

RADIO MODULE PORTIA V 1.1



Features the SpiderMesh
LPWA Wireless Cooperative
Mesh Technology



smartrek

RADIO MODULE

SPIDERMESH

NEW PORTIA PROGRAMMABLE MODULE

- Low power application (IoT)
- True Cooperative Mesh Networking
- Long Range Communication
- AES 128 bits Encryption • Analog & Digital I/O For Sensing/Control Applications
- Virtual Machine Upgradeable OTA
- Fully customizable co-processor
- Xbee compatible footprint



PORTIA v.1.0

PORTIA radio transceivers provide an extremely high wireless network range. To achieve this, radios use the proprietary SPIDERMESH technology, a cooperative mesh wireless protocol developed by Smartrek Technologies. This protocol provides synchronous communication between the links to mitigate network contention issues. This strategy allows PORTIA radios to offer a connectivity solution for the most challenging applications.

Each of the radios can be configured either as a gateway or as a node. Gateways control the entire mesh network by coordinating wireless data exchanges. They also act as a bridge between mesh networks and a host such as a computer, tablet or internet gateway.

The nodes act as repeaters within the linked networks. Data transfer is bidirectional, and thus, nodes allow for controlling and/or reading digital/analog external modules, therefore connecting them to the mesh network. Activating a link in the field only requires the node to be on the same radio frequency channel as the network during deployment. This considerably reduces installation complexity as there is no technical knowledge required for its use.

SPECIFICATIONS

General	
Dimension	1.140" x 1.890" (29mm x 48 mm)
Operating Temperature	-20 to 70 °C guaranteed for max hop count / -40 to 85 °C guaranteed for half hop count
Storage Temperature	-40 to 85 °C
Antenna Connector	U.FL
Encryption	AES 128 bits
Virtual Machine Memory	16 KBytes
Internal Modules	1x TTL Serial port, 13x GPIOs, 1x SPI, 1x I2C, 2x ADC channels, 1x channel
Serial Baud Rate	2400, 4800, 9600, 19200, 38400, 57600, 115200, 125000
Coprocessor	8 kbytes flash memory, 128 bytes EEPROM, 512 bytes SRAM

RADIO MODULE SPIDERMESH



EUROPE

ETSI 869MHz standard frequencies

Transceiver	
Urban / Indoor / NLOS*	100 - 500m
Outdoor / LOS**	> 10 km
Transmit Power	Low: 25mW High 100mW
RF Data Rate	50 Kbits
Nb. of Channels	5
Frequency (Mhz)	869.425 to 869.625 MHz
Receiver Sensitivity	- 110 dBm
Electrical characteristics	
Supply	3.3-6.5V
All input/output pins	-0.5 to 3.3V
Transmit Current	130mA peak
Receive Current	20mA
Sleep	30uA

NORTH AMERICA

FCC 915MHz ISM standard frequencies

Transceiver	
Urban / Indoor / NLOS*	100 - 500m
Outdoor / LOS**	> 10 km
Transmit Power	Low: 50mW High 100mW
RF Data Rate	50 Kbits
Nb. of Channels	6
Frequency (Mhz)	902 to 928 MHz
Receiver Sensitivity	- 110 dBm
Electrical characteristics	
Supply	3.3-6.5V
All input/output pins	-0.5 to 3.3V
Transmit Current	130mA peak
Receive Current	20mA
Sleep	30uA

RADIO MODULE SPIDERMESH

The mesh network algorithm synchronizes all wireless communications over time. This reduces energy consumption in order to achieve very long network operating time. Most applications can reach an autonomy ranging from 12 to 48+ months per link, depending on the batteries type and capacity and the network refresh time. With these low energy specifications, PORTIA radios offer a powerful solution for object connectivity.

SERIAL INTERFACE

PORTIA radios have 2 serial communication modes to interact with the mesh network. The first mode is transparent and all data received on the serial port of a node will be transmitted to all other nodes. The second mode uses a programming interface (API). Messages transmitted on the serial port contain an address and a command which allows you to specify a node or to communicate to all nodes simultaneously.

VIRTUAL MACHINE AND OVER-THE-AIR UPDATES

PORTIA radios feature an embedded virtual machine allowing over-the-air firmware updates. This allows application-specific user scripting to control the internal modules of the PORTIA radio and ease interfacing with external sensors, without needing supplementary glue logic. The execution of the virtual machine is made possible by sharing the resources of the main processor used for wireless communications.

HARDWARE

PORTIA radios are equipped with a serial port, digital and analog inputs/outputs, I2C and SPI communication ports. They also feature Xbee footprint compatible connectors in order to reduce friction when migrating existing systems to SpiderMesh enabled PORTIA radios. For tasks requiring real-time execution, a co-processor is made available in addition to the main processor.

Sensitive data can be secured using 128-bit AES encryption

