PolyGard® SB2 / MSC2 MSB2 / MGC2 / PX2

Digital Sensor Board / Controller Series

Modbus Supplement

March 2018 / Germany

Software from version 1.01.03 or higher

GASB2-MSC2ModBus_E_0318

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Serial Modbus Interface at the ModBUS

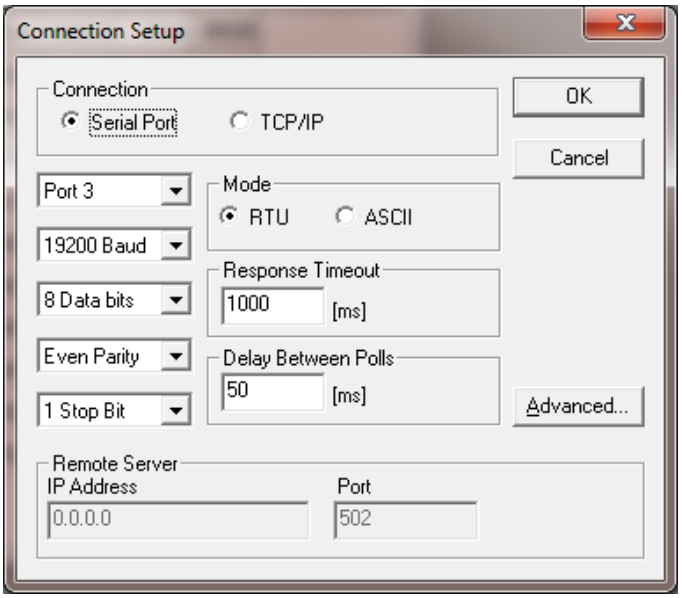
This functionality is available from version 1.01.03 on.

The standard protocol for an additional serial port of the gas controller Modbus is ModBus RTU.

Definition of communication

The gas sensor (SB2/MSC2 /MSB2) operates at the RS 485 interface (Bus A, Bus B Terminals) only
as **MODBUS slave.**

Parameter for communication:
Baud rate 19,200 baud
1 start bit, 8 data bits
1 stop bit, even parity



Picture1: from Modbus Poll Setup

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1 Modbus Function 03

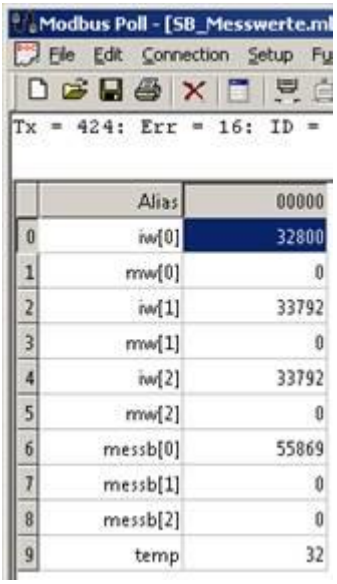
Read Holding Registers (reading of holding registers) are used to receive data from the DGC-06 system.

It is possible to query address 0 with a total of 9 information (words).

1.1 Values of digital sensors – sensor addresses 1 to 3, MODBUS addresses: 0 to 9

In the ModBus poll, the values are as follows:

	Alias Name	Meaning
Address 0:	iw(0)	(current value Sensor 1)
Address 1:	mw(0)	(average value Sensor 1)
Address 2:	iw(1)	(current value Sensor 2)
Address 3:	mw(1)	(average value Sensor 2)
Address 4:	iw(2)	(current value Sensor 3)
Address 5:	mw(2)	(average value Sensor 3)
Address 6:	messb(0)	(measuring range Sensor 1)
Address 7:	messb(1)	(measuring range Sensor 2)
Address 8:	messb(2)	(measuring range Sensor 3)
Address 9:	temp	(temperature Grad C)



	Alias	00000
0	iw[0]	32800
1	mw[0]	0
2	iw[1]	33792
3	mw[1]	0
4	iw[2]	33792
5	mw[2]	0
6	messb[0]	55869
7	messb[1]	0
8	messb[2]	0
9	temp	32

Picture2: from Modbus Poll Window

In the ModBus poll, the values for PX2 are as follows:

	Alias Name	Meaning
Address 0:	iw(0)	(current value Sensor 1)
Address 1:	mw(0)	(average value Sensor 1)
Address 2:	0 (not used)	
Address 3:	0 (not used)	
Address 4:	0 (not used)	
Address 5:	0 ((not used)	
Address 6:	messb(0)	(measuring range Sensor 1)
Address 7:	0 (not used)	
Address 8:	0 (not used)	
Address 9:	temp	(temperature Grad C)

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Dynamic resolution for the gas information is used, that means that
if the measuring range < 10, then the gas value is multiplied with 1000,
if the measuring range < 100 & >=10, then the gas value is multiplied with 100,
if the measuring range < 1000 & >=100, then the gas value is multiplied with 10,
if the measuring range >= 1000, then the gas value is multiplied with 1.
So in all cases a resolution of 1000 can be guaranteed.
E.g.: 0-150 ppm CO is always multiplied with 10
E.g.: 0-5 % LEL CO2 is always multiplied with 1000

For carbon monoxide:

Reg. 6-8	MSR Type	Gas		range	unit	Reading is
56008	1110	Carbon monoxide	CO	0-50	ppm	x 100
55849	1110	Carbon monoxide	CO	0-100	ppm	x 10
55869	1110	Carbon monoxide	CO	0-150	ppm	x 10
55889	1110	Carbon monoxide	CO	0-200	ppm	x 10
55909	1110	Carbon monoxide	CO	0-250	ppm	x 10
55929	1110	Carbon monoxide	CO	0-300	ppm	x 10

Error codes occurring in the Modbus Poll are the same as documented in the GC06 Manual:

"DP 0X Sensor Element"	(0x8001) (32769) Sensor element - error.
"DP 0X ADC Error"	(0x8002) (32770) Monitoring of the amplifier and AD converter - error.
"DP 0X Voltage"	(0x8004) (32772) Monitoring of the sensor and/or process power supply - error.
"DP 0X CPU Error"	(0x8008) (32776) Monitoring of the processor function –error.
"DP 0x EE Error"	(0x8010) (32784) Monitoring of the data storage – reports an error.
"DP 0X I/O Error"	(0x8020) (32800) Power ON / monitoring of the in/outputs of processor -error.
"DP 0X Overtemp."	(0x8040) (32832) Ambien temperature too high
"DP 0X Overrange"	(0x8200) (33280) Signal of sensor element at the sensor head is out of range.
"DP 0X Underrange"	(0x8100) (33024) Signal of sensor element at the sensor head is out of range.
"SB 0X Error"	(0x9000) (36864) Communication error from central unit to SB 0X
"DP 0X Error"	(0xB000) (45056) Communication error of SB to DP 0X sensor
"EP_06 0X Error"	(0x9000) (36864) Communication error to EP_06 0X module
"Maintenance"	**(0x0080)** System maintenance is due.
"UPS Error"	(0x8001) (32769) UPS doesn't work correctly, can only be signaled by the GC.
"Power Failure"	(0x8004) (32772) can only be signaled by the GC.
"Horn Error"	(0xA000) (40960) can only be signaled by the GC/EP with hardware option.
"Warning Sign Error"	(0x9000) (36864) can only be signaled by the GC/EP with hardware option.
"XXX FC: 0xXXXX"	Occurs, if there are several errors from one measuring point.

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2 Modbus Function 06

Write Single Registers (writing of single registers) is used to write on individual registers in the DGC06.

Currently, it is NOT possible to write any information.

3 Modbus Function 16

Write Multiple Registers (writing of several registers) is used to write on several registers in the DGC06.

Currently, it is NOT possible to write any information.

All other parameter changes are not permitted for safety reasons; therefore, the data direction is clearly defined from the warning system to the open MODBUS side. Retroaction is not possible.

4 Notes and General Information

It is important to read this user manual carefully in order to understand the information and instructions. The PolyGard® gas monitoring, control and alarm system may only be used for applications in accordance to the intended use. The appropriate operating and maintenance instructions and recommendations must be followed.

Due to permanent product developments, MSR reserves the right to change specifications without notice. The information contained herein is based on data considered to be accurate. However, no guarantee or warranty is expressed or implied concerning the accuracy of these data.

4.1 Intended Product Application

The PolyGard® device is designed and manufactured for controlling, for saving energy and keeping OSHA air quality in commercial buildings and manufacturing plants.

4.2 Installer's Responsibilities

It is the installer's responsibility to ensure that all PolyGard® devices are installed in compliance with all national and local regulations and OSHA requirements. All installation shall be executed only by technicians familiar with proper installation techniques and with codes, standards and proper safety procedures for control installations and the latest edition of the National Electrical Code (ANSI/NFPA70).
The equipotential bonding required (also e.g. secondary potential to earth) or grounding measures must be carried out in accordance with the respective project requirements. It is important to ensure that no ground loops are formed to avoid unwanted interference in the electronic measuring equipment.
It is also essential to follow strictly all instructions as provided in the user manual.

4.3 Maintenance

We recommend checking the PolyGard® system regularly. Due to regular maintenance differences in efficiency can easily be corrected. Re-calibration and replacement of parts can be realised on site by a qualified technician with the appropriate tools. Alternatively the removable Gas Controller can be returned to MSR-Electronic GmbH for services.

4.4 Limited Warranty

MSR-Electronic GmbH warrants the PolyGard® device against defects in material or workmanship for a period of one (1) year beginning from the date of shipment. Should any evidence of defects in material or workmanship occur during the warranty period, MSR will repair or replace the product at their own discretion, without charge.

This warranty does not apply to units that have been altered, had attempted repair, or been subjected to abuse, accidental or otherwise. The above warranty is in lieu of all other explicit warranties, obligations or liabilities.

This warranty extends only to the PolyGard® device. MSR-Electronic GmbH shall not be liable for any incidental or consequential damages arising out of or related to the use of the PolyGard® system.

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