

CHEMIST 900 RACK - MODBUS REGISTER LIST

Protocol number: 042160

Date: 18.09.2023

Reg. Address (dec)	Description	Measure Units	Register - Content		Value min	Value max	N° Data Byte	R/W	Modbus Function
			Byte High	Byte Low					
0	ModbusAddr (Scrittura in flash 200ms) [Default value: 0x0001]		0	Indirizzo = 1-247	1	247	1 (Int)	RW	3,6
1	ModbusResponseDelay (Ritardo risposta in ms) (Scrittura in flash 200ms) [Default value: 0x0005]		0	0 ... 255 (multipli di 10ms)	5	255	2 (Int)	RW	3,6
2	ModbusBaudRate (Tempo scrittura in flash 200ms) [Default value: 0x0003]		0	0 = 1200 1 = 2400 2 = 4800 3 = 9600 4 = 19200 5 = 38400	0	3	1 (Int)	RW	3,6
3	ModbusCfg [Default: 0x000F]		0	Bit 0 0=7bit, 1=8bit Bit 1 0=ASCII, 1=RTU Bit 2,3 0=-, 1=pari, 2=dispari, 3=none	-	-	1 (Int)	R	1,3
4 - 31	Reserved		0		-	-	2	R	3
32 - 33	GAS 1	ppm (% for O2)			-	-	4 (Float)	R	3
34 - 35	GAS 2	ppm			-	-	4 (Float)	R	3
36 - 37	GAS 3	ppm			-	-	4 (Float)	R	3
38 - 39	---	-			-	-	4 (Float)	R	3
40 - 41	---	-			-	-	4 (Float)	R	3
42 - 43	---	-			-	-	4 (Float)	R	3
44 - 45	---	-			-	-	4 (Float)	R	3
46 - 47	CO2 NDIR	ppm			-	-	4 (Float)	R	3
48 - 49	CO NDIR	ppm			-	-	4 (Float)	R	3
50 - 51	HC NDIR	ppm			-	-	4 (Float)	R	3
52 - 53	Pressure Draft	Pa			-	-	4 (Float)	R	3
54 - 55	Temperature Air	°C			-	-	4 (Float)	R	3
56 - 57	Temperature Gas	°C			-	-	4 (Float)	R	3
58 - 59	Temperature Aux	°C			-	-	4 (Float)	R	3
60 - 61	Temperature Sensors	°C			-	-	4 (Float)	R	3
62 - 63	Flow rate	l/min			-	-	4 (Float)	R	3
64 - 65	Pressure Gas	Pa			-	-	4 (Float)	R	3
66 - 67	CO Auto	ppm			-	-	4 (Float)	R	3
68 - 69	Speed Pitot	m/s			-	-	4 (Float)	R	3
70 - 71	Temperature Peltier	°C			-	-	4 (Float)	R	3
72 - 73	Temperature Hose	°C			-	-	4 (Float)	R	3
74 - 75	Gas 9	ppm			-	-	4 (Float)	R	3
76 - 105	Reserved	-	0		-	-	4 (Float)	R	3
108 - 109	Gas 1 (Ref O2)	ppm			-	-	4 (Float)	R	3
110 - 111	Gas 2 (Ref O2)	ppm			-	-	4 (Float)	R	3
112 - 113	Gas 3 (Ref O2)	ppm			-	-	4 (Float)	R	3
114 - 115	---	-			-	-	4 (Float)	R	3
116 - 117	---	-			-	-	4 (Float)	R	3
118 - 119	---	-			-	-	4 (Float)	R	3
120 - 121	---	-			-	-	4 (Float)	R	3
122 - 123	Gas CO2 NDIR (Ref O2)	ppm			-	-	4 (Float)	R	3
124 - 125	Gas CO NDIR (Ref O2)	ppm			-	-	4 (Float)	R	3
126 - 127	Gas HC NDIR (Ref O2)	ppm			-	-	4 (Float)	R	3
128 - 129	Gas NOx	ppm			-	-	4 (Float)	R	3
130 - 131	Gas NOx (Ref O2)	ppm			-	-	4 (Float)	R	3
132 - 133	Gas CO2	%			-	-	4 (Float)	R	3
134 - 135	Lambda	-			-	-	4 (Float)	R	3
136 - 137	Exc. Air	%			-	-	4 (Float)	R	3
138 - 139	dT (Tgas - Tair)	°C			-	-	4 (Float)	R	3
140 - 141	QS (Sensible heat losses, referred to the LHV)	%			-	-	4 (Float)	R	3
142 - 143	ES (Sensible heat efficiency, referred to the LHV)	%			-	-	4 (Float)	R	3
144 - 145	Patm (Pressure atmospheric)	Pa			-	-	4 (Float)	R	3
146 - 147	M _{air} (Combustion air mass with excess air)	kg/kg			-	-	4 (Float)	R	3

Reg. Address (dec)	Description	Measure Units	Register - Content		Value min	Value max	N° Data Byte	R/W	Modbus Function
			Byte High	Byte Low					
148 - 149	M_gas (Dry smoke mass with excess air)	kg/kg			-	-	4 (Float)	R	3
150 - 151	X_air (Humidity from combustion air including excess air)	kg/kg			-	-	4 (Float)	R	3
152 - 153	X_gas (Maximum fuel humidity with excess air)	kg/kg			-	-	4 (Float)	R	3
154 - 155	X_res (Residual smoke humidity after condensation)	kg/kg			-	-	4 (Float)	R	3
156 - 157	T_dew (Dew temperature)	°C			-	-	4 (Float)	R	3
158 - 159	RH_gas (Relative humidity of fumes at a given temperature)	%			-	-	4 (Float)	R	3
160 - 161	Qlat (Latent heat of water evaporation)	kJ/kg			-	-	4 (Float)	R	3
162 - 163	Qc (Heat recovered with condensation)	kJ/kg			-	-	4 (Float)	R	3
164 - 165	Ec (Condensation efficiency, referred to the LHV)	%			-	-	4 (Float)	R	3
166 - 167	Et (Total combustion efficiency, referred to the LHV)	%			-	-	4 (Float)	R	3
168 - 169	Qs_hhv (Sensible heat losses referred to the HHV)	%			-	-	4 (Float)	R	3
170 - 171	Qt_hhv (Total heat losses referred to the HHV)	%			-	-	4 (Float)	R	3
172 - 173	Es_hhv (Sensible heat efficiency referred to the HHV)	%			-	-	4 (Float)	R	3
174 - 175	Ec_hhv (Condensation efficiency referred to the HHV)	%			-	-	4 (Float)	R	3
176 - 177	Et_hhv (Total heat efficiency referred to the HHV)	%			-	-	4 (Float)	R	3
178 - 179	Rho (Smoke density with excess air and condensation effect)	kg/m3			-	-	4 (Float)	R	3
180 - 181	Co Auto (Ref O2)	ppm			-	-	4 (Float)	R	3
182 - 183	Carbon content	%			-	-	4 (Float)	R	3
184 - 185	Gas 9 (Ref O2)	ppm	0		-	-	4 (Float)	R	3
186 - 213	Reserved	-	0		-	-	4 (Float)	R	3
214	Gas 1 - Sensor Name		0	0 - 255 (See table SenName)	-	-	1 (Int)	R	3
215	Gas 2 - Sensor Name		0	0 - 255	-	-	1 (Int)	R	3
216	Gas 3 - Sensor Name		0	0 - 255	-	-	1 (Int)	R	3
217	---		0	0 - 255	-	-	1 (Int)	R	3
218	---		0	0 - 255	-	-	1 (Int)	R	3
219	---		0	0 - 255	-	-	1 (Int)	R	3
220	---		0	0 - 255	-	-	1 (Int)	R	3
221	Gas CO2 NDIR - Sensor Name		0	0 - 255	-	-	1 (Int)	R	3
222	Gas 4 CO NDIR - Sensor Name		0	0 - 255	-	-	1 (Int)	R	3
223	Gas 4 HC NDIR - Sensor Name		0	0 - 255	-	-	1 (Int)	R	3
224 - 225	Measure 6V digital	V			-	-	4 (Float)	R	3
226 - 227	Measure Vin	V			-	-	4 (Float)	R	3
228 - 229	Measure 3V Bat	V			-	-	4 (Float)	R	3
230 - 231	Measure 5V Analog	V			-	-	4 (Float)	R	3
232 - 233	Measure -2V	V			-	-	4 (Float)	R	3
234 - 235	Measure 3,3V Analog	V			-	-	4 (Float)	R	3
236	DL_status		0	Bit 0 Autozero done 0=NO, 1=YES Bit 1 Autoclean done, 0=NO, 1=YES Bit 2 L1 status 0=OFF, 1=ON Bit 3 L2 status 0=OFF, 1=ON Bit 4-7 free	-	-	1 (Int)	R	3
237	Gas Line Selection		0	0 = GAS_LINE_OFF 1 = GAS_LINE_L1 2 = GAS_LINE_L2 3 = GAS_LINE_AUTO 4 = GAS_LINE_DATALOGGER	0	4	1 (Int)	RW	3,6
238	Manual autoclean Start		0	0 = Nothing, 1 = Start autoclean	0	1	1 (Int)	RW	3,6
239	Manual autozero Start		0	0 = Nothing, 1 = Start aurozero	0	1	1 (Int)	RW	3,6
240	Manual pump gas ON/OFF	s	0	0 = OFF, 1 = ON	0	1	1 (Int)	W	3,6
241	Autozero Time	s			60	600	2 (int)	RW	3,6
242	Autoclean Time	s			0	600	2 (int)	RW	3,6
243*	Manual instrument reboot		0	0 = Nothing, 1 = Reboot	0	1	1 (Int)	RW	3,6
244	Num. Reboot		0	0-255	-	-	1 (Int)	R	3
245-268**	Combustible name				-	-	48 (char)	R	3

***: Warning!** When the MODBUS serial port parameters are remotely modified (via Modbus), it is necessary to perform a "Manual Instrument reboot" by pressing the on/off key on the front cover.

If the restart is not performed by pressing the button, every time the power supply to the instrument is removed, the values of registers 241 and 242 must be rewrite

**** : Warning!** Swap the byte High with the byte Low to obtain the correct composition of the string; the same is valid for all the character arrays, (see ex.: address 65280-65287).

ID Area

Reg. Address (dec)	Description	Measure Units	Register - Content		Value min	Value max	N° Data Byte	R/W	Modbus Function
			Byte High	Byte Low					
65280-65287**	Product code				-	-	16 (char)	R	3
65288-65295**	OEM Distributor name				-	-	16 (char)	R	3
65296-65303**	Brand name (Char)				-	-	16 (char)	R	3
65304-65305	Firmware protocol number				-	-	4 (Long Int)	R	3
65306-65307	Serial number				-	-	4 (Long Int)	R	3
65308-65309	Batch number				-	-	4 (Long Int)	R	3
65310-65317**	SVN number				-	-	16 (char)	R	3
65318-65325**	Note				-	-	16 (char)	R	3
65326	Product Family		0-255 = Registers revision Modbus map (for this family only)	1 = Family GAS 2 = Family SOLAR 3 = Family CLIMATIC 4 = Family RADIO 5 = Family THERMOSTAT 6 = Family INSTRUMENT 7 = Family ANALYZER 8 = Family GENERIC	0	65535	2 (Int)	R	3
65327	Product subfamily		0-255 = Registers revision Modbus map (for this subfamily only)	1 = CENTRAL UNIT 2 = TRANSMITTER 3 = DETECTOR 4 = BOARD INPUT 5 = BOARD OUTPUT 6 = BOARD I/O	0	65535	2 (Int)	R	3
65328	Modbus revision map (common for all families)				0	65535	2 (Int)	R	3
65329	Device HW revision				0	65535	2 (Int)	R	3
65330-65337**	Seitron product code				-	-	16 (char)	R	3

Serial port settings:

bit: 8

parity : none

stop bit: 1

baud rate: 1200 to 38400

SenName Table (see registers 214 – 223)

SenName Number	Model
0	AACSE11
1	AACSE12
2	AACSE10
3	AACSE15
4	...
5	AACSE13
6	AACSE14
7	AACSE18
8	AACSE17
9	AACSE33
10	AACSE20
11	AACSE34
12	AACSE21
13	AACSE30
14	AACSE19
15	AACSE35
16	AACSE38_1
17	AACSE38_2
18	AACSE38_3
19	AACSE24
20	AACSE25
21	AACSE26

22	AACSE28
23	AACSE39
24	AACSE40
25	AACSE41
26	AACSE42
27	AACSE43
28	AACSE44
29	AACSE45
30	AACSE47
31	AACSE48
32	AACSE56
33	AACSE57
34	AACSE68
35	AACSE71
36	AACSE72
37	AACSE73
38	AACSE74
39	AACSE75
40	AACSE76_1
41	AACSE76_2
42	AACSE76_3
43	AACSE77
44	AACSE78
45	ACSE79

Modbus usage example for a periodic cycle: L1-L2

Cycle phase	Modbus address (dec)	Note
Init: Set AUTOZERO time	241	60-600 seconds
Init: Set CLEAN time	242	0-600 seconds
**Start cycle: Switch off line selector: SetLine(4)	237	Payload: 0x04. Close L1 and L2 input valve.
Start Clean	238	
Start pump	240	Payload: 0x01
Wait clean_done status flag to be up: GetStatus	236	Wait bit:1 to be 1
Start AZ	239	
Wait autozero_done status flag to be up: GetStatus	236	Wait bit:0 to be 1
SetLine(L1)	237	Payload: 0x01. Open L1 input valve
Sampling L1	32-180	
Switch off line selector: SetLine(4)	237	Payload: 0x04. Close L1 and L2 input valve.
Start Clean	238	
Wait clean_done status flag to be up: GetStatus	236	Wait bit:1 to be 1
Start AZ	239	
Wait autozero_done status flag to be up: GetStatus	236	Wait bit:0 to be 1
SetLine(L2)	237	Payload: 0x02. Open L2 input valve
Sampling L2	32-180	
Restart cycle from '**Start cycle'		