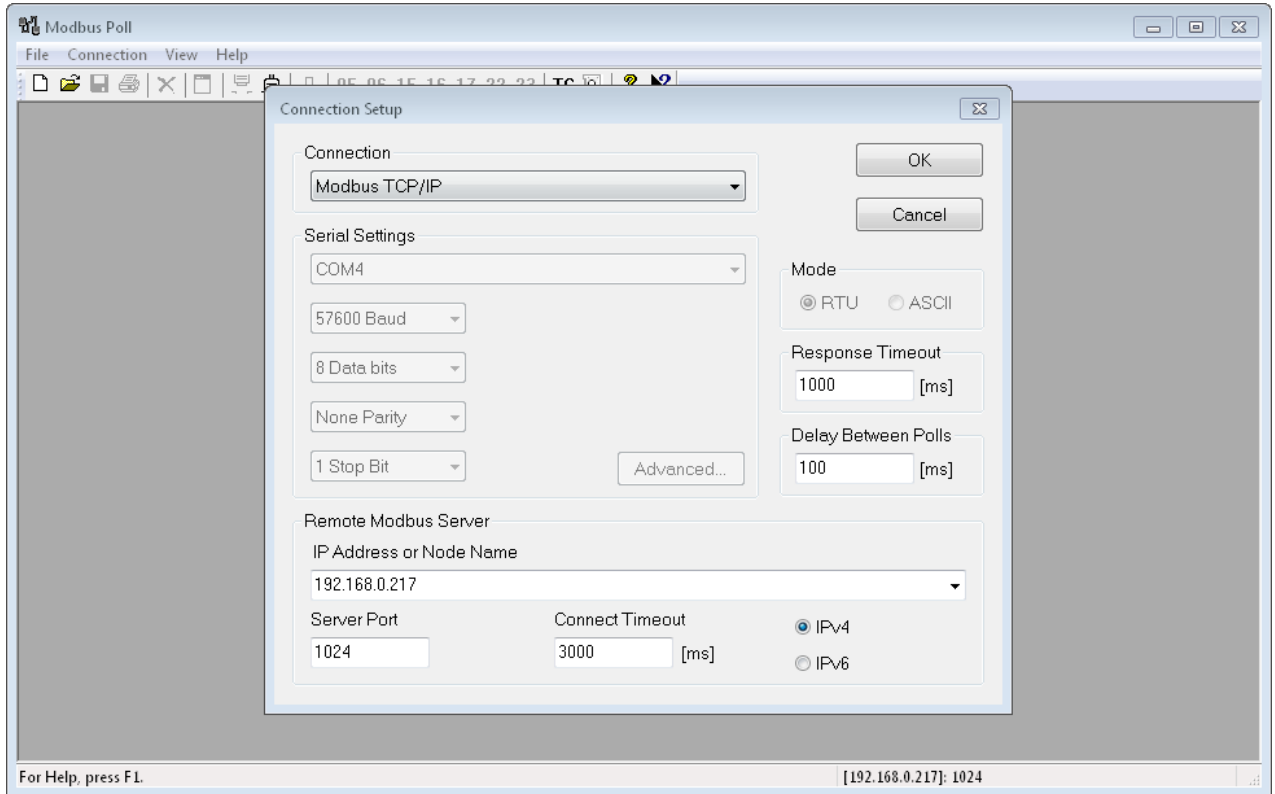
For Help, press F1. [192.168.0.217]: 1024

8.4 Initial step: Select MODBUS/TCP to MODBUS/RTU gateway mode

A gateway can be switched very fast to one of the following states:

5. Activate DIP switch 3: MODE
6. Activate DIP switch 4: CFG
7. Wait for approx.. 30s. The gateway will flash very fast
8. Deactivate all DIP switches

Now you have done a factory reset to the IP standard settings and you have selected MODBUS/TCP to MODBUS/RTU gateway mode. To configure the gateway use MODBUS POLL with the following parameters:



Then select the function Setup/Read-Write Definition.. and configure the following parameters. If successful you should see the following values:

The screenshot shows the Modbus Poll interface. The main window displays a table with the following data:

	Alias	65520	Alias	65530
0		0		2000
1		0		0
2		64		0
3		4096		0
4		96		0
5		1		0
6		8		
7		1		
8		0		
9		254		

The 'Read/Write Definition' dialog box is open, showing the following configuration:

- Slave ID: 254
- Function: 03 Read Holding Registers (4x)
- Address: 65520 (Protocol address: E.g. 40011 -> 10)
- Quantity: 16
- Scan Rate: 500 [ms]
- Disable options:
 - Read/Write Disabled
 - Disable on error
- View options:
 - Rows: 10, 20, 50, 100, Fit to Quantity
 - Hide Alias Columns
 - Address in Cell
 - PLC Addresses (Base 1)
 - Enron/Daniel Mode

Buttons: OK, Cancel, Apply, Read/Write Once.

8.5 HOWTO change gateway configuration with ASCII commands

- **Step 1:** First of all, there must be at least 2 seconds silence on the socket (no data transfer), before you can use an ASCII command for setting some parameters. If you have changed the parameter CONFIG PAUSE you have to wait at least you configured pause time in ms.
- **Step 2:** Check if your gateway is in transparent mode: Work mode must be NONE.
If not change the work mode with the Webpage or set DIP switch 3 MODE to OFF and DIP Switch 4 CFG to ON, wait for approx.. 30s until the Config-LED flashes very fast, the reset DIP Switch 4 to OFF.

The screenshot shows the web interface for the RESI MBUS64LVL-ETH device. The browser address bar shows the IP address 192.168.0.217. The page title is 'RESI MBUS64LVL-ETH'. The main content area is divided into three columns: 'Current Status', 'Current settings', and 'help'. The 'Current settings' column contains various configuration options for the serial and network settings. The 'Socket A Parameters' section is highlighted with a yellow box, showing 'Work Mode' set to 'None' and 'Socket Number' set to 1024. The 'help' column provides additional information about local and remote ports and packet time/length.

Current settings

Baud Rate: 115200 bps
for RESI-MBUSxLVL-ETH always 115200

Data Size: 8 bit
for RESI-MBUSxLVL-ETH always 8 bit

Parity: None
for RESI-MBUSxLVL-ETH always None

Stop Bits: 1 bit
for RESI-MBUSxLVL-ETH always 1

Run Serial Mode: RS232
for RESI-MBUSxLVL-ETH always RS232

Flow Control: NONE
for RESI-MBUSxLVL-ETH always None

UART Packet Time: 2 (0~255)ms
for RESI-MBUSxLVL-ETH should be 0

UART Packet Length: 0 (0~1460)chars
for RESI-MBUSxLVL-ETH should be 0

Sync Baudrate(RF2217 Similar):
for RESI-MBUSxLVL-ETH always OFF

Enable Uart Heartbeat Packet:
for RESI-MBUSxLVL-ETH always OFF

Socket A Parameters

Work Mode: TCP Server None
for RESI-MBUSxLVL-ETH always TCPServer+Modbus TCP

Socket Number: 1024 23 (1~65535)
for RESI-MBUSxLVL-ETH default is 502

PRINT:
for RESI-MBUSxLVL-ETH always OFF

ModbusTCP Poll: Poll Timeout : 200 (200~9999) ms
for RESI-MBUSxLVL-ETH always OFF+200ms

Enable Net Heartbeat Packet:
for RESI-MBUSxLVL-ETH always OFF

Registry Type: None Location Connect With
for RESI-MBUSxLVL-ETH always None

Socket B Parameters

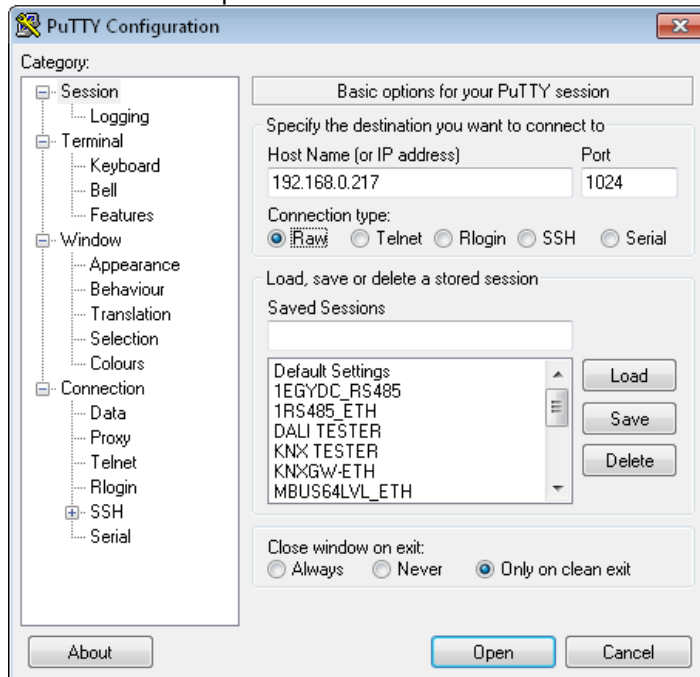
Work Mode: NONE
for RESI-MBUSxLVL-ETH always NONE

help

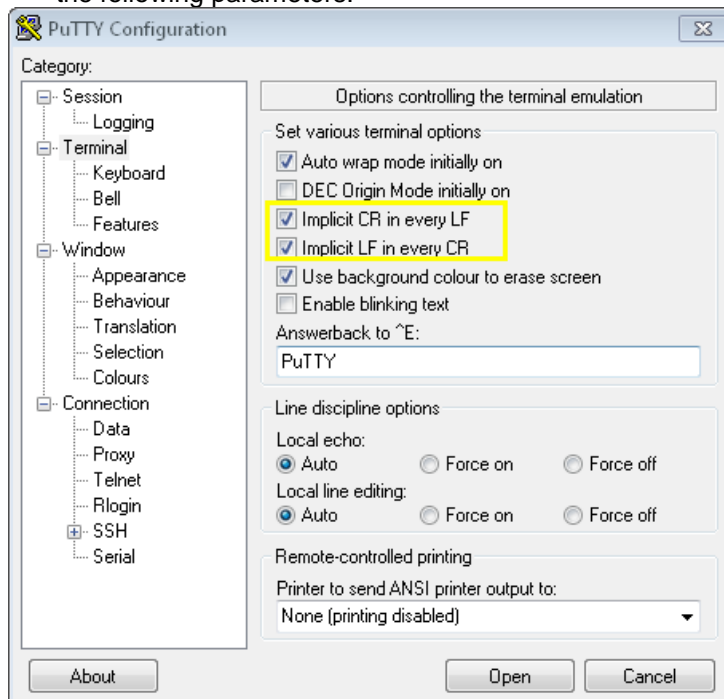
- **local port**
1~65535. when TCP Client, set this to 0 means use random local port
- **remote port**
1~65535
- **packet time/length**
default 0/0, means automatic packet mechanism; you can modify it as a none-zero value

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website: www.RESI.cc

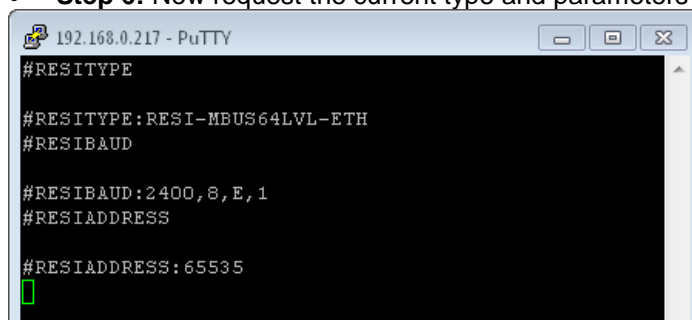
- **Step 3:** Use a terminal program, which can handle a transparent socket connection like putty. Setup the correct IP parameters.



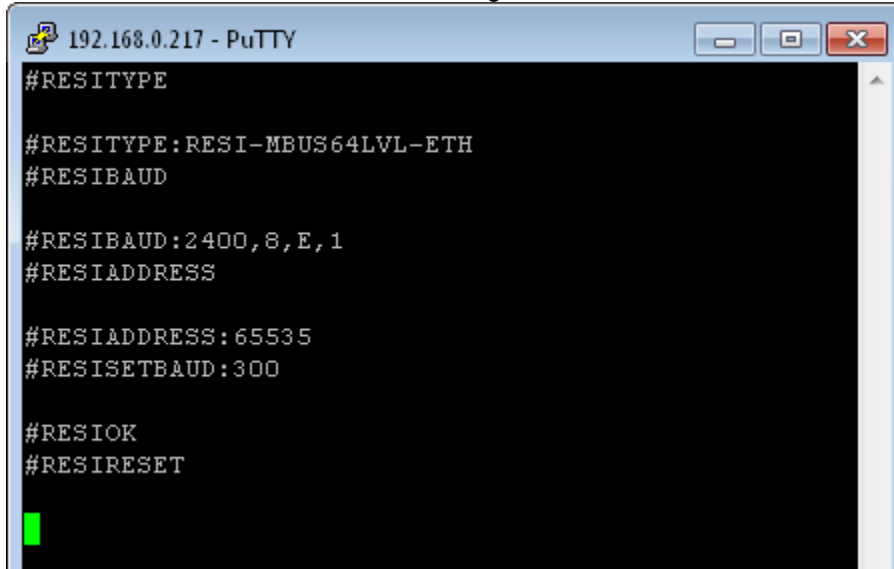
- **Step 4:** Before you select Open, check the terminal emulation page and change the parameters to the following parameters:



- **Step 5:** Now click OPEN to establish a socket connection.
- **Step 6:** Now request the current type and parameters of the gateway:

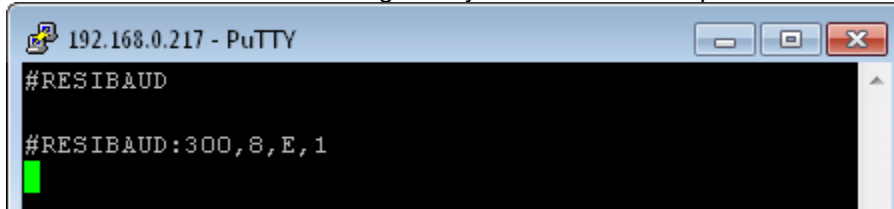


- **Step 7:** Now we change the baud rate settings to 300 Baud for the MBUS settings and then we reboot the module to activate the new settings:



```
192.168.0.217 - PuTTY
#RESITYPE
#RESITYPE:RESI-MBUS64LVL-ETH
#RESIBAUD
#RESIBAUD:2400,8,E,1
#RESIADDRESS
#RESIADDRESS:65535
#RESISETBAUD:300
#RESIOK
#RESIRESET
```

- **Step 8:** Now we reopen the socket with the putty (Use Duplicate session), because the socket was closed with the reset of the gateway and we check the parameters for the MBUS line with:

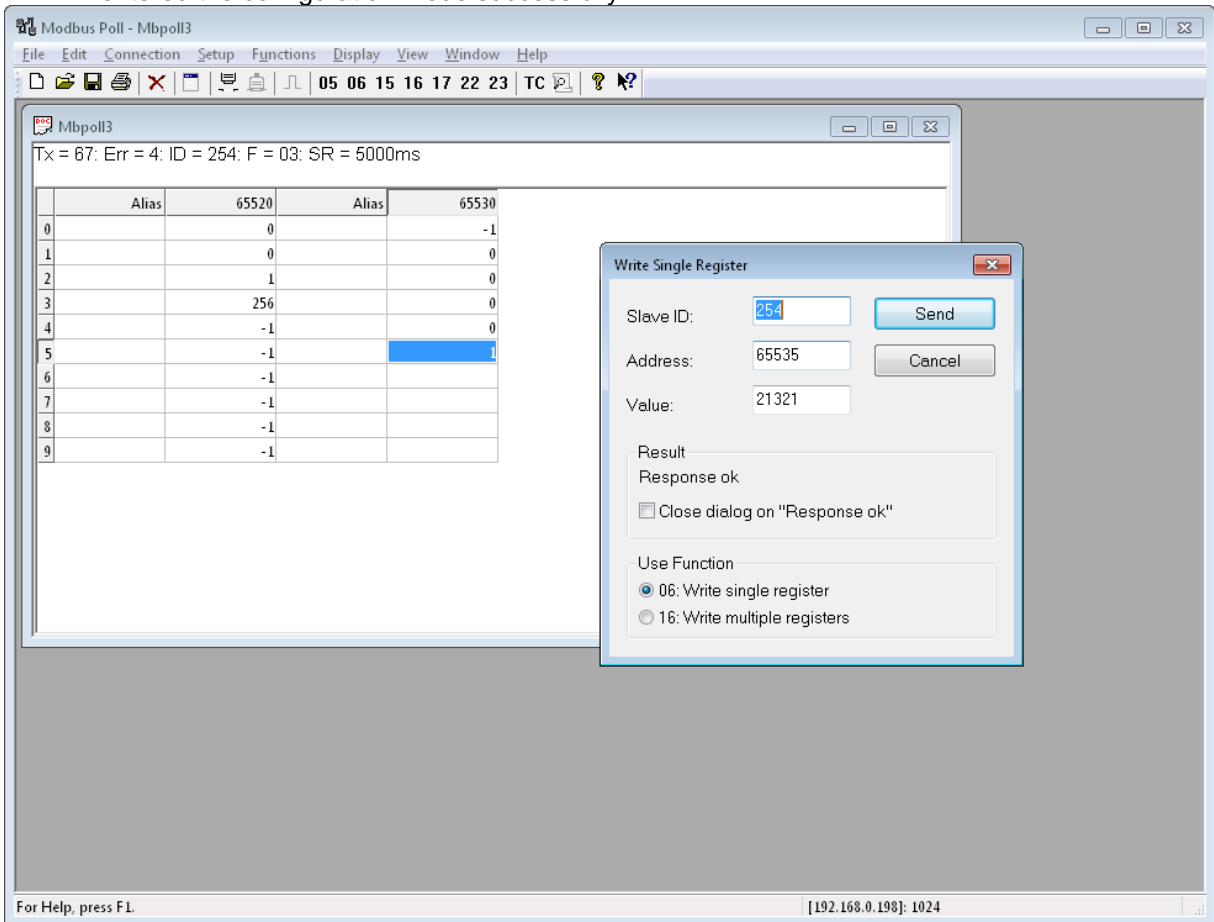


```
192.168.0.217 - PuTTY
#RESIBAUD
#RESIBAUD:300,8,E,1
```

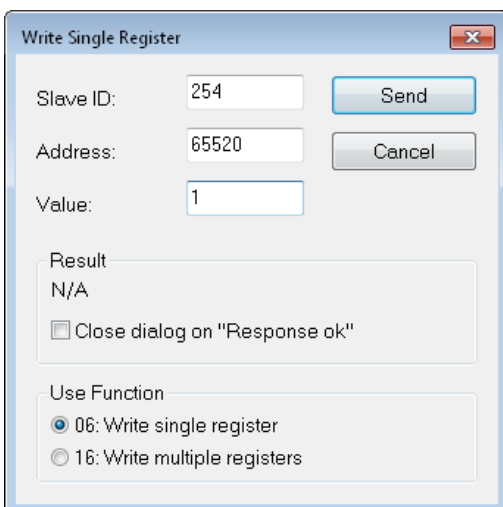
- **Finished:** Your gateway works with your new settings.

8.6 HOWTO enter configuration mode

- **Step 1:** First of all, there must be at least 2 seconds silence on the socket (no data transfer), before you can switch to configuration mode for changing serial parameter. If you have changed the parameter CONFIG PAUSE you have to wait at least you configured pause time in ms.
- **Step 2:** Write the magic number 21321 (0x5349) to the register 4x65536 I:65535 H:0xFFFF. As a result the content of the register will show the value 1 and the STATE LED flashes faster. You have entered the configuration mode successfully.



- **Step 3:** Change now the register contents according to the register table for your purposes.
- **Step 4:** Don't forget to reset the gateway either by shortly unplugging the power or by writing 1 to the RESET register. 4x65521 I:65520 H:0xFFFF0 RESET SYSTEM

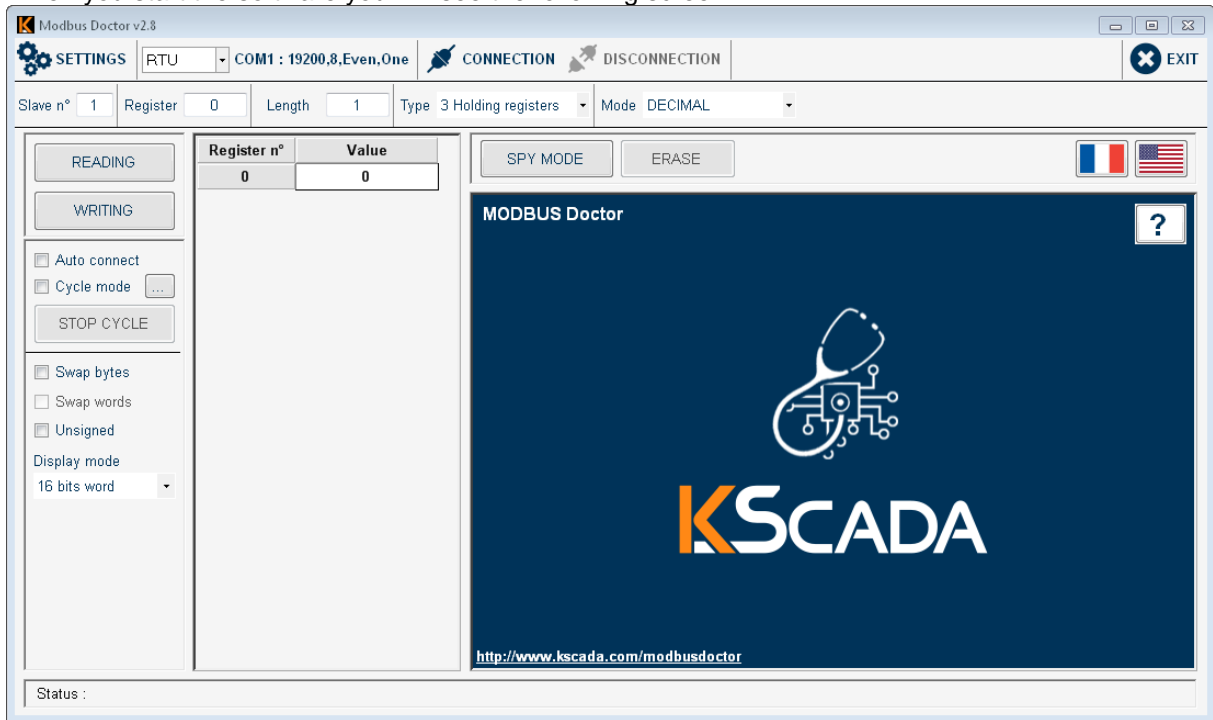


- **Finished:** Your gateway works with your new settings.

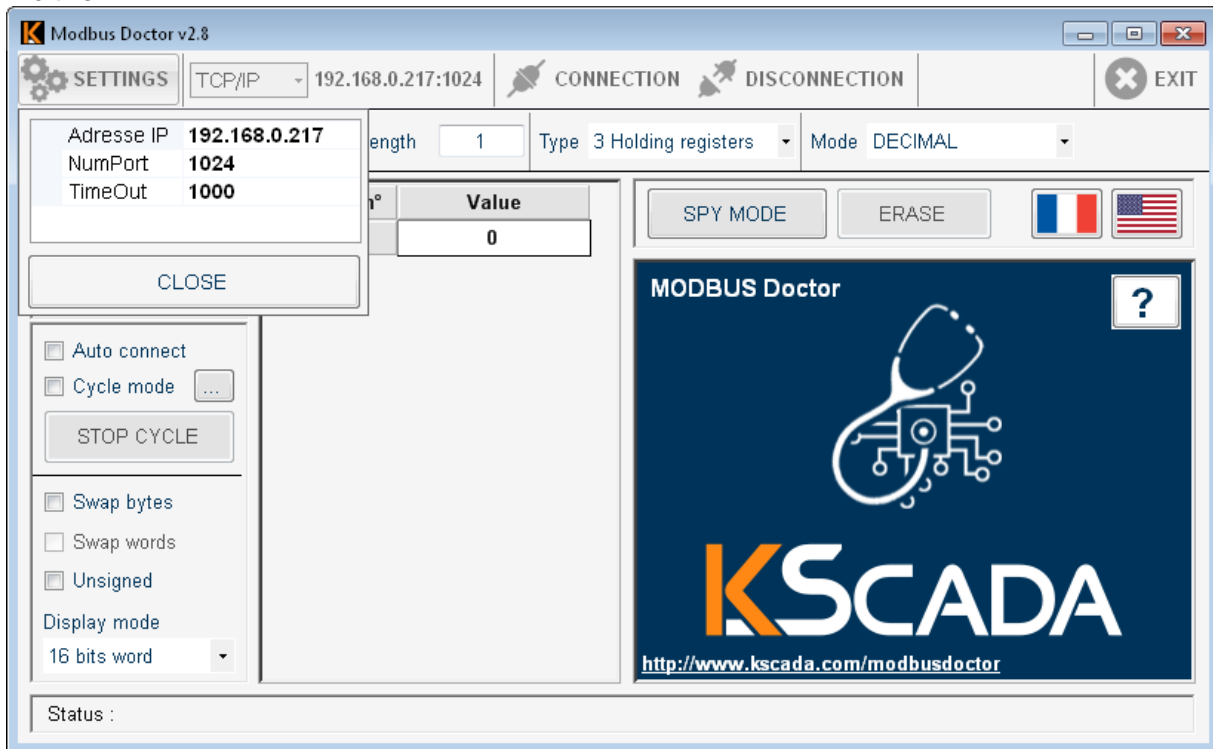
9 Using software MODBUS Doctor to configure

In this chapter we show the configuration with software MODBUS Doctor. You can download this free software under <https://www.kscada.com/modbusdoctor.html>

When you start the software you will see the following screen:



Now click on the drop down field RTU and select TCP/IP mode. Then open the settings. The result will look like this:



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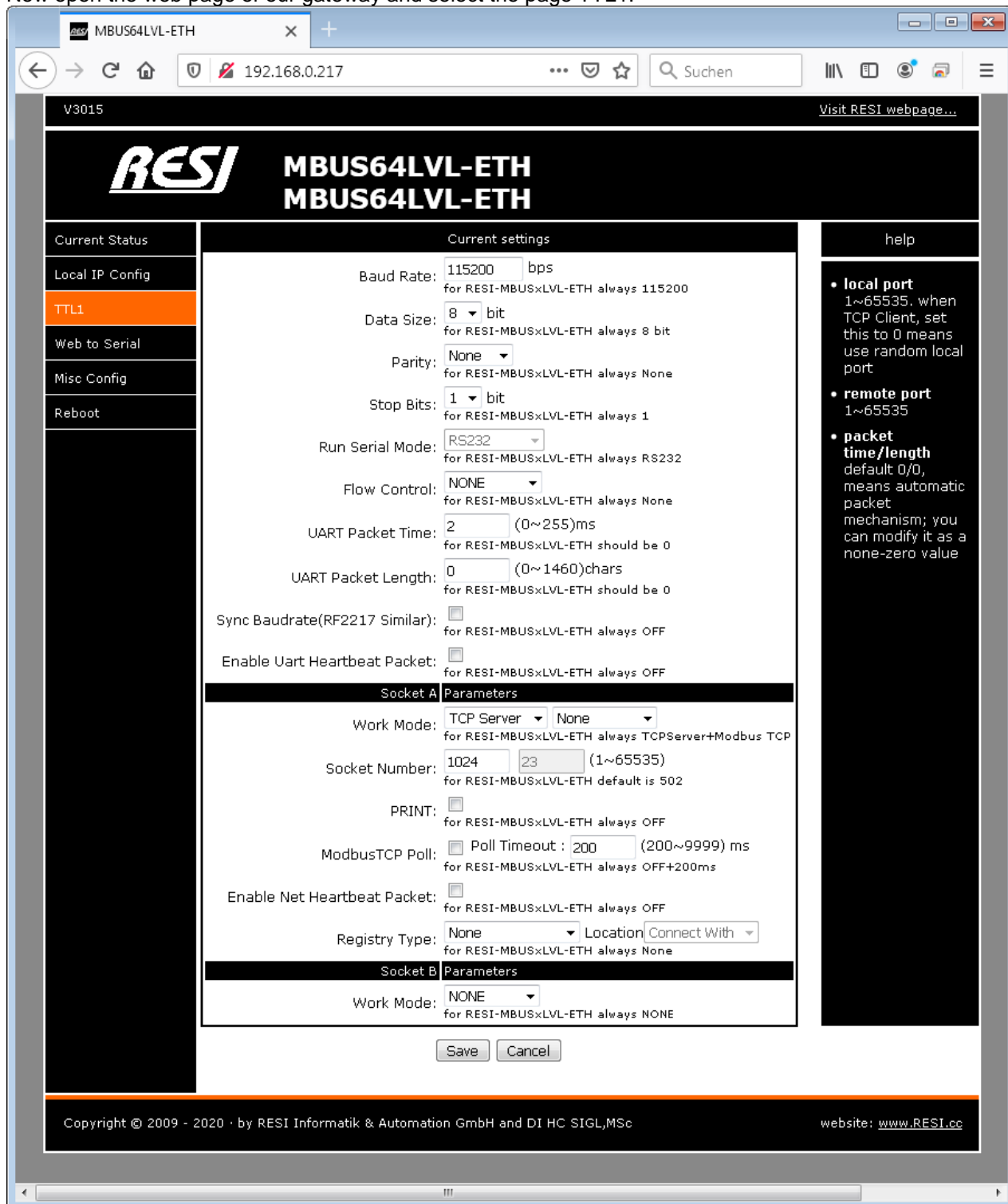
Enter the following data into the settings field:

- IP address of your gateway e.g. 192.168.0.217
- Socket for MODBUS/TCP communication e.g. 1024
- Timeout for polling e.g. 1000ms

Then we set the correct register range to enter setup mode of the gateway:

- Slave ID 254 for setup of gateway
- Register 65535 to enter configuration mode
- Length to 1, only one register should be read out

Now open the web page of our gateway and select the page TTL1:



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Concentrate on the current mode of the gateway. Usually it is in transparent mode:

Socket A		Parameters	
Work Mode:	TCP Server	None	
for RESI-MBUSxLVL-ETH always TCPServer+Modbus TCP			
Socket Number:	1024	23	(1~65535)
for RESI-MBUSxLVL-ETH default is 502			

In this mode the gateway simple sends all commands incoming from the socket to the serial line and sends all received bytes from the serial line to the socket.

To configure our gateway, we use MODBUS/RTU protocol. The software MODBUS Doctor supports on the TCP side only MODBUS/TCP protocol. So we have to activate the mode MODBUS/TCP to MODBUS/RTU conversion in our gateway. You can do this in two ways:

First way:

1. Set DIP switch 3 MODE to ON
2. Now our gateway will initialize all parameters
3. Wait until the gateway has rebooted
4. Now the gateway works in MODBUS/TCP to MODBUS/RTU conversion mode
5. Set DIP switch 3 MODE to OFF
6. Wait until the gateway has rebooted

Second way: You can also change the behaviour with the web interface. Open the page TTL1 and select the following parameters:

The screenshot shows a web browser window with the URL 192.168.0.217. The page title is 'MBUS64LVL-ETH'. The interface includes a navigation menu on the left with 'TTL1' selected. The main content area is titled 'Current settings' and contains various configuration options for serial communication. A yellow box highlights the 'Socket A Parameters' section, which includes:

- Work Mode: TCP Server (selected) and ModbusTCP (selected)
- Socket Number: 1024 and 23 (1~65535)

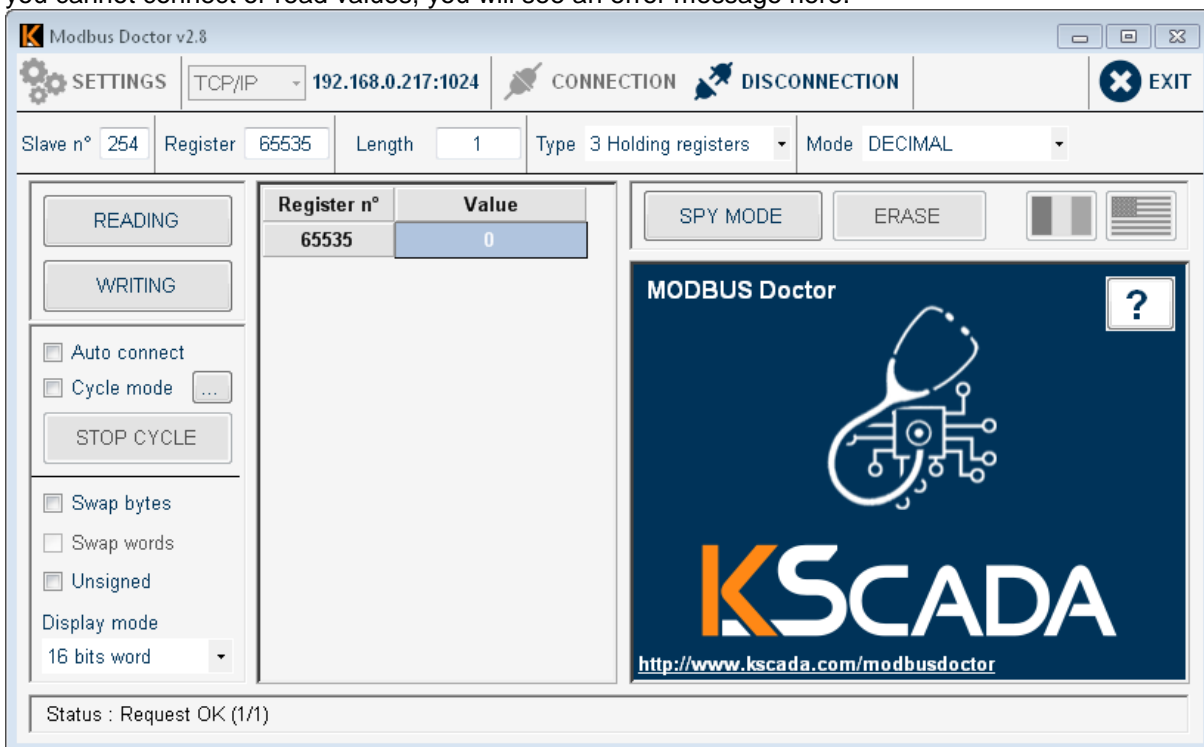
Other visible settings include Baud Rate (115200), Data Size (8 bit), Parity (None), Stop Bits (1 bit), Run Serial Mode (RS232), Flow Control (NONE), UART Packet Time (2 ms), and UART Packet Length (0 chars). A 'help' sidebar on the right provides details for local port, remote port, and packet time/length. At the bottom, there are 'Save' and 'Cancel' buttons.

After you have changed the parameters, lick on save and then on "Restart Module" button in the web interface. Now you have activated the MODBUS/TCP to MODBUS/RTU conversion.

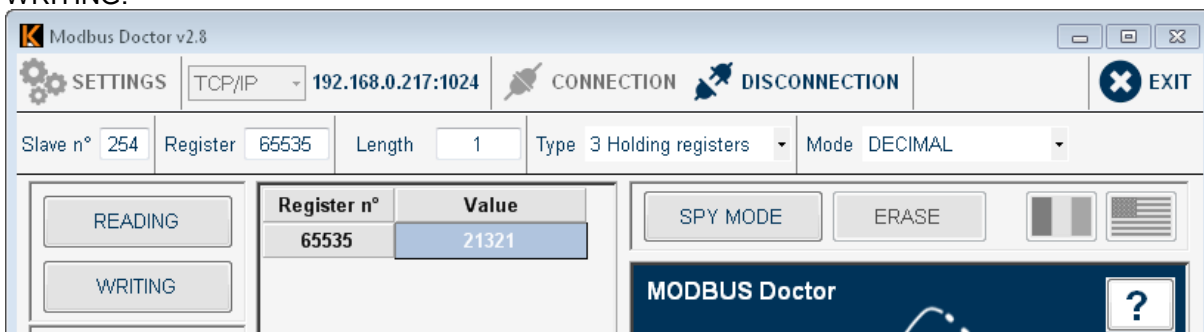
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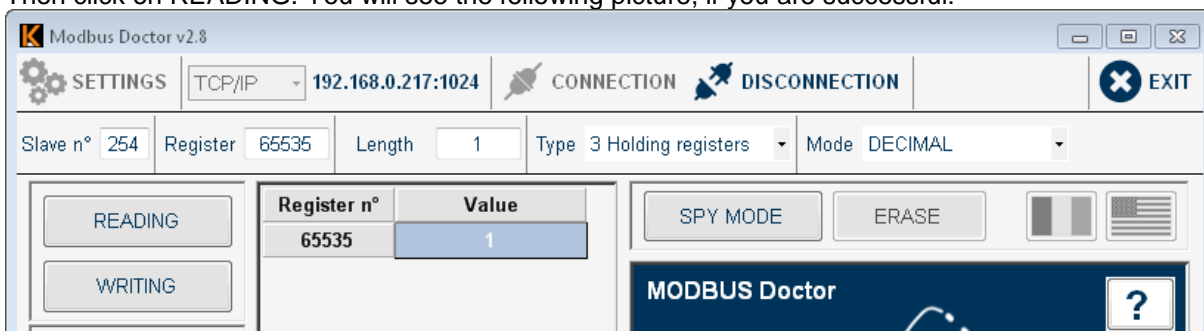
The next step is to test the communication with the gateway via the MODBUS Doctor software. First lick on CONNECTION to establish a TCP/IP connection, then select the button READING to test the readout of register 65535. If everything is ok, you will see in the Status in the left bottom corner the hint Request OK. If you cannot connect or read values, you will see an error message here.



In the next step enter the magic number 21321 into the field Value beside the Field 65535 and click on WRITING:



Then click on READING. You will see the following picture, if you are successful:



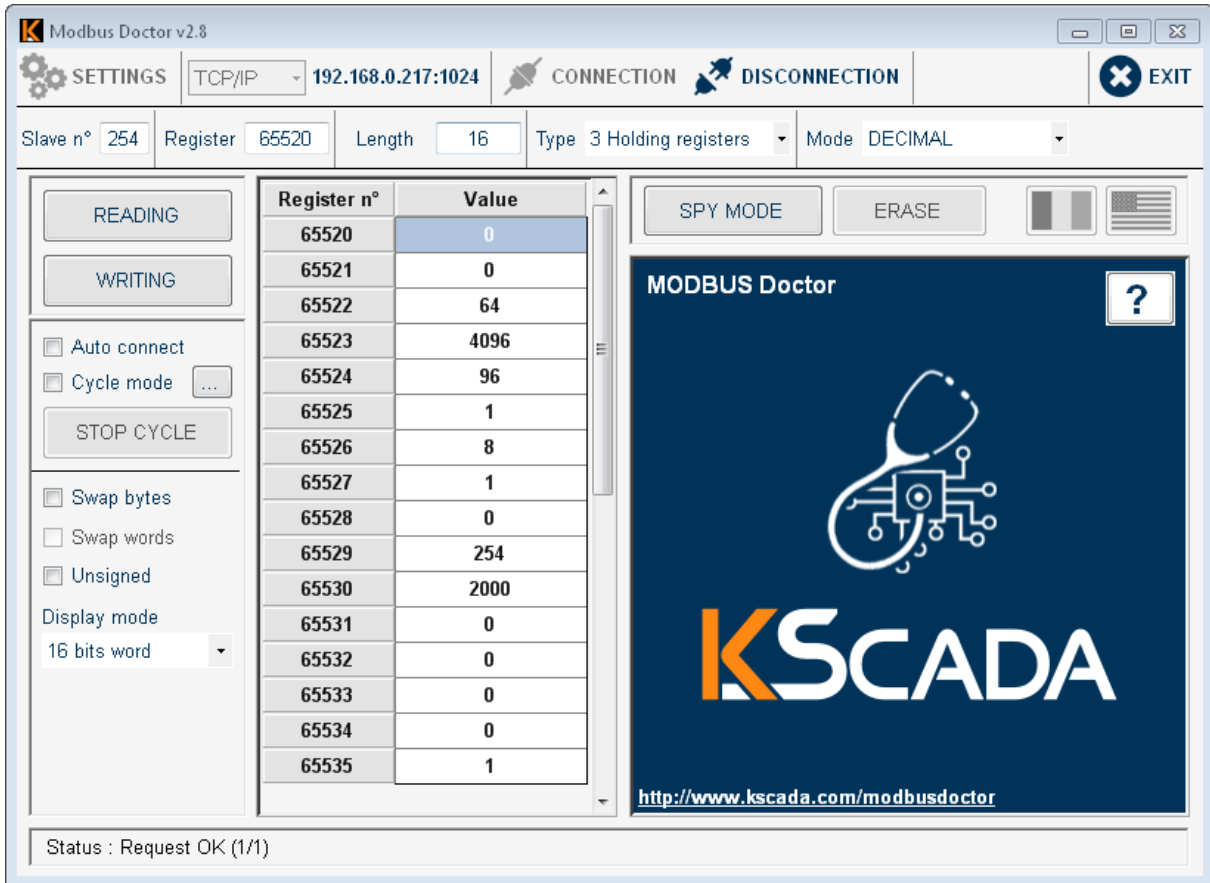
The displayed 1 indicates, that you are in configuration mode. Now we change the field Register to I:65520 and the field Length to 16 and click on READING.

Be aware, that the software uses the protocol indexes starting with 0, not the MODBUS index of registers starting with 1!

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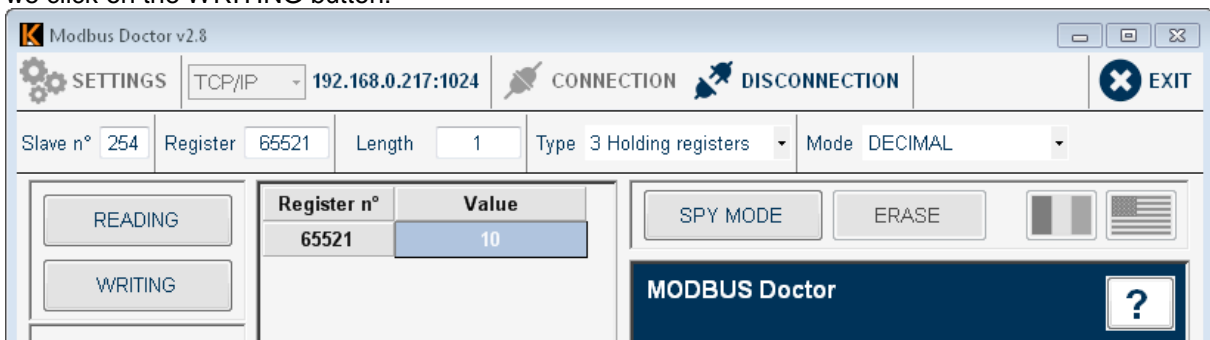
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The result should look like this:

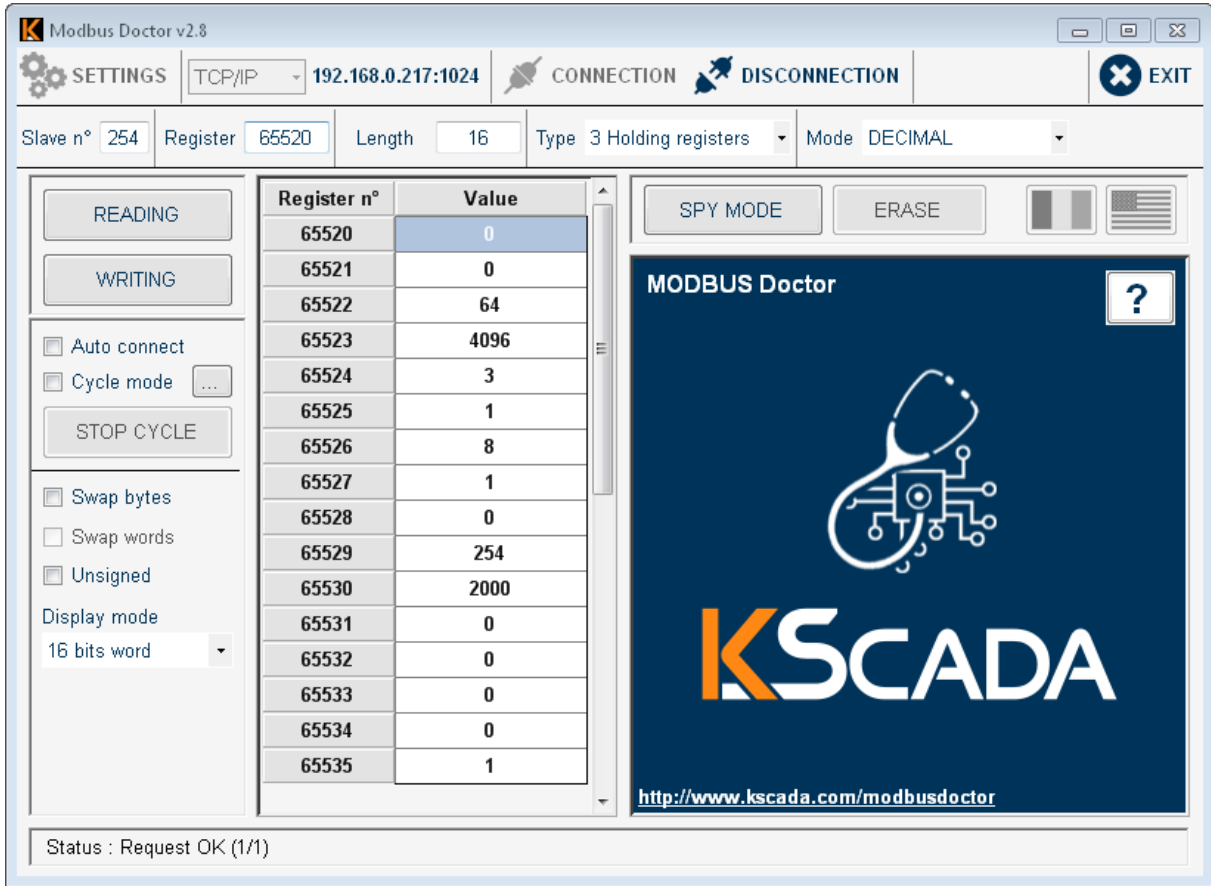


You will see all current selected parameters. In our example we want to connect to change the MBUS settings to 300bd.

Therefore we use the quick setup register 4x65522 , I:65521 STANDARD CONFIG, and we want to write the value 10 into it. For that we do the following steps: We change Register to 65521 and Length to 1. Then we click on READING. The Value should be 0, After that we enter the new value 10 into the field Value and then we click on the WRITING button:



Then we change the field Register back to 65520 and the field Length to 16 and click on READING. We see the new settings:



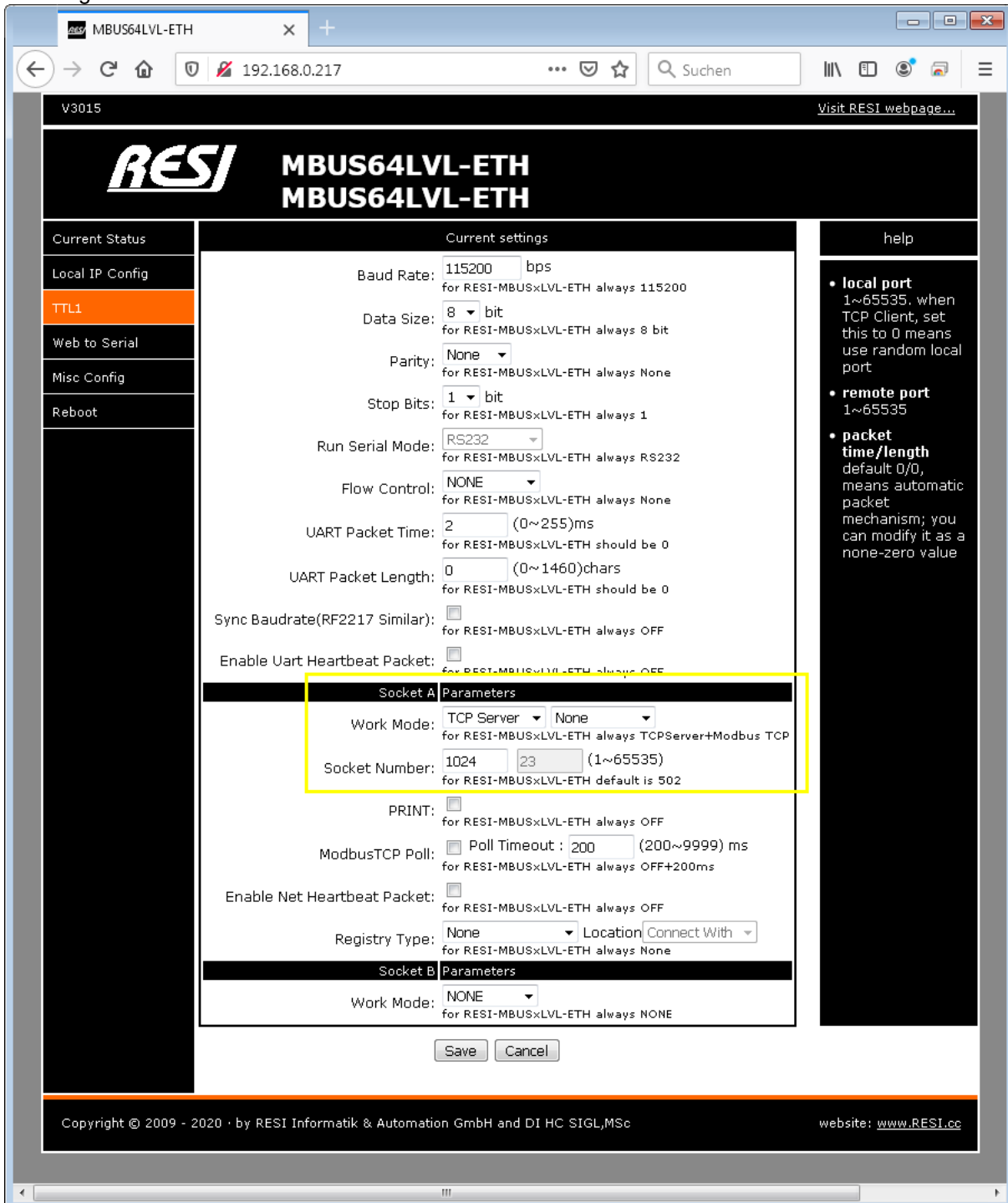
Now we have to reboot the gateway to leave the setup mode. Therefore we set the field Length to 1 and we write 1 into the register 65520 Value in the list and click on WRITING. The gateway will reboot.

Now the gateway works in MODBUS/TCP to MODBUS/RTU mode and will convert incoming MODBUS/TCP requests into MODBUS/RTU requests on the serial line.

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Now we have to change the mode of the gateway from MODBUS/TCP to Transparent. Therefore we open the Webpage of the gateway and click on the SAVE and RESTART button. Now our gateway work in transparent mode again.



To set the transparent mode of the gateway you can also use the DIP switches. Set the DIP switch 3 MODE to OFF and DIP switch 4 CFG to ON, wait for approx.. 30 seconds, and reset both switches. It's the same as if you change the parameters on the webpage.

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10 Specifications

10.1 Dimensions RESI-MBUSxLVL-ETH

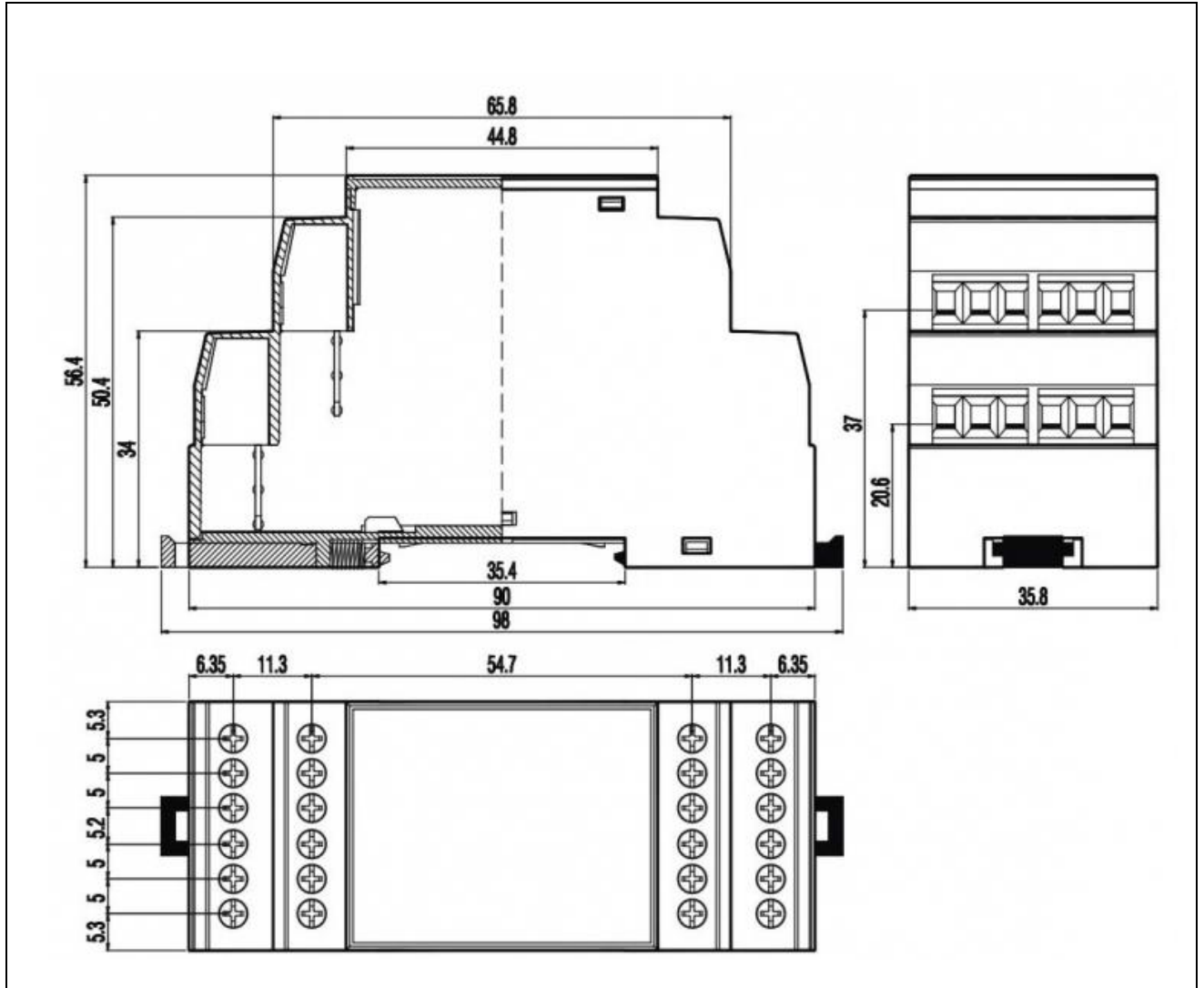


Illustration: dimension illustration in mm for RESI-MBUSxLVL-ETH

Dimensions	
Enclosure dimensions L x W x H (mm)	35.8 x 90 x 58
Weight	90 g
Colour	Grey RAL7035
Material	PA - UL 94 V0
Protection class	IP20 based on DIN 40050/EN 60529

Table: Data of enclosure for RESI-MBUSxLVL-ETH

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10.2 3D drawing

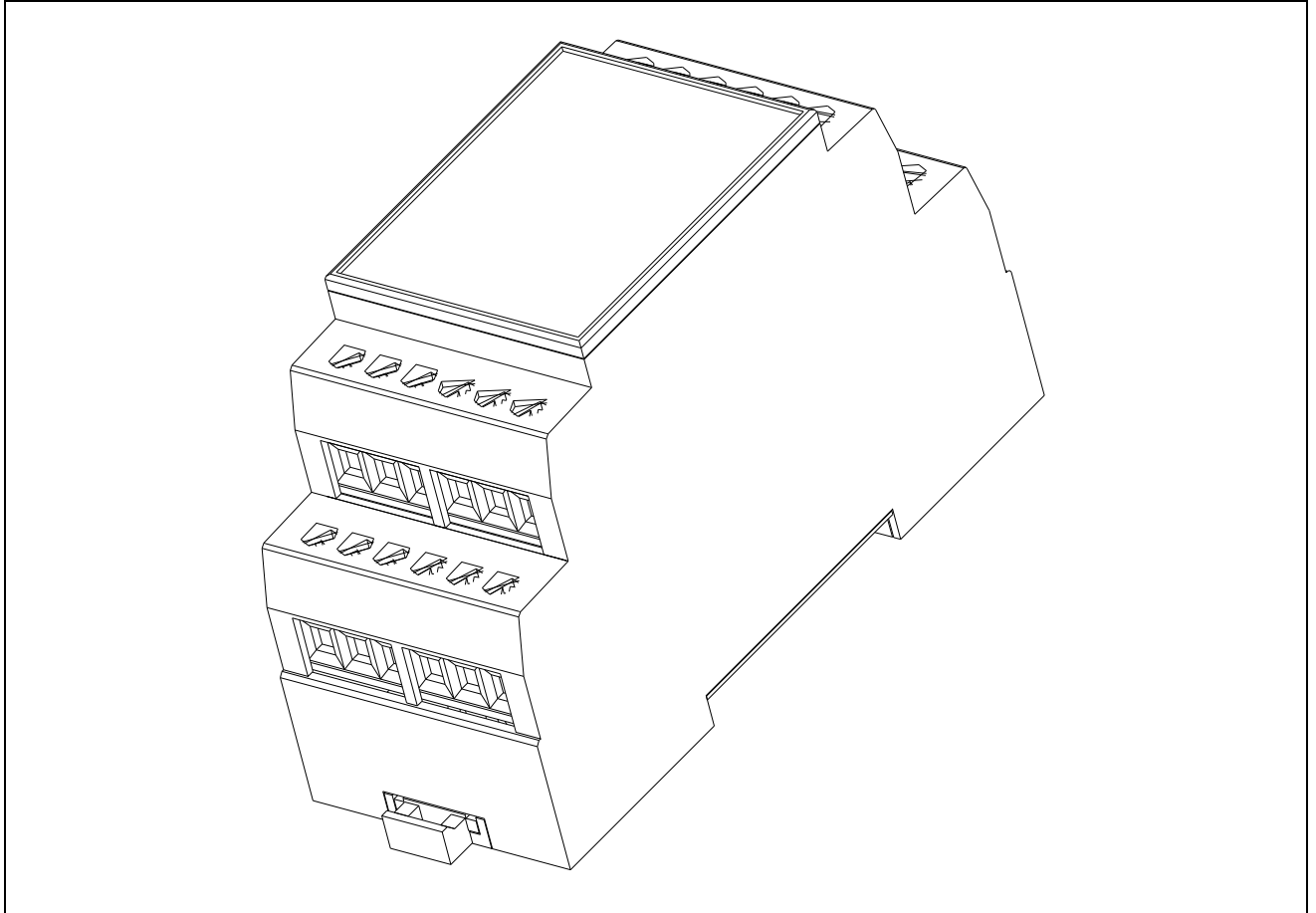


Illustration: Housing in 3D

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