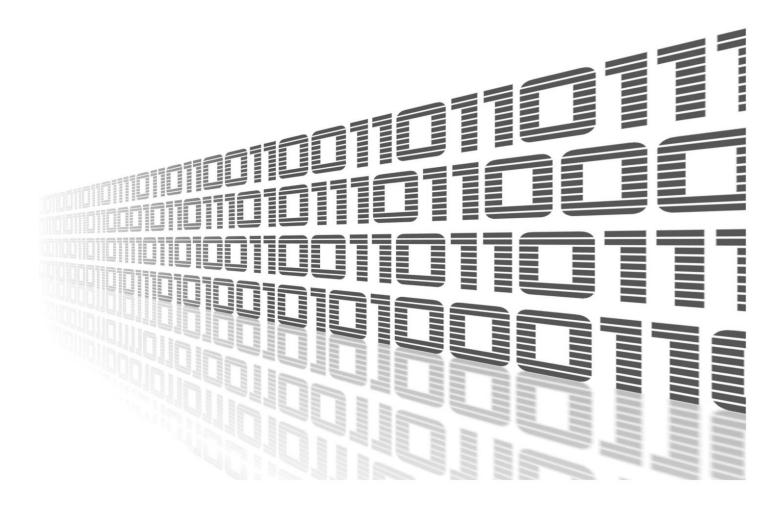




Protocol ALPHA-MODBUS



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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.

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1. Changelog

1.1 Protocol ALPHA-MODBUS Changelog

v1.0.0 (2011-05-30)

• First release

v1.1.0 (2011-09-26)

Added support of EasyVPN Client

v1.1.1 (2011-11-07)

· Fixed issue with redudant character LF

v1.2.0 (2012-09-03)

Added support of the second port

v1.3.0 (2014-01-09)

• Added support of FW 4.0.0+

v1.4.0 (2017-03-16)

• Recompiled with new SDK

v1.4.1 (2018-09-27)

· Added expected ranges of values to JavaSript error messages

2. Router App Description

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

Router app is not compatible with v4 router platform.

Protocol ALPHA-MODBUS is a binary transparent serial protocol for communication with Mitsubishi AL-PHA automatons. From Advantech router to dispatching (and vice versa) the MODBUS-TCP protocol is used. On the serial line from/to Advantech router the proprietary ALPHA dedicated protocol is used. Router does the real-time transparent conversion of data flowing in both ways.

In the Client mode the router communicates with the automaton in the interval configured. If the interval isn't configured, the data won't be sent regularly. Alarm flags are also detected in the configurable interval. Data will be sent to the server in the configured period or when alarm detected. If router reads and sends desired data to the server, alarm flag will be changed to nonactive level.

in the Server mode the router communicates only when requested from dispatching and allows to write values into the Mitsubishi automaton, too.



Mitsubishi ALPHAAdvantech RouterDispatchingFigure 1: Principle of communication – Advantech router with ALPHA-MODBUS router app

3. Configuration

Access the configuration in the *Customization* section in the *Router Apps* item. Two modules appear after uploading the router app – see the following figure. These are to allow the configuration on both expansion ports separately.

	User Modules
ALPHA-MODBUS 1 1.0.3 (2013-12-09) Delete ALPHA-MODBUS 2 1.0.3 (2013-12-09) Delete	
New Module Vybrat soubor Soubor nevybrán	Add or Update

Figure 2: Use module ALPHA-MODBUS after upload

Clicking on one of the modules, you can configure them – se the next figure. The following table describes the items of configuration.

ALPHA-MODBUS 1 Configuration					
Enable ALPHA-MODBUS protocol on expansion port					
Expansion Port	PORT1 •]			
Baudrate	9600 🔻				
Data Bits	8 🔻]			
Parity	none 🔻]			
Stop Bits	1 •]			
Server Address					
TCP Port	502				
Station Number	0				
Data Reading Period		sec			
Alarm Reading Period		sec			
Starting Address Number of Registers Alarm Address					
Apply					

Figure 3: Configuration of ALPHA-MODBUS router app

Item	Description
Baudrate	bit communication speed [bit/s].
Data Bits	8 or 7 data bits
Parity	none, even or odd parity
Stop Bits	1 or 2 stop bits
Server Address	IP adress of the server (only for Client mode)
TCP Port	port of the server/client
Station Number	adress of the connected automaton
Data Reading Period	period of reading data (only for Client mode)
Alarm Reading Period	period of alarms detection (only for Client mode)
Starting Address	starting address of the data area to send (only for Client mode)
Number of Registers	length of the data area to send (only for Client mode)
Alarm Address	address of the alarm register (only for Client mode)

Table 1: Items of APLHA-MODBUS configuration

4. Map of MODBUS/ALPHA device registers

Notes:

- More detailed description of the items can be found in the documentation of ALPHA automatons Alpha 2 Communication manual.pdf.
- All the items are 16-bit, higher byte (MSB) is sent first.

APLHA device	Can write	Note
System Bit 1–16	NO	
System Bit 17–24	NO	Bits 25–32 always 0
Input Terminal 1–15	YES	Bit 16 is always 0
Reserve	YES	Not used, always 0
External Input 1–4	YES	Bits 5–16 always 0
Output Terminal 1–9	YES	Bits 10–16 always 0
External Output 1-4	YES	Bits 5–16 always 0
Key Input 1–8	YES	Bits 9–16 always 0
Link Input 1–4	YES	Bits 5–16 always 0
Link Output 1–4	YES	Bits 5–16 always 0
Control Device 1–4	YES	Bits 5–16 always 0
Reserve	NO	Not used, always 0
Analog In 1	NO	
Analog In 2	NO	
Analog In 3	NO	
Analog In 4	NO	
Analog In 5	NO	
Analog In 6	NO	
Analog In 7	NO	
Analog In 8	NO	
Reserve	NO	Not used, always 0
System Bit 1–16	NO	
System Bit 17–24	NO	Bits 25–32 always 0
Input Terminal 1–8	YES	Bits 9–16 always 0
Reserve	YES	Not used, always 0
External Input 1-4	YES	Bits 5–16 always 0
Output Terminal 1–6	YES	Bits 7–16 always 0
External Output 1-4	YES	Bits 5–16 always 0
	System Bit 1–16 System Bit 17–24 Input Terminal 1–15 Reserve External Input 1–4 Output Terminal 1–9 External Output 1–4 Key Input 1–8 Link Input 1–4 Link Output 1–4 Control Device 1–4 Reserve Analog In 1 Analog In 2 Analog In 2 Analog In 3 Analog In 4 Analog In 4 Analog In 5 Analog In 6 Analog In 7 Analog In 7 Analog In 8 Reserve System Bit 1–16 System Bit 1–16 System Bit 1–24 Input Terminal 1–8 Reserve External Input 1–4 Output Terminal 1–6	System Bit 1–16NOSystem Bit 17–24NOInput Terminal 1–15YESReserveYESExternal Input 1–4YESOutput Terminal 1–9YESExternal Output 1–4YESKey Input 1–8YESLink Input 1–4YESControl Device 1–4YESReserveNOAnalog In 1NOAnalog In 2NOAnalog In 3NOAnalog In 4NOAnalog In 5NOAnalog In 7NOAnalog In 7NOAnalog In 8NOSystem Bit 1–16NOSystem Bit 17–24NOInput Terminal 1–8YESExternal Input 1–4YESOutput Terminal 1–6YESExternal Output 1–4YES

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RefNum MODBUS	APLHA device	Can write	Note	
264	Key Input 1–8	YES	Bits 9–16 always 0	
265	Link Input 1–4	YES	Bits 5–16 always 0	
266	Link Output 1–4	YES	Bits 5–16 always 0	
267	Control Device 1-4	YES	Bits 5–16 always 0	
268–512	Reserve	NO	Not used, always 0	
513	Communication Bit Device 1	YES		
514	Communication Bit Device 2	YES		
515	Communication Bit Device 3	YES		
516–612	Communication Bit Device 4 – Communication Bit Device 100	YES		
613–1024	Reserve	NO	Not used, always 0	
1025	Communication Word Device 1	YES		
1026	Communication Word Device 2	YES		
1027	Communication Word Device 3	YES		
1028–1124	Communication Word Device 4 – Communication Word Device 100	YES		
1125–1536	Reserve	NO	Not used, always 0	
1537	RTC – Year	YES		
1538	RTC – Month	YES		
1539	RTC – Day	YES		
1540	RTC – Hour	YES		
1541	RTC – Min	YES		
1542	RTC – Sec	YES		
1543	RTC – Adj	YES		
1544	RTC – DoW	NO		
1545	RTC – Status	NO		
1546–2048	Reserve	NO	Not used, always 0	
2049	Run/Stop	YES	Only write, can't be read! 1 = Run, 0 = Stop	
2050-8192	Reserve	NO	Not used, always 0	
8193-8216	System Bit 1 – System Bit 24	NO		
8217–8448	Reserve	NO	Not used, always 0	
8449–8463	Input Terminal 1 – Input Termi- nal 15	YES		
8464-8704	Reserve	NO	Not used, always 0	
To be continued on the next page				

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RefNum MODBUS	APLHA device	Can write	Note
8705–8708	External Input 1 – External In- put 4	YES	
8709-8960	Reserve	NO	Not used, always 0
8961–8969	Output Terminal 1 – Output Ter- minal 9	YES	
8970–9216	Reserve	NO	Not used, always 0
9217–9220	External Output 1 – External Output 4	YES	
9221–9472	Reserve	NO	Not used, always 0
9473–9480	Key Input 1 – Key Input 8	YES	
9481–9728	Reserve	NO	Not used, always 0
9279–9282	Link Input 1 – Link Input 4	YES	
9283–9984	Reserve	NO	Not used, always 0
9985–9988	Link Output 1 – Link Output 4	YES	
9989– 10240	Reserve	NO	Not used, always 0
10241– 10244	Control Device 1 – Control De- vice 4	YES	

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Table 2: Map of MODBUS/ALPHA device registers

5. Related Documents

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.