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CANx / LoRa 433 MHz 4 x 5A Relays

ENG - Data sheet
Issue date 5.02.2019

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-110926/01 Electromagnetic compatibility
EMC:	EN61000-6-1 EN61000-6-3
PCT	Certificate

Technical data:

Power supply:	12-32V DC	Power supply
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	Power consumption	10 mA (LoRa not active, relays off) 25 mA (LoRa peak load, relays off) 93 mA (LoRa peak load, relays on)
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	0.8mm ²
	Relays	5 mm ²
	Power supply	5 mm ²
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

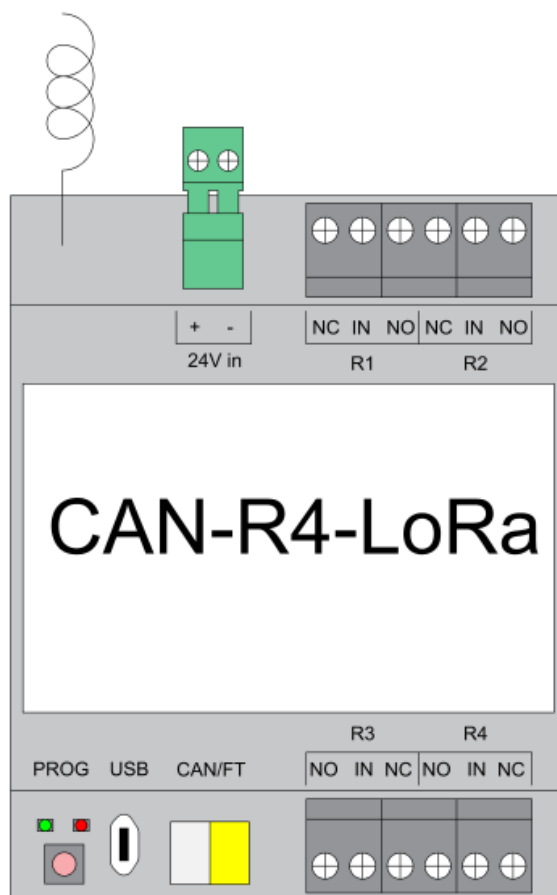
Max. number of group addresses per object : 16

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.



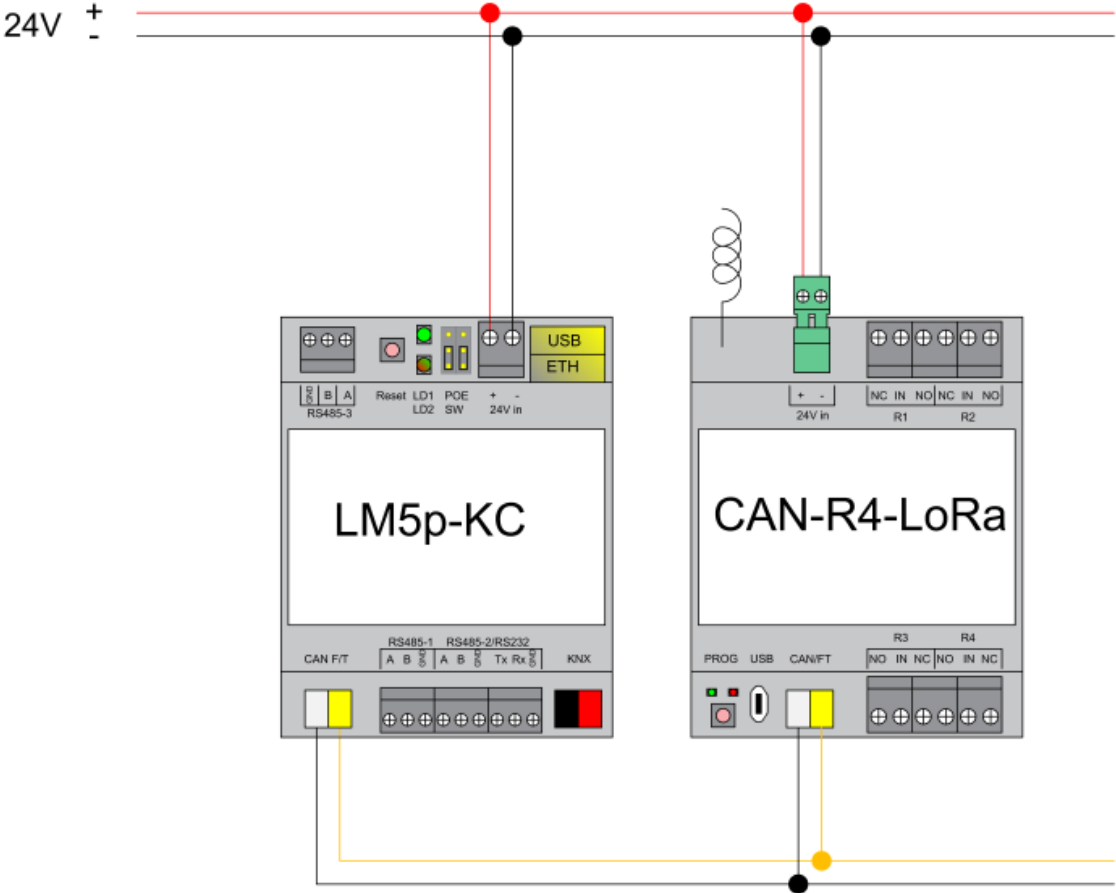
Manual relay control

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

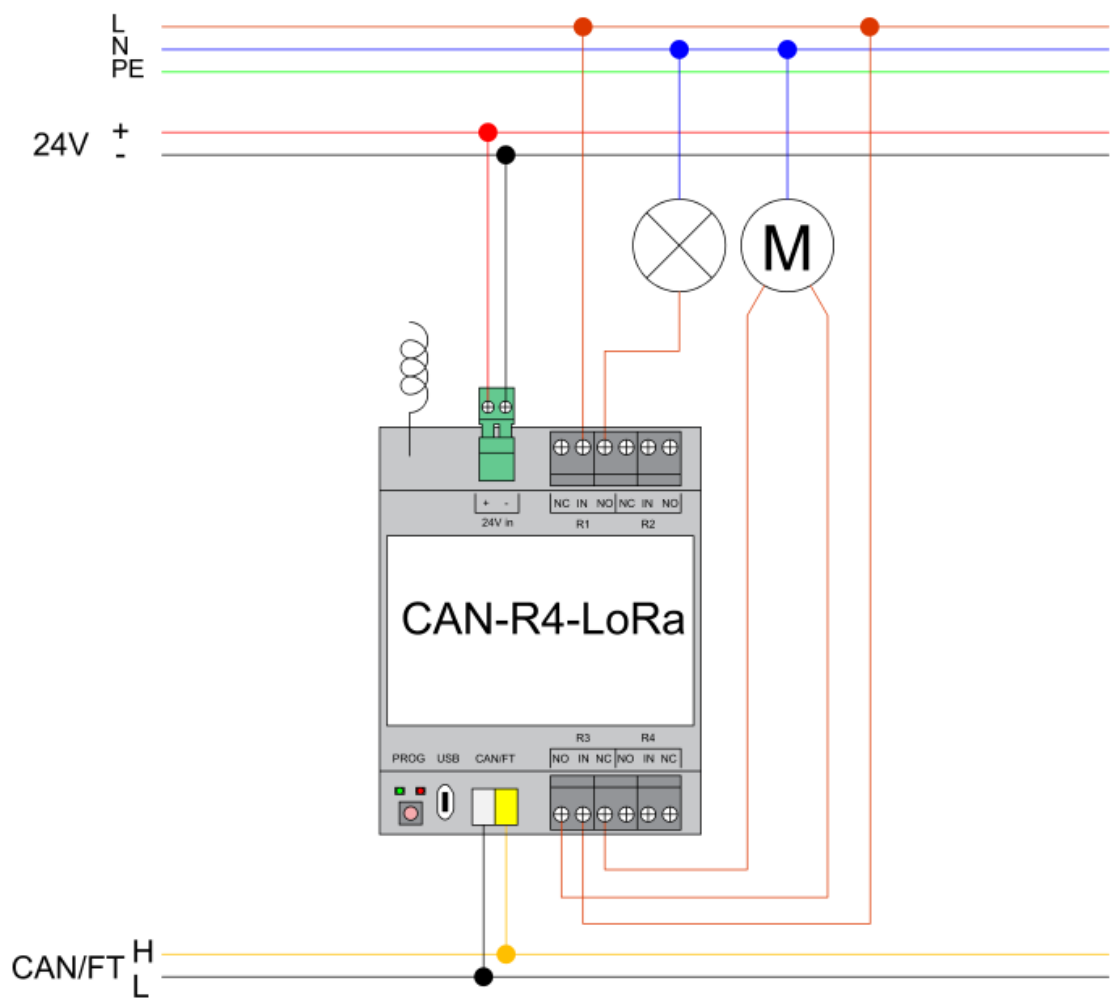


1. Connection diagrams

CAN FT connection and power supply



Lamp / motor / etc. connection



2. CANx software settings

Relay

R4 (4 Relay outputs + LoRa) (0.1)

Device location + Add ×

All Enabled Disabled

- Port 1
- Port 2
- Port 3
- Port 4
- LoRa general
- LoRa messages
- LoRa security

Relay 1 + Relay status 1 +

Relay 1

Normal - Off after power-up

Flags

F T R W

Group addresses + Add 1 bit (boolean)

× 0/0/2 UIO8 (8 Universal IO ports + LoRa) - Input 1

Q

Tags

Q No tags set

Save and write to device

Save

Cancel

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

R4 (4 Relay outputs + LoRa) (0.1) Device location + Add x

All Enabled Disabled Relay 1 Relay status 1

- Port 1
- Port 2
- Port 3
- Port 4
- LoRa general
- LoRa messages
- LoRa security

Relay status 1

Normal
Disabled
Normal
Inverse

Flags F T R W

Tags No tags set

No group addresses selected

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 | Spreading 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 | Spreading 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. Bandwidth should be equal on transmitter and receiver(-s).

Frequency TX power Bandwidth Spreading Factor

Bandwidth

- 125 kHz (lower data rate, longer range)
- 125 kHz (lower data rate, longer range)
- 250 kHz
- 500 kHz (higher data rate, shorter range)

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).

Frequency TX power Bandwidth Spreading Factor

Spreading Factor

- SF7 (higher data rate, shorter range)
- SF7 (higher data rate, shorter range)
- SF8
- SF9
- SF10
- SF11
- SF12 (lower data rate, longer range)

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

ACK mode | Filter mode | Statistics 


ACK mode

ACK disabled (faster, less reliable) ▼
ACK disabled (faster, less reliable)
ACK enabled (slower, more reliable)
ACK gateway mode (slower, more reliable)

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

Flags

F T R W

ACK mode | Filter mode | Statistics 

Filter mode

No filtering ▼
No filtering
Pass messages without filter flag
Pass messages with filter flag

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.

ACK mode | Filter mode | Statistics 

Statistics

Enabled (Source, RSSI, TX power) ▼

Flags

F T R W

Group addresses Add 4 byte LoRa status

× 0/0/3 R6 (6 Relay outputs + LoRa) - Statistics
Q

Tags

Q No tags set

Groups Devices Locations Connection helper Line scan Device scan Reports Monitor Tools

Name or address Datatype Tags All tags Any tag Location Exact Incl. sub Properties

Address	Name	Datatype	Tags	Value	Properties
0/0/1	UIO8 (8 Universal IO ports + LoRa) - Statistics	4.5. 4 byte LoRa status		0.4 / -15 dB / 17 dBm	E R P
0/0/2	UIO8 (8 Universal IO ports + LoRa) - Input 1	0.1. 1 bit (boolean)		0	E R P
0/0/3	R6 (6 Relay outputs + LoRa) - Statistics	4.5. 4 byte LoRa status		0.2 / -15 dB / 17 dBm	E R P

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



Encryption key 1 Encryption key 2

38 54 3A B8 0D FD 9B CF

*Up to 8 HEX characters, separated by space.
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.