Protocol Manual of Modbus RTU Relay

From Waveshare Wiki
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Command format

The command contains 8 bytes:

Byte 1：Address

Byte 2：Function code

Byte3 4：Address of register (big-endian)

Byte 5 6：data of register (big-endian)

Byte7 8：CRC cheksum (little-endian)

Function code

Function code	Description
01	Read state of Relay
03	Read address, revision
05	Write single Relay
06	Configure baudrate, address
0F	Write all Relays

Control single relay

command：01 05 00 00 FF 00 8C 3A

Byte	Meaning	Description
01	Device address	0x00 is broadcast address；0x01-0xFF are device addresses
05	05 Command	Command for controlling Relay
00 00	Address	The register address of controlled Relay, 0x00 - 0x0008
FF 00	Command	0xFF00：Open Replay; 0x0000：Close Relay; 0x5500：Flip Relay
8C 3A	CRC16	The CRC checksum of first six bytes.

Answer： 01 05 00 00 FF 00 8C 3A

Byte	Meaning	Description
01	Device address	0x00 is broadcast address；0x01-0xFF are dives addresses
05	05 Command	Command for controlling relay
00 00	Address	The register address of controlled Relay,0x0000-0x0008
FF 00	Command	0xFF00：Open Relay; 0x0000：Close Relay 0x5500：Flip Relay.
8C 3A	CRC16	The CRC checksum of the first six bytes.

Examples： [Device with address 01]: Open Relay 0: 01 05 00 00 FF 00 8C 3A

Close Relay 0: 01 05 00 00 00 00 CD CA

Open Relay 1: 01 05 00 01 FF 00 DD FA

Close Relay 1: 01 05 00 01 00 00 9C 0A

Open Relay 2: 01 05 00 02 FF 00 2D FA

Close Relay 2: 01 05 00 02 00 00 6C 0A

Open Relay 3: 01 05 00 03 FF 00 7C 3A

Close Relay 3: 01 05 00 03 00 00 3D CA

Flip Relay 0: 01 05 00 00 55 00 F2 9A

Flip Relay 1: 01 05 00 01 55 00 A3 5A

Flip Relay 2: 01 05 00 02 55 00 53 5A

Flip Relay 3: 01 05 00 03 55 00 02 9A

Controll all Relay

Command：01 05 00 FF FF FF FC 4A

Byte	Meaning	Description
01	Device address	0x00 is broadcast；0x01-0xFF are devices address
05	05 command	Command for controlling Relay
00 FF	Address	Fixed 0x00FF
FF FF	Command	0xFFFF：Open Relay；
FC 4A	CRC16	The CRC checksum of the first six bytes

Answer： 01 05 00 FF FF FF FC 4A

Byte	Meaning	Description
01	Devices	0x00 is broadcast address；0x01-0xFF is device address
05	05 Command	Command for controlling
00 FF	Address	Fixed 0x00FF
FF FF	Command	0xFFFF：Open Relay； 0x0000：Close Relay； 0x5A00：Flip Relay；
FC 4A	CRC16	The CRC16 checksum of the first six bytes.

Example：

[Device with address 01]:

Open all Relays : 01 05 00 FF FF FF FC 4A

Close all Relays : 01 05 00 FF 00 00 FD FA

Flip all Relays : 01 05 00 FF 5A 00 C7 5A

Read states of all Relays

Command：01 01 00 FF 00 01 CD FA

Bytes	Meaning	Description
01	Device address	0x00 is broadcast address；0x01-0xFF are device addresses
01	01 Command	Command for checking states of Relay
00 FF	Address	Fixed 0x00FF
00 01	Command	Fixed 0x0001
CD FA	CRC16	The CRC16 of the first six bytes

Answer：01 01 01 00 51 88

Byte	Meaning	Description
01	Device address	0x00 is broadcast address；0x01-0xFF are device addressese
01	01 Command	Command for checking states of Relay
01	Number	The number of bytes returned。
00	Sate	The state of Relay Bit0:The state of the first Relay； Bit1: The state of the second Relay； Bit2: The state of the third Relay； …… Bit7:The state of the eighth Relay；
8C 35	CRC16	The CRC cheksum of first six bytes.

Examples：

[Device with Address 01]

Command : 01 01 00 FF 00 01 CD FA

Answer: 01 01 01 00 51 88 //Close all Relays

Command : 01 01 00 FF 00 01 CD FA

Answer : 01 01 01 01 90 48 //Open Relay 0 and close other Relays

Command : 01 01 00 FF 00 01 CD FA

Answer : 01 01 01 41 91 B8 //Open Relay 0 and Relay 6, close other Relays

Write Relay

Command：01 0F 00 00 00 01 94 0B

Byte	Meaning	Description
01	Device address	0x00 is the boradcast address；0x01-0xFF are device addresses
0F	0F Command	Command for writing Relay
00 00	Address	Fxied 0x0000
00 01	Command	Bit0:Control the first Relay； Bit1:Control the second Relay； Bit2:Control the third Relay； …… Bit7:Control the eighth Relay；
94 0B	CRC16	The CRC checksum of first six bytes.

Answer：01 0F 00 00 00 01 94 0B

Byte	Meaning	Description
01	Device address	0x00 is the boradcast address；0x01-0xFF are device addresses
0F	0F Command	Command for controlling all Relay
00 00	Address	Fixed 0x0000。
00 01	Command	0x0001，Write Relay sate Bit0:Control the first Relay； Bit1:Control the second Relay； Bit2:Control the third Relay； …… Bit7: Control the eighth Relay；
94 0B	CRC16	The CRC checksum of first six bytes.

Example：

[Device with address 01]

Open all Relay : 01 0F 00 00 00 FF 15 8B

Close all Relay : 01 0F 00 00 00 00 55 CB

0-1 Open；3-7 Close : 01 0F 00 00 00 03 15 CA

Open/Close Relay in current time

Command：01 05 02 00 00 07 8D B0

Byte	Meaning	Description
01	Device address	0x00 is the boradcast address；0x01-0xFF are device addresses
05	05 Command	Command for controlling signle Relay
02	Command	02 is command for close Relay in current time，04 is command for open Relay in current time
00	Address of Relay	The address of Relay controlled
00 07	Delay	The Delay time is Data*100ms Data:0x0007，Delay:7*100MS = 700MS
8D B0	CRC16	The CRC checksum of first six bytes.

Answer：01 05 02 00 00 07 8D B0

Byte	Meaning	Description
01	Device address	0x00 is the boradcast address；0x01-0xFF are device addresses
05	05 Command	Command for controlling single Relay
02	Command	02 is command for close Relay in current time，04 is command for open Relay in current time
00	Address of Relay	The address of Relay controlled
00 07	Delay	The delay time is the data*100ms data:0x0007，Delay:7*100MS = 700MS
8D B0	CRC16	The CRC checksum of first six bytes.

Example：

[Device with address 01]

Open Relay 0 : 01 05 02 00 00 07 8D B0 //700MS = 7*100MS = 700MS

Open Relay 1 : 01 05 02 01 00 08 9C 74 //800MS

Close Relay 0 : 01 05 04 00 00 05 0C F9 //500MS

Close Relay 1 : 01 05 04 01 00 06 1D 38 //600MS

Set baud rate

Command：00 06 20 00 00 05 43 D8

Byte	Meaning	Description
00	Device address	0x00 is the boradcast address；0x01-0xFF are device addresses
06	06 Command	Set baud rate or device address
20 00	Command register	0x2000: Set baud rate，0x4000:Set device address
00 05	Baud rate	Baudrate: 0x0000 : 4800 0x0001 : 9600 0x0002 : 19200 0x0003 : 38400 0x0004 : 57600 0x0005 : 115200 0x0006 : 128000 0x0007 : 256000
43 D8	CRC16	The CRC checksum of first six bytes.

Answer：00 06 20 00 00 05 43 D8

Byte	Meaning	Description
00	Device address	0x00 is the boradcast address；0x01-0xFF are device addresses
06	06 Command	Set baud rate or device address
20 00	Command register	0x2000: Set baud rate，0x4000 Set device address
00 05	Baud rate	The baud rate 0x0000 : 4800 0x0001 : 9600 0x0002 : 19200 0x0003 : 38400 0x0004 : 57600 0x0005 : 115200 0x0006 : 128000 0x0007 : 256000
43 D8	CRC16	The CRC checksum of first six bytes

Example：

[Device with address 0x01]

Set baud rate as 4800： 00 06 20 00 00 00 83 DB

Set baud rate as 9600： 00 06 20 00 00 01 42 1B

Set baud rate as 115200： 00 06 20 00 00 05 43 D8

Set device address

Command：00 06 40 00 00 01 5C 1B

Byte	Meaning	Description
00	Device address	0x00 is the boradcast address；0x01-0xFF are device addresses
06	06 Command	Set baud rate or device address
40 00	Command register	0x2000: Set baud rate，0x4000: Set device address
00 01	Device address	The device address,0x0001-0x00FF
5C 1B	CRC16	The CRC checksum of first six bytes.

Answer：00 06 40 00 00 01 5C 1B

Byte	Meaning	Description
00	Device address	0x00 is the boradcast address；0x01-0xFF are device addresses
06	06 Command	Set baud rate or device address
40 00	Command register	0x2000: Set baud rate，0x4000:Set device address
00 01	Device address	Set device address,0x0001-0x00FF
5C 1B	CRC16	The CRC checksum of first six bytes.

Example:

[Device with address 0x01]

Set device address as 0x01 ： 00 06 40 00 00 01 5C 1b
Set device addrss as 0x02 ： 00 06 40 00 00 02 1C 1A
Set device address as 0x03 ： 00 06 40 00 00 03 DD DA

Read device address

Command：00 03 40 00 00 01 90 1B

Byte	Meaning	Description
00	Device address	0x00 is the boradcast address；0x01-0xFF are device addresses
03	03 Command	Read Device address
40 00	Command register	0x0200: Read software revision，0x0040: Read device address
00 01	Device address	Device address
90 1B	CRC16	The CRC checksum of first six bytes.

Answer：01 03 01 01 31 88

Byte	Meaning	Description
00	Device address	0x00 is the boradcast address；0x01-0xFF are device addresses
03	03 command	Read software revision or device address
01	Number of bytes	Number of bytes returned
01	Device address	Devicess
31 88	CRC16	The CRC checksum of first six bytes.

Example:

[Device with address 01]

Command : 00 03 40 00 00 01 90 1B
Answer : 01 03 01 01 31 88 //Address 0x01
[Device with address 02]

Command : 00 03 40 00 00 01 90 1B
Answer : 02 03 01 02 71 CD //Address 0x02
[Device with address 03]

Command : 00 03 40 00 00 01 90 1B

Answer : 03 03 01 03 B1 F1 //Adress 0x03

Read software revision

Command：01 03 20 00 00 01 8F CA

Byte	Meaning	Description
01	device address	0x00 is the boradcast address；0x01-0xFF are device addresses
03	03 Command	Read software revision or device address
20 00	Command register	0x0200: Read software revision，0x0040: Read device address.
00 01	Device address	Device address
8F CA	CRC16	The CRC checksum of first six bytes.

Answer：01 03 01 64 F1 A3

Byte	Meaning	Description
01	Device address	0x00 is the boradcast address；0x01-0xFF are device addresses
03	03 Command	Read software revision, read device address
01	Number of bytes	number of bytes returned
64	Revision of Software	Convert it to DEX and multiply by 0.01 is the value of software revision. 0x64 = 100 = V1.00
F1 A3	CRC16	The CRC checksum of the first six bytes.

Example：

Command：01 03 20 00 00 01 8F CA

Answer：01 03 01 64 F1 A3 // 64 = 100 =V1.00