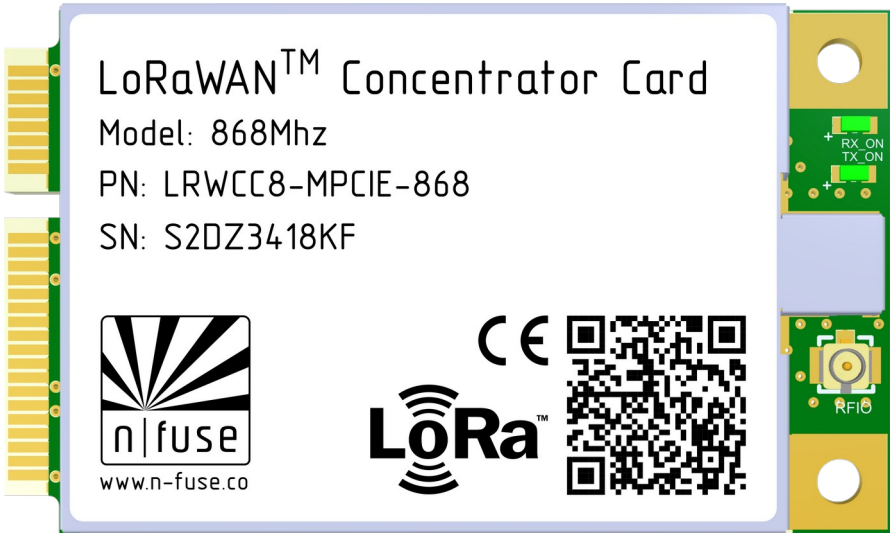
Data Sheet

LoRaWAN™ Concentrator Card Mini PCIe

LRWCCx-MPCIE-xxx



LoRaWAN® Concentrator Card based on Semtech SX1301 and SX1308 Chips in Mini PCIe Form Factor

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

Key Features

- Compact size
- Broad usage spectrum through standard mini PCIe form factor
- USB host interface (through mini PCIe) or UART
- SX1301/ SX1308 digital base band processor with dual SX1257 Tx/ Rx front-ends
- Output power level up to 21 dBm
- Firmware upgradeable via USB DFU

Application Areas

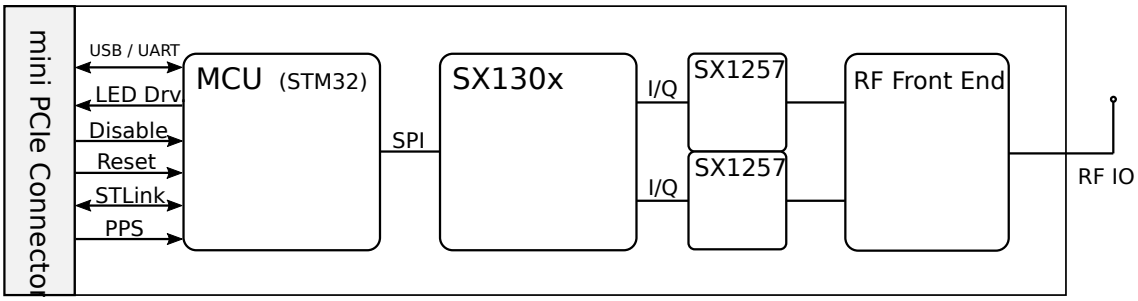
- Internet of Things (IoT) and Industrial Internet of Things (IIoT) Applications
- Machine to Machine (M2M)
- Smart City
- Agricultural Monitoring
- Home-, Building-, Industrial Monitoring and Control
- Remote Control
- Wireless Alarm and Security Systems
- Tracking Applications

Specifications

Category	Feature	Description
General Radio	Semtech Radios	SX1301/ SX1308 and 2x SX1257
Connectors	Connector Type	Mini PCI Express (full length)
	External Antenna	U.FL connector 50 Ω impedance
Host Interface		USB Version 2 or greater (default) UART with alternative firmware
Power	Input Voltage	3.3 VDC +/- 5%
	Consumption	TX (max): 450 mA RX (all channels): 340 mA Idle: 40 mA
RF	Frequency Range	863 to 870 MHz [a] 915 to 928 MHz [b]
	Sensitivity	[a] Up to -124 dBm at SF7, BW 125 KHz Up to -138 dBm at SF12, BW 125 kHz [b] Up to -125 dBm at SF7, BW 125 KHz Up to -139 dBm at SF12, BW 125 kHz
	Max RF Output Power	Up to +21 dBm
Modulation	LoRa®	
Status Indication	LEDs, green	Rx Tx
Host Software	HAL user space driver	https://github.com/Lora-net/picoGW_hal
	Packet forwarder	https://github.com/Lora-net/picoGW_packet_forwarder
Firmware	For MCU (STM32)	https://github.com/Lora-net/picoGW_mcu Variants for USB/ CDC and UART available. Note that the UART variant is not mini PCIe compatible.
Operating Conditions	Temperature (operating)	-40 to +75° C [1] -40 to +70° C [2] The Tx power rises with lower temperatures. It might be necessary to limiting the TX power to comply with your regulatory domain.
	Humidity	10% ~ 90% RH Non-condensing
Physical Properties	Dimensions WxHxD	51 x 30 x 4.8 mm (device) 51 x 30 x 1 mm (PCB)
	Weight	9 g
Regulatory	Certifications	CE (Radio Equipment Directive 2014/53/EU) [a] FCC (FCC ID: 2AY53LRWCC1915) [b] LoRa® Alliance [a, b]
	Materials	RoHS, REACH
Warranty		12 months for B2B customers 24 months for B2C customers

[1] for SX1301, [2] for SX1308 [a] for 868 Mhz, [b] for 915 Mhz

Block Diagram



Interfaces

Mini-PCIe Connector

The concentrator card is compliant with the mini PCIe 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	NC	-	
4	GND	power	
5	PPS	input	Pulse per second signal usually from GNSS devices for accurate timing.
6	NC	-	
7	NC	-	
8	NC	-	
9	GND	power	
10	SWDIO	input/ output	STLink serial I/O line
11	NC	-	
12	SWCLK	input	STLink clock
13	NC	-	
14	NC	-	
15	GND	power	
16	BOOT0	input	MCU boot0 signal
17	NC	-	
18	GND	power	
19	NC	-	
20	nDISABLE	input	Low active radio disable
21	GND	power	
22	nRESET	input	Low active MCU reset signal
23	NC	-	

Pin #	Symbol	Type	Description
24	VCC	power	
25	NC	-	
26	GND	power	
27	GND	power	
28	NC	-	
29	GND	power	
30	NC	-	
31	NC	-	
32	NC	-	
33	NC	-	
34	GND	power	
35	GND	power	
36	USB_D- / Tx	input/ output	USB data - / UART Tx
37	GND	power	
38	USB_D+ / Rx	input/ output	USB data + / UART Rx
39	VCC	power	
40	GND	power	
41	VCC	power	
42	nTX	output	Open drain LED driver for Tx indication
43	GND	power	
44	nRX	output	Open drain LED driver for Rx indication
45	NC	-	
46	NC	-	
47	NC	-	
48	NC	-	
49	NC	-	
50	GND	power	
51	NC	-	
52	VCC	power	

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

RF IO Port

The RF IO port is a U.FI type connector for the connection to the antenna. Usually a 'pigtail' cable with a U.FI 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
lrwcc8-mpcie-868	SX1308 based 868 MHz variant	available
lrwcc8-mpcie-915	SX1308 based 915 MHz variant	available
lrwcc1-mpcie-868	SX1301 based 868 MHz variant	available
lrwcc1-mpcie-915	SX1301 based 915 MHz variant	available
lrwccx-mpcie-433		upon request

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.

Version 13.05.2021