



## RF Module Overview Guide

Linx strives to *make every engineer a hero in record time™* by minimizing the risk, delays and technical challenges for design engineers to implement wireless functionality and connectivity to the Internet. Unlike other module producers, every aspect of our product and design experience is specifically crafted to achieve *Wireless Made Simple®*.

**Linx RF Module Parameters**

Type		Transparent (Radio only, no built-in protocol or software configuration)					Packetized Wireless Data (Serial UART interface with built-in protocol for data transfer)					Remote Control & Sensor (Built-in encoder/decoder/transcoder)			
		LC	LR	LT	ES	NT	EUR/DTS	25	250	HumDT™	HumPRO™	HumRC™ (RC)		TT	KH3
Series		LC	LR	LT	ES	NT	EUR/DTS	25	250	HumDT™	HumPRO™	HumRC™ (RC)		TT	KH3
Function		Transmitter	Separate transmitter & receiver	Transceiver	Separate transmitter & receiver	Transceiver	Transceiver	Transceiver	Transceiver	Transceiver		Transceiver		Transceiver	Separate transmitter & receiver
Product Positioning		Lowest power, easy to implement, flexibility of protocol for remote control and non-periodic data			Transparent data module, user protocol on external MCU		Spread spectrum for data with integrated MCU			Lowest cost spread spectrum data with integrated MCU		Plug & play for remote control with integrated MCU and FHSS protocol			Plug & play, integrated encoder / decoder
		Lowest cost transmitter	More robust transmitter	Two way link, acknowledgement	Analog / audio option	Long range, serial data option	Medium range, robust		Longest range, robust	Medium range		Medium range	Short range, worldwide acceptance	Long range, robust	
Size (mm)	TX	9.14 x 12.70	9.14 x 12.70	15.72 x 16.00	16.00 x 12.95	16.00 x 29.21	20.32 x 23.75	20.32 x 23.75	30.48 x 30.48	11.43 x 13.97	11.43 x 13.97	11.43 x 13.97	11.43 x 13.97	16.00 x 29.21	16.00 x 30.99
	RX	-	16.00 x 20.62		16.00 x 20.62										16.00 x 36.32
Frequencies		315, 418, 433MHz	315, 418, 433MHz	315, 418, 433MHz	869, 916MHz	863-870MHz 902-928MHz	868-870MHz 902-928MHz	902-928MHz	902-928MHz	418, 433MHz 863-870MHz 902-928MHz	902-928MHz	418, 433MHz 863-870MHz 902-928MHz	2.40-2.48GHz	902-928MHz	315, 418, 433MHz
Modulation		OOK	OOK	OOK	FM / FSK	FSK	FSK	FSK	FSK	FSK	FSK	FSK	MSK	FSK	OOK
Max TX Power		4dBm	7.5dBm	9.2dBm	1dBm	12.5dBm	12dBm	13dBm	23.5dBm	9.5dBm	9.5dBm	9.5dBm	1dBm	12.5dBm	4dBm
TX Current	0dBm	2.0mA	5.4mA	7.6mA	6.2mA	16mA	38mA	30mA	54mA	20.5mA	22mA	22mA	28mA	16mA	1.0mA
	Max. Power	5.2mA	8.5mA	12mA	7mA	36mA	67mA	65mA	190mA	38mA	40.5mA	36mA		36mA	36mA
RX Current		-	5.2mA	6.1mA	6.0mA	19mA	20mA	20mA	25mA	22mA	23.5mA	25.5mA	25.5mA	19mA	5.2mA
Power Down Current	TX	<1µA	<1µA	11.5µA	90µA	<1µA	35µA	3µA	3µA	<0.3µA	<0.7µA	<0.5µA	<0.5µA	<1µA	<1µA
	RX	-	28µA		50µA		50µA	3µA	3µA	<0.3µA	<0.7µA	<0.5µA	<0.5µA	<1µA	28µA
Sleep Current		-	-	-	-	1.4mA	0.85mA	1.4mA	1.5mA	4.5mA	-	-	-	0.2mA	-
Operating Voltage Range	TX	2.7-5.2VDC	2.1-3.6VDC	2.1-3.6VDC	2.1-4.0VDC	2.5-5.5VDC	2.7-3.6VDC	3.0-3.6VDC	2.7-3.6VDC	2.0-3.6VDC	2.0-3.6VDC	2.0-3.6VDC	2.0-3.6VDC	2.7-5.5VDC	2.7-5.2VDC
	RX	-	2.7-3.6VDC		4.5-5.5VDC		4.5-5.5VDC	3.0-3.6VDC	2.7-3.6VDC	2.0-3.6VDC	2.0-3.6VDC	2.0-3.6VDC	2.0-3.6VDC	2.0-3.6VDC	2.7-5.5VDC
Data Rate		0.1-5kbps	0.1-10kbps	0.065-10kbps	0.2-56kbps	1-300kbps	2.4-115.2kbps	2.4-115.2kbps	2.4-115.2kbps	1.2-115.2kbps	1.2-115.2kbps	-	-	-	-
RX Sensitivity	Min. Rate	-	-112dBm	-112dBm	-96dBm	-113dBm	-106/-105dBm	-105dBm	-105dBm	-101dBm	-101dBm	-98dBm	-99dBm	-111dBm	-112dBm
	Max. Rate	-	-	-	-	-102dBm	-102/-100dBm	-100dBm	-100dBm	-92dBm	-94dBm	-	-	-	-
Line-of-Sight Range <sup>1</sup>		2,500m	2,500m	6,000m	300m	5,000m	2,000m	2,000m	7,000m	1,500m		1,600m	100m	3,500m	2,500m
		1.5 miles	1.5 miles	3.2 miles	1,000ft	3.1 miles	1.2 miles	1.2 miles	4.3 miles	1.0 miles		1.0 miles	300ft	2.2 miles	1.5 miles
Operating Temp Range	TX	-30 to +70°C	-40 to +85°C	-40 to +85°C	0 to +70°C	-40 to +85°C	-40 to +85°C	-40 to +85°C	-40 to +85°C	-40 to +85°C	-40 to +85°C	-40 to +85°C	-40 to +85°C	-40 to +85°C	-40 to +85°C
	RX	-	-40 to +70°C		-40 to +70°C										
Interface		Transparent Serial	Transparent Serial	Transparent Serial	Transparent Serial	Transparent Serial or UART	UART	UART	UART	UART	UART	Parallel	Parallel	Parallel	Parallel
Channels/Spread Spectrum		1	1	1	1	68 / 101	32 or 84 DTS	32 FHSS	32 FHSS	4	25 / 50 FHSS	25 FHSS	25 FHSS	25 FHSS	1
Protocol		None	None	None	None	None or Serial	DTS	FHSS	FHSS	Frequency Agility, Extended Star	FHSS	RC FHSS	RC FHSS	RC FHSS	RC
Certifications		None	None	None	None	None	EVM module: FCC, ANATEL	EVM module: FCC	EVM module: FCC, IC, COFETEL / IFETEL	CE	FCC, IC	FCC, IC (900MHz)	None	FCC, IC	None
Applications		Remote control, keyless entry, sporting, lighting, irrigation, consumer, security/safety, proximity sensing, home and industrial automation, signage, sensors, telemetry				Data transfer, sensors/telemetry, home and industrial automation, M2M, lighting, irrigation, security/safety, proximity sensing, healthcare, signage, automotive aftermarket					Remote control, keyless entry, sporting, consumer, home and industrial automation, signage, lighting				
						Consumer, home, sporting	Medium range telemetry, robust applications			Long range, telemetry, robust applications	Consumer, home, sporting, cost sensitive applications, Internet of Things, sensors		Digital and analog sensor input, acknowledgement, robust, Internet of Things	Analog sensor, robust, acknowledgement	Compatible with Linx DS Series

1. Based on maximum broadcast power, 0dBm antenna and 20dBm link margin.

## RF Module Part Numbering System

Our part numbers are structured as follows: product type, frequency and series.

TTT - FFF - SSS



RF Module Part Numbering System Descriptions		
Product Type Options	Frequency	Series
RXM (Receiver module)	315, 418, 433, 868, 900, 916 (Frequency in MHz)	LC, LR, LT, ES, NT, DTS, EUR, 25, 250, DT, RC, PRO, TT, KH3
TXM (Transmitter module)	2.4 (Frequency in GHz)	
TRM or HUM (Transceiver module)		

## Basic Evaluation Kits and Master Development Systems

The evaluation and development kits are not an afterthought to us at Linx. They are key to how we make Wireless Made Simple®. We do not consider a designer who purchases our kit to be a customer yet; they are potential customers who must be won over by our development experience and the support we provide. Linx kits are different in that they are:

- 1. Intuitive** – We took inspiration from modern consumer products and usability best practices to design our kits to be extremely intuitive. Open the box and begin preliminary testing without reading the manual.
- 2. Everything you need** – Contains everything a designer needs to make their product wireless including printed documentation, various Antenna Factor™ antennas, RF connectors and preloaded and configured firmware. There are no additional software licenses to buy. Master Development Kits include PC software to customize the module and troubleshoot the development.
- 3. Ergonomic to develop** – Linx is unique in providing a hardware development area with easy to access lines and clips tied directly to output the RF module. The developer can easily switch between the benchmark provided in the kit and the prototype development to troubleshoot.
- 4. Affordable** – The goal of Linx is to make it as easy as possible to try out our products, not to make a profit on the kit. We price most development and evaluation kits at \$99 and our master development kits at \$149 to \$199.



Linx Technologies is continually striving to improve the quality and function of its products. For this reason, we reserve the right to make changes to our products without notice. The information contained in this Data Guide is believed to be accurate as of the time of publication. Specifications are based on representative lot samples. Values may vary from lot-to-lot and are not guaranteed. "Typical" parameters can and do vary over lots and application. Linx Technologies makes no guarantee, warranty, or representation regarding the suitability of any product for use in any specific application. It is Customer's responsibility to verify the suitability of the part for the intended application. At Customer's request, Linx Technologies may provide advice and assistance in designing systems and remote control devices that employ Linx Technologies RF products, but responsibility for the ultimate design and use of any such systems and devices remains entirely with Customer and/or user of the RF products.

Some customers may want Linx radio frequency ("RF") products to control machinery or devices remotely, including machinery or devices that can cause death, bodily injuries, and/or property damage if improperly or inadvertently triggered, particularly in industrial settings or other applications implicating life-safety concerns ("Life and Property Safety Situations").

NO OEM LINX REMOTE CONTROL OR FUNCTION MODULE SHOULD EVER BE USED IN LIFE AND PROPERTY SAFETY SITUATIONS. No OEM Linx Remote Control or Function Module should be modified for Life and Property Safety Situations. Such modification cannot provide sufficient safety and will void the product's regulatory certification and warranty.

Customers may use our (non-Function) Modules, Antenna and Connectors as part of other systems in Life Safety Situations, but only with necessary and industry appropriate redundancies and in compliance with applicable safety standards, including without limitation, ANSI and NFPA standards. It is solely the responsibility of any Linx customer who uses one or more of these products to incorporate appropriate redundancies and safety standards for the Life and Property Safety Situation application.

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