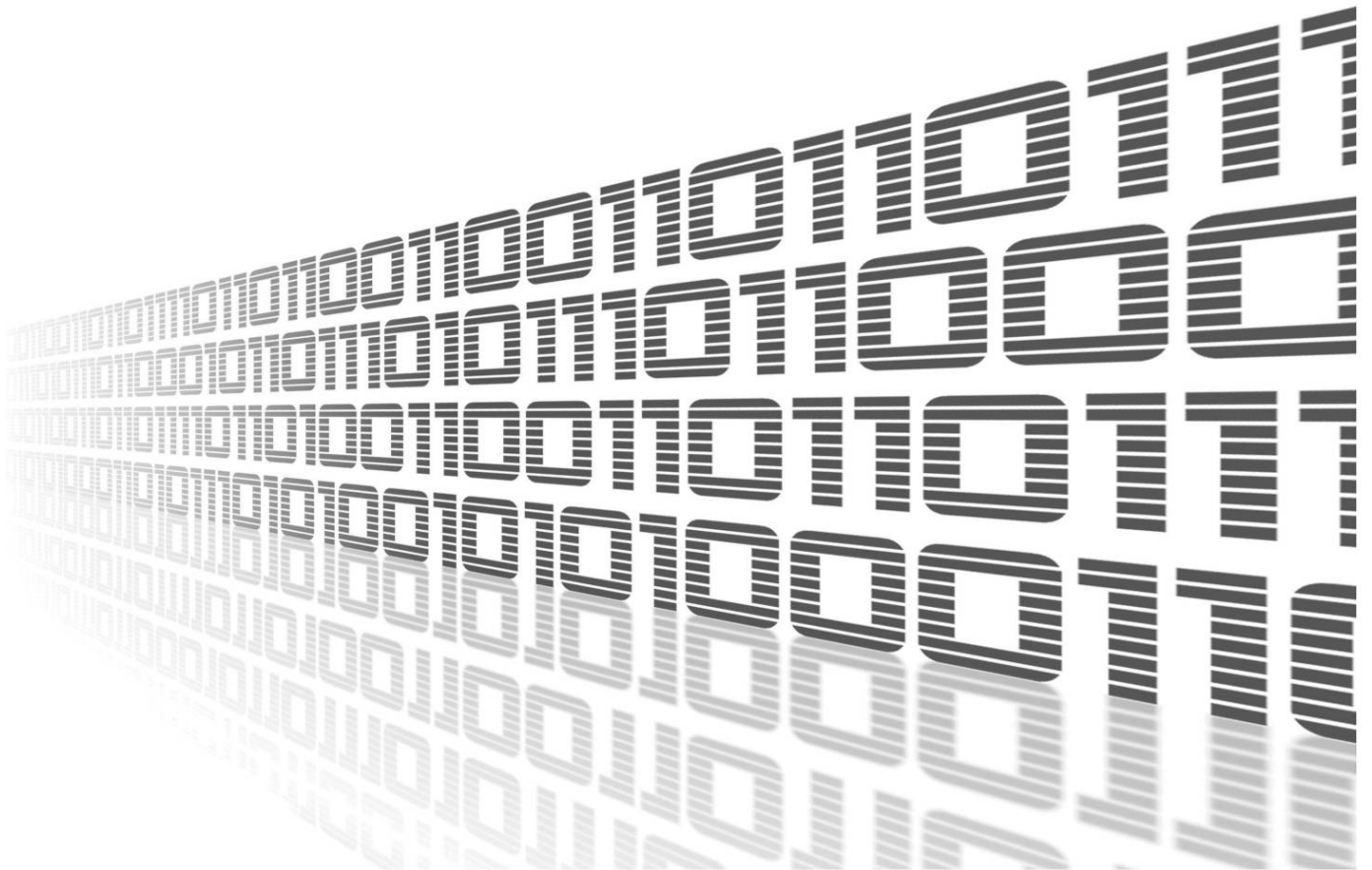


ADVANTECH



Protocol MODBUS-RTU2TCP



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Used symbols

 *Danger* – Information regarding user safety or potential damage to the router.

 *Attention* – Problems that can arise in specific situations.

 *Information* – Useful tips or information of special interest.

 *Example* – Example of function, command or script.

Contents

1. Changelog	1
1.1 Protocol MODBUS-RTU2TCP Changelog	1
2. Router App Description	2
2.1 MODBUS RTU and MODBUS TCP Protocol	2
3. Configuration	4
4. Related Documents	6

List of Figures

1 Router with router app converting data from boilers to SCADA	2
2 Modbus message on serial line	3
3 Modbus message on TCP/IP	3
3 Configuration form	4

List of Tables

1 Configuration form	5
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1. Changelog

1.1 Protocol MODBUS-RTU2TCP Changelog

v1.0.0 (2015-07-31)

- First release

v1.0.1 (2015-11-04)

- Added option "Slave ID"

v1.0.2 (2016-11-10)

- Fixed bug in uart read loop

v1.1.0 (2018-09-27)

- Added support of ttyUSB

v1.1.1 (2018-09-27)

- Added expected ranges of values to JavaScript error messages

2. Router App Description



Router app *Protocol MODBUS-RTU2TCP* is not contained in the standard router firmware. Uploading of this Router app is described in the Configuration manual (see Chapter [Related Documents](#)).



Modbus RTU2TCP is not v4 platform compatible.

The router app in Advantech router enables the conversion of Modbus RTU messages received via serial line – into Modbus TCP messages. These are sent via TCP to the specified Modbus server afterwards. This is useful for applications where a computer is collecting data from e.g. boilers or other devices. The data in Modbus RTU format are sent to the Advantech router via RS485. They are converted to Modbus TCP format and sent via Internet to the Modbus server and then to SCADA. See the figure below:

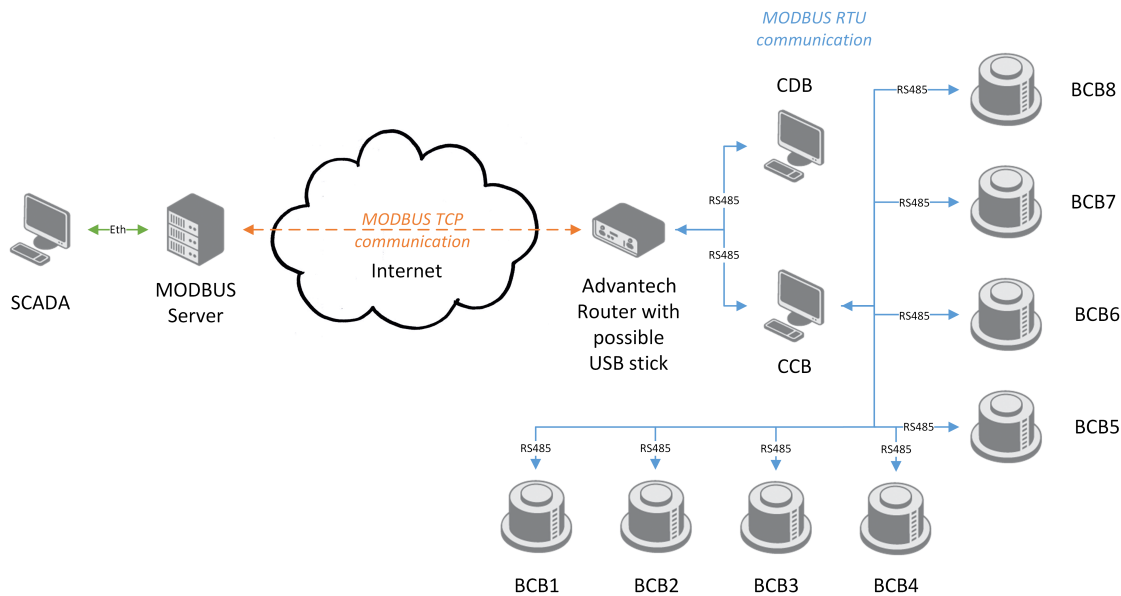


Figure 1: Router with router app converting data from boilers to SCADA

The router with the router app enabled is a RS485 Modbus slave – all data has to be sent to the router by a computer or a cascade display.

The router app can store the received data on the USB flash stick if TCP network connection (Internet) is not available at the moment. It is then resent when connection is established with the proper order of data.

2.1 MODBUS RTU and MODBUS TCP Protocol

The conversion of MODBUS RTU protocol to MODBUS TCP protocol is provided by the router app. The MODBUS RTU protocol runs on serial line. The RS232 or RS485/422 expansion port can be used in the router.

Both protocols have a common part – protocol data unit (PDU). They differ in application data unit (ADU) part. The received PDU on the serial line has the address of destination unit as a header and the checksum at the end.

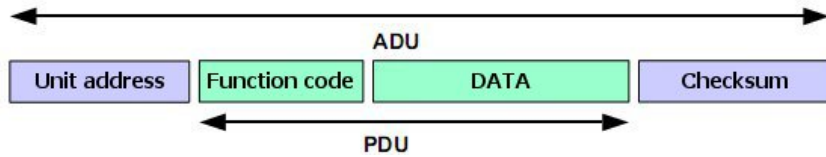


Figure 2: Modbus message on serial line

When sending MODBUS ADU on the TCP/IP, the MBAP header is used for identification. The 502 TCP port is dedicated for MODBUS TCP ADU.

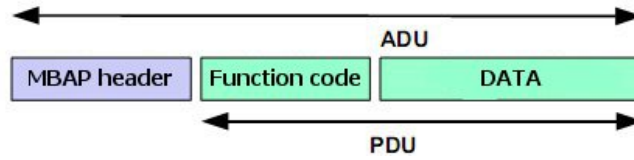


Figure 3: Modbus message on TCP/IP

3. Configuration

Use the Web interface of the router app *Modbus RTU2TCP* to configure it. It is accessible from the router's Web interface by clicking on the *Router Apps* page and then the name of the router app. There are just two items in the Router app's menu on the left. *Config* is this configuration page and *Return* is to return to the router's Web interface. See the table below for the configuration items explained:

MODBUS-RTU2TCP Configuration

Enable MODBUS-RTU2TCP protocol on expansion port

Expansion Port:

Baudrate:

Data Bits:

Parity:

Stop Bits:

Split Timeout: msec

Server Address:

TCP Port:

Reply Timeout: msec

Enable Cache on USB memory stick

Figure 4: Configuration form

Item	Description
Enable	Enables conversion of MODBUS RTU protocol to MODBUS TCP/IP protocol.
Expansion port	Port the MODBUS RTU connection will be established on: <ul style="list-style-type: none"> • PORT1 – MODBUS RTU connection established on PORT 1 • PORT2 – MODBUS RTU connection established on PORT 2 Look at <i>General</i> page in the router or <i>Expansion Port 1</i> or <i>Expansion Port 2</i> pages to see the position of serial interface in your router.
Baudrate	Serial interface communication speed. 300 to 115200 range.
Data Bits	Number of data bits in serial communication. 7 or 8.
Parity	Control parity bit in serial communication: <ul style="list-style-type: none"> • none – No parity will be sent • even – Even parity will be sent • odd – Odd parity will be sent
Stop Bits	Number of stop bits in serial communication. 1 or 2.

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Item	Description
Split Timeout	Time interval to break off the message. If some space between the two characters is recognized on receive and if this space is longer than the parameter value in milliseconds, message from all received data is compiled and sent.
Server Address	Defines server address of the TCP server where data will be sent.
TCP Port	TCP port of the server (above) to send received data on. The 502 port is set for MODBUS ADU by default.
Reply Timeout	Specifies the time interval in which a response is expected. If the response doesn't come, one of these error codes will be sent: <ul style="list-style-type: none">• <i>0A</i> – Transmission path unavailable <i>Gateway is not able to allocate internal transmission path from the input port to the output port. It is probably overloaded or incorrectly set.</i>• <i>0B</i> – The target device doesn't response <i>The target device doesn't response, may not be available.</i>
Enable Cache on USB memory stick	Enables storing the messages that could not be delivered to the TCP side. Every single Modbus message is saved as a file. Up to 65536 files (messages) can be saved. The router app is regularly trying to send the oldest message again. If resend is successful, other messages are resent, too. The order of the messages is preserved.

Table 1: Configuration form

All changes in settings will be applied after pressing the *Apply* button.

4. Related Documents

- [1] Advantech Czech: **Expansion Port RS232 – User Manual**
(MAN-0020-EN)
- [2] Advantech Czech: **Expansion Port RS485/422 – User Manual**
(MAN-0025-EN)

You can obtain product-related documents on *Engineering Portal* at icr.advantech.cz address.

To get your router's *Quick Start Guide*, *User Manual*, *Configuration Manual*, or *Firmware* go to the [Router Models](#) page, find the required model, and switch to the *Manuals* or *Firmware* tab, respectively.

The *Router Apps* installation packages and manuals are available on the [Router Apps](#) page.

For the *Development Documents*, go to the [DevZone](#) page.