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Modbus implementation

Design of this device follows “Modbus protocol specification” and “MODBUS over Serial Line Specification & Implementation guide V1.0”.

http://www.modbus.org/docs/Modbus_Application_Protocol_V1_1b3.pdf

http://www.modbus.org/docs/Modbus_over_serial_line_V1.pdf.

Following functions are supported:

```
* 0x03 Read Holding Registers
* 0x04 Read Input registers
* 0x06 Write Single Register
* 0x10 Write Multiple Registers
```

Modbus Communication

Modbus slave module support following communication settings. Settings can change with EM-236 interface unit and communication parameters found on product documentatation.

Protocol:	Modbus RTU
Baudrates:	9600, 19200 (default value **19200**)
Parity:	none, odd, even (default value **even**)
Stop bit:	1, 2 (default value **1**)
Slave address:	1…247, (default value **1**)
RS-485:	Two wire, half duplex

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Modbus registers definitions

Holding registers

All holding registers are 16bit.

Modbus Function: Read/ Write holding register
Function codes: 3, 6, 16

Mem variable	Register numbers	Modbus Data Addr	Range	Description
MB_Bus_enable	40001	0	0 … 1	0 = Local, 1 = Bus enable See definition at Device parameter description.
MB_SPEED	40002	1	0 … 1000	
MB_Disable	40003	2	0 … 1	
MB_DIR	40004	3	0 … 1	
N/A	40005	4		
N/A	40006	5		
MB_userMemControl	40007	6	0 … 2	0 = no action 1 = read Eeprom to user Memory 2 = Write user Memory to Eeprom
MB_FIRMWAREVERSION	40008	7	ASCII value	
MB_Device ID	40009	8	ASCII value	
MB_Device ID	40010	9	ASCII value	
MB_Device ID	40011	10	ASCII value	
MB_Device ID	40012	11	ASCII value	
MB_Device ID	40013	12	ASCII value	
MB_Device ID	40014	13	ASCII value	
MB_userMem	40015	14	ASCII value	
MB_userMem	40016	15	ASCII value	
MB_userMem	40017	16	ASCII value	
MB_userMem	40018	17	ASCII value	
MB_userMem	40019	18	ASCII value	
MB_userMem	40020	19	ASCII value	

Parameter Update	40021	20	0 … 3	0 = no change to parameters 1 = write MB registers to parameters 2 = write MB registers to parameters and store parameters to EEPROM 3 = read parameters to MB registers After read/write this is set to zero (0)
Parameter_1	40022	21	check device parameter list	
Parameter_2	40023	22	check device parameter list	
Parameter_3	40024	23	check device parameter list	
Parameter_4	40025	24	check device parameter list	
Parameter_5	40026	25	check device parameter list	
Parameter_6	40027	26	check device parameter list	
Parameter_7	40028	27	check device parameter list	
Parameter_8	40029	28	check device parameter list	
Parameter_9	40020	29	check device parameter list	
Parameter_10	40021	30	check device parameter list	
Parameter_11	40022	31	check device parameter list	
Parameter_12	40023	32	check device parameter list	
Parameter_13	40024	33	check device parameter list	
Parameter_14	40025	34	check device parameter list	
Parameter_15	40026	35	check device parameter list	
Parameter_16	40027	36	check device parameter list	
Parameter_17	40028	37	check device parameter list	
Parameter_18	40029	38	check device parameter list	
Parameter_19	40030	39	check device parameter list	
Parameter_20	40031	40	check device parameter list	
Parameter_21	40032	41	check device parameter list	
Parameter_22	40033	42	check device parameter list	

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Data inputs

Modbus Function: Read input registers
Function code: 4

Mem variable	Register numbers	Modbus Data Addr	Range
N/A	30001	0	
MB_Current	30002	1	Motor Current
MB_BrakeCurrent	30003	2	Braking current
MB_ Voltage	30004	3	Supply voltage
MB_Freq	30005	4	Motor pulse Frequency
MB_I/O_Stop13	30006	5	I/O Input state
MB_I/O DIR	30007	6	I/O Input state
MB_I/O SPEED	30008	7	I/O Input state
MB_I/O ILIM	30009	8	I/O Input state
MB_I/O DISABLE	30010	9	I/O Input state
MB_PWM	30011	10	Motor driving PWM
MB_Speed2Enable	30012	11	Speed 2 Enbled
MB_Fault	30013	12	Fault indicated
MB_Fail I	30014	13	Fail from current
MB_FailTemperature	30015	14	Fail from temperature
MB_VS	30016	15	Fail from supply
MB_Overvoltage	30017	16	Fail from overvoltage