6.8.2021/Jam

ELECTROMEN Oy

Modbus Control definitions for motor drivers

EM-308
EM-314
EM-318A

for firmware 1.7 and above

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 documentation.

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_Command	40001	0	0 … 5	1 … 4, Drive motor as presets 1…4
			5	Drive motor with MB_Freq and to Position = 32bit int (MB_position _MSB and MB_Position_LSB)
MB_Disable	40002	1	0 … 1	1 = Disable
MB_Freq	40003	2	50 … 1000	
MB_Position_MSB	40004	3	0 … 65535	
MB_Position_LSB	40005	4	0 … 65535	
MB_Reset_Position	40006	5	0 … 1	Reset current position to zero
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	
user Memory	40015	14		
user Memory	40016	15		
user Memory	40017	16		
user Memory	40018	17		
user Memory	40019	18		
user Memory	40020	19		

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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)

Note: On device start up Parameters are updated to MB_registers. If later Parameters were changed by other than via Modbus Parameter values have to update to MB_register write (3) to Parameter update register. As described above.

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	40030	29	check device parameter list
Parameter_10	40031	30	check device parameter list
Parameter_11	40032	31	check device parameter list
Parameter_12	40033	32	check device parameter list
Parameter_13	40034	33	check device parameter list
Parameter_14	40035	34	check device parameter list
Parameter_15	40036	35	check device parameter list
Parameter_16	40037	36	check device parameter list
Parameter_17	40038	37	check device parameter list
Parameter_18	40039	38	check device parameter list
Parameter_19	40040	39	check device parameter list
Parameter_20	40041	40	check device parameter list
Parameter_21	40042	41	check device parameter list
Parameter_22	40043	42	check device parameter list
Parameter_23	40044	43	check device parameter list
Parameter_24	40045	44	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
MB_Status	30001	0	Motor status 0 = stop, 1 = Start Index run 4 = Index run, wait stop 5 = Continuous run 6 = Ramp down, wait stop 40 Position reached 41 Driving to position 42 Exit from Position drive
MB_Current	30002	1	Motor Current
MB_Position_MSB	30003	2	Motor Position 32bit MSB
MB_Position_LSB	30004	3	Motor Position 32bit LSB
MB_I/O Pin 8	30005	4	I/O Input state
MB_I/O Pin 9	30006	5	I/O Input state
MB_I/O Pin 10	30007	6	I/O Input state
MB_I/O Pin 11	30008	7	I/O Input state
MB_I/O Pin 12	30009	8	I/O Input state
MB_I/O Pin 14	30010	9	I/O Input state