Modbus Protocol
for
PSBEN Power Supplies

Edition: 1 from 30-08-2017
Supersedes the edition: -----

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1. Revision history

Version	Date	Author	Changes
1.0	1.06.2017	BTR	Initial release

2. The Modbus Protocol

The Modbus Protocol is an industrial communication protocol that is currently used in PSBEN Power Supplies. The Power Supplies use two type of connections:

- RS-485 - Modbus RTU (19200 kbps, 8E1 – default settings)
- TCP/IP - Modbus RTU over TCP

3. Function codes

The following Modbus function codes are supported by the implemented protocol:

Function code	**Dec**
Read Input Registers	04

4. Registers

Register address	**Register description**	**Function description**	**Position**	**Type**	**Format**	**Access**
00	Firmware version and power supply version	Firmware version	7…0	uint8_t	v1.0 is equal to 10	R
		Power supply type	11…8	4-bit	0 – PSBEN 1 – EN54	
03	Error flags (1)	F13 - Cover opened	3	1-bit	0 – inactive 1 – active	R
		F61 - Internal supply fail	4	1-bit	0 – inactive 1 – active	
		F60 - No communication	5	1-bit	0 – inactive 1 – active	
		F61 - Control panel fail	6	1-bit	0 – inactive 1 – active	
04	Error flags (2)	F05 - Battery test error	0	1-bit	0 – inactive 1 – active	R
		F03 - Battery fuse fail	1	1-bit	0 – inactive 1 – active	
		F02 - AUX fuse fail	2	1-bit	0 – inactive 1 – active	

		F04 - Output overload	3	1-bit	0 – inactive 1 – active	
		F04 - Output overload - off	4	1-bit	0 – inactive 1 – active	
		F50 - Internal supply fail	5	1-bit	0 – inactive 1 – active	
		F50 - Internal supply fail	6	1-bit	0 – inactive 1 – active	
		F07 - High battery voltage	7	1-bit	0 – inactive 1 – active	
		F06 - High AUX voltage	8	1-bit	0 – inactive 1 – active	
		F08 - Charge circuit fail	9	1-bit	0 – inactive 1 – active	
		F10 - Low battery voltage	10	1-bit	0 – inactive 1 – active	
		F11 - Low battery voltage – off	11	1-bit	0 – inactive 1 – active	
		F09 - Low AUX voltage	12	1-bit	0 – inactive 1 – active	
		F12 - External input EXT	13	1-bit	0 – inactive 1 – active	
		F51 - Internal supply fail	14	1-bit	0 – inactive 1 – active	
		F01 - AC power fail	15	1-bit	0 – inactive 1 – active	
05	Led indication, Buzzer state	Charge level LED 30%	0	1-bit	0 – off 1 – on	R
		Charge level LED 60%	1	1-bit	0 – off 1 – on	
		Charge level LED 90%	2	1-bit	0 – off 1 – on	
		Led EXT	3	1-bit	0 – off 1 – on	
		Led OVL	4	1-bit	0 – off 1 – on	
		Led PSU	5	1-bit	0 – off 1 – on	
		Led APS	6	1-bit	0 – off 1 – on	
		Buzzer	7	1-bit	0 – off 1 – on	
06	Signals state and technical output	Battery charging	0	1-bit	0 – inactive 1 – active	R
		Battery test in progress	2	1-bit	0 – inactive 1 – active	
		Technical input EXT	3	1-bit	0 – inactive 1 – active	
		Technical output APS	8	1-bit	0 – inactive 1 – active	
		Technical output PSU	9	1-bit	0 – inactive 1 – active	
		Technical output EPS	10	1-bit	0 – inactive 1 – active	

09-11	Measurements	09 - Battery voltage	15…0	uint16_t	0,01 V	R
		10 - AUX voltage	15…0	uint16_t	0,01 V	
		11 - AUX current	15…0	uint16_t	0,01 A	
16	Power version	Rated current	12…0	12-bit	0,01A	R
		Rated voltage	13	1-bit	0 – 13,8 V 1 – 27,6 V	
18	EPS time settings	EPS time	15…0	uint16_t	0 – 5 seconds 1 – 20 seconds 2 – 17 minute 3 – 140 minute	R

5. Example

TXD	Address	Read Input Registers	Starting address	Quantity of Input Registers	Crc
	0x05	0x04	0x0000	0x0013	0xB043

RXD	Address	Read Input Registers	Byte count	Input Registers	Crc
	0x05	0x04	0x26	….	…