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# CANx / LoRa 433 MHz 4 x 5A Relays

**ENG - Data sheet**
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## Application

4 channel CAN relay extension is designed to be used in building and industrial automation applications as an extension module to LogicMachine series devices based on CAN FT bus and LoRa 433 wireless. The configuration and monitoring of the device is done through separate LogicMachine CANx application. The device is designed for DIN-rail mounting and requires 4 DIN-units.

## Types of product

| | |
|---|---|
| CAN-R4-LoRa | CANx / LoRa 433 MHz 4 x 10A Relays |
| CAN-R4 | CANx 4 x 10A Relays, manual control buttons |

## Standards and norms compliance

| | |
|---|---|
| CE conformity: | EMBS-CE-190223/13   Electromagnetic compatibility |
| EMC: | EN61000-6-1 |
| | EN61000-6-3 |
| PCT | Certificate |

## Technical data:

| | | |
|---|---|---|
| Power supply: | 12-32V DC | Power supply |
| | Power consumption (at 24V) | 10 mA (LoRa not active, relays off) |
| | | 25 mA (LoRa peak load, relays off |
| | | 93 mA (LoRa peak load, relays on) |
| | DC overvoltage protection: | ±50 V |
| | Wrong wiring polarity protection | |
| Interface: | Relays | 4 |
| | Rated voltage/current | 250V AC (5A), 30V DC (5 A) |
| | USB | 1 microUSB for upgrade firmware flashing |
| | CAN FT | 1 |
| Operating elements | LED | 1 – CPU load |
| | | 1 - Error |
| | | 2 – RX/TX LoRa |
| | Relays status LED | 4 |
| | Relay manual operating Buttons | 4 |
| | Programming/reset button | 1 |
| LoRa specification | Power on transmitter | 1.6-50 mW (software adjustable) |

|                        |                     |                      |
|------------------------|---------------------|----------------------|
|                        | Frequency range     | 433-434,750 MHz      |
|                        | Channel bandwidth   | 125 / 250 / 500 kHz  |
|                        | Carrier frequency step | 125 kHz           |
|                        | Spreading factor    | 7-12                 |
| Clamps:                | CAN FT Terminal     | 0.8mm2               |
|                        | Relays              | 5 mm2                |
|                        | Power supply        | 5 mm2                |
| Enclosure:             | Material:           | Polyamide            |
|                        | Color:              | Gray                 |
|                        | Dimensions:         | 70(W)x91(H)x68(L) mm |
| Protection:            | IP20 according to EN 60529 |               |
| Usage temperature:     | -5C … +55C          |                      |
| Storage temperature:   | -20C … +70C         |                      |
| Net weight:            | 145g                |                      |
| Gross weight:          | 160g                |                      |

⚠️ **Caution**

**Security advice**

The installation and assembly of electrical equipment may only be performed by skilled electrician. The devices must not be used in any relation with equipment that supports, directly or indirectly, human health or life or with application that can result danger of people, animals or real value

**Mounting advice**

The devices are supplied in operational status. The cables connections included can be clamped to the housing if required.

**Electrical connection**

The devices are constructed for the operation of protective low voltage (SELV). Grounding of device not needed. When switching the power supply on or off, power surges must be avoided.

**Default settings**

Line ID: 0

Node ID: 1

Max. number of group addresses per object : 16

Reset to defaults

Press programming button for 5 seconds, the RED LED blinks 2 times, then release button - GREEN lights up shortly.

**Programming physical address**

Press *Tools* → *Write device address* from CANx app. Choose address and press *Write*. Then press programming button shortly on the device, GREEN LED lights up shortly. The LED is switched off automatically in 1 second which means address is written.
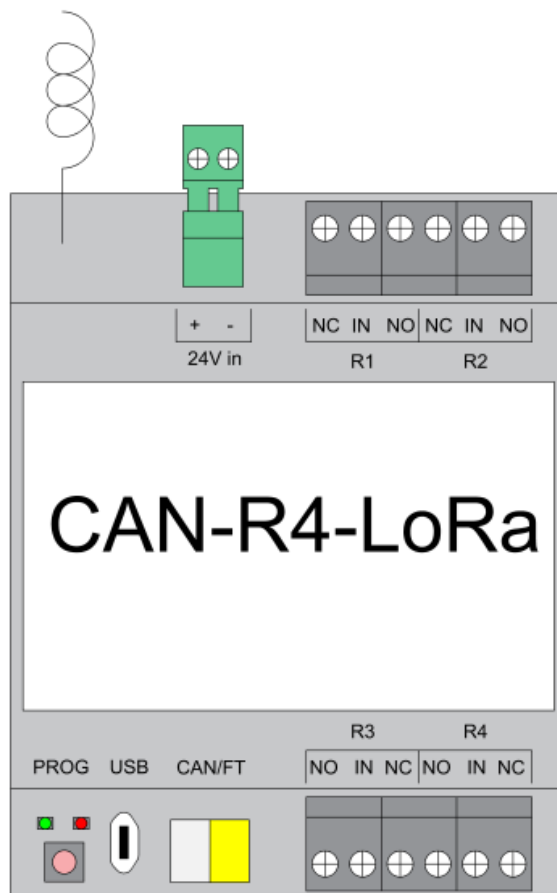
**Manual relay control**

When opening the front cover, you will find buttons for manual relay control.

# 1. Connection diagrams

CAN FT connection and power supply
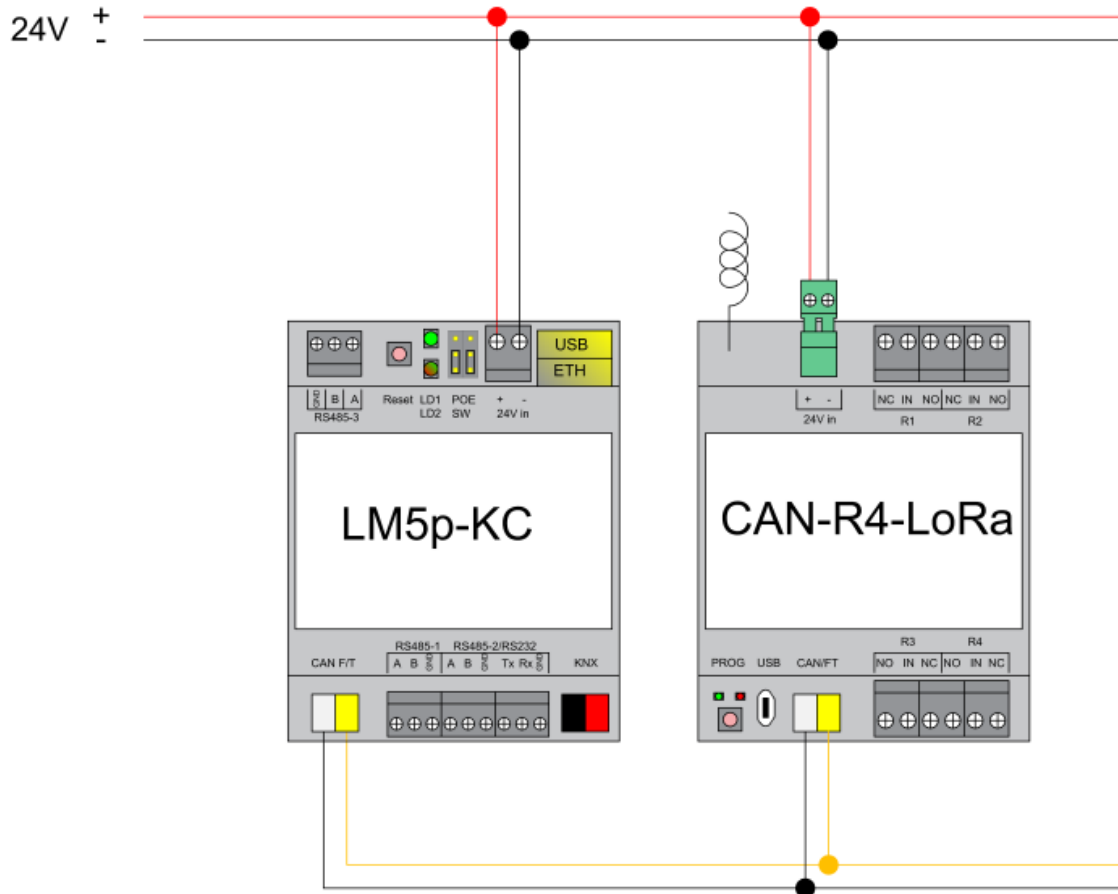
## Lamp / motor / etc. connection
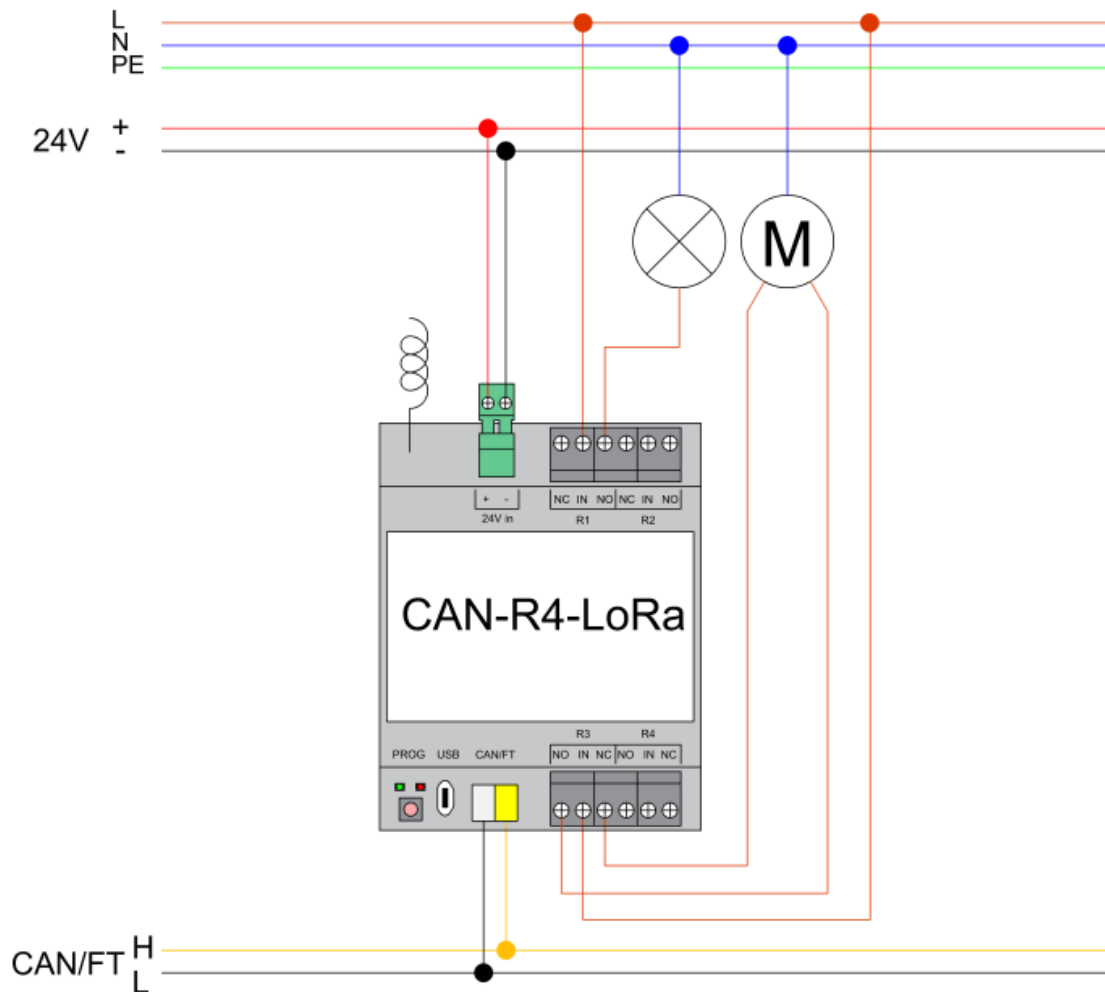
## 2. CANx software settings

 Relay



**Default flags:** read (R), write (W), transmit (T)

**Relay mode:**

Normal – Off after power-up

Inverse – Off after power-up

Normal – On after power-up

Inverse – On after power-up

*Group addresses* – you can assign group addresses from the predefined list or add manually by clicking on ADD button. You can assign max 16 group addresses to one object / output.

Relay status



*Default flags:* read (R), transmit (T)

*Output status:*  Disabled, Normal, Inverse

*Group addresses* – you can assign group addresses from the predefined list or add manually by clicking on ADD button. You can assign max 16 group addresses to one object / relay status

## LoRa General settings

**Frequency** – define the frequency LoRa will operate in. Frequency should be equal on transmitter and receiver(-s).

Frequency    TX power    Bandwidth    Speading Factor

**Frequency**

| 433 MHz | ▾ |
|---|---|

| LoRa disabled |
| **433 MHz** |
| 433.125 MHz |
| 433.250 MHz |
| 433.375 MHz |
| 433.500 MHz |
| 433.625 MHz |
| 433.750 MHz |
| 433.875 MHz |
| 434 MHz |
| 434.125 MHz |
| 434.250 MHz |
| 434.375 MHz |
| 434.500 MHz |
| 434.625 MHz |
| 434.750 MHz |

**TX power** – output power of LoRa transceiver

Frequency    TX power    Bandwidth    Speading Factor

**TX power**

| 17 dBm | ▾ |
|---|---|

| **17 dBm** |
| 16 dBm |
| 15 dBm |
| 14 dBm |
| 13 dBm |
| 12 dBm |
| 11 dBm |
| 10 dBm |
| 9 dBm |
| 8 dBm |
| 7 dBm |
| 6 dBm |
| 5 dBm |
| 4 dBm |
| 3 dBm |
| 2 dBm |

**Bandwidth** – define the bandwidth of the channel. The lower the bandwidth – the lower the data rate / longer the distance. Bandwith should be equal on transmitter and receiver(-s).



**Spreading factor** - The basic principle of spread spectrum is that each bit of information is encoded as multiple chirps. Within the given bandwidth the relationship between the bit and chirp rate for LoRa modulation may differ between spreading factor (SF) 7 to 12. Spreading factor should be equal on transmitter and receiver(-s).



**Date rates**

Best case: SF7 / 500 kHz = 16ms per message (22 kbps)
Default: SF7 / 125 kHz = 62ms per message (5.5kbps)
Worst case: SF12 / 125 kHz = 1300ms per message (0.3 kbps)

2x increase in bandwidth provides 2x less air time
SF+1 takes approximately 2x more air time compared to previous SF

LoRa Messages

**ACK mode** – message acknowledgement mode

ACK disabled  - no ACK will be done (faster and less reliable communication)
ACK enabled  - each message will be acknowledged (slower, more reliable)
ACK gateway mode – the node will retransmit ACK to the next node

**Filter mode** – define either to pass messages with F (Filter) flag enabled in object settings



**Statistics** – receive statistic information to group address – source address / RSSI signal level / TX power. Statistics telegram can be sent on all valid telegrams which are received by LoRa.

## LoRa Security

Define security key 1 or/and key 2 in HEX form. Up to 8 HEX characters are supported for each of the keys. Encryption keys must be equal for all LoRa devices on the same line



## Notification LEDs

- During transmission you can see two LEDs on LoRa device

| | |
|---|---|
| | Sending LoRa telegram |
| | Receiving LoRa telegram |

- In case statistics is enabled on receiver device and CAN FT line is disconnected from it, both LEDs will light up (receiving telegram from sender, sending telegram with statistics).
- In case ACK is enabled, both orange and blue LEDs will light up.