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Bernini Design

BE1 MODBUS PROTOCOL

THE GENERATOR AUTO START CONTROLLER MODBUS REGISTERS

Communication speed:	9600 baud
Data bits:	8
Parity:	none
Stop bits:	1
Transmission mode:	RTU
Flow control:	none
Device address:	1 (default)

The setting RS485 NODE ADRESS can be found at parameter P47.
Full information about MODBUS can be found at www.modbus.org

The communication protocol meets the MODBUS RTU convention and includes the following function codes:

Code (hex)	Function
03	Read Holding Registers
04	Read Input Registers
06	Write Single Register
10	Write Multiple Registers

Note: If the client want to use ModlinkDemo must access the menu: Tools -> Modbus Connection Options… and Tools -> Modbus Client Options… for configure the modbus communication.
The program is free and can be downloaded from the address:
www.ozm.cz/ivobauer/modlink/Downloads.htm

BE1 MODBUS Holding Registers:

Registers Address	BE 1 Param	Description	Notes
40000	P0	Remote start	Note 3
40001	P1	Remote stop	Note 3
40002	P2	Over voltage	Note 2
40003	P3	Over voltage delay	-
40004	P4	Under voltage	Note 1
40005	P5	Under voltage delay	-
40006	P6	Over frequency	Note 2
40007	P7	Over frequency delay	-
40008	P8	Under frequency	Note 1
40009	P9	Under frequency delay	-
40010	P10	Over speed	Note 2
40011	P11	Over speed delay	-
40012	P12	Under speed	Note 1
40013	P13	Under speed delay	-
40014	P14	Number of the teeth of the flywell	Note 1
40015	P15	Number of poles of the alternator	Note 1, Note 4
40016	P16	Crank delay after fuel solenoid activation	-
40017	P17	Crank timing	-
40018	P18	Rest timing	-
40019	P19	Starting attempts (numbers)	-
40020	P20	Purge timing (for gas engine)	-
40021	P21	Pre-glow time	Note 1, Note 3
40022	P22	Pre-glow time modes	-
40023	P23	Stop solenoid timing	Note 3
40024	P24	Crank termination (charger alternator)	Note 1, Note 5
40025	P25	Belt break setting (charger alternator)	Note 1, Note 5
40026	P26	Crank termination (rpm speed)	-
40027	P27	Engine warm up timing	Note 3
40028	P28	Engine cool down timing	Note 3
40029	P29	Low oil pressure warning	Note 1, Note 5
40030	P30	Low oil pressure shutdown	Note 1, Note 5
40031	P31	Coolant temperature warning	Note 1
40032	P32	Coolant temperature shutdown	Note 1
40033	P33	Oil temperature warning	Note 1
40034	P34	Oil temperature shutdown	Note 1
40035	P35	Canopy temperature warning	Note 1
40036	P36	Canopy temperature shutdown	Note 1
40037	P37	Engine alarm bypass	-
40038	P38	Fail to stop alarm control	Note 6

40039	P39	Horn timeout	Note 2, Note 3
40040	P40	No fuel in the tank delay	Note 1, Note 3
40041	P41	Low fuel shutdown	Note 1
40042	P42	Low fuel warning	Note 1
40043	P43	High fuel warning	Note 2
40044	P44	Periodic test interval	Note 1
40045	P45	Periodic test duration	Note 3
40046	P46	Maintenance service	Note 1
40047	P47	RS485 node address	-
40048	P48	Hour counter set	-
40049	Inp1	Input 1	-
40050	Pol1	Contact type or sensor 1	Note 7
40051	Inp2	Input 2	-
40052	Pol2	Contact type or sensor 2	Note 7
40053	Inp3	Input 3	-
40054	Pol3	Contact type or sensor 3	Note 7
40055	Inp4	Input 4	-
40056	Pol4	Contact type or sensor 4	Note 7
40057	Inp5	Input 5	-
40058	Pol5	Contact type or sensor 5	Note 7
40059	Out1	Output 1	
40060	Out2	Output 2	
40061	Out3	Output 3	
40062	Out4	Output 4	
40063	Pr1	Oil pressure 1	Note 5
40064	-r1-	Resistance 1	
40065	Pr2	Oil pressure 2	Note 5
40066	-r2-	Resistance 2	
40067	Pr3	Oil pressure 3	Note 5
40068	-r3-	Resistance 3	
40069	Pr4	Oil pressure 4	Note 5
40070	-r4-	Resistance 4	
40071	Pr5	Oil pressure 5	Note 5
40072	-r5-	Resistance 5	
40073	Pr6	Oil pressure 6	Note 5
40074	-r6-	Resistance 6	
40075	Fue1	Fuel level 1	
40076	-r1-	Resistance 1	
40077	Fue2	Fuel level 2	
40078	-r2-	Resistance 2	
40079	Fue3	Fuel level 3	
40080	-r3-	Resistance 3	
40081	Fue4	Fuel level 4	
40082	-r4-	Resistance 4	
40083	Fue5	Fuel level 5	
40084	-r5-	Resistance 5	
40085	Fue6	Fuel level 6	

40086	-r6-	Resistance 6	
40087	°C1.1	Cooling temperature 1	
40088	-r1-	Resistance 1	
40089	°C1.2	Cooling temperature 2	
40090	-r2-	Resistance 2	
40091	°C1.3	Cooling temperature 3	
40092	-r3-	Resistance 3	
40093	°C1.4	Cooling temperature 4	
40094	-r4-	Resistance 4	
40095	°C1.5	Cooling temperature 5	
40096	-r5-	Resistance 5	
40097	°C1.6	Cooling temperature 6	
40098	-r6-	Resistance 6	
40099	°C2.1	Oil temperature 1	
40100	-r1-	Resistance 1	
40101	°C2.2	Oil temperature 2	
40102	-r2-	Resistance 2	
40103	°C2.3	Oil temperature 3	
40104	-r3-	Resistance 3	
40105	°C2.4	Oil temperature 4	
40106	-r4-	Resistance 4	
40107	°C2.5	Oil temperature 5	
40108	-r5-	Resistance 5	
40109	°C2.6	Oil temperature 6	
40110	-r6-	Resistance 6	
40111	°C3.1	Canopy temperature 1	
40112	-r1-	Resistance 1	
40113	°C3.2	Canopy temperature 2	
40114	-r2-	Resistance 2	
40115	°C3.3	Canopy temperature 3	
40116	-r3-	Resistance 3	
40117	°C3.4	Canopy temperature 4	
40118	-r4-	Resistance 4	
40119	°C3.5	Canopy temperature 5	
40120	-r5-	Resistance 5	
40121	°C3.6	Canopy temperature 6	
40122	-r6-	Resistance 6	
40300		Password	Note 8

BE1 MODBUS Input Registers:

Registers Address	Measurement Value	Measurement Unit
30000	Generator Voltage	Vac
30001	Generator Frequency	10 * Hz
30002	Speed	R.p.m.
30003	Battery Voltage	10 * Vdc
30004	Charger Voltage	10 * Vdc
30005	Oil Pressure	10 * Bars
30006	Fuel Level	%
30007	Coolant Temperature	ºC
30008	Oil Temperature	ºC
30009	Canopy Temperature	ºC
30010	Hours of working	Hours
30011	Output 1	1 - active 0 - inactive
30012	Output 2	
30013	Output 3	
30014	Output 4	
30015	Output D Plus	
30016	Resistor 1	Ω
30017	Resistor 2	Ω
30018	Resistor 3	Ω
30019	Resistor 4	Ω
30020	Resistor 5	Ω
30021	Nr. of starts	-
30022	KG status	0 – open 1 - close
30023	Operating mode	0 – OFF 1 – Manual 2 – Auto 3 – Test 4 – Programming 5 – Calibration 6 – EPM
30024	Battery type	1 – 12V 0 – 24V
30025	Maintenance service	Hours
30026	Engine running	1 – active 0 – inactive
30027	Engine status	0 – OFF 1 – Starting 2 – Running 3 – Cooling 4 – Stopping

30028	Over frequency shutdown	1 - active 0 - inactive
30029	Under frequency shutdown	
30030	Over voltage shutdown	
30031	Under voltage shutdown	
30032	Over speed shutdown	
30033	Under speed shutdown	
30034	Belt break shutdown	
30035	Alternator failure shutdown	
30036	Low oil pres shutdown	
30037	Fuel level shutdown	
30038	Coolant temp shutdown	
30039	Oil temp shutdown	
30040	Canopy temp shutdown	
30041	Fail to start shutdown	
30042	Fail to stop shutdown	
30043	Input 1 shutdown	
30044	Input 2 shutdown	
30045	Input 3 shutdown	
30046	Input 4 shutdown	
30047	Input 5 shutdown	
30048	Input 1 warning	
30049	Input 2 warning	
30050	Input 3 warning	
30051	Input 4 warning	
30052	Input 5 warning	
30053	Low oil pres warning	
30054	Fuel level warning	
30055	Coolant temp warning	
30056	Oil temp warning	
30057	Canopy temp warning	
30058	Sensor failure warning	
30059	Battery high low warning	
30060	Maintenance service warning	
30061	Memory error warning	
30062	Pick-up failure shutdown	
30072	Last event	*Code for alarm
…	..	
30171	First event	
30172	Hour for last event	Hour of alarm
…	..	
30271	Hour for first event	

Notes:

Note 1 - To program the parameter with the value OFF, we send minimum value subtract 1.

Example:

1) For programming parameter P12 (Under speed) with value OFF, we send the value 99 (100-1).

Note 2 - To program the parameter with the value OFF, we send maximum value plus 1.

Example:

1) For programming parameter P10 (Over speed) with value OFF we send the value 4001 (4000+1).

Note 3 - To program parameter with a value in seconds we need just to send the value. To program with a value in minutes we must sum 59 to the value; if we want hours and minutes apply the formula: (hours * 60 + minutes + 59)

Example:

1) For programming parameter P0 (Remote start) with value 37 sec we send the value 37. If we want with value 10 minutes, we send 69 (10 + 59). If we want with value 10 hours and 20 minutes, we send 679 (10 * 60 + 20 + 59).

2) For programming parameter P23 (Stop solenoid timing) with value 48 sec we send the value 48. If we want with value 5 min, we send 64 (5 + 59).

Note 4 – Parameter has the following values: 1 – OFF; 2 – 2 poles; 4 – 4 poles;

Note 5 – The value we send is multiplied by 10 .

Example: If we want to program the parameter P24 (Crank termination charger alternator) with the value 8,7V, we must send the value 87 (8,7 * 10)

Note 6 – Parameter has the following values: 0 = OFF; 1 = ON;

Note 7 – Parameter has the following values: 1 = NO; 2 = NC; 3 = SENSOR;

Note 8 – We can write this register with a value between (0 to 9999) if we don't have already a password. We can't read the value of this register.

* Codes for alarms

Over frequency shutdown	0
Under frequency shutdown	1
Over voltage shutdown	2
Under voltage shutdown	3
Over speed shutdown	4
Under speed shutdown	5
Belt break shutdown	6
Pick up failure shutdown	7
Alternator failure shutdown	8
Oil pres shutdown	9
Fuel level shutdown	10
Coolant temp shutdown	11
Oil temp shutdown	12
Canopy temp shutdown	13
Fail to start shutdown	14
Fail to stop shutdown	15
Input 1 shutdown	16
Input 2 shutdown	17
Input 3 shutdown	18
Input 4 shutdown	19
Input 5 shutdown	20
Input 1 warning	21
Input 2 warning	22
Input 3 warning	23
Input 4 warning	24
Input 5 warning	25
Oil pres warning	26
Fuel level warning	27
Coolant temp warning	28
Oil temp warning	29
Canopy temp warning	30
Sensor failure warning	31
Battery high/low warning	32
Maintenance warning	33
Memory error warning	34