

Standard Modbus Requests

[Related Topics](#)



Introduction

These requests are used to exchange memory words or bits between remote devices. The table format is the same for both RTU and ASCII modes.

Format	Reference number
Bit	%Mi
Word	%MWi

Modbus Master: Read N Bits

The following table represents requests 01 and 02.

	Table Index	Most significant byte	Least significant byte
Control table	0	01 (Transmission/reception)	06 (Transmission length) (*)
	1	03 (Reception offset)	00 (Transmission offset)
Transmission table	2	Slave@(1..247)	01 or 02 (Request code)
	3	Address of the first bit to read	
	4	N ₁ = Number of bits to read	
Reception table (after response)	5	Slave@(1..247)	01 or 02 (Response code)
	6	00 (byte added by Rx Offset action)	N ₂ = Number of data bytes to read = [1+(N ₁ -1)/8], where [] means integral part
	7	Value of the 1 st byte (value = 00 or 01)	Value of the 2 nd byte (if N ₁ >1)
	8	Value of the 3 rd byte (if N ₁ >1)	
	...		
	(N ₂ /2)+6 (if N ₂ is even) (N ₂ /2+1)+6 (if N ₂ is odd)	Value of the N ₂ th byte (if N ₁ >1)	

(*) This byte also receives the length of the string transmitted after response

Modbus Master: Read N Words

The following table represents requests 03 and 04.

	Table Index	Most significant byte	Least significant byte
Control table	0	01 (Transmission/reception)	06 (Transmission length) (*)
	1	03 (Reception Offset)	00 (Transmission offset)
Transmission table	2	Slave@(1..247)	03 or 04 (Request code)
	3	Address of the first word to read	
	4	N = Number of words to read	
Reception table (after response)	5	Slave@(1..247)	03 or 04 (Response code)
	6	00 (byte added by Rx Offset action)	2*N (number of bytes read)
	7	First word read	
	8	Second word read (if N>1)	
	...		
	N+6	Word N read (if N>2)	

(*) This byte also receives the length of the string transmitted after response

Note: The Rx offset of three will add a byte (value = 0) at the third position in the reception table. This ensures a good positioning of the number of bytes read and of the read words' values in this table.

Modbus Master: Write Bit

This table represents Request 05.

	Table Index	Most significant byte	Least significant byte
Control table	0	01 (Transmission/reception)	06 (Transmission length) (*)
	1	00 (Reception offset)	00 (Transmission offset)
Transmission table	2	Slave@(1..247)	05 (Request code)
	3	Address of the bit to write	
	4	Bit value to write	
Reception table (after response)	5	Slave@(1..247)	05 (Response code)
	6	Address of the bit written	
	7	Value written	

(*) This byte also receives the length of the string transmitted after response

Note:

- This request does not need the use of offset.
- The response frame is the same as the request frame here (in a normal case).
- For a bit to write 1, the associated word in the transmission table must contain the value FF00H, and 0 for the bit to write 0.

Modbus Master: Write Word

This table represents Request 06.

	Table Index	Most significant byte	Least significant byte
Control table	0	01 (Transmission/reception)	06 (Transmission length) (*)
	1	00 (Reception offset)	00 (Transmission offset)
Transmission table	2	Slave@(1..247)	06 (Request code)
	3	Address of the word to write	
	4	Word value to write	
Reception table (after response)	5	Slave@(1..247)	06 (Response code)
	6	Address of the word written	
	7	Value written	

(*) This byte also receives the length of the string transmitted after response

Note:

- This request does not need the use of offset.
- The response frame is the same as the request frame here (in a normal case).

Modbus Master: Write of N Bits

This table represents Request 15.

	Table Index	Most significant byte	Least significant byte
Control table	0	01 (Transmission/reception)	8 + number of bytes (transmission)
	1	00 (Reception Offset)	07 (Transmission offset)
Transmission table	2	Slave@(1..247)	15 (Request code)
	3	Number of the first bit to write	

	4	N ₁ = Number of bits to write	
	5	00 (byte not sent, offset effect)	N ₂ = Number of data bytes to write = [1+(N ₁ -1)/8], where [] means integral part
	6	Value of the 1 st byte	Value of the 2 nd byte
	7	Value of the 3 rd byte	Value of the 4 th byte
	...		
	(N ₂ /2)+5 (if N ₂ is even) (N ₂ /2+1)+5 (if N ₂ is odd)	Value of the N ₂ th byte	
Reception table (after response)		Slave@(1..247)	15 (Response code)
		Address of the 1 st bit written	
		Address of bits written (= N ₁)	

Note:

- The Tx Offset=7 will suppress the 7th byte in the sent frame. This also allows a good correspondence of words' values in the transmission table.

Modbus Master: Write of N Words

This table represents Request 16.

	Table Index	Most significant byte	Least significant byte
Control table	0	01 (Transmission/reception)	8 + (2*N) (Transmission length)
	1	00 (Reception offset)	07 (Transmission offset)
Transmission table	2	Slave@(1..247)	16 (Request code)
	3	Address of the first word to write	
	4	N = Number of words to write	
	5	00 (byte not sent, offset effect)	2*N = Number of bytes to write
	6	First word value to write	
	7	Second value to write	
	...		
	N+5	N values to write	
Reception table (after response)	N+6	Slave@(1..247)	16 (Response code)
	N+7	Address of the first word written	
	N+8	Address of words written (= N)	

Note: The Tx Offset = 7 will suppress the 7th byte in the sent frame. This also allows a good correspondence of words' values in the transmission table.