

MODBUS Communication

GMC phasecut compact



Software version: Software 1.01 Version 1.0

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1 General notes

1.1 Target group

This specification addresses users with excellent knowledge of serial bus systems and in particular of the MODBUS RTU protocol.

The MODBUS RTU protocol specification is not part of this document.

1.2 Exclusion of liability

Concurrence between the contents of these document and the described software has been examined. It is still possible that non-compliances exist. No guarantee is assumed for complete conformity.- To allow for future developments given are subject to alteration. We do not accept any liability for possible errors or omissions in the information contained in data, illustrations or drawings provided. We accept no liability for damage caused by misuse, incorrect use, improper use or as a consequence of unauthorized repairs or modifications.

1.3 Copyright

These operating instructions contain copyright protected information. The operating instructions may be neither completely nor partially photocopied, reproduced, translated or put on data medium without previous explicit consent. Infringements are liable for damages. All rights reserved, including those that arise through patent issue or registration on a utility model.

2 Safety instructions



Attention!

Remarks concerning safety, installation and connection must be followed (→ Assembly instructions or Operating Instructions).

3 Register Description

3.1 Introduction

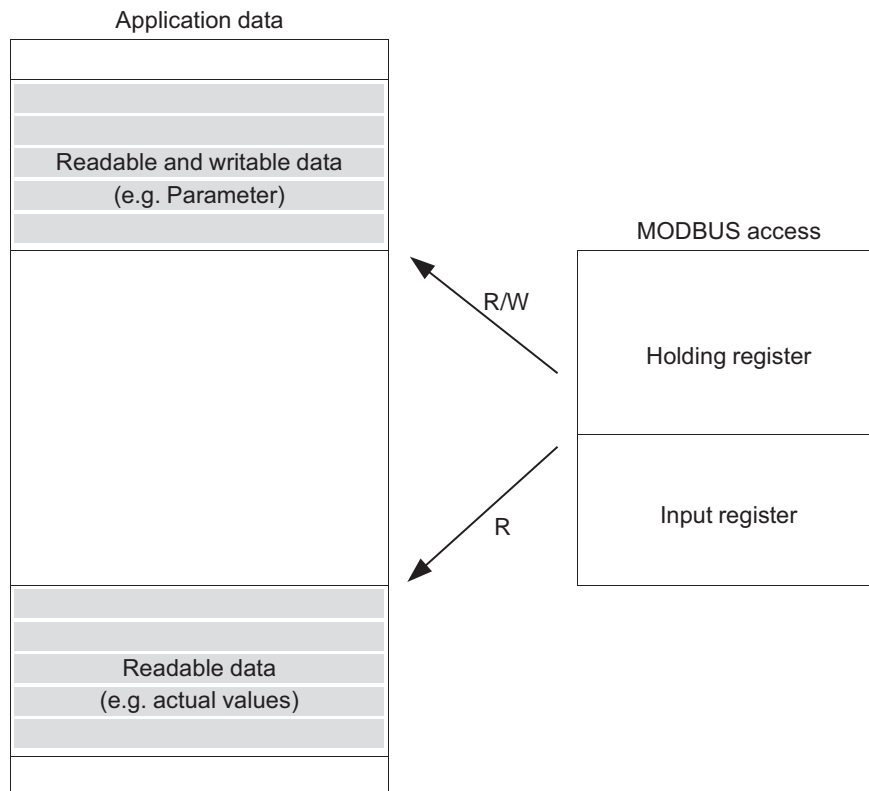
These devices are equipped with an RS-485 interface (D+, D-, GND) as standard. The device can be controlled and parameterised by the MODBUS-RTU protocol by using this interface. The MODBUS-RTU protocol implementation of the device complies with the standards as described in the Modbus Application Protocol Specification 1.1. Not all the function codes contained therein are implemented in the device. The device basically supports all functions which are available for holding and input registers.

3.2 Data model and access options

The application data of the device are organised so that access to them is possible with the MODBUS function for 16-bit registers. Data items which have a smaller word width internally are extended to 16 bits, data items which have a larger word width are distributed to 2 registers. The device does not support bit-oriented data items.

The MODBUS access to the application data is gained with the following MODBUS functions for registers:

- Read Input register (function code 4)
- Read Holding register (function code 3)
- Write Single register (function code 6)
- Write Multiple registers (function code 16)



The application data are arranged completely in the Holding Register and the Input Register section respectively beginning at MODBUS register address 1. An exception message is output on exceeding the register range.

3.3 Device address

The easiest way to change the bus address is with the menu. There is a menu item for this in the "IO Setup" menu group. The address is programmed to the highest possible MODBUS address (247) in the factory setting.

Holding Register 109 contains the current address, this can also be changed by this register, then the master must also change its address, of course, to be able to continue communicating with this device.

The write protection register 113 = 1 and/or J1 must be set to "Unlock" in order to change the address.

3.4 Interface and communication parameters

The communication parameters are set at the factory to 19200 Baud, 8 data bits, 1 stop bit, even parity (preferred parameters according to MODBUS specification).

In the case of devices from program version 1.01, the parameters can be changed under the "Internal" menu group or via holding registers 111 and 112. When changing via registers, this may temporarily result in communication problems.

"Internal" menu group is suppressed. Activation by means of PIN "4543" in "Start – PIN" menu group.

3.5 Description for input register (actual values)

Register addr.	Name	Description
1	control actual value	2740 corresponds to 0, decimal point dependent on measuring range
2	control setpoint	2740 corresponds to 0, decimal point dependent on measuring range
3	Measurement sensor1	dependent on measuring range or operation mode
4	Measurement sensor2	dependent on measuring range or operation mode
5	Setpoint1	
6	Setpoint2	
7	Setting relative	100 corresponds to 100%
8	Modulation relative	0..100 corresponds to 0..100%
9	Manual mode	0 = OFF, 1 = ON
10	Minimum speed cut off	0 = OFF, 1 = ON
11	error code	see following error code list
12	program version	101 corresponds to 1.01
13	For test purposes	
14	E1 (Thermistor)	2740 corresponds to 0.0 °C , 2940 corresponds to 20.0 °C
15	E2 (Thermistor)	2740 corresponds to 0.0 °C , 2940 corresponds to 20.0 °C
16	E1 (current input)	0 - 2000. 2000 corresponds to 20.00 mA
17	E2 (current input)	0 - 2000, 2000 corresponds to 20.00 mA
18	E1 (voltage input)	0 - 1000, 1000 corresponds to 10.00 V
19	E2 (voltage input)	0 - 1000, 1000 corresponds to 10.00 V
20	Status D1	0 = closed, 1 = open
21	Status D2	0 = closed, 1 = open
22	Status K1	0 = OFF, 1 = ON
23	Status K2	0 = OFF, 1 = ON
24	Temperature of heat sink	2740 corresponds to 0.0 °C , 2940 corresponds to 20.0 °C
25	Diagnostic 1	

error code

Code	Description
128	no error
129	general error
131	motor overheat (TK)
132	Motor blocked
133	Heatsink overheating
134	Earth fault
135	HALL-IC error
136	Overcurrent
137	line failure
138	Wire failure thermistor heat sink etc.
139	DC Volt. High
140	Wrong rotating direction
141	Temperature derating
142	Connection failure
143	External error(digital alarm input)
144	Factory setting is loaded
145	EEP memory fault
146	RTC general error
147	RTC voltage failure
148	Filter alarm (pollution)
149	
150	Transmission error / general bus error
151	Data connection line break
152	Data connection checksum fault
160	Sensor fault input1
161	Sensor fault input2
162	Sensor fault input3

3.6 Description of holding registers (parameters)

Register addr.	Name	Description
1		do not use
2	Menu language	0=D, 1=GB, 2=F, 3 = SE, 4= I
3	reset command	1 = device reset!
4	Setpoint 1.1	2740 corresponds to 0, ranges after resolution (mode)
5	Setpoint 1.2	2740 corresponds to 0, ranges after resolution (mode)
6	Pband1	2740 corresponds to 0, ranges after resolution (mode)
7	Setpoint 2.1	2740 corresponds to 0, ranges after resolution (mode)
8	Setpoint 2.2	2740 corresponds to 0, ranges after resolution (mode)
9	Pband 2	2740 corresponds to 0, ranges after resolution (mode)
10	Set intern 1	0 - 100 %
11	Set intern 2	0 - 100 %
12	Minimum 1	0 - 100 %
13	Maximum 1	0 - 100 %
14	Minimum 2	0 - 100 %
15	Maximum 2	0 - 100 %
16	Manual setting	0 - 100 %
17	Manual setting mode	0/1 = Off/On
18	Set external modus	0/1 = Off/On

Register addr.	Name	Description
19	operation mode	0 = 1.01, 1= 2.01 etc.
20	Type of control	0 = P, 1 = PID
21	Change control function 1	0/1 = Off/On
22	Change control function 2	0/1 = Off/On
23	Minimum speed cut off	1 = On
24	External setpoint function	do not use
25	Value limit	100 = 100%
26	Rampup time	2 - 250 sec
27	Rampdown time	2 - 250 sec
28	Motor CosPhi	0 - 100 = 0 – 1.0
29	pin protection	1 = ON
30	Set protection	1 = ON
31	Dummy	do not use
32	Filter test	0/1 = Off/On
33	KP	0 - 200 %
34	KI	0 - 200 %
35	KD	0 - 200 %
36	TI	0 - 200 %
37	Sensor alarm	0/1 = Off/On
38	SD temperature range	2740 corresponds to 0,1 k
39	SD start temperature	2740 corresponds to 0, 0,1 °C
40	SD minimal pressure	2740 corresponds to 0, ranges after resolution (mode)
41	Sensor unit 1	Do not use, set at the device
42	Fixed point 1	Do not use, set at the device
43	Sensor min 1	Do not use, set at the device
44	Sensor max 1	Do not use, set at the device
45	Sensor offset 1	Do not use, set at the device
46	K Factor 1	Do not use, set at the device
47	Refrigerant 1	Do not use, set at the device
48	Setpoint min. 1	Do not use, set at the device
49	Setpoint max. 1	Do not use, set at the device
50	Sensor unit 2	Do not use, set at the device
51	Fixed point 2	Do not use, set at the device
52	Sensor min 2	Do not use, set at the device
53	Sensor max 2	Do not use, set at the device
54	Sensor offset 2	Do not use, set at the device
55	K Factor 2	Do not use, set at the device
56	Refrigerant 2	Do not use, set at the device
57	Setpoint min. 2	Do not use, set at the device
58	Setpoint max. 2	Do not use, set at the device
59	allocation A1	Do not use, set at the device
60	allocation K1	Do not use, set at the device
61	allocation K2	Do not use, set at the device
62	allocation D1	Do not use, set at the device
63	allocation D2	Do not use, set at the device
64	allocation E	Do not use, set at the device
65	E1 Modus	Do not use, set at the device
66	E2 Mode	Do not use, set at the device
67	A1 Min.	Do not use, set at the device
68	A1 max	Do not use, set at the device
69	Limit modulation function	0 = OFF, 1 = message only, 2 = release alarm
70	Limit modulation Min.	100 corresponds to 100%

Register addr.	Name	Description
71	Limit modulation Max.	100 corresponds to 100%
72	Limit modulation delay	2 corresponds to 2 sec
73	Lmt E1 Function	0 = OFF, 1=message only, 2=release alarm
74	Lmt E1 Min	dependent on sensor setting 1
75	Lmt E1 Max	dependent on sensor setting 1
76	Lmt E1 Hyst.	dependent on sensor setting 1
77	Lmt E1 Delay	2 corresponds to 2 sec
78	Lmt E2 Function	0 = OFF, 1 = message only, 2 = release alarm
79	Lmt E2 Min	dependent on sensor setting 2
80	Lmt E2 Max	dependent on sensor setting 2
81	Lmt E2 Hyst.	dependent on sensor setting 2
82	Lmt E2 Delay	2 corresponds to 2 sec
83	Lmt Offset Function	0 = OFF, 1=message only, 2=release alarm
84	Lmt Offset 1	Do not use, set at the device
85	Lmt Offset 2	Do not use, set at the device
86	GW Offset Hyst	Do not use, set at the device
87	Lmt Offset delay	Do not use, set at the device
88	Suppression Modus 1	1 = On
89	Suppression Start 1	100 corresponds to 100%
90	Suppression End 1	100 corresponds to 100%
91	Suppression Modus 2	1 = On
92	Suppression Start 2	100 corresponds to 100%
93	Suppression End 2	100 corresponds to 100%
94	Suppression Modus 3	1 = On
95	Suppression Start 3	100 corresponds to 100%
96	Suppression End 3	100 corresponds to 100%
97	Dummy	do not use
98	alarm mask	For internal purposes
99	Inverting K1	1 = Inverting
100	Inverting K2	1 = Inverting
101	Inverting D1	1 = Inverting
102	Inverting D2	1 = Inverting
103	Inverting E1	1 = Inverting
104	Inverting E2	1 = Inverting
105	Inverting A1	1 = Inverting
106	Group2 value On	0 - 100 %
107	Grpup 2 Minimum	0 - 100 %
108	Control circuit 2 mode	For future use
109	Bus address	1-247, factory set 247
110	Env. pressure	For future use
111	COM Baudrate	0=4800, 1=9600, 2=19200, 3=38400
112	COM Mode	0=8N1, 1=8E1, 2=8O1
113	Write protection Bus-address	1 = OFF, 0 = ON
114	D1 Busmode	0/1 Off/On
115	D2 Busmode	0/1 Off/On
116	Startvoltage	100 corresponds to 100 %

4 Document history

Drawing number: L-BAL-E267-GB		
Edition / Index	Editor	Description
1608 / 001	sd	Transfer to XML database

5 Enclosure

5.1 Manufacturer reference

Our products are manufactured in accordance with the relevant international regulations. If you have any questions concerning the use of our products or plan special uses, please contact:

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