

MOD-C1-LORA

User Guide

Thank you for choosing Wiseconn Engineering products. This quick guide will provide you with the necessary information to start using the BU-C1-LoRa device you have purchased. If you need additional technical information, please do not hesitate to send an email to support@wiseconn.com.

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1. Warranty

The MOD-C1-LoRa equipment comes with a 24-month Wiseconn warranty that covers all parts and components against manufacturing and material defects, provided they are used for their intended purpose and maintained according to the instructions. The warranty applies to equipment failures but does not cover installation, extreme weather events, misuse, theft or vandalism, physical or electrical damage. The warranty period starts when the Authorized Distributor delivers the product. Defective parts will be replaced with new ones of the same capacity. Non-functioning parts or any problems that may arise will not be compensated. Changing or replacing a part within the warranty period does not extend the original warranty period. All equipment submitted for warranty review will be sent to Technical Service.

It is recommended to read and save the Safety Instructions before unpacking and handling the equipment.

2. Safety Instructions

Before attempting to install, operate, maintain, or inspect the device, it is essential to read this text and all related documents thoroughly. Additionally, complete the corresponding training for installation and configuration to ensure proper use. Only use the device for its intended purpose and after acquiring complete knowledge of its safety information and instructions.

Keep all warnings and instructions for future reference.

⚠ The components inside the device do not require any kind of maintenance or manipulation, except that indicated by the Certified Installer and / or Wiseconn Support personnel. Do not disassemble any parts without guidance from qualified personnel. Always use covers, protection devices, and assembled elements in perfect technical condition.

⚠ All electrical connections, as well as all repair and maintenance tasks, may be carried out only by qualified personnel. The power supply must be disconnected to avoid the danger of material and/or personal damage, and even death by electric shock. It is important to respect all applicable electrical safety regulations and regulations at the place of use.

⚠ Do not place the equipment near sources of heat. Avoid any contact with fire.

3. Parts and pieces

Available versions and their part number:

Part number	Description	Region
MOD-C1-LORA-900	C1 expansion module. Concentrator for RF-V1-900 models	US/LATAM/AU
MOD-C1-LORA-868	C1 expansion module. Concentrator for RF-V1-868 models	EU

Unpack and inspect the unit to ensure that it has not been damaged in transit. If damage has occurred, contact your dealer. Each MOD-C1-LORA includes:

- 1x MOD-C1-LoRa
- 1x Antenna mounting bracket
- 1x 3dBi Fiberglass antenna
- 1x 8m RP-SMA to N coaxial cable
- Spare fuses
- Screws

4. Description

The MOD-C1-LoRa is an expansion module for the RF-C1 that enables LoRa-based communication with RF-V1 devices. As a LoRa concentrator, it provides remote valve control for RF-C1s that store programs and connect to DropControl's 900MHz mesh network or the cloud via LTE modem communication.



5. Specifications

Processor	RAK11720 (ARM® 32-bit Cortex®-M4F)
Dimensions	100 x 68.5 x 50 mm
Enclosure	IP65 outdoor rugged UV resistant polycarbonate enclosure
User Interface	Status Leds for CAN, and LoRa Communications status.
Power	Supply Voltage: 3 - 4.2 VDC, provided by the RF-C1. Current: 30 mA Typ (500 mA Max, fused)
Inputs and outputs	1x CAN 2.0 port with input power source 1x Service USB-C port

6. Components

The following image describes the internal components of the MOD-C1-LORA.



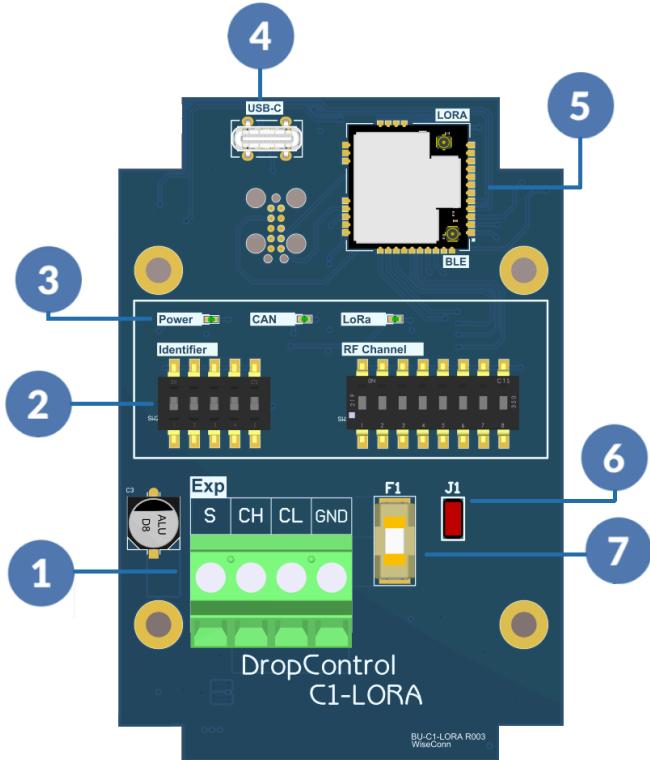
ID	DESCRIPTION	Q
A	Central Unit Board	1
B	Polycarbonate Box	1
C	Pigtail IPEX MHF4 - RP-SMA 6"	1
D	PG16 gland	1

6.1. Accessories

Component	Description
Antenna mounting bracket	Metallic mounting bracket for the included fiberglass antenna
3dBi Fiberglass antenna	3DBI Fiberglass antenna for outdoor use.
8m RP-SMA to N coaxial cable	Coaxial cable to connect the antenna to the MOD-C1-LORA

7. Central Unit Board

The main board of the MOD-C1-LORA has the following connectors and interfaces.



ID	DESCRIPTION
1	Power and CAN 2.0 Connector
2	Dip Switches for CAN ID, channel and network ID.
3	LED status indicators
4	Service USB-C port
5	LoRa and BLE antennas
6	CAN termination resistor jumper
7	Power supply fuse

7.1. Fuses

The MOD-C1-LORA has the following fuse. This fuse is located in the front of the board.

Fuses	Current	Fuse model
F1	1.5 A	Littelfuse Inc. 045301.5MR

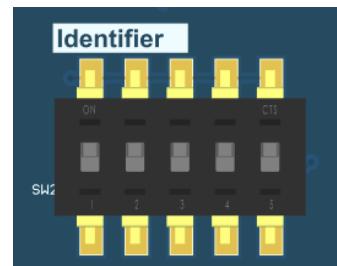
7.2. Dip Switches

The MOD-C1-LORA has 2 DIP switches to select the ID and Channel for both the CANBus interface and the LoRA network

Identifier:

ON-OFF selector for the CANBus identifier. Valid identifiers are:

ID	DIP 1	DIP 2	DIP 3	DIP 4	DIP 5
1	0	0	1	0	0
2	0	1	0	0	0
3	0	1	1	0	0
4	1	0	0	0	0
5	1	0	1	0	0

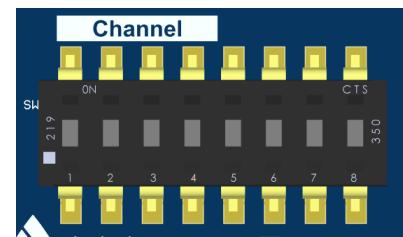


The switches 4 and 5 are reserved for internal use, and any other combination is considered invalid.

Channel:

ON-OFF combination for each network. All nodes in a network must have the same network channel to synchronize (including the gateway node) except for dip switch 1 which has no defined use.

The valid network channels, with their respective frequency and bandwidth are shown in the tables below



MOD-C1-LORA-900

US/LA		
Position	Freq [MHz]	Bw [kHz]
"00000001"	902.5	500
"00000011"	903.1	500
"00000101"	903.7	500
"00000111"	904.3	500
"00001001"	904.9	500
"00001011"	905.5	500
"00001101"	906.1	500
"00001111"	906.7	500
"00010001"	907.3	500
"00010011"	907.9	500
"00010101"	908.5	500
"00010111"	909.1	500
"00011001"	909.7	500
"00011011"	910.3	500
"00011101"	910.9	500
"00011111"	911.5	500
"00100001"	912.1	500
"00100011"	912.7	500
"00100101"	913.3	500
"00100111"	913.9	500
"00101001"	914.5	500
"00101011"	915.1	500
"00101101"	915.7	500
"00101111"	916.3	500
"00110001"	916.9	500
"00110011"	917.5	500
"00110101"	918.1	500
"00110111"	918.7	500

AU		
Position	Freq [MHz]	Bw [kHz]
"00000000"	915.5	500
"00000010"	916.1	500
"00000100"	916.7	500
"00000110"	917.3	500
"00001000"	917.9	500
"00001010"	918.5	500
"00001100"	919.1	500
"00001110"	919.7	500
"00010000"	920.3	500
"00010010"	920.9	500
"00010100"	921.5	500
"00010110"	922.1	500
"00011000"	922.7	500
"00011010"	923.3	500
"00011100"	923.9	500
"00011110"	924.5	500
"00100000"	925.1	500
"00100010"	925.7	500
"00100100"	926.3	500
"00100110"	926.9	500
"00101000"	927.5	500

"00111001"	919.3	500
"00111011"	919.9	500
"00111101"	920.5	500
"00111111"	921.1	500
"01000001"	921.7	500
"01000011"	922.3	500
"01000101"	922.9	500
"01000111"	923.5	500
"01001001"	924.1	500
"01001011"	924.7	500
"01001101"	925.3	500
"01001111"	925.9	500
"01010001"	926.5	500
"01010011"	927.1	500

MOD-C1-LORA-868

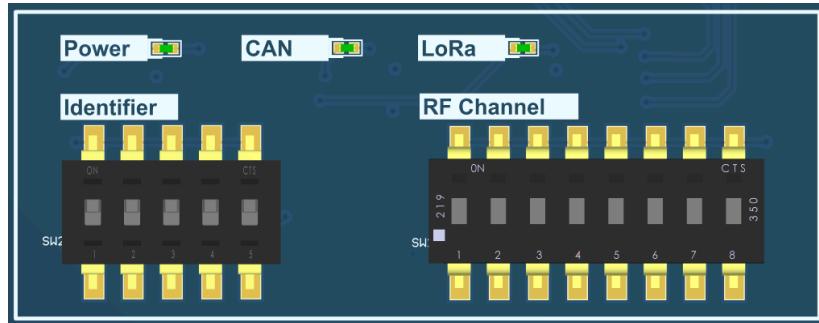
EU		
Position	Freq [MHz]	Bw [kHz]
"00000000"	865.15	250
"00000010"	865.45	250
"00000100"	865.75	250
"00000110"	866.05	250
"00001000"	866.35	250
"00001010"	866.65	250
"00001100"	866.95	250
"00001110"	867.25	250
"00010000"	867.55	250
"00010010"	867.85	250
"00010100"	868.15	250
"00010110"	868.45	250

"00011000"	869.85	250
"00011010"	863.5	500
"00011100"	864.1	500
"00011110"	864.7	500
"00100000"	865.3	500
"00100010"	865.9	500
"00100100"	866.5	500
"00100110"	867.1	500
"00101000"	867.7	500
"00101010"	868.3	500

Note that even though the central unit board is the same for the 900 and 868 versions, the region is a non configurable factory setting.

7.3. Status Description LEDs

The internal user interface of all MOD-C1-LORA has the following leds.



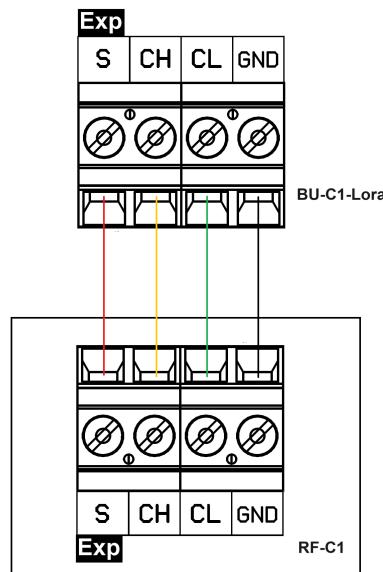
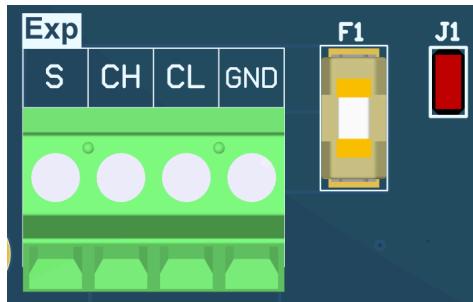
Indicator	Behavior	Description
Power	Solid	Node started correctly
	Blinking	Node is starting and trying to establish communication with the RF-C1
Comm	Solid	Connection CAN is OK
	OFF	No connection between RF-C1 and MOD-Lora
LoRa	One Blink	A message from any RF-V1 was received
	Blinking	Invalid RFChannel combination

7.4. I/O Interfaces

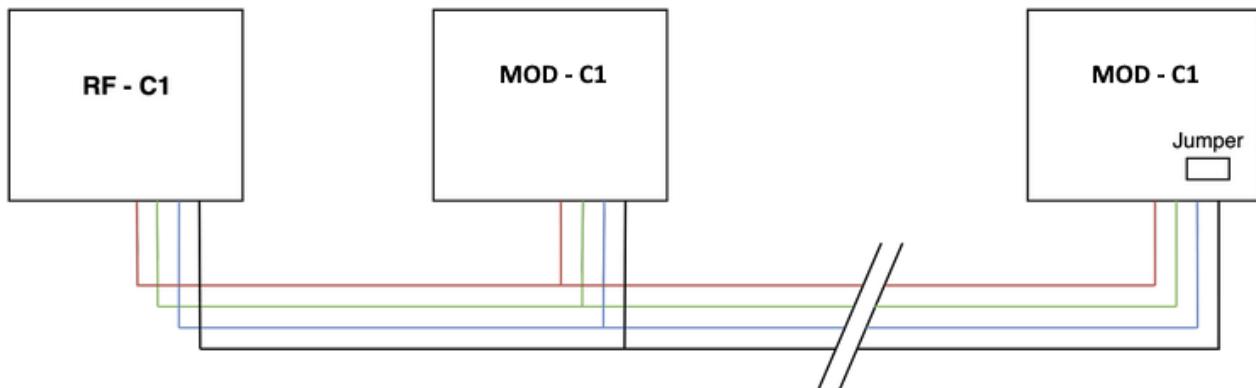
The MOD-C1-LORA has only one I/O terminal block, used to connect the MOD to the RF-C1 CANBus interface.

7.4.1. Exp

Group	Terminal	Description
EXP	S	Input: 3-5 [VDC] (max input current: 1.5A mA, fused)
	CH	CAN H
	CL	CANL
	GND	GND



All C1 MODs must be connected in a daisy chain topology, as shown in the following figure.



On the last expansion of the chain, the jumper near the “Exp” terminal block (J1 in the MOD-C1-LORA) should be installed. This jumper connects an embedded resistor between the CAN data lines. Additionally, it is important to note that the **RF-C1 must always be at one of the ends of the daisy chain**, as it contains the other required termination resistor.

Connecting the expansions in a different wiring scheme, or not installing the correct jumper, may cause communication problems.

FCC:

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

FCC Caution:

Changes or modifications not expressly approved by the part responsible for compliance could void the user's authority to operate the equipment.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC RF Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20cm between the radiator and any part of your body.

ISED:

This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s).

Operation is subject to the following two conditions:

1. This device may not cause interference.
2. This device must accept any interference, including interference that may cause undesired operation of the device.

L'émetteur/recepteur exempt de licence contenu dans le présent appareil est conforme aux CNR d'Innovation, Sciences et Développement économique Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes :

1. L'appareil ne doit pas produire de brouillage;
2. L'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

This equipment complies with IC RSS-102 radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20cm between the radiator and any part of your body.

Pour se conformer aux exigences de conformité CNR 102 RF exposition, une distance de séparation d'au moins 20 cm doit être maintenue entre l'antenne de cet appareil et toutes les personnes.