
Modbus FlexLine

Use case

The humidifier is to be integrated into a building management system. Access to read and write values.

Functional description

The humidifier can be integrated into an existing bus network as a Modbus RTU slave via an RS485 interface. The RS485 interface is adjustable and electrically isolated.

Communication settings

The option CN-07-10010 can be ordered ex works with the generator, HygroMatik prepares the programming for you.

Alternatively, all FlexLine humidifiers can be retrofitted with an interface driver with the option CN-07-10000.

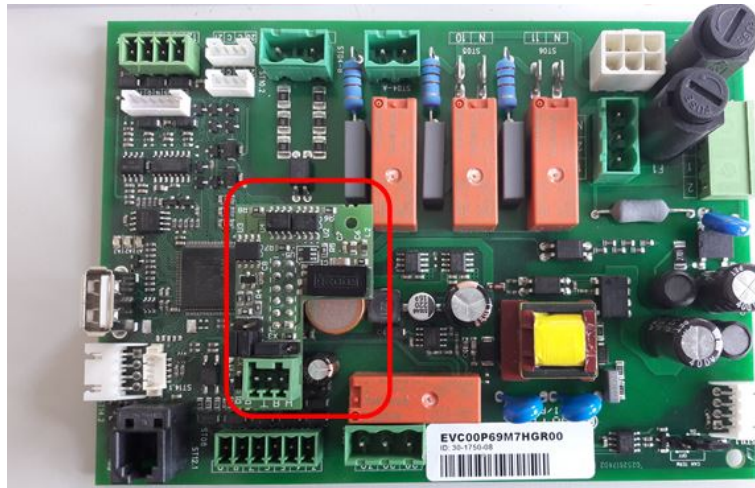
Communication interface RS485

Factory settings



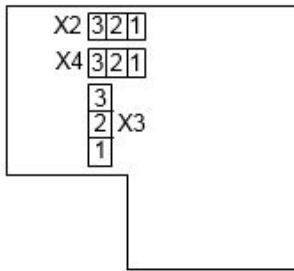
1 Address	1
2 Baud_rate	19200
3 Parity	None
4 Stop_bits	1
5 Modbus_timeour	20 sec

Interface



The red rectangle shows the position of the interface on the main board.

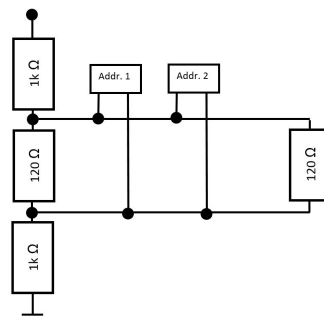
The interface may only be plugged in when the board is switched off. The correct position of the interface must be checked before switching on the unit. All PIN's of the interface must be plugged into the connector of the board. The holes on the main board and the interface must be on top of each other. The driver should be fixed with the enclosed locking post.



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

Picture of the interface EIA-485 E-2525174 with the positions to activate deactivate the resistors

The jumpers are used to activate the following three resistors. X3 as terminating resistor of the RS485 line at both ends of the lines. X2 and X4 as pull up/down resistors in the network. These are only set once in the network.



Plug

The plug (Phoenix FK-MC05/3-ST-2.5) is part of the option as well as the retrofit. It can also be ordered from HygroMatik. Item number E-2526102

Read values (Inputs)

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

Addr_0	Addr_1	Parameter	Range	Factor	Unit
0x0000	1	Status_unit	0-255	1	State
0x0001	2	Fault_message_unit	0-999	1	Fault
0x0002	3	Fault_message_cyl. 1	0-999	1	Fault
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	0-1	1	On/Off
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	Temperatur_Istwert 1	0-60,0	10	°C
0x0037	56	Temperatur_Istwert 2	0-60,0	10	°C
0x003B	60	Current_actual_cyl. 1	0-100,0	1	A
0x0046	71	Water_level_cyl. 1	0-255	1	mm
0x0096	151	Fault_message_cyl. 2	0-999	1	Fault
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	Current_actual_cyl. 2	0-100,0	10	A
0x009F	160	Water_level_cyl. 2	0-255	1	mm

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Parameters (Holdings)

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

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

Addr_0	Addr_1	Parameter	Range	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	0-100,0	10	°C
0x033A	827	Δ Temp._ECO	0-100,0	10	°C
0x033B	828	Δ Temp._max.	0-100,0	10	°C
0x033C	829	PI-controller_gain	0-100,0	10	%
0x033D	830	PI-controller_integral	0-100	1	%
0x036A	875	Modbus_Timeout	0-60	1	sec
0x04B2	1203	Safety_interlock_virtuell	0-1	1	On/Off
0x04B3	1204	ECO	0-1	1	Ein/Aus
0x04B6	1207	Modus_demand	0,0-100,0	10	%
0x04B7	1208	Modbus_counter	0-255	10	sec
0x04B8	1209	Light 1	0-1	1	On/Off
0x04B9	1210	Light 2	0-1	1	On/Off
0x04BA	1211	Light 3	0-1	1	On/Off
0x04BB	1212	Light 4	0-1	1	On/Off

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Demand via Modbus



1 Control_settings

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 error counter counts up by one every second. If the error counter is greater than the value in address 875, steam production is stopped. If the Modbus communication does not function correctly, unwanted humidification will be avoided.

Units

The following three tables list all status, error and service numbers of the HygroMatik units. Depending on the device type and application, numbers may not apply. The applicable numbers can be found in the respective device instructions.

Service

0	No_service_msg.	4	Cycles_main_contactor 3	12	Warning_electrodes
1	Steam_amount_counter	5	Cycles_main_contactor 4	13	Warning_pump
2	Cycles_main_contactor 1	7	Operating_time	14	Warning_valve
3	Cycles_main_contactor 2				

State

0	Initialization	30	Filling_valve 1	150
1	Safety_interlock_open	60	Start_blow-down	151
2	No_Demand	61	Part._blow-down	152
3	Humidification	62	Full_blow-down	270
4	Runtime_limitation	63	Dilution	900
5	Remote_off	64	Max._current_blow-down	901
6	No_bus-signal	65	Max._level_blow-down	902
7	Standby_heating_heating	66	Standby_blow-down	903
8	Standby_heating_interval	67	Dead_leg_flushing	999
9	No_demand_ECO	68	Manual_blow-down	
10	Humidification_ECO	81	Part._blow-down_pending	
11	Timer_steam_off	82	Full_blow-down_pending	
12	Display_steam_off	90	Cylinder_full	
13	Weeckly_timer_steam_off			
14	Digital_input_steam_off			

Error

0	No_fault	90	Cylinder_full	210
1	Plug_ST09	91	Current_measurement	211
2	Cylinder_extension 1	92	Main_contactor_current	240
6	Relay_extension 1	93	Main_contactor_cyl._full	241
7	Relay_extension 2			242
20	Input_voltage_min.	120	Thermoswitch	243
21	Input_voltage_max.	121	Water_level_sensor	244
22	Input_current_min.	122	Max.-level	245
23	Input_current_max	123	Steam_down_time	
24	Input_resistance_OC	124	Relay_main_contactor	
25	Input_resistance_SC	150	Pressure_sensor	
29	Internal	151	Pressure_max.	
30	Filling_valve 1	152	Pressure_min.	
61	Part._blow-down	153	Pressure_water_inlet	
62	Full_blow-down	154	Leakage	
63	Blow-down_dilution	155	Frequency_converter	
64	Max._current_blow-down	156	Temperature_engine	
65	Max._level_blow-down	157	Temperature_housing	
66	Standby_blow-down	158	Temperature_pump	
67	Start_blow-down			

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Example

Read unit status

The status of the unit with address 1 is read out. In this example, the response of the unit is 1 = safety interlock open.

TxD 01 04 00 00 00 01 31 CA

RxD 01 04 02 00 01 78 F0

Switch off steam production

Steam production should be switched off. A zero is written to address 0x04B2.

TxD 01 10 04 B2 00 01 02 00 00 F8

RxD 01 10 04 B2 00 01 A0 DE

Set control signal

The unit should generate steam with 50% control signal. The control signal is transmitted in one frame and the timeout counter is set to 0. 500 = 50.0% is written to address 0x04B6 and 0 is written to the next address.

TxD 01 10 04 B6 00 02 04 01 F4 00

RxD 01 10 04 B6 00 02 A1 1E
