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MB-LS-1 v2

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÷9500 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

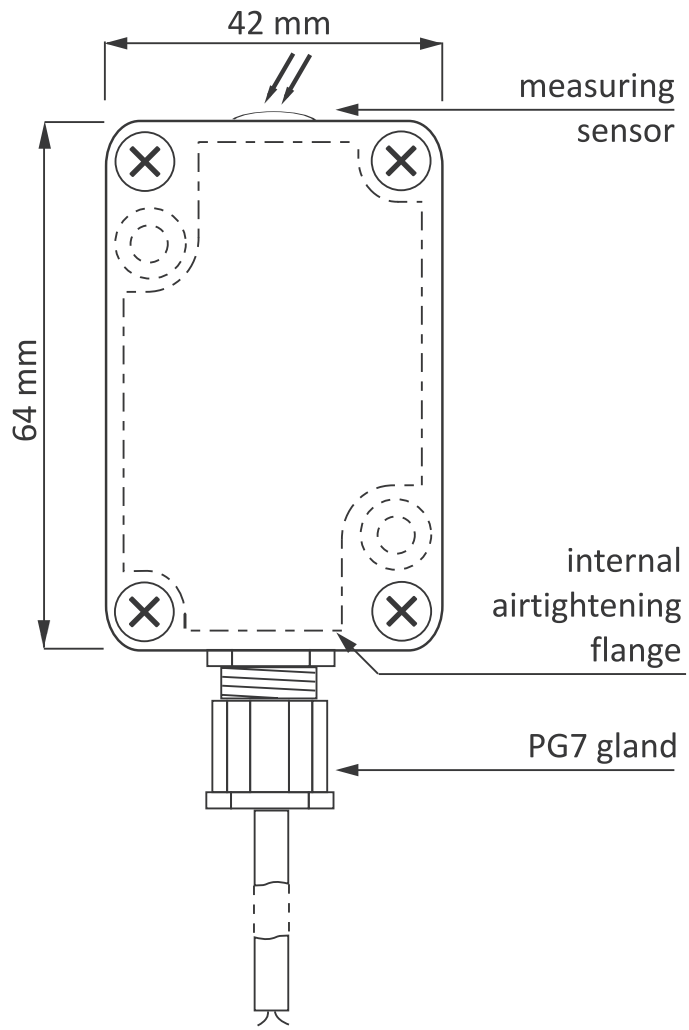
The module continuously measures brightness with a built-in sensor at a frequency of 1Hz (once per second). Readout of values, setting of all measurement, communication and data exchange parameters are carried out through the RS-485 port using the Modbus RTU communication protocol. The result saved in 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 ø7.

Box with a special sealing flange, fixed to the ground with 2 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

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.

Modbus RTU protocol parameters

Command codes			
code (dec)	**code (hex)**	**description**	**name**
3	0x03	Read the values of a group of registers	Read Holding Registers
4	0x04	Reading a group of input registers	Read Input Registers

Command codes (cont.)

code (dec)	code (hex)	description	name
6	0x06	Setting the value of a single register	Write Single Register
16	0x10	Setting the value of multiple registers	Write Multiple Registers
23	0x17	Reading and setting the value of multiple registers	Read/Write Multiple Registers

Register types

name	acr.	description	supported codes
Input register	IR	Read-only register	0x04
Holding registers	HR	Read-only register and write	0x03, 0x06, 0x10, 0x17

Variable types

name	acr.	description	range
int	int	16 bit variable with sign	-32768÷32767
unsigned int	uint	16 bit variable without sign	0÷65535

Measurement and status registers

address	description	reg.	variable
0	Brightness level [lx]	IR	uint
1	Operating status of measurement sensor: 0 – normal operation; 1 – sensor failure; 2 – overheating; 3 – sensor failure and overheating	IR	uint
2	Temperature [°C]	IR	int

Configuration registers (factory settings)

address	description	reg.	variable
256	Read current and write new base address: **1**÷245	HR	uint
257	Read current and write the baud rate: 0:1200/1:2400/2:4800/**3:9600**/ 4:19200/5:38400/6:57600/7:115200	HR	uint

Configuration registers (cont.)

address	description	reg.	variable
258	Read current and write new parity value: **0:NONE**/1:EVEN/2:ODD	HR	uint
260	Number of samples of measurement averaging (range 1÷30). Entering 0 deactivates the sensor (OFF state)	HR	uint
261	Restore factory setting of communication parameters. Specify value: 1.	HR	uint

Status registers

address	description	reg.	variable
1026 ÷ 1027	Serial number R1026×256²+R1027	IR	uint
1028	Production date: 5 bits-day; 4 bits--month; 7 bits-year (without 2000)	IR	uint
1029	Software version	IR	uint
1031 ÷ 1035	Identifier: F& | F_ | MB | -L | S- | 1_	IR	uint

Technical data

power supply	9÷30 V DC
maximum current consumption	40 mA
measuring range	1÷9500 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	1/2
parity bits	EVEN/ODD/NONE
address	1÷247
power consumption	0.3 W
working temperature	-40÷70°C
terminal	2.5 mm² 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 L.P. 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 on the product page: www.fif.com.pl from the product subpage.

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