



Wavefront™

A COST-OPTIMIZED WAVENIS™ RF FRONT-END FOR OEM INTEGRATION

Wavefront™ is a wireless front-end platform that lets you add Wavenis long-range and ultra-low-power wireless connectivity to cusptom devices using a host microcontroller.

Wavefront™ OEM cards are specifically designed integrators who have to meet specific power and range requirements, but who wish to benefit from a wireless platform that's easy to integrate into custom products using a separate microcontroller.

With Wavefront, developers benefit from optimized wireless services, low per-unit costs, and fast time-to-market for innovative new products.

Creating optimized ultra-low-power wireless products

The Wavenis connectivity stack runs on the host device's microcontroller, along with your custom application. By supporting the leading low-power microcontrollers on the market, this solution gives OEMs and manufacturers a cost-effective way to deploy innovative new products in many sectors.

Connections between Wavefront and the host microcontroller are made via simple serial-type connections. This solution offers cost savings often associated with single-chip RF solutions, plus the convenience of using the target device's existing micro-controller for your own applications and the Wavenis protocol stack.

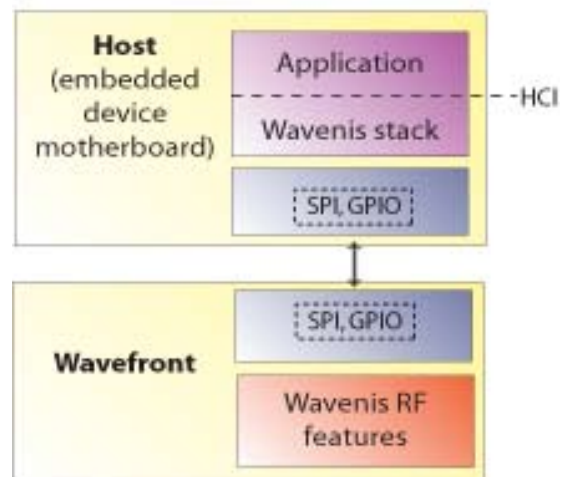
Find out more!

Wavefront is ideal for creating high-volume wireless products. Contact your Coronis representative for more details.

Key features

A development environment and complete API give you full control over all the high-performance wireless features Wavenis has to offer.

- Fully configurable ultra-low-power wireless solution for custom devices
- Wavenis RF front-end with SPI/GPIO connections to host CPU
- Wavenis protocol stack compatible with leading micro-controllers
- Ideal for product volumes up to around 50,000 units
- Programming tools to merge your applications on top of the Wavenis connectivity stack



Wavefront OEM card connected to embedded host microcontroller

* For mid-range product volumes, consider using the Wavenis Wavecard OEM board.



Wavefront™ Specifications

General features

- Industrial Wavenis RF board with transceiver
- Wavenis protocol stack implemented in separate application CPU
- 25mW and 10 mW versions
- 50 ohm RF port for antenna connection
- Extreme power efficiency: 12µA average operating current with 1s access time
- SPI link for connection to MCU platform
 - Embedded EEPROM:
 - 2 kB standard (8 kB optional)
 - 128 Bytes used for Wavenis parameters
 - R/W access through SPI
- Power Supply
 - 2.3V embedded linear voltage regulator
 - V_in: 2.4V min < 3V typical < 6V max
 - I_peak_RX: 17mA typical (full run)
 - I_peak_TX: 45mA typical (50mA max)
 - I_sby = 0.5µA typical
- Temperature range:
 - Operating -20° to +70°C (-4° to + 158°F)
 - Storage -40° to +85°C (-40° to + 185° F)
- Dimensions:
 - 30 x 28 x 7 mm (1.2 x 1.1 x 0.3 in)

Channel bandwidth	25 kHz	50 kHz
Radio data rate	4.8 kbps (433/868MHz)	9.6 kbps (433MHz and 868MHz) 19.2 kbps (915MHz)
FHSS or mono-channel	Mono (ETS) 1 channel	FHSS (16 channels@ 868 & 433 MHz FHSS (50 channels @ 915 MHz)
Output power	25mW	10mW or 25mW
Range	>1km -3dBi antenna	1km -3dBi antenna
References	On request	433MHz-10mW: WFR433-10MW 868MHz-25mW: WFR868-25MW 915MHz-25mW: WFR915-25MW

Protocol stack

- Point-to-Point, Point-to-Multipoint (broadcast, polling), and repeater modes
- Tree, star, and mesh network topologies
- Self-configuration and dynamic routing algorithm optimized for ULP networks
- Programmable access time: standby-receive duty cycle in operating mode
10ms < 1s (typical value) < 10s
- Relaxed synchronization schemes
- Complete Wavenis API - Host Controller Interface (HCI)
- Stack uses 8-32 kB flash code depending on Wavenis feature set and microcontroller
- Compatible with Microchip PIC18, Texas Instruments MSP430, ARM7 (check with us for others)

RF Properties

- Operates in license-free ISM 433 MHz 868 MHz, and 915 MHz frequency bands
- ETS300-220 / FCC15.247 certified
- Throughput:
 - 9.6 kbps @ 433 MHz and 868 MHz
 - 19.2 kbps @ 915 MHz
- Designed for reliability, power savings, network coexistence, robustness against interferers
- Fast Frequency Hopping Spread Spectrum
- Fast FHSS: multi-hop during transmission
- Single channel operation for narrowband applications (alarm regulations)
- GFSK modulation
- Data interleaving, Forward Error Correction BCH (31,21), data scrambling
- Quality of Service management (RSSI) and output power control (-10dBm to +15dBm / 10 steps)
- Automatic Frequency Control (AFC) for optimal performance over operating lifetime
- Automatic sensitivity threshold management for increased power savings
- Accesses hard-to-reach devices with link budget of 125 dB (25mW) or more
 - Line-of-sight range up to 1 km (25mW)
 - Line-of-sight range up to 4 km (500mW)
 - Up to +15dBm & +27dBm output power
 - Sensitivity: -110 dBm @ 9.6 and 19.2 kbps
- Frame Error rate: 0.1% with Wavenis protocol

