

# Function Block



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0.15€ TTC/mm

Référence	MRTU_CPU_Slave
Révision	2.0
Auteur	JP Viskovic
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+ Support	<a href="http://support-omron.fr/">http://support-omron.fr/</a>

## Function Block Modbus RTU slave for Hostlink port (CPU)

Function Symbol	<p>Modbus RTU Slave</p>																														
File	<a href="#">MRTU_CPU_Slave.cxf</a>																														
PLC	CPU : port série de CJ1xx-V3, CP1H, CP1L-L, CP1L-M, CJ2H, CJ2M																														
Conditions of use	<p>The FB Modbus RTU slave is offered 'as is' and may serve as a basis for development. Users should previously test its adequacy to the final application. <b>Omron could not be held responsible in case of malfunction.</b></p> <p>The serial port should be setup to RS232C mode using 8 data bits <b>Front switch related to serial port should be on « Setup » (User configuration).</b></p> <p>Supported functions :</p> <table border="1"> <thead> <tr> <th>Code</th> <th>Function</th> <th>Name in MODBUS</th> </tr> </thead> <tbody> <tr> <td>0x01</td> <td>I/O memory area (CIO) Read bits</td> <td>Read Coils</td> </tr> <tr> <td>0x02</td> <td>I/O memory area (CIO) Read bits</td> <td>Read Discrete Inputs</td> </tr> <tr> <td>0x03</td> <td>I/O memory area (DM) Read Multiple Registers</td> <td>Read Holding Registers</td> </tr> <tr> <td>0x04</td> <td>I/O memory area (CIO) Read Multiple Registers</td> <td>Read Input Registers</td> </tr> <tr> <td>0x05</td> <td>I/O memory area Write Single Coil (CIO)</td> <td>Write Single Coil</td> </tr> <tr> <td>0x06</td> <td>I/O memory area (DM) Write Single Register</td> <td>Write Single Register</td> </tr> <tr> <td>0x08</td> <td>Echo back test</td> <td>Diagnostic</td> </tr> <tr> <td>0x0F</td> <td>***** NOT SUPPORTED *****</td> <td>Write Multiple Coils</td> </tr> <tr> <td>0x10</td> <td>I/O memory area (DM) Write Multiple Registers</td> <td>Write Multiple Registers</td> </tr> </tbody> </table> <p>Broadcast is supported using slave number 00</p>	Code	Function	Name in MODBUS	0x01	I/O memory area (CIO) Read bits	Read Coils	0x02	I/O memory area (CIO) Read bits	Read Discrete Inputs	0x03	I/O memory area (DM) Read Multiple Registers	Read Holding Registers	0x04	I/O memory area (CIO) Read Multiple Registers	Read Input Registers	0x05	I/O memory area Write Single Coil (CIO)	Write Single Coil	0x06	I/O memory area (DM) Write Single Register	Write Single Register	0x08	Echo back test	Diagnostic	0x0F	***** NOT SUPPORTED *****	Write Multiple Coils	0x10	I/O memory area (DM) Write Multiple Registers	Write Multiple Registers
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Restrictions of use	<p>Available memory area: CP1L-M &amp; CJxx-V3 : CIO0 to CIO6143 and D0 à D32767 CP1L-L: CIO0 to CIO6143 and D0 à D9999</p> <p>The FB check if address requested is not above DM32767. In case of CP1L-L, Error flag will not signal the overflow over D9999.</p> <p>CP1L-L FB Memory is not sufficient then size of array Send[256] and Recv[256] should be reduced.</p>																														

Note: Modbus communications can be checked with the utility software [Multiway](#)

## Input Variables

Name	type	Range	Description
Slave No	UINT	1 to 247	Numéro d'esclave Modbus
Port	UINT	0,1 or 2	Serial Port. CJ1xx-V3 : &0 CJ2H : &0 CJ2M-CPU1x : &0 CJ2M-CPU3x(*): &0 CP1L-L : &1 CP1L-M left : &2 CP1L-M right: &3 CP1H left : &2 CP1H right : &3 (*): + CP1W-CIF01/11/12

## Output Variables

Name	type	Range	Description
ENO	Bool	OFF, ON	Non utilisé
Error	Bool	OFF, ON	Error flag address, quantity out of range
Err_Counter	UINT	0000 to FFFF	Counter of request in error
Rcv_Counter	UINT	0000 to FFFF	Counter of request received with a correct CRC16

## Modbus protocol

### I/O memory area (CIO) Read Multiple Coils

Example: read 19 bits (CIO 0001.04 to 0002.06)

Request		Response	
	Data		Data
Function Code	0x01	Function Code	0x01
Starting Address(H)	0x00	Byte Count	0x03
Starting Address(L)	<b>0x14</b>	Coil Status 27-20	0xCD
Quantity of Coils(H)	0x00	Coil Status 35-28	0x6B
Quantity of Coils(L)	0x13	Coil Status 38-36	0x05

	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
0CH	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
1CH	<i>31</i> <sub>1</sub>	<i>30</i> <sub>0</sub>	<i>29</i> <sub>1</sub>	<i>28</i> <sub>1</sub>	<i>27</i> <sub>1</sub>	<i>26</i> <sub>1</sub>	<i>25</i> <sub>0</sub>	<i>24</i> <sub>0</sub>	<i>23</i> <sub>1</sub>	<i>22</i> <sub>1</sub>	<i>21</i> <sub>0</sub>	<i>20</i> <sub>1</sub>	19	18	17	16
2CH	47	46	45	44	43	42	41	40	39	<i>38</i> <sub>1</sub>	<i>37</i> <sub>0</sub>	<i>36</i> <sub>1</sub>	<i>35</i> <sub>0</sub>	<i>34</i> <sub>1</sub>	<i>33</i> <sub>1</sub>	<i>32</i> <sub>0</sub>
3CH	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49	48

*Italic characters show the ON/OFF(1/0) status of its bit condition.*

### Reads registers in I/O memory area

Example: read 3 words (DM 1000 to DM 1002)

Request		Response	
	Data		Data
Function Code	0x03	Function Code	0x03
Starting Address(H)	0x03	Byte Count	0x06
Starting Address(L)	0xE8	Register Value(H)DM1000	0xAB
Quantity of Registers(H)	0x00	Register Value(L) DM1000	0x12
Quantity of Registers(L)	0x03	Register Value(H)DM1001	0x56
		Register Value(L) DM1001	0x78
		Register Value(H)DM1002	0x97
		Register Value(L) DM1002	0x13

DM	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
1000	A				B				1				2			
1001	5				6				7				8			
1002	9				7				1				3			

**Writes single coil.**

Example: write 1 coil. (CIO 0002.02 ON)

Request		Response	
	Data		Data
Function Code	0x05	Function Code	0x05
Output Address(H)	0x00	Output Address(H)	0x00
Output Address(L)	0x22	Output Address(L)	0x22
Output Value(H)	0xFF	Output Value(H)	0xFF
Output Value(L)	0x00	Output Value(L)	0x00

	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
0CH	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
1CH	31 <sub>1</sub>	30 <sub>0</sub>	29 <sub>1</sub>	28 <sub>1</sub>	27 <sub>1</sub>	26 <sub>1</sub>	25 <sub>0</sub>	24 <sub>0</sub>	23 <sub>1</sub>	22 <sub>1</sub>	21 <sub>0</sub>	20 <sub>1</sub>	19	18	17	16
2CH	47	46	45	44	43	42	41	40	39	38 <sub>1</sub>	37 <sub>0</sub>	36 <sub>1</sub>	35 <sub>0</sub>	34 <sub>1</sub>	33 <sub>1</sub>	32 <sub>0</sub>
3CH	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49	48

*Italic characters show the ON/OFF(1/0) status of its bit condition.*

**Writes single register.**

Example: write &h3AC5 to DM 2000.

Request		Response	
	Data		Data
Function Code	0x06	Function Code	0x06
Register Address(H)	0x07	Register Address(H)	0x07
Register Address(L)	0xD0	Register Address(L)	0xD0
Register Value(H)	0x3A	Register Value(H)	0x3A
Register Value(L)	0xC5	Register Value(L)	0xC5

DM	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
2000	3			A				C			5					
2001																
2002																

**Writes registers.**

Example: write 2 words into DM1000-1001.

Request		Response	
	Data		Data
Function Code	0x10	Function Code	0x10
Starting Address(H)	0x03	Starting Address(H)	0x03
Starting Address(L)	0xE8	Starting Address(L)	0xE8
Quantity of Registers(H)	0x00	Quantity of Registers(H)	0x00
Quantity of Registers(L)	0x02	Quantity of Registers(L)	0x02
Byte Count	0x04		
Registers Value(H)	0x3A		
Registers Value(L)	0xC5		
Registers Value(H)	0x97		
Registers Value(L)	0x13		

DM	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
1000	3			A				C			5					
1001	9			7				1			3					