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ENGO

ENGO Controls EFAN-24 PWM Fan Speed Controller

Specifications

- Protocol: MODBUS RTU
- Controller Model: EFAN-24
- Communication Interface: RS485
- Address Range: 1-247
- Data Size: 32-bit

Product Usage Instructions

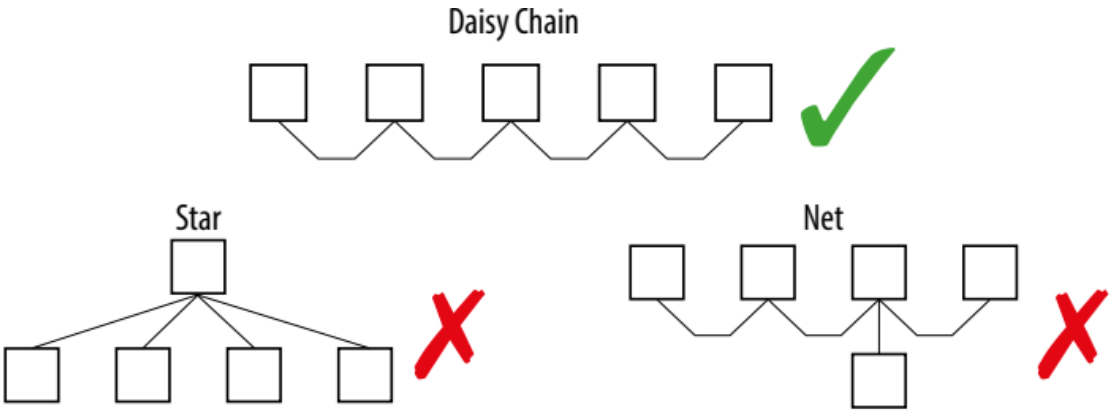
- Configuration of the EFAN-24 controller must be carried out by a qualified person with appropriate authorization and technical knowledge, following country and EU standards and regulations.
- Failure to adhere to instructions may void the manufacturer’s responsibility.
- The controller can operate as a slave in a MODBUS RTU network with specific features and communication requirements. Ensure proper wiring configuration to avoid data corruption.
- Network Connection: RS-485 serial interface
- Data Configuration: Address, speed, and format are determined by hardware
- Data Access: Full access to the controller’s ladder program data
- Data Size: 2 bytes per MODBUS data register
- Before connecting the controller to the RS-485 network, ensure proper configuration of communication settings, including address, baud rate, parity, and stop bits.
- Unconfigured controllers should not be connected to the network to avoid operational issues.

General information

General information about MODBUS RTU

The MODBUS RTU structure uses a master-slave system to exchange messages. It allows a maximum of 247 slaves, but only one master. The master controls the operation of the network, and only it sends the request. Slaves do not undertake transmissions on their own. Each communication begins with the master requesting the Slave, which responds to the master with what it has been asked. The master (computer) communicates with slaves (controllers) in two-wire RS-485 mode. This uses data lines A+ and B- for data exchange, which MUST be one twisted pair.

No more than two wires can be connected to each terminal, ensuring that a “Daisy Chain” (in series) or “straight line” (direct) configuration is used. Star or network (open) connection is not recommended, as reflections within the cable can cause data corruption.



Configuration

- Configuration must be carried out by a qualified person with the appropriate authorization and technical knowledge, following the standards and regulations of the country and the EU.
- The manufacturer will not be held responsible for any conduct not following the instructions.

ATTENTION:

There may be additional protection requirements for the entire installation and configuration, which the installer/programmer is responsible for maintaining.

MODBUS RTU network operation – Slave mode

Engo's MODBUS controller has the following features when operating as a slave in a MODBUS RTU network:

- Network connection via RS-485 serial interface.
- Address, communication speed, and byte format are determined by hardware configuration.
- Allows access to all tags and data used in the controller's ladder program.
- 8-bit slave address
- 32-bit data size (1 address = 32-bit data return)
- Each MODBUS data register has a size of 2 bytes.

ATTENTION:

- Before the controller is connected to the RS-485 network, it must first be properly configured.
- The communication settings are configured in the service parameters of the regulator (device).

ATTENTION:

- Connecting unconfigured controllers to the RS-485 network will result in improper operation.
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communication settings

RS-485 communication settings

Pxx	Function	Value	Description	Default value
Addr	MODBUS Slave device address (ID).	1 – 247	MODBUS Slave device address (ID).	1
BAUD	Baud	4800	Bitrate (Baud)	9600
		9600		
		19200		
		38400		
PARI	Parity bit – sets data parity for error detection	None	None	None
		Even	Even	
		Odd	Odd	
STOP	StopBit	1	1 stop bit	1
		2	2 stop bit	

Supports the following function codes:

- 03 – reading n registers (Holding Registers)
- 04 – reading n registers (Input Registers)
- 06 – Write 1 register (Holding Register)

INPUT registers – read only

Adress	Acc		Value		Def

Dec	Hex	ess	Description	range	Means	ault
0	0x0000	R (#03)	Engo MODBUS Model ID	1-247	MODBUS Slave (ID)	1
1	0x0001	R (#03)	Firmware-Version	0x0001-0x9999	0x1110=1.1.10 (BCD code)	
2	0x0002	R (#03)	Working-state		0b00000010=Idle, switch OFF 0b00000000=Idle, room meet temperature 0b10000001=Heating 0b10001000=Cooling 0b00001000 = Idle, sensor error	
3	0x0003	R (#03)	Value of the Integrated temperature sensor, °C	50 – 500	N-> temp=N/10 °C	
5	0x0005	R (#03)	Value of the External temperature sensor S1, °C	50 – 500	0 = Open (sensor break) / contact open 1 =Closed (sensor short circuit)/ contact closed N-> temp=N/10 °C	

6	0x0006	R (#03)	Value of the External temperature sensor S2, °C	50 – 500	0 = Open (sensor break) / contact open 1 =Closed (sensor short circuit)/ contact closed N-> temp=N/10 °C	
7	0x0007	R (#03)	Fan state	0b00000000 – 0b00001111	0b00000000= OFF 0b00000001= I Fan stage low 0b00000010= II Fan stage medium 0b00000100= III Fan state high 0b00001000= Auto – OFF 0b00001001= Auto – I low 0b00001010= Auto – II medium 0b00001100= Auto – III high	
8	0x0008	R (#03)	Valve 1 stat	0 – 1000	0 = OFF (valve closed) 1000 = ON / 100% (valve open)	
9	0x0009	R (#03)	Valve 2 state	0 – 1000	0 = OFF (valve closed) 1000 = ON / 100% (valve open)	
10	0x000A	R (#03)	Humidity measurement (with 5% indication accuracy)	0 – 100	N-> humidity=N %	

HOLDING registers – for reading and writing

Adress		Access	Description	Value range	Means	Default
Dec	Hex					
0	0x0000	R/W (#04)	Engo MODBUS Model ID	1-247	MODBUS Slave (ID)	1
234	0x00EA	R/W (#06)	Fancoil type	1 – 6	1 = 2 pipe – only heating 2 = 2 pipe – only cooling 3 = 2 pipe – heating & cooling 4 = 2 pipe – underfloor heating 5 = 4 pipe – heating & cooling 6 = 4 pipe – underfloor heating & cooling by fancoil	0
				0	Input inactive. Change between heating and cooling with the buttons.	

235	0x00EB	R/W (#06)	S1-COM input configuration (Installer Parameters -P01)	1	Input used to change heating/cooling via external contact connected to S1-COM: – S1-COM open –> HEAT mode – S1-COM shorted –> COOL mode	0
				2	Input used to AUTOMATICALLY change heating/cooling based on PIPE TEMPERATURE in a 2-pipe system. The controller switches between heating and cooling modes based on the pipe temperature set in parameters P17 and P18.	

				3	Allow fan operation dependent on the temperature measurement on the pipe. For example, if the temperature on the pipe is too low, and the controller is in heating mode – The pipe sensor will not allow the fan to run. The change of heating/cooling is done manually, using the buttons. Values for fan control based on pipe temperature are set in parameters P17 and P18.	
				4	Activation of the floor sensor in the floor heating configuration.	
236	0x00EC	R/W (#06)	S2-COM input configuration (Installer Parameters -P02)	0	Input disabled	0
				1	Occupancy sensor (when contacts are opened, activate ECO mode)	
				2	External temperature sensor	
2	0x	R/	Selectable ECO mode (Ins	0	NO – Disabled	

37	00ED	W (#06)	taller Parameters -P07)	1	YES – Active	0
238	0x00EE	R/W (#06)	ECO mode temperature value for heating (Installer parameters -P08)	50 – 450	N-> temp=N/10 °C	150
239	0x00EF	R/W (#06)	ECO mode temperature value for cooling (Installer parameters -P09)	50 – 450	N-> temp=N/10 °C	300

240	0x00F0	R/W (#06)	ΔT of 0- 10V valve operation This parameter is responsible for the modulated 0-10V output of the valve. – In heating mode: If the room temperature drops, the valve opens proportionally to the delta size. – In cooling mode: If the room temperature increases, the valve opens in proportion to the size of the delta. The valve opening starts from the room set temperature. (Installer parameters -P17)	1-20	N-> temp=N/10 °C	10
241	0x00F1	R/W (#06)	Fan on temperature for heating The fan will start working if the temperature in the room drops below the preset by the value of the parameter (Installer parameters -P15)	0 – 50	N-> temp=N/10 °C	50

Address	Ac				De

Dec	Hex	cess	Description	Value range	Means	fault
242	0x00F2	R/W (#06)	Control algorithm (TPI or hysteresis) for the heating valve (Installer parameters -P18)	0 – 20	0 = TPI 1 = ±0,1C 2 = ±0,2C… N-> temp=N/10 °C (±0,1…±2C)	5

243	0x00F3	R/W (#06)	FAN delta algorithm for cooling The parameter determines the width of the temperature range in which the fan operates in cooling mode. If the room temperature increases, then: 1. When a small value of Delta FAN, the faster the response of the fan to a change in temperature temperature – faster the increase in speed. 2. When large value of Delta FAN, the slower fan increases speed. (Installer parameters - P16)	5 – 50	N-> temp=N/10 °C	20

244	0x00F4	R/W (#06)	Fan on temperature for cooling. The fan will start working if the temperature in the room rises above the setpoint by the value of the parameter. (Installer parameters -P19)	0 – 50	N-> temp=N/10 °C	50
245	0x00F5	R/W (#06)	Hysteresis value for the cooling valve (Installer parameters -P20)	1 – 20	N-> temp=N/10 °C (±0,1…±2C)	5

246	0x00F6	R/W (#06)	Dead zone of switching heating/cooling In a 4-pipe system.The difference between the Set temperature and the room temperature, at which the controller will automatically change the heating/cooling operation mode. (Installer parameters - P21)	5 – 50	N-> temp=N/10 °C	20
247	0x00F7	R/W (#06)	The switching temperature value from heating to cooling – 2-pipe system. In a 2-pipe system, below this value, the system switches to cooling mode and allows the fan to start. (Installer parameters -P22)	270 – 400	N-> temp=N/10 °C	300

248	0x00F8	R/W (#06)	The value of the switching temperature from cooling to heating, 2-pipe system. In a 2-pipe system, above this value, the system switches to heating mode and allows the fan to start. (Installer parameters -P23)	100 – 250	N-> temp=N/10 °C	100
249	0x00F9	R/W (#06)	Cooling ON delay. A parameter used in 4-pipe systems with automatic switching between heating and cooling. This avoids too frequent switching between heating and cooling modes and oscillation of the room temperature. (Installer parameters -P24)	0 – 15 min		0

250	0x00FA	R/W (#06)	Maximum floor temperature To protect the floor, heating will be turned off when the floor sensor temperature rises above the maximum value. (Installer parameters - P25)	50 – 450	N-> temp=N/10 °C	350
251	0x00FB	R/W (#06)	Minimum floor temperature To protect the floor, heating will be switched on, when the floor sensor temperature drops below the minimum value. (Installer parameters -P26)	50 – 450	N-> temp=N/10 °C	150
254	0x00FE	R/W (#06)	PIN code for installer settings (Installer Parameters -P28)	0 – 1	0 = disabled 1 = PIN (First default code 0000)	0

Adress		Access	Description	Value range	Means	Default
Dec	Hex					
255	0x00FF	R/W (#06)	Requiring a PIN code to unlock the keys (Installer Parameters -P29)	0 – 1	0 = NIE 1 = TAK	0
256	0x0100	R/W (#06)	Fan operation (Installer parameters -FAN)	0 – 1	0 = NO – Inactive – output contacts for fan control are completely disabled 1 = YES	1
257	0x0101	R/W (#06)	Power on/off – switching off the regulator	0,1	0=OFF 1=ON	1
258	0x0102	R/W (#06)	Operation mode	0,1,3	0=Manual 1=Schedule 3=FROST – anti-freeze mode	0

260	0x0104	R/W (#06)	Fan speed setting		0b000000= OFF – fan off 0b00000001= I (low) fan gear 0b000010= II (medium) fan gear 0b00000100= III (high) fan gear 0b00001000= Automatic fan speed – OFF 0b00001001= Automatic fan speed – 1st gear 0b00001010= Automatic fan speed – 2nd gear 0b00001100= Automatic fan speed – 3rd gear	
262	0x0106	R/W (#06)	Key lock	0,1	0=unlocked 1=Locked	0
263	0x0107	R/W (#06)	Display brightness (Installer Parameters -P27)	0-100	N-> Brightness =N%	30
268	0x010C	R/W (#06)	Clock – minutes	0-59	Minutes	0
269	0x010D	R/W (#06)	Clock – hours	0-23	Hours	0

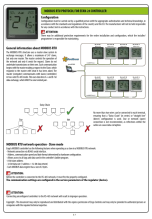
270	0x010E	R/W (#06)	Clock – Day of the week (1=Monday)	1~7	Day of the week	3
273	0x0111	R/W (#06)	Set the temperature in schedule mode	50-450	N-> temp=N/10 °C	210
274	0x0112	R/W (#06)	Set temperature in manual mode	50-450	N-> temp=N/10 °C	210
275	0x0113	R/W (#06)	Set the temperature in FROST mode	50	N-> temp=N/10 °C	50
279	0x0117	R/W (#06)	Maximum setpoint temperature	50-450	N-> temp=N/10 °C	350
280	0x0118	R/W (#06)	Minimum setpoint temperature	50-450	N-> temp=N/10 °C	50
284	0x011C	R/W (#06)	Accuracy of displayed temperature	1, 5	N-> temp=N/10 °C	1

285	0x011D	R/W (#06)	Correction of the displayed temperature	-3.0…3.0 °C	in steps of 0.5	0
288	0x0120	R/W (#06)	Selection of system type – heating/cooling (dependent on the setting of input S1)	0,1	0 = Heating 1 = Cooling	0
291	0x0123	R/W (#06)	Minimum fan speed (Installer Parameters-P10)	0-100	N-> speed=N %	10
292	0x0124	R/W (#06)	Maximum fan speed (Installer Parameters-P11)	0-100	N-> speed=N %	90
293	0x0125	R/W (#06)	Speed of fan 1st gear in manual mode (Installer parameters-P12)	0-100	N-> speed=N %	30
294	0x0126	R/W (#06)	Speed of fan 2nd gear in manual mode (Installer parameters-P13)	0-100	N-> speed=N %	60
295	0x0127	R/W (#06)	Speed of fan 3rd gear in manual mode (Installer parameters-P14)	0-100	N-> speed=N %	90

FAQ

- **Q:** What are the default communication settings for the EFAN-24 controller?
- **A**: The default settings include a slave device address of 1, the baud rate of 9600, no parity bit, and one stop bit.
- **Q:** How can I access different data registers in the MODBUS RTU network?
- **A:** Use the appropriate function codes such as #03 for reading holding registers or #06 for writing a single register. Each register has specific data values related to controller parameters.

Documents / Resources

	ENGO Controls EFAN-24 PWM Fan Speed Controller [pdf] Instruction Manual EFAN-230B, EFAN-230W, EFAN-24 PWM Fan Speed Controller, EFAN-24 , PWM Fan Speed Controller, Fan Speed Controller, Speed Controller

References

- User Manual

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EFAN-230B, EFAN-230W, EFAN-24, EFAN-24 PWM Fan Speed Controller, ENGO CONTROLS, Fan Speed Controller, PWM Fan Speed Controller, Speed Controller

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