



Wireless Technology to Control and Monitor Anything from Anywhere™

## SYNAPSE RF Engines®

Synapse offers a wide range of wireless modules that have been especially designed for ease of use and to speed up your product design time.

Synapse designs modules with great care to ensure the best range possible. In addition to power amps to increase the transmit power we also use receive amps to provide 10 dBm additional link margin. We are also very careful to ensure that the maximum RF energy gets to the antenna instead of being wasted with poor antenna matching.

Synapse's modules offer a broad range of computing performance. From the entry level 8051 CPU all the way up to an ARM7 CPU, you have plenty of options regarding compute speed as well as available memory sizes.

Each module comes with basic encryption built-in so that you can prevent casual attacks on the network and all modules have AES-128 encryption available.



*Our through-hole family of modules can be interchanged so that you can see how your project works at 2.4 GHz and then try it at 900 MHz using the same board footprint.*

### RF Modules provide advantage over embedded RF designs:

- All the RF design aspects have been taken care of for you
- RF certifications have already been completed
- No need to learn the electrical design requirements for the CPU
- Much faster design time to get your solution to prototype form rapidly
- Interchangeability of modules for different amplification or CPU needs without having to change your board footprint
- Simplified logistics - you have one component for RF and CPU requirements in your design instead of 20 to 30 components

And of course, all of our modules come with Synapse's SNAP®, an award-winning, wireless mesh network operating system that is instant-on, self-healing, multi-hopping and supports over-the-air programming. The network is formed and managed for you automatically, and can even support wireless connectivity to Internet. SNAP provides an on-board Python interpreter for ease in writing applications. Synapse's software development environment, Portal, is provided at no cost to developers.

**SNAP Mark™** scores represent Python instructions per second (see the RF module

chart on the opposite side). This performance indicator measures the combination of IO and processor speed, and allows for a comparison of the relative performance of the application environment within each MCU.





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Featuring SNAP Mark

Synapse SNAP Modules	Through-Hole Modules								Surface-Mount Modules			
	RF100PC6	RF100PD6	RF200P81	RF200PD1/ RF200PF1	RF300PC1	RF300PD1	RF301PC1 / RF301PU1	RF266PC1 / RF266PU1	SM300PC1	SM301PC1/ SM301PU1	SM700PC1 / SM700PM1	SM200P81
SNAP Mark	11,400	11,400	39,240	39,240	3,952	3,952	3,952	39,240	3,952	3,952	43,500	39,240
User Application Scripts Uploadable Over-the-Air	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Core SNAP Network Upgradeable Over-the-Air	No	No	No	No	No	No	No	No	No	No	Yes	No
Frequency Band	2.4 GHz	2.4 GHz	2.4 GHz	2.4 GHz	915 MHz	915 MHz	868 MHz	2.4 GHz	915 MHz	868 MHz	2.4 GHz	2.4 GHz
Raw Bandwidth	250Kbps	250Kbps	2 Mbps	2 Mbps	150Kbps	150Kbps	150Kbps	2 Mbps	150Kbps	150Kbps	250Kbps	2 Mbps
Memory Size	60K	60K	128K	128K	196K	196K	196K	128K	64K	196K	128K	128K
RAM Size	4K	4K	16K	16K	4K	4K	4K	4K	4K	4K	96K	16K
Antenna	F	RP-SMA External	Chip	RP-SMA External / F	Chip	RP-SMA External	Chip / U.FL	Chip / U.FL	Chip	Chip / U.FL	F / MMCX	Chip
Receive Amp	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
Transmit Amp	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
Processor Size	8 bit	8 bit	8 bit	8 bit	8 bit	8 bit	8 bit	8 bit	8 bit	8 bit	32 bit	8 bit
Size	33.86mm x 33.86mm	33.86mm x 33.86mm	33.86mm x 33.86mm	33.86mm x 33.86mm	33.86mm x 33.86mm	33.86mm x 33.86mm	33.86mm x 33.86mm	24.38mm x 32.94mm	29.8mm x 19mm	29.8mm x 19mm	25mm x 36mm	29.8mm x 19mm
RF100 Pin Compatible	Yes	Yes	Some Exception	Some Exception	See Datasheet	See Datasheet	See Datasheet	*Digi Footprint	-NA-	-NA-	-NA-	-NA-
Distance (Open Field)	2.5 miles	3 miles	1500ft	3 mi/2.5 mi	1 mile	3 miles	2500ft/1 mi	4000ft/1 mi	1 mile	2500ft/1 mi	1.5 miles / X	1500ft
Temperature Range	-40°C / +85°C	-40°C / +85°C	-40°C / +85°C	-40°C / +85°C	-40°C / +85°C	-40°C / +85°C	-40°C / +85°C	-40°C to +85°C	-40°C / +85°C	-40°C / +85°C	-40°C / +85°C	-40°C / +85°C
Certifications	FCC,IC	FCC,IC	FCC, IC, CE	FCC,IC,CE	FCC,IC	FCC,IC	CE	FCC,IC	FCC,IC	CE	FCC, IC, CE	FCC,IC, CE
I/O Pins	19	19	20	20	15	15	15	15	19	19	46	33
A/D Pins	8	8	7	7	12	12	12	4	16	16	8	8
A/D Bits	10	10	10	10	10	10	10	10	10	10	12	10
Memory available for applications	15K	15K	58.5K	58.5K	64K	64K	64K	58K	64K	64K	58.5K	58.5K
Basic encryption	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included
AES encryption	RF150PC6	RF150PD6	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included

RF100P86 users should migrate to RF100PC6 or RF200P81.

\*Pin-compatible with sockets already designed in for Digi International's XBee® and XBee-PRO® RF modules.

Customized modules with different antenna types or amplifications can be made. Please contact Sales at: 1.877.982.7888. Specifications subject to change without notice - confirm that data is current.

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