

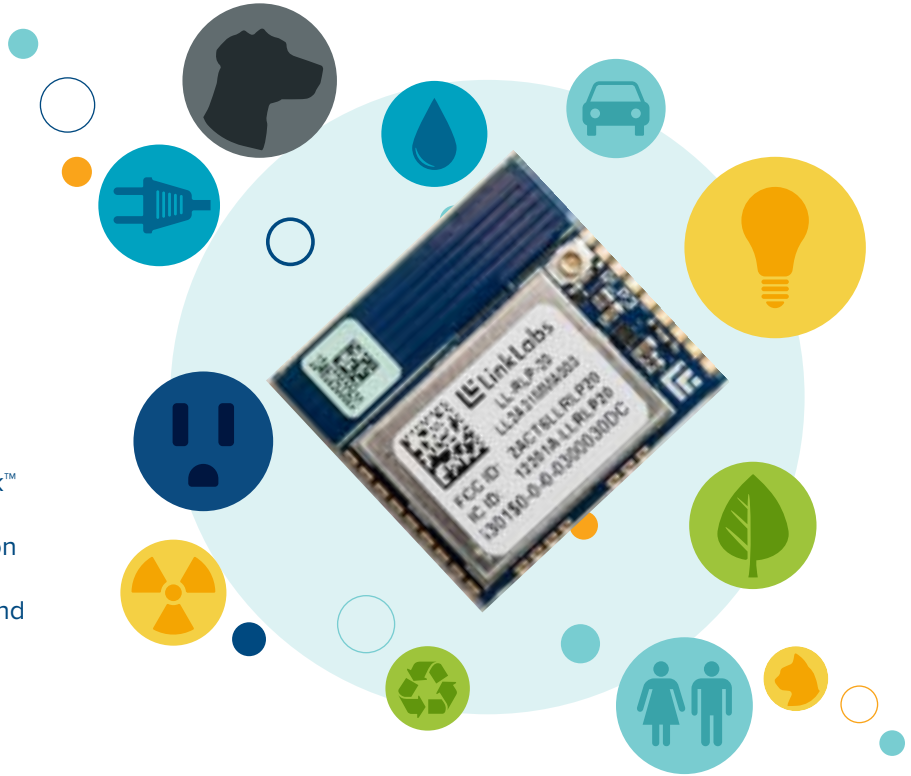


SPEC SHEET

Symphony Module

LL-RLP-20

The LL-RLP-20 is a highly integrated, bidirectional, multi-band radio transceiver module. It supports Link Labs' Symphony Link™ system for wide area, private networking. The modules use Semtech's LoRa® modulation to maximize range while minimizing power consumption. The network stack and command interface is controlled by a low power 32-bit microcontroller.



Key Features

- -155 dBm sensitivity
- Low Power
- Small form factor
- FCC/IC/CE/ETSI compliance
- Integrated PCB antenna and U.FL connector
- Multi-band operation
- Supports Symphony Link Protocol
- Small Host driver - C source available
- Window GUI for evaluation

Model Numbers

w/ Trace Antenna	w/o Trace Antenna
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Symphony Link

LL-RLP-20-915-SYM-A	LL-RLP-20-915-SYM-B
LL-RLP-20-868-SYM-A	LL-RLP-20-868-SYM-B

For ordering, or additional questions:
link-labs.com/contact
 +1 (202) 524-1390
 Additional product info:
<http://docs.link-labs.com>
 Warranty and repair info:
support@link-labs.com

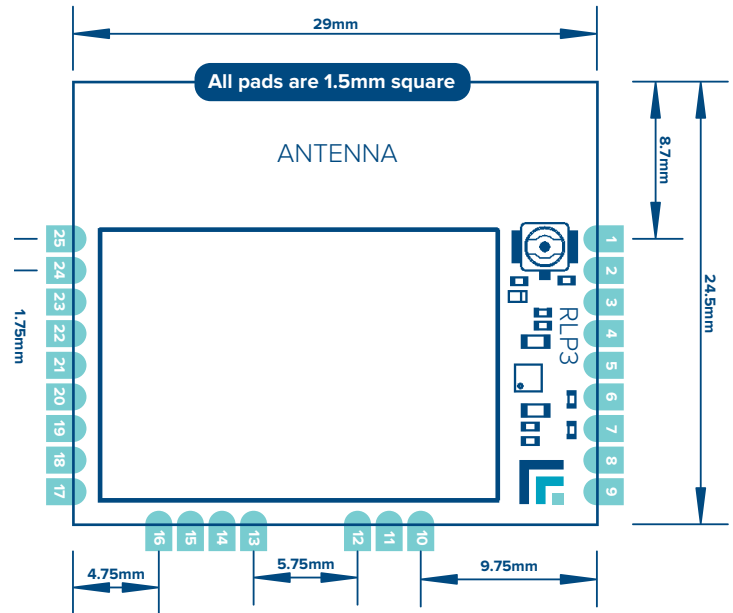
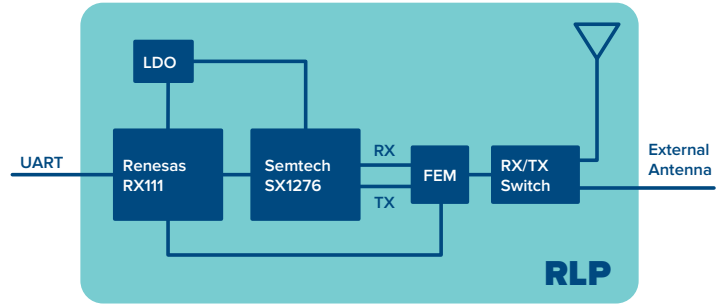
Communication Protocols	Symphony Link
Interfaces	UART (Rx, Tx)
Dimensions	24.5 x 29 mm (with trace antenna); 15.8 x 29 mm (without antenna)
Modulation	LoRa Digital Spread Spectrum; FSK (future use)
Frequency	902-928 MHz ISM (US); 868 MHz ETSI (EU)
MCU	Renesas - R5F51116ADNE
Sleep current	<1uA
Max Clock	32 MHz
Flash Memory	256 KB
RAM	32 KB
Max. Transmitter Power Output	18 dBm
Max. Receive Sensitivity	-137 dBm (spreading factor 12 – 125 kHz)
Link Budget	155 dB + point to multi-point
Maximum EIRP	19.9 dBi (dipole antenna), 15 dBi (trace antenna)
Operating Temperature	-20° to +70°C
Storage Temperature	- 40° to +85°C
Compliance	FCC Part 15 Class B, ETSI, IC
Other	UL/cUL 60950-1 2nd Ed., CE

PINOUT

Symphony Module LL-RLP-20

Notes:

- RF connection is via U.FL connector on upper left side of the module or Pin 2
- RF output is 50 Ω , DC blocking capacitor not required
- ALL I/O signals must be 3.3 V. If necessary, pin 4 (3.3 OUT) may be used to supply an off-module level shifter
- Default UART baud rate is 115,200 8n1
- If possible, keep area under module free of copper. If not possible, ensure all features are masked.
- If using VBAT, you must tie LDO_OUT to VCC



Pin #	Name	Type	Description
2	ANT	RF I/O	RF path if not using U.FL connector
3	VBAT	Input Voltage	Optional unregulated supply voltage 3.5 to 5.5V
4	LDO_OUT	Output Voltage	Power digital. 3.3V
5	VCC	Input Voltage	Regulated supply voltage. 2.5 - 3.3V
7	nRESET	I	External reset pin, active low
8	HOST_IO0	O	Status message indicator

Pin #	Name	Type	Description
17	BOOT	I	NC = Boot normally, GND = Bootloader
23	HOST_RXIN	I	UART interface: module Rx
24	HOST_TXOUT	O	UART interface: module Tx
1, 9, 25	GND	Ground	-
6, 10, 11-16, 18-22	Reserved	-	-

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