

PolyGard® Modbus Communication Module MOD-05 for the DGC-05 System

DESCRIPTION

The Bus Communication Module MOD-05 works as data server and protocol translator between the DGC-05 system and the open Modbus environment. It also protects the Modbus against overload, over-voltage and reverse polarity, with terminals for the direct connection of the Modbus cable. The termination resistance for the return line is already included.

The Communication Module can be mounted in the central unit as well as in the field. The field version device is delivered with a separate housing.

A power supply unit (230 VAC / 24 VDC) is available for the field version in order to increase the supply voltage in the field.



APPLICATION

The MOD-05 Communication Module is used in the DGC-05 system as data conversion module. The module passes all important data information from the internal DGC-05 system to external systems like PLC or visualisation systems via the Modbus protocol.

FEATURES

- Protection of the field-bus inputs against over-voltage and reverse polarity
- Overload protection of the fieldbus cable
- Termination resistance for fieldbus return line
- 4 terminals each for outgoing and return lines of the Modbus cable
- Supply voltage 24 VDC
- Signal amplification for cable lengths > 900 m / 2700 ft.
- Suitable for rail mounting
- Option: Housing for field installation
- Option: Power supply unit 230 VAC / 24 VDC, 1,0 A, installed in the housing of the field device

TECHNICAL DATA

Electrical	
Power supply	24 VDC (16 VDC to 30 VDC)
Power consumption	0.7 W, 30 mA
Fieldbus current	Max. 1.0 A
Over-voltage protection	Max. 35 V
Reverse polarity protection	Max. 30 V
Repeater	
Signal repeater	Max. 900 m /2700 ft. segment length
Environmental conditions	
Humidity	15 – 95 % RH non condensing
Working temperature	-10 °C to + 70 °C (14 °F to 158 °F)
Storage temperature	0 °C to + 50 °C (32 °F to 122 °F)
Physical	
Enclosure	Plastic housing ABS
Colour	RAL 7035
Protection class	IP 40
Weight	0.1 kg (0.2 lbs.)
Installation	Top hat rail installation
Connection	Spring type: 0.5, to 1.5 mm ² (AWG 22 to 16)
Dimensions (W x H x D)	36 x 86 x 56 mm (1.4 x 3.4 x 2.2 in.)
Housing of repeater for field installation	
Enclosure	Plastic housing ABS
Colour	RAL 7035
Protection class	IP 55
Weight	0.5 kg (1.1 lbs.)
Installation	Wall/ ceiling installation
Dimensions (W x H x D)	112 x 152 x 76 mm (4.4 x 6.0 x 3.0 in.)
Housing of repeater for field installation incl. power supply unit	
Enclosure	Plastic housing ABS
Colour	RAL 7035
Protection class	IP 55
Weight	1.5 kg (3.2 lbs.)
Installation	Wall/ ceiling installation
Dimensions (W x H x D)	200 x 250 x 100 mm (7.9 x 9.8 x 3.9 in.)
Power supply unit for field installation	
Power supply	110/230 VAC 50/60Hz
Secondary	24 VDC, 1.0 A max., overload and short-circuit proof
Guidelines	EMC – Directive 2004/108/EC Low voltage directive 2006/95/EC
Warranty	1 year on material

ORDERING INFORMATION

DGC-MOD-05-XXX

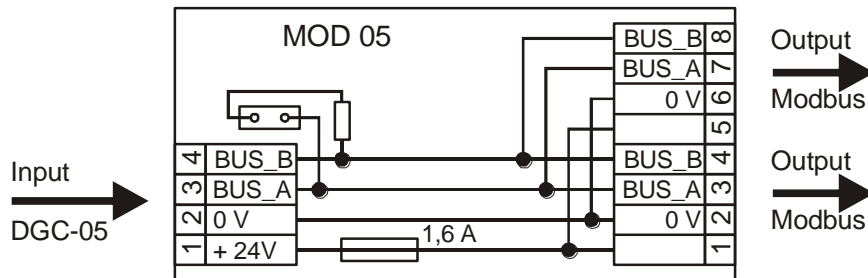
Options

- 1XX Housing / field installation
- X1X Field installation incl. power supply unit
230 VAC /24 VDC 1.0 A
- XX1 With internal termination resistor
- XX2 Without internal termination resistor

Example: Module for field installation, with termination resistor

Order number: **DGC-MOD-05-1X1**

WIRING CONNECTION

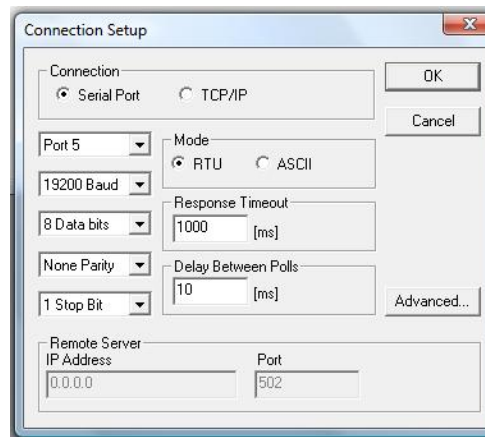


COMMUNICATION AND PARAMETER DEFINITIONS

Communication Definitions:

This module works
as **MODBUS slave** only

Baud rate 19,200 Baud
1 start bit, 8 data bits
1 stop bit, no parity
Default address: 01



Modbus function 16

Write Multiple Holding Registers are used to send the configuration to the communication module.

There are two kinds of information to define:

1. Own module Modbus address – address: 0
2. Full scale of each sensor from No. 1 to No. 98 on address: 1 to 98.

Internal signal range from 0-10.000 digits will be recalculated to 0- full scale value of above parameter.

Modbus function 03

Read Holding Registers are used to get information from the DGC-05 system.

There are six data blocks:

1. Current value of internal sensors- sensor address 1 to 98 MODBUS address: 1000 to 1098 d

	Alias	01000	Alias	01010	Alias	01020	Alias	01030	Alias	01040	Alias	01050	Alias	01060	Alias	01070	Alias	01080	Alias	01090
0				0		-10		-10		-10		-10		-10		-10		-10		-10
1		0		0		-10		-10		-10		-10		-10		-10		-10		-10
2		0		0		-10		-10		-10		-10		-10		-10		-10		-10
3		0		0		-10		-10		-10		-10		-10		-10		-10		-10
4		0		0		-10		-10		-10		-10		-10		-10		-10		-10
5		0		0		-10		-10		-10		-10		-10		-10		-10		-10
6		0		-10		-10		-10		-10		-10		-10		-10		-10		-10
7		0		-10		-10		-10		-10		-10		-10		-10		-10		-10
8		0		-10		-10		-10		-10		-10		-10		-10		-10		-10
9		0		-10		-10		-10		-10		-10		-10		-10		-10		0

2. Current value of external sensors- sensor address 1 to 98 MODBUS address: 2000 to 2098 d

3. Average value of internal sensors- sensor address 1 to 98 MODBUS address: 3000 to 3098 d

	Alias	03000	Alias	03010	Alias	03020	Alias	03030	Alias	03040	Alias	03050	Alias	03060	Alias	03070	Alias	03080	Alias	03090
0				0		-10		-10		-10		-10		-10		-10		-10		-10
1		0		0		-10		-10		-10		-10		-10		-10		-10		-10
2		0		0		-10		-10		-10		-10		-10		-10		-10		-10
3		0		0		-10		-10		-10		-10		-10		-10		-10		-10
4		0		0		-10		-10		-10		-10		-10		-10		-10		-10
5		0		0		-10		-10		-10		-10		-10		-10		-10		-10
6		0		-10		-10		-10		-10		-10		-10		-10		-10		-10
7		0		-10		-10		-10		-10		-10		-10		-10		-10		-10
8		0		-10		-10		-10		-10		-10		-10		-10		-10		-10
9		0		-10		-10		-10		-10		-10		-10		-10		-10		0

4. Average value of external sensors- sensor address 1 to 98 MODBUS address: 4000 to 4098 d



5. Output data block

Address 0: Own MODBUS address read data

Address 1: Relay information bits of first module (controller module)

Relay 1 is bit 0 up to Relay 5 is bit4

Address 2: Relay information bits of extension module Address_1

Relay 6 is bit 0 up to Relay 10 is bit4

Address 3: Relay information bits of extension module Address_2

Relay 11 is bit 0 up to Relay 15 is bit4

Address 4: Relay information bits of extension module Address_3

Relay 16 is bit 0 up to Relay 20 is bit4

Address 5: Relay information bits of extension module Address_4

Relay 21 is bit 0 up to Relay 25 is bit4

Address 6: Relay information bits of extension module Address_5

Relay 26 is bit 0 up to Relay 30 is bit4

The addresses 8 to 19 reflect Hardware Analog Output 1 to Analog Output 12

The values are defined from 0 to 10.000 (full scale value of the sensor)

	Alias	00000	Alias	00010
0	my_mod_adr	3	AO_3	1
1	master_modul	2	AO_4	1
2	ep_modul_1	3	AO_5	0
3	ep_modul_2	255	AO_6	0
4	ep_modul_3	255	AO_7	0
5	ep_modul_4	255	AO_8	0
6	ep_modul_5	255	AO_9	0
7	leer	0	AO_10	0
8	AO_1	0	AO_11	0
9	AO_2	1	AO_12	0

6. Data block: Full scale values

Address 0: free

Sensor address 1 to 98, MODBUS address: 5001 to 5098

The full scale value is deposited in these registers.

Alias	05000	Alias	05010	Alias	05020	Alias	35030	Alias	5040	Alias	35050	Alias	05060	Alias	05070	Alias	5080	Alias	35090	
0		Messbereich_10	10000	Messbereich_20	300	Messbereich_30	300	Messbereich_40	300	Messbereich_50	300	Messbereich_60	300	Messbereich_70	300	Messbereich_80	300	Messbereich_90	300	
1	Messbereich_1	10000	Messbereich_11	10000	Messbereich_21	300	Messbereich_31	300	Messbereich_41	300	Messbereich_51	300	Messbereich_61	300	Messbereich_71	300	Messbereich_81	300	Messbereich_91	300
2	Messbereich_2	10000	Messbereich_12	10000	Messbereich_22	300	Messbereich_32	300	Messbereich_42	300	Messbereich_52	300	Messbereich_62	300	Messbereich_72	300	Messbereich_82	300	Messbereich_92	300
3	Messbereich_3	10000	Messbereich_13	10000	Messbereich_23	300	Messbereich_33	300	Messbereich_43	300	Messbereich_53	300	Messbereich_63	300	Messbereich_73	300	Messbereich_83	300	Messbereich_93	300
4	Messbereich_4	10000	Messbereich_14	10000	Messbereich_24	300	Messbereich_34	300	Messbereich_44	300	Messbereich_54	300	Messbereich_64	300	Messbereich_74	300	Messbereich_84	300	Messbereich_94	300
5	Messbereich_5	10000	Messbereich_15	10000	Messbereich_25	300	Messbereich_35	300	Messbereich_45	300	Messbereich_55	300	Messbereich_65	300	Messbereich_75	300	Messbereich_85	300	Messbereich_95	300
6	Messbereich_6	10000	Messbereich_16	300	Messbereich_26	300	Messbereich_36	300	Messbereich_46	300	Messbereich_56	300	Messbereich_66	300	Messbereich_76	300	Messbereich_86	300	Messbereich_96	300
7	Messbereich_7	10000	Messbereich_17	300	Messbereich_27	300	Messbereich_37	300	Messbereich_47	300	Messbereich_57	300	Messbereich_67	300	Messbereich_77	300	Messbereich_87	300	Messbereich_97	300
8	Messbereich_8	10000	Messbereich_18	300	Messbereich_28	300	Messbereich_38	300	Messbereich_48	300	Messbereich_58	300	Messbereich_68	300	Messbereich_78	300	Messbereich_88	300	Messbereich_98	300
9	Messbereich_9	10000	Messbereich_19	300	Messbereich_29	300	Messbereich_39	300	Messbereich_49	300	Messbereich_59	300	Messbereich_69	300	Messbereich_79	300	Messbereich_89	300		

The full scale values can be set individually.

7. Data block: Parameter Write Data (Command 16)

Address 0: Own MODBUS Address Write Data

If several Modbus modules are interconnected, you have to assign individual addresses to each module. This entry has to be changed.

Possible values of the Modbus addresses 1-245 (default at delivery 1)

Sensor address 1 to 98, MODBUS address: 001 to 098 d

Full scale value range 1-32000 maximum

Definition of measurement or communication error:

If one unit is missing, the values will be set to the fixed presentable values:

Sensor_value -10

Relay information (address 1 to 6) 255 means: information is not available

Changes of parameters are not admitted for safety reasons therefore the data direction is clearly defined from the warning system to the open MODBUS side! Retroaction is not possible.