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MB-LS-1

Lighting brightness
level transducer
with Modbus RTU output



Do not dispose of this device in the trash along with other waste! According to the Law on Waste, electro coming from households free of charge and can give any amount to up to that end point of collection, as well as to store the occasion of the purchase of new equipment (in accordance with the principle of old-for-new, regardless of brand). Electro thrown in the trash or abandoned in nature, pose a threat to the environment and human health.



Purpose

The transducer continuously measures the brightness level (light intensity) in the range of 1÷2000 lx and exchanges data using the RS-485 port in accordance with the Modbus RTU protocol.

Features

- » measurement of light intensity
- » operating status of the sensor

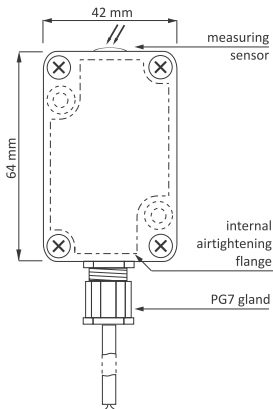
Functioning

The module continuously measures brightness with a built-in sensor at a frequency of 1Hz (once per second). Readout of values, setting of all measurement, communication and data exchange parameters are carried out through the RS-485 port using the Modbus RTU communication protocol. The result saved in the module register is an average value from the set number of last samples from the range 1÷30 (for example setting the value of 30 means that the result will be the average of the last 30 seconds).

The module is able to signal sensor operation and overheating (status of register 512). Exceeding the critical temperature of 80°C may cause incorrect operation of the measuring system.

Transducer design

Transducer in special, compact-sized plastic box, connected through a PG7 cable gland with circular cables of any length, maximum diameter $\varnothing 7$. Box with a special sealing flange, fixed to the ground with two screws, closed with a cover with silicone gasket using 4 screws.



Separation

No galvanic isolation between power supply, RS-485 line and sensor inputs.

Mounting



The use of anti-interference and surge filters (such as OP-230) is recommended.



It is recommended to use shielded twisted-pair cables to connect the module to another device.



When using shielded cables, ground the screens only on one side and as close to the device as possible.



Do not route signal cables in parallel in close proximity to high and medium voltage lines.



Do not install the module in the immediate vicinity of high-power electric receivers, electromagnetic measuring instruments, phase power control devices and other devices that may cause interference.



Installing the transducer in direct sunlight may cause the system to overheat on hot summer days.

1. Before installing the module, set the selected Modbus communication parameters and measurement options.
2. Disconnect the power supply.
3. Unscrew the cover fixing screws.
4. At the measuring point, fix the module to the ground with the measuring sensor facing down.
5. Pull the cable through the cable gland and tighten it firmly so that the inner gasket fits tightly to the cable.
6. Connect the power supply cables to the +0 V(-) terminals.
7. Connect the A-B signal output (RS-485 port) to the MASTER device output. Maximum (UTP) cable length is 300 m.
8. Screw the cover to the case.

Communication parameters

Protocol	Modbus RTU
Operating mode	Slave
Port settings (<u>factory settings</u>)	Number of bits per second: 1200, 2400, 4800, <u>9600</u> , 19200, 38400, 57600, 115200 Data bits: <u>8</u> Parity: <u>NONE</u> , EVEN, ODD Start bits: <u>1</u> Stop bits: 1/1,5/ <u>2</u>
Network address range (<u>factory settings</u>)	1÷245 (<u>1</u>)
Command codes	3: Read the values of a group of registers (0×03 – Read Holding Register) 6: Set the value of a single register (0×06) – Write Single Register

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Max. frequency of queries	15 Hz

Measuring parameters (factory settings)

Number of averaging samples	1 (value of register: 260)
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Communication registers

address	description	function	type	attrib.
256	Read current and write new base address: <u>1</u> ÷245	03 06	int	R/W
257	Read current and write the baud rate: 0:1200/1:2400/ 2:4800/ <u>3:9600</u> /4:19200/ 5:38400/6:57600/7:115200	03 06	int	R/W
258	Read current and write new parity value: <u>0:NONE</u> /1:EVEN/2:ODD	03 06	int	R/W
259	Read current and write new number of stop bits: 0:1 bit/1:1,5 bita/ <u>2:2 bity</u>	03 06	int	R/W
261	Restore factory settings. Enter value 1.	06	int	W

Communication registers cont.

address	description	function	type	attrib.
Note! Changes in communication parameters (baud rate, number of stop bits, parity) are only taken into account only after the power is restarted.				
1026 ÷ 1027	Serial number $R1026 \times 256^2 + R1027$	03	int	R
1028	Production date: 5 bits-day; 4 bits-month; 7 bits-year (without 2000)	03	int	R
1029	Software version	03	int	R
1031 ÷ 1035	Identifier: F& F MB -L S- 1_	03	int	R

The transducer does not support broadcast commands (address 0).

Measurement and configuration registers

address	description	function	type	attrib.
0	Brightness level [lx] – unsigned number	03	int	R
1	Operating status of the measurement sensor: 0 – normal operation; 1 – sensor failure; 2 – overheating; 3 – sensor failure and overheating	03	int	R

Measurement and configuration registers cont.

address	description	function	type	attrib.
260	Number of averaging samples (range 1÷30) Entering 0 deactivates the sensor (OFF)	03 06	int	R/W

Technical data

power supply	9÷30 V DC
maximum current consumption	40 mA
measuring range	1÷1200 lx
maximum temperature measurement error	±2%
port	RS-485
communication protocol	Modbus RTU
operating mode	Slave
communication parameters	
baud rate (adjustable)	1200÷115200 bit/s
data bits	8
stop bits	1/1,5/2
parity bits	EVEN/ODD/NONE
address	1÷247
power consumption	0.3 W
working temperature	-40÷70°C
terminal	2.5 mm ² screw terminals
tightening torque	0.4 Nm
dimensions	42×64×30 mm)
mounting	surface
protection level	IP65

Warranty

F&F products are covered by a 24-month warranty from the date of purchase. The warranty is only valid with proof of purchase. Contact your dealer or contact us directly.

CE declaration

F&F Filipowski sp. j. declares that the device is in conformity with the essential requirements of The Low Voltage Directive (LVD) 2014/35/EU and the Electromagnetic Compatibility (EMC) Directive 2014/30/UE.

The CE Declaration of Conformity, along with the references to the standards in relation to which conformity is declared, can be found at www.fif.com.pl on the product page: www.fif.com.pl from the product subpage.