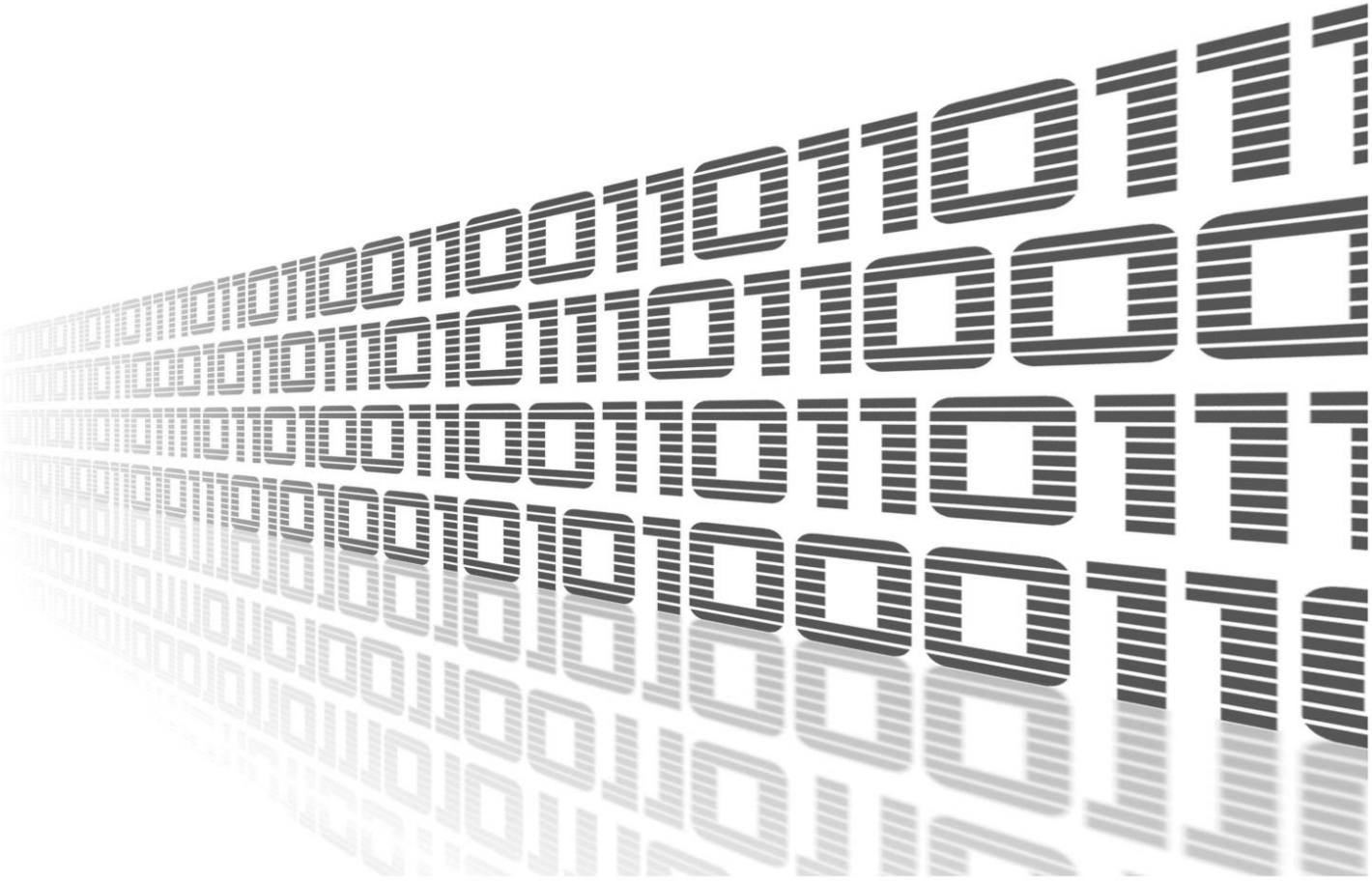
ADVANTECH

RouterApp

Protocol MODBUS-RTUMAP



Advantech Czech s.r.o., Sokolska 71, 562 04 Usti nad Orlici, Czech Republic
Document No. APP-0057-EN, revised on May 7, 2025.

© 2025 Advantech Czech s.r.o. No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photography, recording, or any information storage and retrieval system without written consent. Information in this manual is subject to change without notice, and it does not represent a commitment on the part of Advantech.

Advantech Czech s.r.o. shall not be liable for incidental or consequential damages resulting from the furnishing, performance, or use of this manual.

All brand names used in this manual are the registered trademarks of their respective owners. The use of trademarks or other designations in this publication is for reference purposes only and does not constitute an endorsement by the trademark holder.

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.

Contents

1. Description of router app **1**

1.1 Terminology Clarification 2

2. Configuration of router app **3**

3. Related Documents **5**

List of Figures

1 Model diagram 1
2 Menu 2
3 Configuration form 4

List of Tables

1 Description of items in configuration form 3

1. Description of router app

Router App *Protocol MODBUS-RTUMAP* is not included in the standard router firmware. Uploading of this router app is described in the Configuration manual (see [1, 2]).

Using this module, it is possible to periodically read data from *Modbus RTU* devices (meters) into a buffer. Each *read* value is mapped to a new virtual holding register, which is accessible via *Modbus TCP*. The mapped registers are arranged consecutively, but it is possible to reserve gaps to ensure the mapping remains unchanged for future updates. The following figure illustrates how this works:

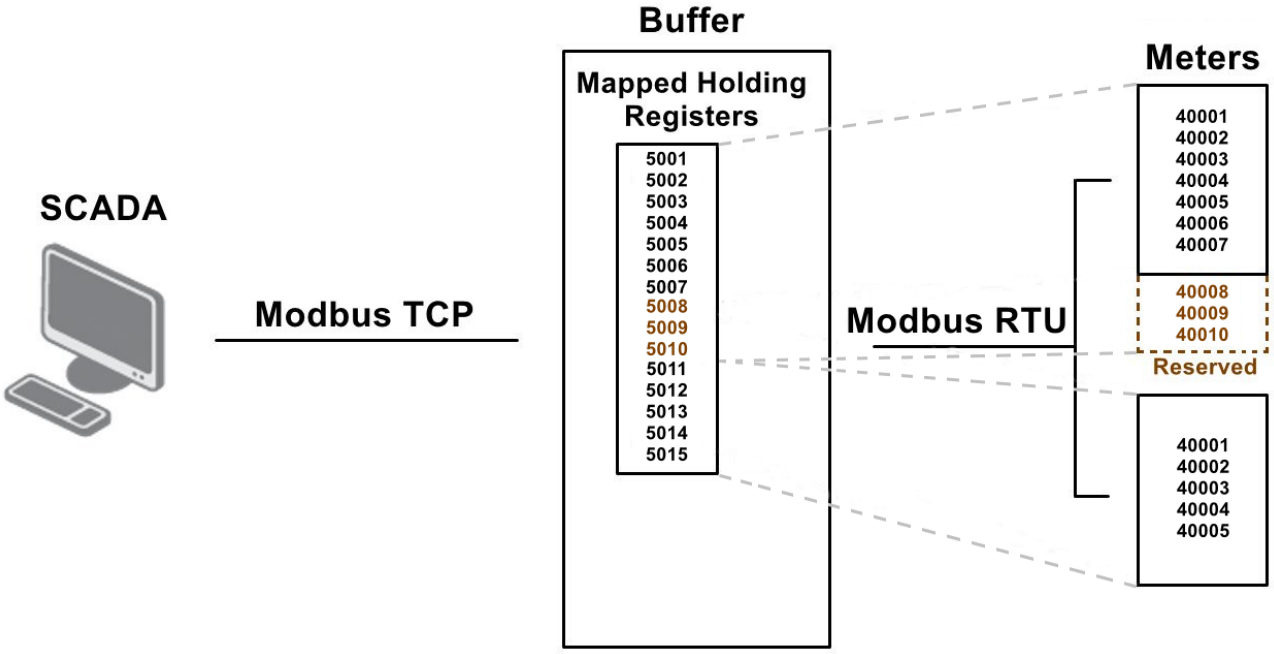


Figure 1: Model diagram

It is also possible to write to the mapped virtual holding registers. The values are then written back to the corresponding registers in the meters. Both single and multiple *write* functions can be used. However, this is only applicable to writable registers (coils and holding registers) on meters. An error is reported for *read-only* registers (discrete inputs and input registers).

Discrete registers (Coils and Discrete Inputs) are not mapped 1:1, but as 16-bit groups. For example, when 20 coils need to be *read* from a meter, they are mapped to 2 holding registers. The first 16 coils are mapped to the first register, while the remaining 4 coils are mapped to the second register, leaving 12 bits in this register unused.

For configuration *RTUMAP* router app is available web interface, which is invoked by pressing the module name on the *Router apps* page of the router web interface. The left part of the web interface (ie. menu) contains *Expansion Port 1 & 2* and *USB Port* in the *Configuration* section and *Return* item in the Administration section, which switches this web interface to the interface of the router. Not all items can be displayed, it depends on the hardware support of the device.

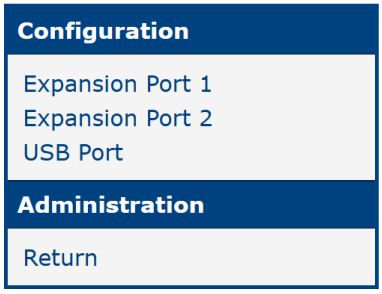


Figure 2: Menu

1.1 Terminology Clarification

Sometimes it is difficult to describe things using standard Modbus terminology, which can lead to confusion. In this document, please interpret the following terms as described below:

- The standalone term **Register** refers to any of the following: *Coil*, *Discrete Input*, *Holding Register*, or *Input Register*.
- **DO** = Discrete Output = *Coil*
- **DI** = Discrete Input
- **AO** = Analog Output = *Holding Register*
- **AI** = Analog Input = *Input Register*

2. Configuration of router app

Configuration of this router app is performed via *Expansion Port 1 & 2*, or *USB Port* forms. Meaning of other items is described in the table below:

Item	Description
Enabled RTUMAP on X	Activate the RTUMAP Router App on one of the following ports: Expansion Port 1, Expansion Port 2, or the USB port – depending on which interface are you currently in use.
Port Type	Type of serial (*RS232* or *RS485*) on an expansion port or connection state of an external serial in the USB port.
Baudrate	Modulation rate (number of distinct symbol changes – signaling events – made to the transmission medium per second).
Data Bits	Number of data bits (*7* or *8*).
Parity	Parity (*none*, *even* or *odd*).
Stop Bits	Number of stop bits (*1* or *2*).
Split Timeout	Time limit for reading each meter (in miliseconds).
Read Period	Period of reading data set from all meters to the buffer (in seconds).
TCP Port	TCP Port Number on which the Modbus master requests are listened to.
Mapped Registers From	An address on which mapped holding registers start. A Modbus master (e.g. SCADA) reads/writes from/to addresses starting at this address. See bellow items how the next addresses are assigned.
Number	Row identifier, serves as a unique number for each entry.
Checkbox	Enables/disables reading/writing of values for the related row. When is disabled, the mapping addresses are counted to be reserved and the mapping schema is preserved after enabling.
Meter Address	Modbus device address of a meter.
Start Register	Starting register on the Modbus device (meter) for reading values.
Number of Values	Number of registers that are actively read and mapped from the Modbus device.
Total Reserved	Total number of registers reserved for reading. Allows future increase of Number of Values without changing the mapped address range. Only Number of Values are actually being read, but mapping is calculated as Total Reserved values would be read.
Type of Registers	Depending on the register type, the program selects the appropriate read/write functions.
Mapped Registers	The range of mapped addresses calculated for this row, based on Mapped Registers From and Number of Values (e.g. 40000–40009).

Table 1: Description of items in configuration form

All changes will take effect after pressing the *Apply* button.

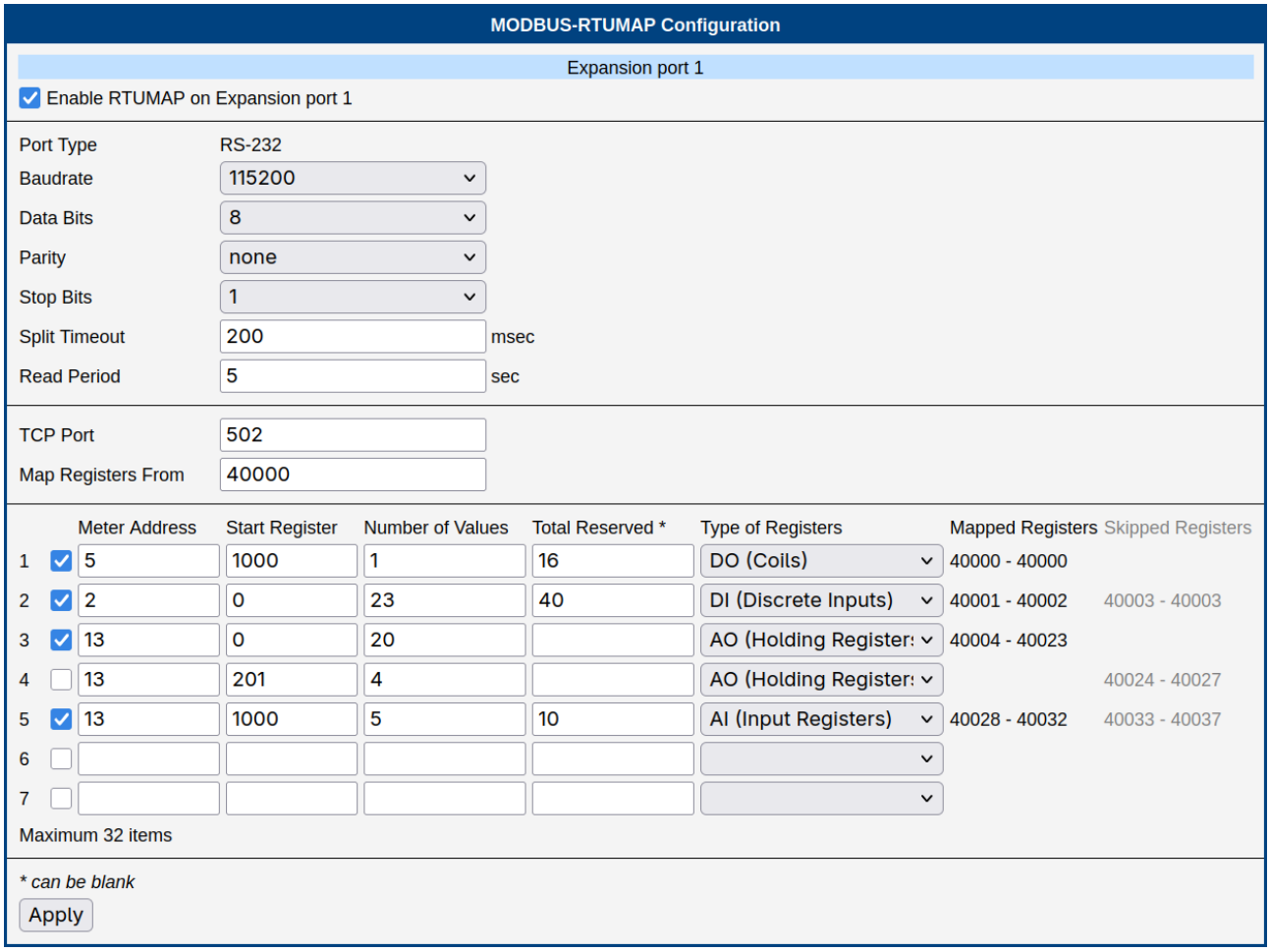


Figure 3: Configuration form

3. Related Documents

You can obtain product-related documents on *Engineering Portal* at *icr.advantech.com* 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 *Development* page.