



Mediator

Custom protocol to Modbus TCP gateway 2 x RS-232/485, 2 x Ethernet, Wi-Fi

Thank you for your choice and we hope that our device will meet your expectations and will be useful for you in automation projects, making your work easy and enjoyable.

As the name suggests, Mediator is an Ethernet-to-serial gateway for an arbitrary custom protocol written in Lua. Its main purpose is to speed up communication and facilitate access to controllers using a non-standard and slow RS-232/485 fieldbus interface.

Attention !

- **When installing the device, ensure that it is protected from harmful external factors such as dust, moisture and temperature.**
- **The device operates with dangerous voltages. Please be careful to ensure that the connecting wires are de-energized.**

1. Operating principle

With the help of Mediator, you can connect a remote serial device with a COM port (electric, heat meters, scales, etc.) to the monitoring or automation system via Ethernet and implement communication with it using a non-standard protocol using a handler written in the language Lua. A web browser is sufficient to configure the gateway. Mediator works asynchronously, reading the required data into the internal memory available to clients via Modbus TCP.

2. Application area

Connecting non-standard slow devices to a monitoring or automation system for which adding or developing a driver for an end device is impractical or impossible. Thus, such a device can simply be connected to the system using the flexible communication capabilities of Ethernet and Wi Fi. Examples of such end devices are electricity meters, heat meters, scales, barcode scanners, identification and smart tags, etc.

3. Technical specifications

Power	85 - 240 VAC
Communication	2 x RS-232/485* with isolation 2 x Fast Ethernet Switch 10/100 Mbit Wi-Fi b/g/n
Isolation voltage	RS-485 : 2500 VRMS

	Ethernet : 1500 VRMS
Relay	2 N.O.
Protocols supported	Modbus TCP, freely programmable in Lua
Mounting	DIN - profile, wall mount
Dimensions	100 x 90 x 40 mm, weight 200 g.
Environmental	0 – 50 °C, 90% humidity w/o condensing
Protection	IP40

* - defined when ordering

4. Internal Mediator registers

There are some internal registers for the remote commissioning:

#	Description	Addr	Type	R/W
1	Relay outputs	C0 - C1	Bit	R/W
2	Uptime	HR11	DW	R
3	Free memory	HR14	W	R
4	Command register, codes: 711 – config mode, 911 – normal mode, 444 – stop Lua script, 555 – run Lua scrip	HR14	W	W

(!) Use slaveId = 65 to access these registers over Modbus TCP.

5. Setting up

Network connection. Mediator can be connected to the network, either via a wired connection or via Wi-Fi. To access the settings panel, press the SET button (configuration), and a new Wi-Fi network with the SSID like 7Bit-ModbusProxy-xxxxxxx will appear. Connect to this network by any client (password: 12345678) and using a browser go to 192.168.4.1 Specify the necessary settings to connect to your network. When finished, click Exit. When you exit the settings, the device will reboot. Knowing the IP address of the gateway, you can enter the settings panel from the local network, and the module must also be in the configuration mode.

Port configuration. The gateway has 2 RS-232/485 ports (A and B). Each port has its own individual settings for speed and parity, which are set from the menu or from a Lua program. If there is no port initialization in Lua, the settings from the web interface will be applied.

6. Operation

Working in Lua. In the configuration mode, the transition to the editor occurs by pressing the upper button "Lua". When you receive a

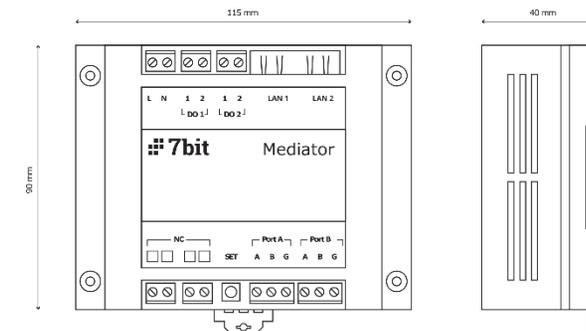
device from a supplier, there is a demo example of a script for exchanging data between Mediator's ports with comments. Save this script and use it as a template. At the end of the script there are pairs of functions for initializing ports and creating threads (threads, threads) into which are passed as arguments to the exchange handler functions. Inside the handlers there must be an infinite loop with a mandatory return of the control context to the OS (call of the thread.sleepms () function)
Access to Modbus TCP registers. The module has a memory area addressed via the Modbus TCP protocol (3rd function, holding registers) with an address range of 0 .. 1000. To write to this area from a Lua program, the following functions are used:
GetReg.Holding (<addr>) - read a word at addr
SetReg.Holding (<addr>, <value>) - write the word value to addr
math.IEEE754_TO_HEX(<addr>, <value>) – converts data to float and write to memory

7. Diagnostics

During normal operation of the device, the following indication is displayed: the red power LED is on, the green LED is blinking slowly (~ 1Hz), which characterizes the system state (and 0.5Hz when in programming mode), as well as the bus exchange indication, next to the RS-232/485 ports (yellow - Tx, green - Rx).

1. **There is no access to the gateway over the network.** Go to the settings menu and check the network settings. Check the connection with a ping command.
2. **The external device is not readable.** Load the factory script, connect the ports to each other and check if the ports are working properly. Check the timeouts waiting for responses from devices in the program. Use the debug console to display data that is sent to and received on the port. Some devices may not respond when receiving packets with errors. Also, in addition to debug printing, you can output the line number, or error code or program/memory block to the Modbus TCP register, which can be controlled from the Modbus TCP client.
3. **Data read delays.** Adjust memory allocation for the Lua script in initialization lines, check thread.sleepms delays.

9. Dimensions drawing



10. Warranty

The company of "Distributed Data Systems LLC", the manufacturer of 7Bit Synapse IO module (hereinafter referred to as the Manufacturer), expresses its great gratitude for your choice. We did our best to ensure that this product met your requirements, and the quality corresponded to the best standards.

The manufacturer sets the life of the Synapse IO module to 10 years in case of its proper usage. The service life is calculated from the date of manufacture of the product.

The manufacturer reserves the right to refuse to meet customer requirements for warranty obligations and for free repair (replacement of the product) in the case of failure to comply with the conditions set forth below. All the terms of the warranty and free repair (replacement) are in force under the law on consumer protection.

The manufacturer sets a warranty period, counted from the date of sale, and the period of free repair (replacement), subject to compliance with the rules of operation, 12 months.

Replacement of defective parts (assemblies, assembly units) in the product during the warranty period does not lead to the establishment of a new warranty period for the entire product, or for replaced parts.

The manufacturer declines all responsibility for the possible harm, directly or indirectly caused by the Synapse device to people, animals, property in case event that this is the result of non-compliance with the rules and conditions of use of the product; Intentional or reckless actions of the buyer (consumer) or third parties.

Also, the Manufacturer declines all responsibility for the possible damage, directly or indirectly caused by the Synapse device as a result of alteration, damage, loss of data and information.

Date of the manufacturer's QA _____

Date of sell _____

Sellers marks _____

Buyer's signature _____