

Synapse RF220

Models RF220UF1, RF220SU, and RF220SU-EU

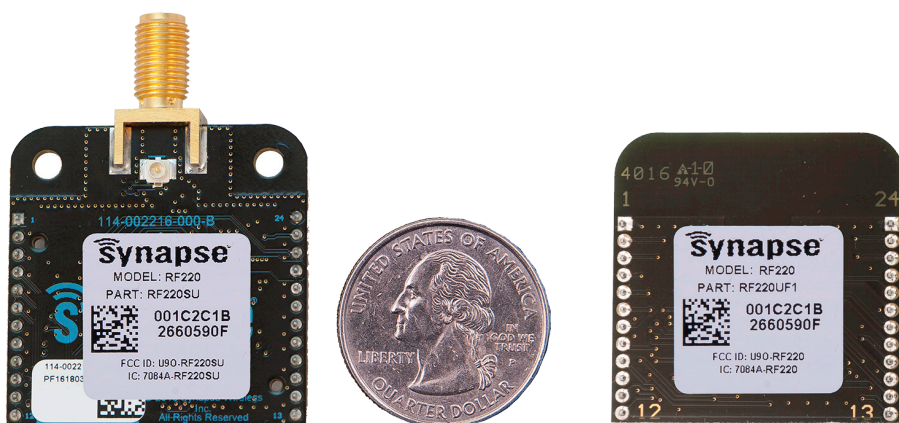
All the power of the SM220 in a modular form

The SNAP Module Model RF220 series is an IEEE 802.15.4, low-power, highly reliable solution for embedded wireless control and monitoring networks that require great range and low power.

When time to market is critical, the modular format of the RF220 makes prototyping and testing easy. Later, when the design is in the field, module swaps and upgrades are just as fast thanks to the common footprint.

The RF220 model embeds Synapse's SNAP OS, the industry's first Internet-enabled, wireless mesh network operating system, into the Atmel ATmega128RFA1 single-chip AVR® microcontroller with an integrated transceiver that delivers up to 2Mbps/sec in up to 15 channels of operation in the ISM 2.4GHz frequency band. This low-cost module enables a new generation of battery-driven systems with current consumptions as low as 390nA. The RF220 also includes a Skyworks SE2431L front-end module, which provides a power amplifier and LNA for increased range.

SNAP's on-board Python interpreter provides for rapid application development and over-the-air programming, while Atmel's low-power RF single-chip design saves board space and lowers power consumption.



Product Highlights

- 20 GPIO with up to 7 A/D inputs
- 128k flash, 58.5k free for over-the-air uploaded user apps
- Two UART ports for control or transparent data
- Three low power modes
- Spread Spectrum (DSSS) technology
- Up to 2 Mbps radio data rate
- 2.4 GHz RF Frequency
- AES 128-bit encryption
- Options for Integrated on-board compact F, U,FL connector, or RP-SMA antennas
- Solder-able or socket-able
- 4K internal EEPROM
- 8 PWM outputs
- Supports over the air firmware upgrades.

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RF220 Specifications*

Performance	Outdoor LOS Range	RF220UF1	Up to 3 miles at 250 Kbps using a 5.5dBi antenna Up to .5 mile using on-board F antenna	
		RF220SU/SU-EU	Up to 3 miles at 250 Kbps using a 5.5dBi antenna	
	Transmit Power Output	up to +20 dBm		
	RF Data Rate	250Kbps, 500Kbps, 1Mbps, 2Mbps		
	Receiver Sensitivity	-103 dBm (1% PER, 250Kbps)		
Power Requirements	Supply Voltage	2.0 - 3.6 V		
	Transmit Current (Typ@3.3V)	at +20 dBm: 150 mA at +6 dBm: 55 mA		
	Idle/Receive On (Typ@3.3V)	22mA		
	Idle/Receive Off (Typ@3.3V)	7.8 mA		
	Sleep Mode Current (Typ@3.3V)	Timed Sleep: 1.27 μ A Untimed Sleep Mode : 390 nA		
General	Frequency	ISM 2.4 GHz		
	Spreading Method	Direct Sequence (DSSS)		
	Modulation	O-QPSK		
	Dimensions (PCB)	33.86mm x 33.86mm		
	Operating Temperature	-40 to 85 deg C.		
	Antenna Options	RF220UF1	U.FL and on-board compact F antenna	
		RF220SU/SU-EU	U.FL and RP-SMA	
	Weight	RF220UF1	6 grams	
RF220SU/SU-EU		9 grams		
Networking	Topology	SNAP		
	Error Handling	Retries and Acknowledgement		
	Number of Channels	15 channels. To avoid exceeding FCC limits, channel 15 operates in a receive only state.		
Available I/O	UARTS with optional HW Flow Control	2 ports		
	GPIO	20 Total, 7 can be analog-in with 10bit ADC		
Agency Approvals	FCC Part 15.247	FCC ID: U9O-RF220		
	CE Certified	The RF220SU-EU is certified to EN300 328 Version 1.8.1		
	Industry Canada (IC)	7084A-RF220		

Part No.	Antenna	Receive Amp	Power Amp
RF220UF1	U.FL and compact Internal F	Yes	Yes
RF220SU	U.FL and RP-SMA	Yes	Yes
RF220SU-EU	U.FL and RP-SMA	Yes	Yes

* at 23° C and 3.3V unless otherwise noted

More technical details are in the RF220 datasheets available from:

<https://developer.synapse-wireless.com/modules/rf220/>