

Guide
HygroMatik Modbus RTU
FlexLine

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1. General



This document is only valid in conjunction with the operating instructions for the control of the unit. Obey all safety notes for use of HygroMatik units. You will find the safety notes in chapter 2 of the user manual delivered with the unit.



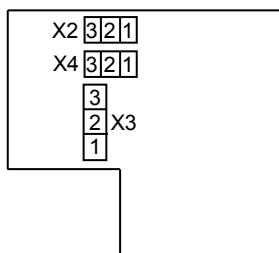
Format: Big-Endian

Baud rate: Baud rate is 19200

Settings of interface: 8-N-1; Data Bits: 8. Parity: None. Stop: 1

2. Interface

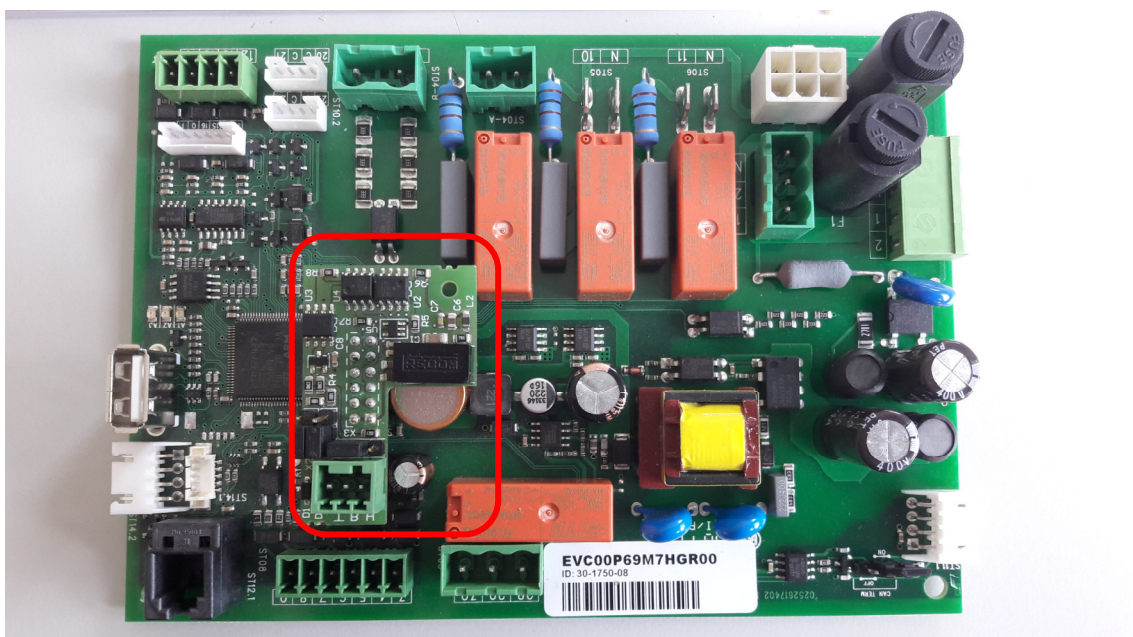
2.1. Interface EIA-485 E-2525174 (galvanically isolated)



Pin	X2	X3	X4
3			
2	Pull up 5V	120ohm	Pull down GND
1			

2.2. Plug for A.B and C E-2526102

Plug 3-core Phönix
FK-MC05/3-ST-2.5



3. Inputs

3.1. Function codes

3.1.1. (0x04) Read Input Registers

Request

Byte 1	Byte 2	Byte 3	Byte 4	Byte 5
Function code 0x04	Starting address 0x0000 to 0xFFFF	Starting address 0x0000 to 0xFFFF	Quantity of inputs 1 to 0x007D	Quantity of inputs 1 to 0x007D

Response

Byte 1	Byte 2	Byte 3	Byte N
Function code 0x04	Byte count 2xN	Input register MSB	Input register LSB

N = Quantity of input registers

3.2. Address table inputs

Addr. Base 0	Addr. Base 1	Description	Value	Factor	Unit
0x0000	1	Status_unit	0 – 255	1	state
0x0001	2	Fault_message_unit	0 – 999	1	error
0x0002	3	Fault_message_cyl. 1	0 – 999	1	error
0x0003	4	Status_cyl. 1	0 – 999	1	state
0x0004	5	Service_message_cyl. 1	0 – 999	1	service
0x0005	6	Steam_actual_unit	0 – 100.0	10	[kg/h]
0x0006	7	Steam_actual_cyl. 1	0 – 100.0	10	[kg/h]
0x0007	8	Demand	0 – 100.0	10	[%]
0x0008	9	Demand_PI	0 – 100.0	10	[%]
0x000A	11	Demand_SPA	0 – 100.0	10	[%]
0x000C	13	Control_sig_internal	0 – 100.0	10	[%]
0x000D	14	Safety_interlock	0 or 1	1	
0x001D	30	Humidity_set_value	0 – 100.0	10	[%]
0x001E	31	Humidity_actual_value	0 – 100.0	10	[%]
0x001F	32	Humidity_actual_max	0 – 100.0	10	[%]
0x0020	33	Humidity_set_max	0 – 100.0	10	[%]
0x0027	40	Temp._set_value	0 – 49.0	10	[°C]
0x0028	41	Temp._actual_value	0 – 60.0	10	[°C]
0x0036	55	Temp._actual_value 1	0 – 60.0	10	[°C]
0x0037	56	Temp._actual_value 2	0 – 60.0	10	[°C]
0x003B	60	FLE: Current_actual_cyl. 1	0 – 100.0	10	[A]
0x0046	71	FLH: Water_level_cyl. 1	0 – 255	1	[mm]
0x0096	151	Fault_message_cyl. 2	0 – 999	1	error
0x0097	152	Status_cyl. 2	0 – 999	1	state
0x0098	153	Service_message_cyl. 2	0 – 999	1	service
0x0099	154	Steam_actual_cyl. 2	0 – 100.0	10	[kg/h]
0x009A	155	FLE: Current_actual_cyl. 2	0 – 100.0	10	[A]
0x009F	160	FLH: Water_level_cyl. 2	0 – 255	1	[mm]

4. Holdings

4.1. Function codes

4.1.1. (0x03) Read Holding Registers

Request

Byte 1	Byte 2	Byte 3	Byte 4	Byte 5
Function code 0x03	Starting address 0x0000 to 0xFFFF	Starting address 0x0000 to 0xFFFF	Quantity of registers 1 to 0x007D	Quantity of registers 1 to 0x007D

Response

Byte 1	Byte 2	Byte 3	Byte N
Function code 0x03	Byte count 2xN	Register value MSB	Register value LSB

N = Quantity of registers

4.1.2. (0x10) Write Multiple registers

Request

Byte 1	Byte 2	Byte 3	Byte 4	Byte 5
Function code 0x10	Starting address 0x0000 to 0xFFFF	Starting address 0x0000 to 0xFFFF	Quantity of Outputs 1 to 0x007B	Quantity of outputs 1 to 0x007B

Byte 6	Byte 7	Byte N
Byte count 2xN	Register value MSB	Register value LSB

N = Quantity of Outputs / 8 if the remainder is different of 0 => **N** = **N**+1

Response

Byte 1	Byte 2	Byte 3	Byte 4	Byte 5
Function code 0x10	Starting address 0x0000 to 0xFFFF	Starting address 0x0000 to 0xFFFF	Quantity of Outputs 1 to 0x007B	Quantity of outputs 1 to 0x007B

4.2. Address table holdings

Addr. Base 0	Addr. Base 1	Description	Value	Factor	Unit
0x031F	800	Steam_output_max.	25.0 – 100.0	10	[%]
0x0333	820	Humidity_set_value	5.0 – 99.9	10	[%]
0x0334	821	Δ Set_value_dehumidification	1.0 – 20.0	10	[%]
0x0335	822	Δ Humidity_ECO	0.0 – 50.0	10	[%]
0x0336	823	PI-controller_gain	0.1 – 99.9	10	[%]
0x0337	824	PI-controller_integral	0 – 100	1	[%]
0x0338	825	Temp._set_value	20.0 – 49.0	10	[°C]
0x0339	826	Δ Temp._steam_off	0.1 – 5.0	10	[°C]
0x033A	827	Δ Temp._ECO	0.0 – 20.0	10	[°C]
0x033B	828	Δ Temp._max.	1.0 – 10.0	10	[°C]
0x033C	829	PI-controller_gain	0.1 – 99.9	10	[%]
0x033D	830	PI-controller_integral	0 – 100	1	[%]
0x036A	875	Timeout value for Modbus	0 – 60	1	[sec]
0x04B2	1203	Virtually safety interlock, steam on/off	0 or 1		
0x04B3	1204	ECO Mode, on/off	0 or 1		
0x04B6	1207	Demand via Modbus	0.0 – 100.0	10	[%]
0x04B7	1208	MODBUS time out counter	0 – 255	1	[sec]
0x04B8	1209	Light 1 on/off	0 or 1		
0x04B9	1210	Light 2 on/off	0 or 1		
0x04BA	1211	Light 3 on/off	0 or 1		
0x04BB	1212	Light 4 on/off	0 or 1		

4.2.1. Demand via Modbus



To control the FlexLine unit with Modbus, parameter "Control_settings" has to be set to Modbus. The demand has to be cyclically written to the address 1207. Additionally the time out counter in address 1208 must be written to 0. The time out count is counting seconds. If the time out counter is larger than address 875 the unit stops steam production. If the communication of the Modbus master is not working properly, this functionality will avoid humidification failures.

5. Units

5.1. State

For detailed description please have a look at the FlexLine documentation.

Value	Description	Value	
00	Initialization	68	Manual_blow-down
01	Safety_interlock_open	81	Part._blow-down_pending
02	No_Demand	82	Full_blow-down_pending
03	Humidification	90	Cylinder_full
04	Runtime_limitation	270	Service
05	Remote off	900	Diagnosis
06	No_bus-signal	999	Fault
07	Standby_heating_heating		
08	Standby_heating_interval		
09	No_demand_ECO		
10	Humidification_ECO		
11	Timer_steam_off		
12	Display_steam_off		
13	Weeckly_timer_steam_off		
14	Digital_input_steam_off		
30	Filling		
60	Start_blow-down		
61	Part._blow-down		
62	Full_blow-down		
63	Dilution		
64	Max._current_blow-down		
65	Max._level_blow-down		
66	Standby_blow-down		
67	Dead_leg_flushing		

5.2. Error

For detailed description please have a look at the FlexLine documentation.

Value	Description
000	No_fault
001	Plug_ST09
024 / 025	Input_resistance_OC, Input_resistance_SC
029	Internal
030	Filling_valve 1
061	Part. blow-down
062	Full blow-down
063	Blow-down dilution
064	Max. current blow-down
065	Max. level blow-down
066	Standby blow-down
067	Start blow-down
090	Cylinder_full
091	Current_measurement
092	Main_contactor_current
093	Main_contactor_cyl. full
120	Thermoswitch
121	Water_level_sensor
122	Max.-level
123	Steam_down_time
124	Relay_main_contactor
210	Humidity_sensor
211	Humidity_sensor 2

Value	Description
240	Temp._sensor_miss
241	Temp._sensor_broken
242	Temperature_max
243	Temp._sensor 2_miss
244	Temp._Sensor 2_broken
245	Temp._deviation

5.3. Service

For detailed description please have a look at the FlexLine documentation.

Value	Description
0	No_service_msg.
1	Steam_amount_counter
2	Cycles_main_contactor 1
3	Cycles_main_contactor 2
4	Cycles_main_contactor 3
5	Cycles_main_contactor 4
6	Cycles_main_contactor 5
11	Warning_electrodes
12	Warning_pump
13	Warning_valve