

CANx / LoRa 433 MHz 6 x 16A Relays, high switch-on current

ENG - Data sheet

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Application

6 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 6 DIN-units.



Types of product

| | |
|---------------|--|
| CAN-R6HC | CANx 6 x 16A Relays, high starting current, manual control buttons |
| CAN-R6HC-LoRa | CANx / LoRa 433 MHz 6 x 16A Relays, high switch-on current |

Standards and norms compliance

| | |
|----------------|---|
| CE conformity: | EMBS-CE-190223/15 Electromagnetic compatibility |
| EMC: | EN61000-6-1 EN61000-6-3 |
| PCT | Certificate |

Technical data:

| | | |
|---------------|----------------------------------|-----------------------|
| Power supply: | 12-32V DC | Power supply |
| | Power consumption: | 200 mW per each relay |
| | DC overvoltage protection: | ±50 V |
| | Wrong wiring polarity protection | |

| | | |
|----------------------|--------------------------------|---|
| Relay contact rating | Relays | 6 |
| | Resistive | 16A / 250VAC |
| | Incandescent lamp | 3000W / 230VAC |
| | Inrush current | 165A / 20ms |
| | LED | 492A / 1.5ms |
| Interface: | 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 | 6 |
| | Relay manual operating Buttons | 6 |
| | Programming/reset button | 1 |
| | Clamps: | CAN FT Terminal |
| | Relays | 5 mm ² |
| | Power supply | 5 mm ² |

| | | |
|----------------------|----------------------------|-----------------------|
| Enclosure: | Material: | Polyamide |
| | Color: | Gray |
| | Dimensions: | 61(W)x90(H)x108(L) mm |
| Protection: | IP20 according to EN 60529 | |
| Usage temperature: | -5C ... +55C | |
| Storage temperature: | -20C ... +70C | |
| Net weight: | 160g | |
| Gross weight: | 170g | |



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

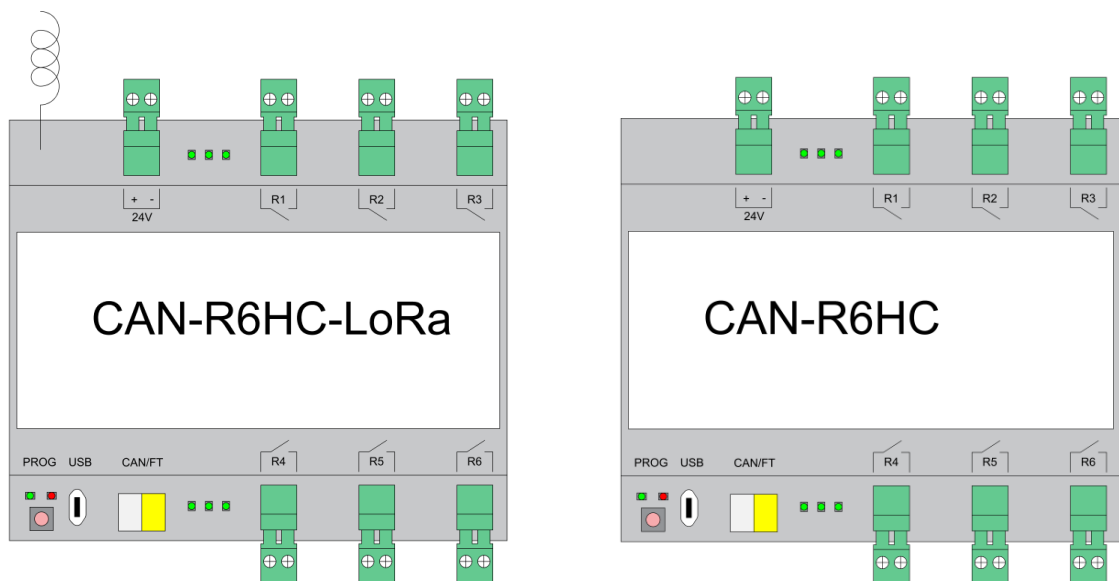
Max. number of group addresses per object : 16

Reset to defaults

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

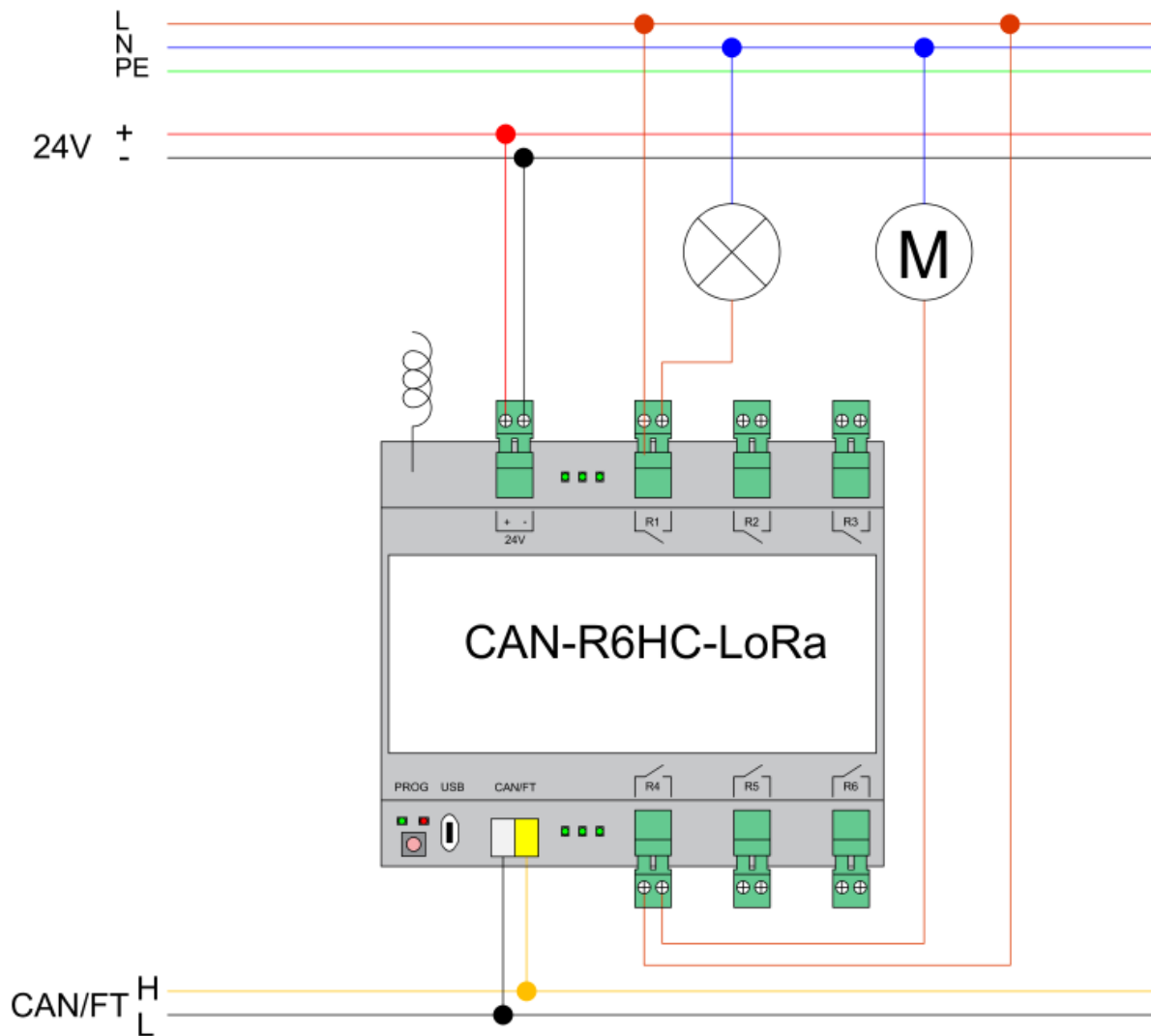
Programming physical address

Press programming button shortly, GREEN LED lights up. After you have programmed address from canX application, it will automatically switch off the LED.

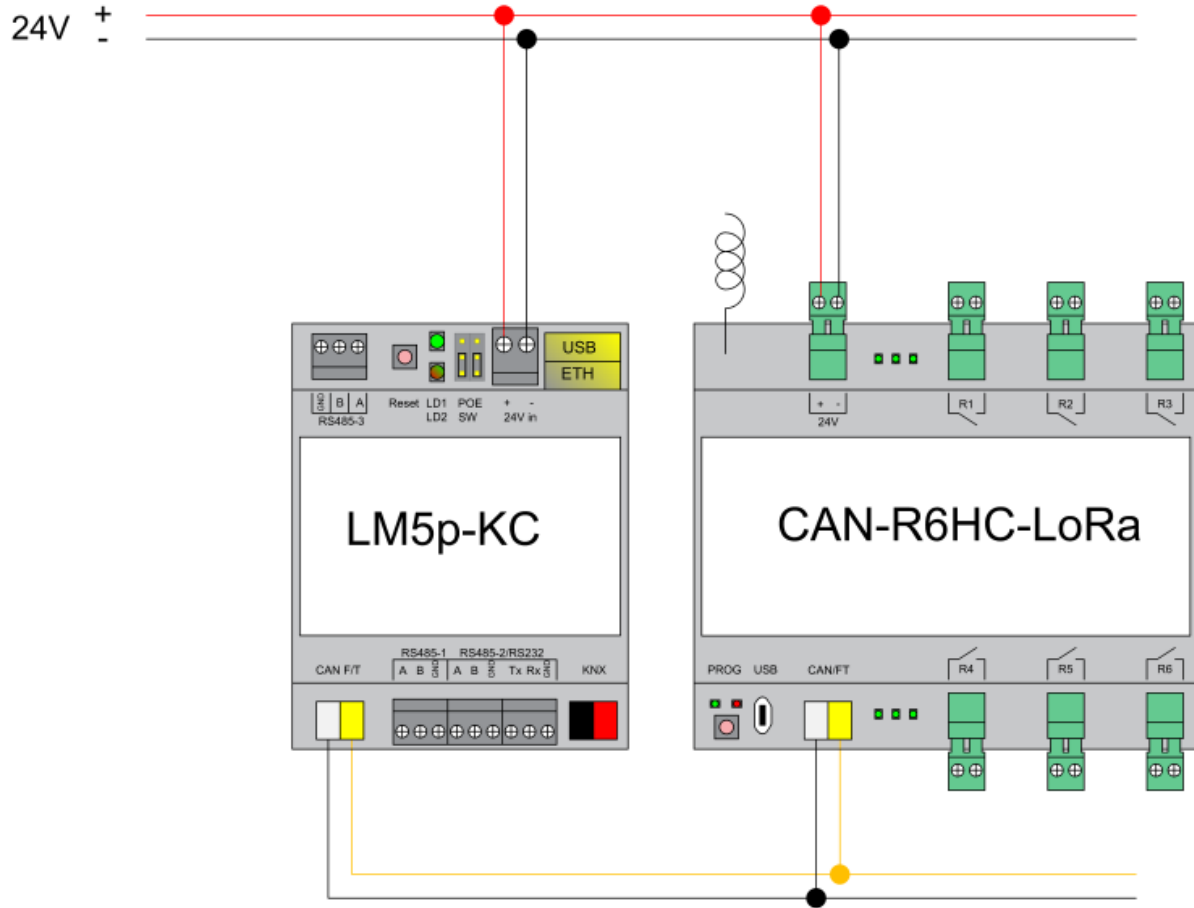


Connection diagrams

Relay output to control loads (lamps, motors etc.)



CAN FT connection



1. canX software settings

1.1. Relay

R6 (6 Relay outputs + LoRa) (0.4)

Device location + Add ×

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

Tags: No tags set

Port 1
Port 2
Port 3
Port 4
Port 5
Port 6
LoRa general
LoRa messages
LoRa security

All Enabled Disabled

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.

1.2. Relay status

R6 (6 Relay outputs + LoRa) (0.4) Device location + Add x

All Enabled Disabled Relay 1 Relay status 1

- Port 1
- Port 2
- Port 3
- Port 4
- Port 5
- Port 6
- LoRa general
- LoRa messages
- LoRa security

Relay status 1

Normal
Disabled
Normal
Inverse

Flags F T R W

Tags Q No tags set

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

1.3. LoRa General settings

1.3.1. **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

1.3.2. **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

1.3.3. **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)

1.3.4. **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)

1.3.5. 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

1.4. LoRa Messages

1.4.1. 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) |

1.4.2. **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

1.4.3. **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 |

- 1.5. **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*

1.6. **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.