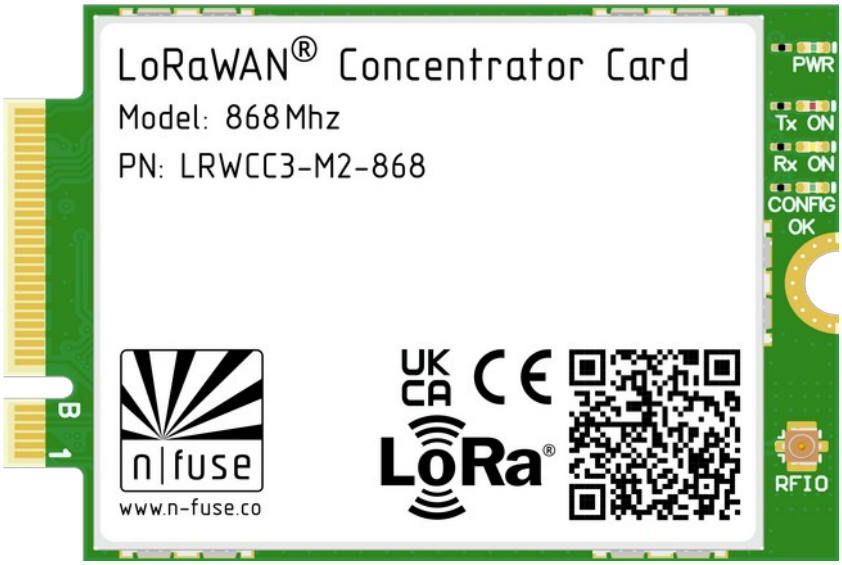
Data Sheet

LoRaWAN® Concentrator Card M.2

LRWCC3-M2-xxx



LoRaWAN® Concentrator Card based on Semtech SX1303 Core Cell Design in M.2 3042 B-Key Form Factor

The n-fuse LRWCC3-M2 family of cards enable OEMs and system integrators to build high-performance, certified LoRaWAN® gateway solutions. Moreover it allows to retrofit existing routers and other edge-level network equipment with LoRaWAN® gateway capabilities.

Key Features

- Compact size
- Broad usage spectrum through standard M.2 2230 B-key form factor
- USB host interface (through M.2) or UART
- Alternative SPI/12C/GPIO host interface (non M.2 compatible)
- SX1303 digital base band proc. and 2x SX1250 and 1x SX1261 Tx/ Rx front-ends
- Listen before talk
- Output power level up to +27 dBm
- Firmware upgradeable via USB DFU
- Low power consumption

Application Areas

- Internet of Things (IoT) and Industrial Internet of Things (IIoT) Applications
- Machine to Machine (M2M)
- Smart City
- Agricultural Monitoring
- Home-, Building-, Industrial Monitoring and Control
- Remote Control
- Wireless Alarm and Security Systems
- Tracking Applications

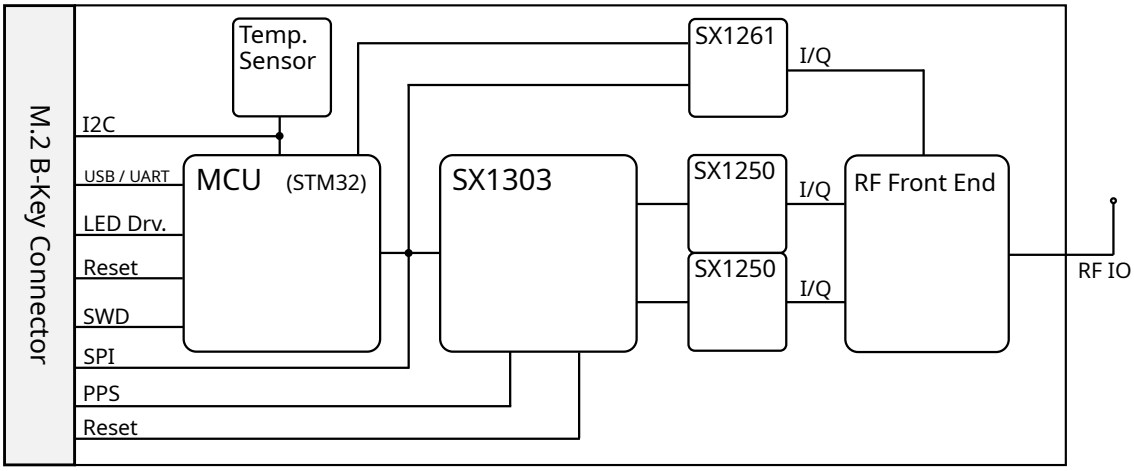
Specifications

Category	Feature	Description
General Radio	Semtech Radios	2x SX1250 and 1x SX1261
Form Factor	Connector Type	M.2 2230 B-Key
	External Antenna	MHF4 connector 50 Ω impedance
Host Interface		USB version 2 or greater (default) SPI/ I2C/ GPIO
Power	Input Voltage	3.3 VDC +/- 5%
	Consumption	TX max, +27 dBm: 464 mA TX typical, +14 dBm: 209 mA RX (all channels): 50 mA Idle: 17 mA
RF	Frequency Range	863 to 870 MHz [a] 915 to 928 MHz [b]
	Sensitivity	[a] **less or equal than** -125 dBm at SF7, BW 125KHz **less or equal than** -140 dBm at SF12, BW 125KHz [b] **less or equal than** -125 dBm at SF7, BW 125KHz **less or equal than** -140 dBm at SF12, BW 125KHz
	Max RF Output Power	Up to +27 dBm
Features	Fine Time Stamping	Enabling Time Difference of Arrival (TDOA) network-based geolocation.
	Listen Before Talk	Prevents collisions while accessing the spectrum.
Modulation	LoRa®	
Status Indication	LEDs	Red: Rx Yellow: Tx Green: Config OK Power
Host Software	HAL User Space Driver and Packet Forwarder	https://github.com/Lora-net/sx1302_hal
Firmware	For MCU (STM32)	USB: https://github.com/Lora-net/sx1302_hal/tree/master/mcu_bin

Category	Feature	Description
Operating Conditions	Temperature (operating)	-40 to +85° C The Tx power rises with lower temperatures but is automatically compensated.
	Humidity	10% ~ 90% RH Non-condensing
Physical Properties	Dimensions WxHxD	42 x 30 x 3 mm (device) 42 x 30 x 0.8 mm (PCB)
	Weight	8 g
Regulatory	Certifications	CE (Radio Equipment Directive 2014/53/EU) [a] FCC ID: [b] ISED:
	Materials	RoHS, REACH
Warranty		12 months for B2B customers 24 months for B2C customers

[a] for 868 Mhz, [b] for 915 Mhz

Block Diagram



Interfaces

M.2 Connector

The concentrator card is compliant with the M.2 specification and can thus be used in any compatible host system. Some reserved pins are used and others re-purposed as shown in the following table.

Pin #	Symbol	Type	Description
1	NC	-	
2	VCC	power	
3	GND	power	
4	VCC	power	
5	GND	power	
6	NC	-	

Pin #	Symbol	Type	Description
7	USB_D+ / Rx	input/ output	USB data + / UART Tx
8	NC	-	
9	USB_D- / Tx	input/ output	USB data - / UART Rx
10	NC	-	
11	GND	power	
12	NC	-	Key B
13	NC	-	Key B
14	NC	-	Key B
15	NC	-	Key B
16	NC	-	Key B
17	NC	-	Key B
18	NC	-	Key B
19	NC	-	Key B
20	SX1261_DIO1	input	SX1261 DIO1
21	NC	-	CONFIG_0 connected to GND
22	SX1261_NRESET	input	SX1261 reset signal (active low, on device pull-up)
23	NC	-	
24	SX1261_BUSY	output	SX1261 busy indicator
25	NC	-	
26	NC	-	
27	GND	power	
28	NC	-	
29	NC	-	
30	MCU_NRESET	input	MCU reset signal (active low, on device pull-up)
31	NC	-	
32	JTCK_SWCLK	input	STLink clock
33	GND	power	
34	JTMS_SWDIO	input/ output	STLink serial I/O line
35	NC	-	
36	MCU_BOOT	input	MCU boot0 signal (active low, on device pull-down)
37	NC	-	
38	NC	-	
39	GND	power	
40	I2C_SCL	input	MCU/ temperature sensor I2C bus clock
41	NC	-	
42	I2C_SDA	input/ output	MCU/ temperature sensor I2C bus data
43	NC	-	
44	POWER_EN	input	Power enable the device (active high)

Pin #	Symbol	Type	Description
45	GND	power	
46	SX1303_GPIO_8	input	SX1303 GPIO8
47	NC	-	
48	SX1261_NSS	input	SX1261 SPI NSS
49	NC	-	
50	SX1303_RESET	input	SX1303 reset signal (active high)
51	GND	power	
52	NC	-	
53	NC	-	
54	NC	-	
55	NC	-	
56	PPS	input	Pulse per second signal usually from GNSS devices for accurate timing
57	GND	power	
58	NC	-	
59	HOST_CSN	input	SPI CSN
60	NC	-	
61	HOST_MOSI	input	SPI MOSI
62	NC	-	
63	HOST_MISO	output	SPI MISO
64	SX1303_GPIO_6	input	SX1303 GPIO6 (NC)
65	HOST_SCK	input	SPI clock
66	NC	-	
67	NC	-	
68	NC	-	
69	NC	-	CONFIG_1 connected to GND
70	VCC	power	
71	GND	power	
72	VCC	power	
73	GND	power	
74	VCC	power	
75	NC	-	CONFIG_2 connected to GND

NC = Not Connected
VCC = 3.3 V Power Supply
GND = Ground

RF IO Port

The RF IO port is a MHF4 type connector for the connection to the antenna. Usually a 'pigtail' cable with a MHF4 to SMA or N-Type connector is used for this.

❗ Note: that the device must not be used without a proper 50 Ohm load on the RF IO port.

Product Family Portfolio

Part Number	Description	Availability
lrwcc3-m2-868	SX1303 based 868 MHz variant	available
lrwcc3-m2-915	SX1303 based 915 MHz variant	available

Ordering Information

All n-fuse products can be ordered directly through the n-fuse website.
You can also contact a sales representative via devices-sales@n-fuse.co for volume ordering.

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