

coronis
 **wireless platforms**

Coronis Wireless OEM Platforms



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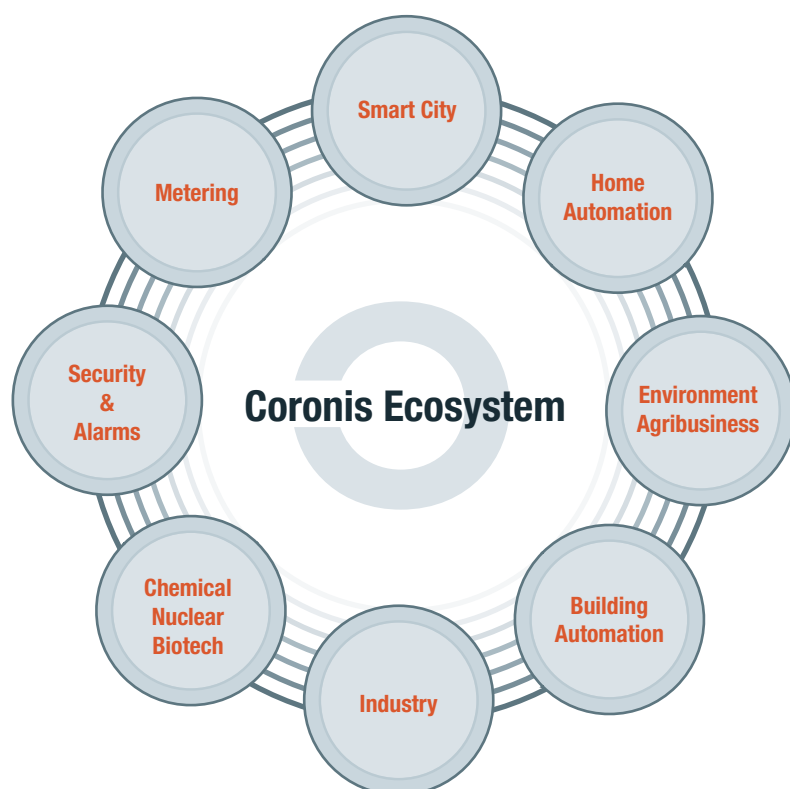
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Coronis Ecosystem

Thank you for your interest in the Coronis M2M connectivity product line. Coronis products offer system integrators and manufacturers many possibilities for creating innovative new wireless solutions. This catalog describes the complete Coronis product and service offer based on Wavenis connectivity.

Coronis, is the brand name for M2M products of Elster S.A.S. With its Coronis products, Elster S.A.S is a world leading designer and provider of wireless OEM platforms for applications and products that require both ultra-low power consumption and long-range connections. Coronis offers system integrators a complete line of wireless and development platforms that meet the technical and cost requirements of today's innovative ultra-low-powered wireless markets, such as professional and industrial M2M applications, home automation, building automation, active RFID, smart cities and health care.

Coronis offers its internal development tools and support services to clients who wish to integrate Wavenis wireless technology. We can also recommend qualified partners to help facilitate device or solution development to accelerate your time-to-market.



Coronis works with OEM manufacturers, integrators, and value-added resellers who deploy innovative products in flexible wireless mesh networks. Our partnerships focus on enhancing existing products with new functionality, as well as creating new products and value-added services based on Wavenis wireless technology.

Coronis solutions are based on Wavenis wireless technology, with options available to integrate other wireless protocols. Coronis is actively involved with industry initiatives, alliances, and European projects. Find out more about partnerships on www.coronis.com.

• Coronis - M2M connectivity offer

Technology and OEM platform performance for a competitive advantage

Key features of Wavenis-based systems from Coronis include:

- **Long battery life (ultra-low power consumption)**

Coronis wireless module consumption is among the lowest on the market for low-data rate M2M applications (typically a few hundred bytes per day), thanks to its dedicated sampling wakeup system combined with an ultra-low-power sleep mode (typically 2µA) and on running mode with fast wakeup (typically 15 µA moy.).

For example, Waveflow lives over 10 years, with one reading per day of the 24 most recent logs, 3.6Ah lithium battery.

- **Long wireless range**

Low sensitivity and highly adapted data process mechanisms (FHSS, data interleaving, FEC) provide a high link budget. Three power classes available:

	Frequency		
	433 MHz	868 MHz	915 MHz
Power	10 mW	25/500 mW	
Line of Sight	Up to 1 km	Up to 1 km	Up to 4 km
Outdoor	500 m to 1km	500 m to 1km	1 km to 4 km
Indoor	50 m to 500 m	50 m to 500 m	200 m to 1 km

- **Bi-directionality**

Make your system intelligent and reachable in real-time with on demand polling and automatic frame transmission (without master/slave mechanism).

- **Reliability**

Bi-directionality, smart acknowledgement system, FHSS, and Forward Error Correction with data interleaving gives robustness to all wireless radio transmissions.

- **Scalability**

Platforms and technology suitable for deployments of any size: from point-to-point to thousands of devices per network keeping Wavenis low power consumption characteristics.

- **Low cost**

Benefit from savings thanks to easy integration and fast time-to-market, fast application development using dedicated product development tools.

- **Simplicity**

Excelyo, a shielded module meeting certification constraints (Europe, US, etc...) ready for deployment, offers a small footprint for easy integration, and is suitable for automated surface mounting (17 x 21 x 4.4mm).

- **Platform flexibility**

The Excelyo module integrates Wavenis wireless technology and is also compatible with many other types of other sub-Gigahertz wireless protocols such as W-Mbus, KNX RF, BACnet, and more.

- **Interoperability**

Coronis offers guidance to integrators wishing to implement standard application profiles to make their devices compatible with the Wavenis product ecosystem. Also, authentication and encryption processes are available to lock device access if necessary.

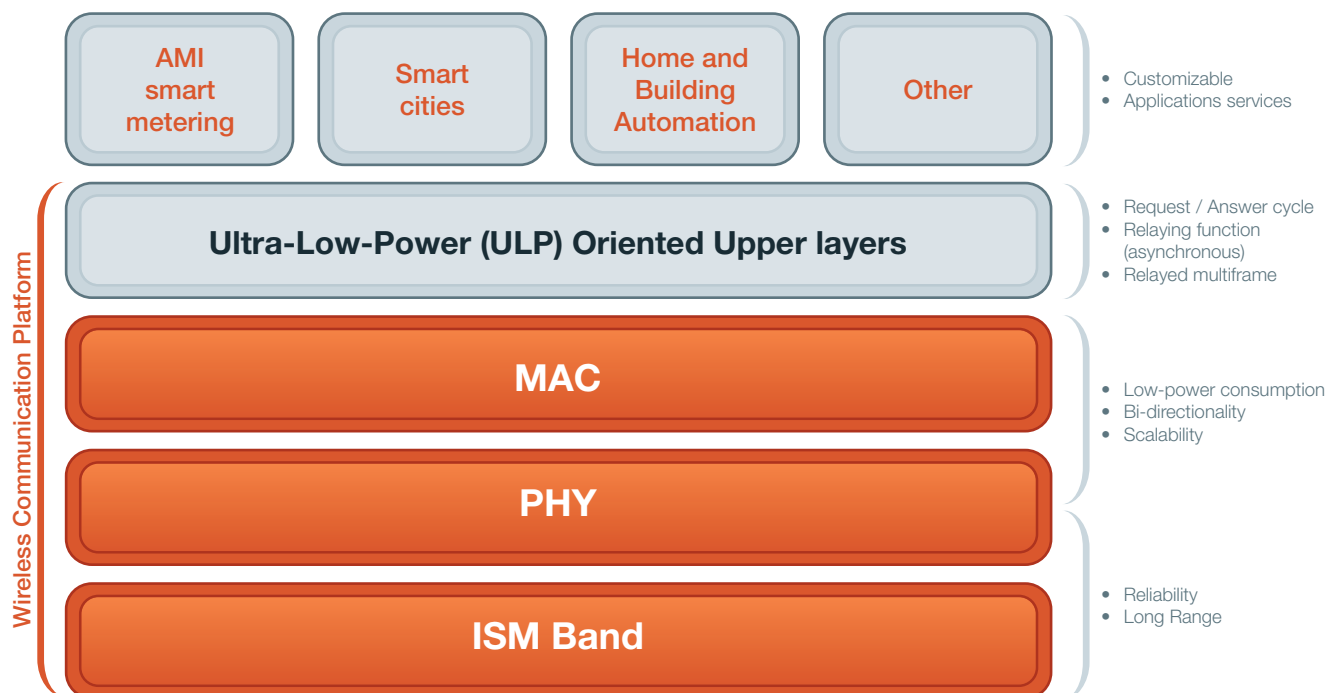
Wavenis Technology Overview

The Wavenis communication protocol combines unparalleled performance for ultra-low power consumption and long wireless range, with other key features such as data security, robustness against interference, and 2-way connectivity.

Based on FHSS techniques, Wavenis operates in license-free sub-GHz ISM bands (420-433, 868, and 915MHz depending on the geographical location), supporting point-to-point, point-to-multipoint, and repeater communication modes in flexible star, tree, and mesh network topologies. With easy-to-integrate Wavenis wireless boards and application programming tools, Wavenis solutions from Coronis are highly optimized for autonomous wireless sensor networks and M2M connectivity. Over 6 million Wavenis solutions have been deployed around the world.

Wavenis Connectivity Stack Layered Description

The diagram below shows the basic architecture of the Wavenis connectivity stack:



Wavenis offers the key technology features required by these markets:

- Low data quantities
- Low radio traffic
- Long battery life (low power)
- High radio link budget (long range)
- Scalability
- Reliability
- Low cost

• Coronis - M2M portfolio

All Coronis OEM products, ready to use RF cards and application-oriented platforms, come with the following common features:

- Operates in license-free ISM 433 MHz, 868 MHz, and 915 MHz frequency bands
- Designed for reliability, power savings, network coexistence and robustness
- 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
- Automatic Frequency Control (AFC) for optimal performance over operating lifetime
- Sensitivity: -110 dBm @ 9.6 and 19.2 kbps

Ready to use OEM RF cards

Coronis offers several options for Wavenis integration to best meet your specific constraints and requirements. Coronis also provides the Wavenis connectivity stack for use with specific microcontrollers (please contact us for compatibility information). The offer includes a front-end OEM board with an optimized Wavenis implementation, fully ready-for-integration. A complete Wavenis API gives developers access to control the front-end module. Excelyo, a new macro-component (described on the following page), is available for developing all types of wireless M2M devices.

Coronis Product Development Kits (PDK) for Wavecard or Excelyo make it easy to develop custom embedded applications on top of the Wavenis layers, with efficient time-to-market. The Excelyo PDK includes the precompiled Wavenis stack and a set of peripheral drivers with sample code so that developers can access all key Coronis Excelyo features.

OEM wavenis Modem

Coronis provides a standard version of these modules with application firmware that enables customers to use the platform as a Wavenis RF modem. This solution gives access to nearly any Wavenis-enabled device, with the proper authentication rights, using a dedicated but open serial protocol.

Ready to use application-oriented OEM platforms

Product	Measurement	Probe	Application
Waveflow	Flow meter reading (pulse counting)	Meter pulse probe (delivered by the meter manufacturer)	<ul style="list-style-type: none"> • Energy monitoring • Reading of water and gas meters (and energy meter if So interface available) • Valve/Credit management • leakage detection
Wavetic	French energy meter reading	TeleInfo (TIC) output from French electronic energy meter (Blue and Yellow tariffs)	<ul style="list-style-type: none"> • Energy monitoring • Reading of energy meter (all Tariffs)
Wavesense	Standard analog reading	Standard analog probe not power supply bu the device : - 0-5V - 4-20mA	<ul style="list-style-type: none"> • Telemetry • Environment monitoring • Tank level monitoring
Wavetherm	Temperature	Digital DALLAS Probe Standard PT100 probe	<ul style="list-style-type: none"> • Telemetry • Temperature monitoring • Temperature threshold detection • Temperature long-term regulation
Wavelog	Digital I/Os	Input : Dry contact Output : active pulse output or static level output	<ul style="list-style-type: none"> • Industry automation • Remote sensor/actuator interface • Datalogger of digital input changes

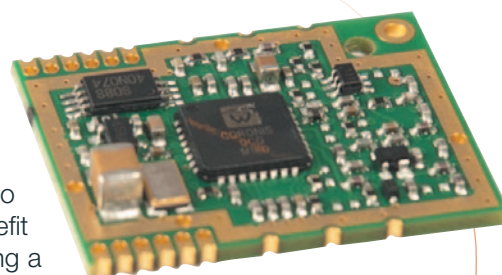
Ready to use OEM RF Cards

Wavefront™

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

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

Connection between Wavefront and your host microcontroller is handled via simple serial-type connections (SPI and GPIOs). This solution offers cost savings and the convenience of using the target device's existing micro-controller for your own applications and the Wavenis protocol stack.



Radio Front End



	433MHz Asia	868MHz Europe	915MHz America
10 mW	WFR433-OEM-10		
25 mW		WFR868-OEM-25-OP	WFR915-OEM-25

Wavefront features

- 50 ohm RF port for antenna connection
- Industrial Wavenis RF board with transceiver
- Complete Wavenis API – Host Controller Interface (HCI)
(Wavenis protocol stack implemented in separate application CPU)
- Stack uses 8-32 KB flash code depending on Wavenis feature set and microcontroller
- Compatible with Microchip PIC18, Texas Instruments MSP430, ARM7 (check with Coronis for others)
- SPI link for connection to MCU platform
- Embedded EEPROM (R/W access through SPI):
 - » 2 KB standard (8 KB optional)
 - » 128 Bytes used for Wavenis parameters
- Power supply
 - » 2.3V embedded linear voltage regulator
 - » Vin: 2.4V min < 3V typical < 6V max
 - » I_{peak_RX}: 17 mA typical (full run)
 - » I_{peak_TX}: 45 mA typical (50 mA max)
 - » I_{sby} = 0.5 µA typical
- Dimensions: 30 x 28 x 7 mm

Wavecard™

Wavecard is a two-chip solution that enables you to add Wavenis wireless functionality to your products with a minimum of integration effort. The full-featured Coronis Wavecard comes complete with the Wavenis RF transceiver and protocol stack so you can plug it into your own assembly or motherboard and get started right away. This solution does not require you to deal with RF or communication protocol development in order to take advantage of the ultra low-power, long range, and flexible networking features Wavenis offers. Wavecard comes as transparent RF modem with a dedicated but open serial protocol.

Wavecard is available in three different frequencies depending on the geographical location :

	433MHz Asia	868MHz Europe	915MHz America
Daughterboard mounting	✓	✓	✓
10 mW	WCA433-OEM-10		
25 mW		WCA868-OEM-25	WCA915-OEM-25
500 mW		WCA868-OEM-500	WCA915-OEM-500

Wavecard features

- Available in finished product with USB or RS232 interface: Waveport
- 50 Ohm antenna port
- Modem operation:
 - » Direct access to Wavenis connectivity via UART link from your platform
- Embedded operation (using PDK tools)
 - » Up to 32 KB available to integrate your application and Wavenis stack in flash memory
 - » Up to 512 Bytes RAM for data
 - » External UART connection
- Power Supply
 - » Integrated linear regulator
 - » I_{peak_RX} : 18 mA typical (full run)
 - » $I_{peak_TX_25\text{ mW}}$: 45 mA
 - » $I_{peak_TX_500\text{ mW}}$: 450 mA
 - » I_{sby} = 3 μ A typical
- Dimensions
 - » 25 mW: 30 x 28 x 7 mm
 - » 500 mW: 37 x 30 x 7 mm



Firmware



Radio Front End



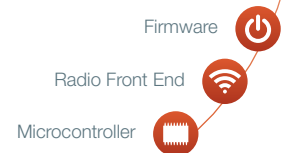
Microcontroller

Excelyo™ – Fully integrated Wavenis SoC solution

Designed for system integrators and manufacturers, Excelyo represents the latest generation of wireless OEM platforms for M2M application environments, offering compatible, simple, and cost-effective solutions to integrate Wavenis ultra-long range and low-power reliability into your own innovative devices in record time.

Integrating an advanced system-on-chip (SoC) designed by Coronis, composed of a unique ultra-low-power 32-bit microcontroller and dedicated wireless transceiver, Excelyo is a macro-component that offers all the advantages of the industry-proven Wavenis wireless solution.

Excelyo may be implemented either as a wireless modem or an embedded development platform. Customers develop embedded applications using the Excelyo PDK, complete with an extensive peripheral driver library and sample code.



	433MHz Asia	868MHz Europe	915MHz America
10 mW	EXC433-OEM-10		
25 mW		EXC868-OEM-25	EXC915-OEM-25
500 mW		EXC868-OEM-500	EXC915-OEM-500

Excelyo features

- Available in packaged USB key implementation
- 50 Ohm antenna port
- Base on Coronis System-on-Chip (with embedded 32-bit RISC CPU)
- Modem operation:
 - » Direct access to Wavenis connectivity via UART link from your platform
- Embedded operation (using PDK tools):
 - » Up to 128 KB available to integrate your application code with Wavenis in flash memory (64 KB max for Wavenis Stack)
 - » Up to 4 KB RAM for data (2 KB max for Wavenis Stack)
- Easy-to-integrate shielded macro-component
- Soldered as SMD component (standard reflow process)
- Tape reel or plate packaging
- Dimensions: 21 x 17 x 4.5 mm

Ready-to-use application-oriented OEM platform

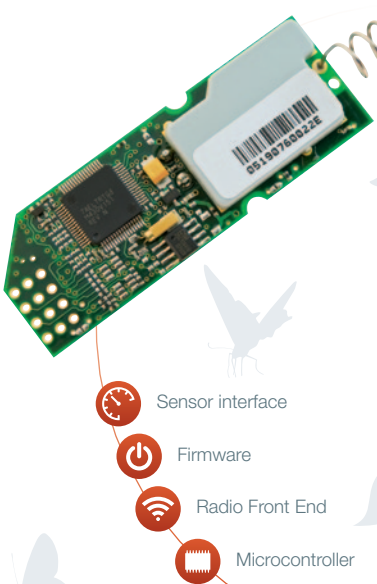
Waveflow™

Applications: Smart metering, energy efficiency

Waveflow is an advanced battery-powered wireless transceiver and data logger for smart metering applications. Deployed in networks covering millions of homes and commercial locations around the world, this flexible OEM platform can be integrated into new gas, water and electric meters designs or connected with existing meters as an after-market add-on.

Waveflow provides fast remote access to available meter information, allowing utilities to speed up data collection and billing cycles and to offer new added value services to customers.

- Logs meter index and events periodically
- Transmits data automatically or on-demand
- Sends alerts for leaks, tampering, backflow, low battery



	433MHz Asia	868MHz Europe	915MHz America
Inputs	Up to 4	Up to 4	Up to 4
Output power	10 mW	25 mW	25 mW
REF	WFL0433-OEM-10-A	WFL0868-OEM-25-A	WFL0915-OEM-25-A

Waveflow features

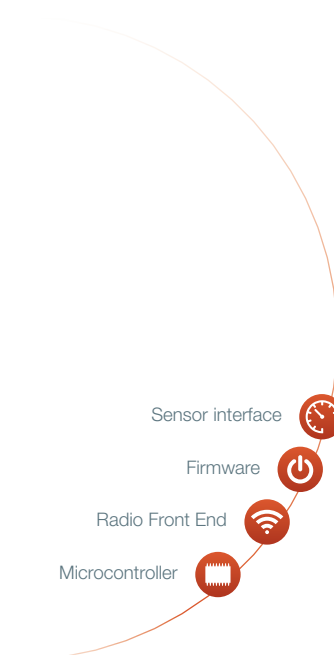
- Inputs for up to 4 identical meters
- Programmable data logging: stores up to 2,100 index readings
- Sample battery life: up to 10 years with 3.6V 3.6Ah battery (with one transmission per day)
- Water valve profile for remote shutoff with compatible meters and equipment
- Alerts for major and residual leaks (programmable thresholds), back-flow, tampering, low battery, weak RSSI
- Supports Wavenis synchronous or asynchronous networks
- Easy to integrate using the Coronis Open Source SDK
- Bareboard with antenna dimensions 81 x 23 x 12 mm

Wavetic™

Applications: Energy efficiency

Wavetic is an advanced wireless transceiver and data logger for today's most demanding smart metering applications. Wavetic reads consumer and professional (blue and yellow) electric meters deployed by ERDF in France. Data collection takes place via Teleinformation meter output designed to provide information and manage the user's installation. Wavetic provides fast wireless access to all relevant meter information, speeding up data collection and enabling providers to offer new value-added services to their customers. Communicating via Wavenis 2-way wireless technology.

	433MHz Asia	868MHz Europe	915MHz America
Inputs	N/A	Up to 2	N/A
Output power	N/A	25 mW	N/A
REF		WTI868-OEM-25-A	



Wavetic features

- Inputs for up to 2 electric meters (blue or yellow, both the same with same rate option)
- Programmable internal data logging, recording period
- Multi-year battery life depending on use
- Immediate alert transmission upon detection of low battery
- Bareboard with antenna dimensions 81 x 23 x 12 mm

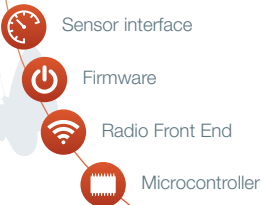
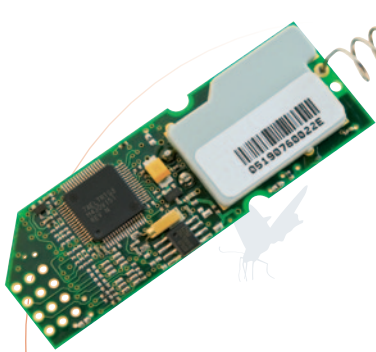
Wavetherm™

Applications: Temperature monitoring, environment monitoring, energy efficiency

Wavetherm is a wireless module that connects standard temperature sensors in today's demanding smart environments. Whether you have critical applications that depend on temperature regularity, or temperature control is part of your home comfort system, you can use Wavetherm wireless transceivers to monitor and control temperature sensors from any location.

Temperature data can be stored in Wavetherm memory and then transmitted wirelessly via Wavenis wireless technology in flexible network installations of any size.

Wavetherm is available for probes compatible with DALLAS DS18B20 (digital) and PT100.



	433MHz Asia	868MHz Europe	915MHz America
Inputs	Up to 2 (DALLAS) 1 (PT100)	Up to 2 (DALLAS) 1 (PT100)	Up to 2 (DALLAS) 1 (PT100)
Output power	25 mW	25 mW	25 mW
REF DALLAS	WTH433-OEM-10-DALLAS	WTH868-OEM-25-DALLAS	WTH915-OEM-25-DALLAS
REF PT100	WTH433-OEM-10-PT100	WTH868-OEM-25-PT100	WTH915-OEM-25-PT100

Wavetherm features

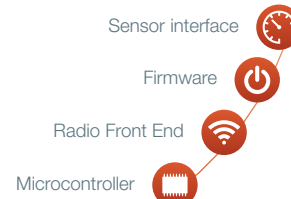
- Inputs for 2 Dallas probes or 1 PT100 probe
- Supports Dallas DS18S20 or PT100 probes (PT probes sold separately)
- Programmable internal data logging, measurement period, threshold alarms
- Extended data logging (optional) stores up to 4,500 readings
- Multi-year battery life depending on use
- Immediate alert transmission upon detection of low battery, wire cut, and threshold conditions
- Bareboard with antenna dimensions 81 x 23 x 12 mm

Wavesense™

Applications: Temperature monitoring, environment monitoring, energy efficiency

Monitoring standard probes (humidity, pressure, tank levels...), environment monitoring Wavesense is a wireless module that lets you monitor and control electronic sensors in a variety of smart environments, including industrial, domestic, medical, and transportation applications. Data and sensor readings can be distributed easily to your back-end management applications and value added services through wireless networks with an unlimited number of nodes.

Compatible with a wide range of sensors offering 0-5 V and 4-20 mA analog interfaces, Wavesense makes it easy for you to establish two-way communications with remote sensors from any location and to build innovative smart environments.



	433MHz Asia	868MHz Europe	915MHz America
Inputs	1 (4-20 mA) 1 (0-5 V)	1 (4-20 mA) 1 (0-5 V)	1 (4-20 mA) 1 (0-5V)
Output power	10 mW	25 mW	25 mW
REF 4.20mA	WSE433-OEM-10-20M	WSE868-OEM-25-20M	WSE915-OEM-25-20M
REF 0.5V	WSE433-OEM-10-5V-A	WSE868-OEM-25-5V-A	WSE915-OEM-25-5V-A

Wavesense features

- Input for 1 standard sensor (note: device does not supply power to the sensor)
- Programmable logging, transmission, alerts, threshold signals, and error management
- Extended data logging to store up to 4,500 readings
- Input impedance (voltage products): 10 Kohm
- 12-bit ADC voltage interface (resolution 1.25 mV)
- Bareboard with antenna dimensions 81 x 23 x 12 mm

Wavelog™

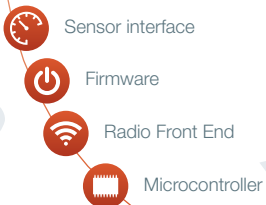
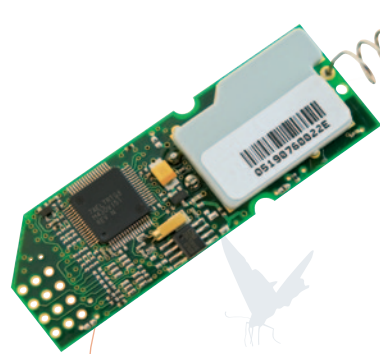
Applications: On/off sensor actuator, on/off state change logger

Wavelog is a 2-way wireless device that allows you to monitor binary state-generating sensors and to control actuators, such as on/off devices and open/closed sensors. When connected to a binary digital I/O device, Wavelog can detect state changes and wirelessly transmit data to a Wavenis enabled data collection unit. Wavelog output ports may be also used simultaneously to control the connected device's actuators, such as valves, motors, and intrusion alarms.

	433MHz Asia	868MHz Europe	915MHz America
Input number	Up to 4	Up to 4	Up to 4
Output number	Up to 4	Up to 4	Up to 4
ATEX version	No	No	No
Output power	10 mW	25 mW	25 mW
REF	WLO433-OEM-10-A	WLO868-OEM-25-A	WLO915-OEM-25-A

Wavelog features

- 4 inputs (dry contact), 4 outputs
- Programmable length, front, and timing in pulse output mode (requires external power for continuous level output)
- Stores up to 500 input change records
- Customizable alarms with automatic transmission
- Instant alarms or delayed send (sequential or cumulated)
- Automatically detects severed cable and low-battery
- Bareboard with antenna dimensions 81 x 23 x 12 mm



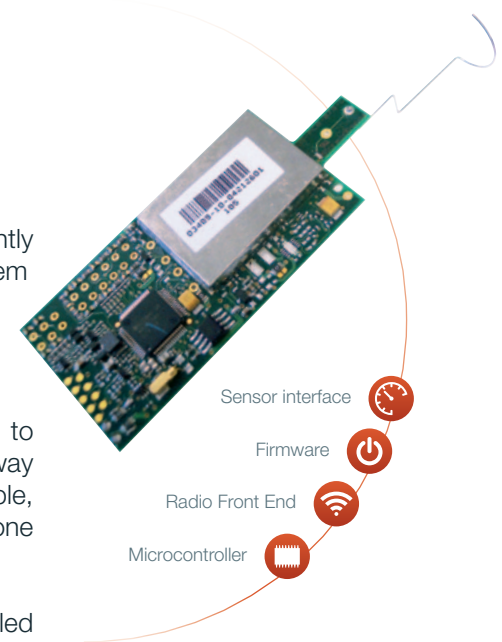
Wavetalk™

Applications: Extension for Wavenis-enabled devices

Wavetalk is a simple Wavenis wireless range extender that relays data transparently between Wavenis wireless devices in order to increase the distance between them when necessary. Even though Wavenis technology offers wireless range that is among the longest in the industry, there are situations where greater coverage is required.

Wavetalk range extenders are used in wireless network scenarios of all sizes to bridge the gap between distant Wavenis products. These modules offer full 2-way communications as a key part of large-scale Wavenis wireless networks. For example, connected to an Ethernet or GPRS gateway, Wavetalk provides the wireless backbone for end-points that would otherwise be beyond the wireless range of the gateway.

Note: All Wavenis-enabled devices can serve as repeaters for other Wavenis-enabled devices. Wavetalk is a dedicated repeater designed to preserve battery life in devices performing other tasks, notably data logging.



	433MHz Asia	868MHz Europe	915MHz America
10 mW	WTA433-OEM-10		
25 mW		WTA868-OEM-25	WTA915-OEM-25
25/500 mW		WTA868-OEM-500	WTA915-OEM-500

Specific features

- Extends Wavenis wireless range up to 4 km (line-of-sight) per repeater
- Up to 3 repeaters per branch
- Transparent data relay
- Sends alert spontaneously in case of low-battery
- More than 10 years autonomy (depending on usage scenario)
- Supports Wavenis asynchronous or synchronous networks (using 868-915MHz models)
- Dimensions: 87 x 36 x 5 mm (without antenna)



Waveport™

Applications: Wavenis modem, network access point

Complete mobility and easy access to installed Wavenis sensor modules of all kinds, Waveport gives you both. With USB, serial or Bluetooth connections for your laptop or handheld PC, the Coronis Waveport is ideal for reading, controlling, and configuring Wavenis-based wireless sensors in a wide variety of industrial, domestic, and professional applications.

Whichever connection type you choose, this versatile product lets you connect mobile equipment directly to installed Wavenis nodes in wireless networks. Waveport is as useful in automatic metering, telemetry, and industrial monitoring, as it is in access control, security, healthcare, and UHF RFID systems. Use it with your application-specific software to read and control remote sensors quickly and wirelessly, saving the time and expense of manual operations. This device is the standard Wavenis node access point (wireless modem).

	433MHz Asia	868MHz Europe		915MHz America	
	10mW	25mW	25/500mW	25mW	25/500mW
USB	WPO433-FP-10-U	WPO868-FP-25-U		WPO915-FP-25-U	
RS232	WPO433-FP-10-R		WPO868-FP-500-R		WPO915-FP-500-R
Bluetooth	WPO433-FP-10-B	WPO868-FP-25-B			

Waveport features

- Direct access to Wavenis connectivity via RS232, USB or Bluetooth
- Dimensions:
 - » USB: 96 x 47 x 24 mm
 - » Serial: 55 x 25 x 100 mm
 - » Bluetooth: 52 x 43 x 06 mm

● Demonstration Kit

The Excelyo DemoKit is a set of wireless devices - “Phidgets” and reference designs with the embedded Excelyo module - and software, enabling the user to run Wavenis technology easily and experience its advanced technology capabilities in various scenarios.

● Development Kits

Coronis, the founding creator of Wavenis wireless technology, has developed all the tools needed for any integrator to develop software and products based on Wavenis. We make it easy for you to join the Wavenis ecosystem. The toolchain in the Coronis development kit is the same for clients as that used by Coronis in-house.

Excelyo Product Development Kit (PDK)

The Excelyo PDK is a process that enables you to easily develop your embedded application on existing Wavenis-enabled equipment supplied by Coronis. The PDK allows straightforward design of custom Wavenis-enabled equipment, without the need to enter a technology licensing process. The provided set of peripheral drivers gives to the user a rich hardware abstraction layer in order to leverage all features of the Coronis module effortlessly.

Description

The Excelyo Product Development Kit (Excelyo PDK) is composed of hardware devices and software tools for fast application development. The Excelyo PDK includes:

- Hardware
 - » Wavenis-based USB modem
 - » Evaluation board
 - » 2 reference designs (daughter-boards with integrated Excelyo)
 - » JTAG USB cable
 - » 2 battery packs
 - » 2 antennas
 - » 2 USB/DC power supplies
- Software
 - » Wavenis stack and development framework
 - » FreeRTOS, an open source, mini real-time kernel
 - » Microcontroller peripheral drivers, and BSP
 - » Tester application to exercise wireless test cases using the Wavenis-enabled USB modem
- Tools
 - » Fully integrated toolchain based on Eclipse
 - » Documentation, access to FAQ incident tickets
- Support
 - » 10 days support included in Level 1-2-3 (cf. Support section)

Software Development Kit (SDK)

The Coronis SDK (Software Development Kit) is a set of components for developing software that exchanges data with Wavenis nodes via a serial port. The SDK architecture offers a modular design to offer maximum flexibility and cover nearly all use cases :

- Separation of communication features for exchanging data with a Wavenis node via a serial driver, and the data itself that may contain application or specific service information.
- Interfaces are defined for each module within the architecture, and each module implementation must respect these interfaces to ensure compatibility with other existing modules.
- LGPL license, allowing the greatest number of users to develop applications using already-integrated modules or to implement specific modules, with the assurance of interoperability with existing modules.
- The choice of open source technology makes it easy to use or extend the SDK with the most common programming languages (C, C++, Java) and a large number of platforms, such as Win32 and Linux.

The Coronis SDK is designed to:

- Enable integrators to generate software libraries that match their device features, and to facilitate and accelerate the integration of their device(s) in Wavenis ecosystems.
- Enable M2M ecosystem managers/providers to standardize Wavenis technology integration into their system.

• Services

Two services levels are available: one specifically related to technical support, and the second dedicated to a partner ecosystem to facilitate the integration process of Coronis OEM products for customers.

M2M SERVICES

TOOLS

- Software Development Kit
- Product Development Kit

PROJECT

- Project Management Services

SUPPORT

- DataBase Access Customer
- Training
- Incident Ticket Management
- Integration documentation
- Certification documentation

ECO SYSTEM

- Eco System partner program
- Eco System Product Environment

Product / Application

As Coronis business model is based on OEM product, Coronis set in place a portfolio of services in order to ease and secure our customer development.

Support / Maintenance / Evolution / Training

DEMO KIT

- Support
 - » Due to the nature of this product, support for the Excelyo Demonstration Kit is essentially provided through the included documentation.

PDK

- Level 1 support: Included in package
 - » 10 days (usable in Level 1/2/3) of technical support are included with the PDK package, used in half-day increments through tickets.
 - » The package includes FAQ access.
 - » Application notes are accessible and included in the package.
- Level 2 support: Training (standard and specific)
- Level 3 support: Development Level (beginner and advanced)
- Additional support (if needed)
 - » Minimum 1 additional day, in half-day increments.
 - » Rate for 10 additional days, in half-day increments.
 - » Other package available on request if more extensive training is required.
- Maintenance
 - » Corrective maintenance is included in the package.
 - » 1 Year applications update.
 - » Corrective maintenance is included in the package.
- Evolution / upgrades
 - » PDK upgrades are included for one year.
 - » Upgrades after one year:
 - » Rate for single upgrade
 - » Rate for full-year package, no limit on the number of upgrades.

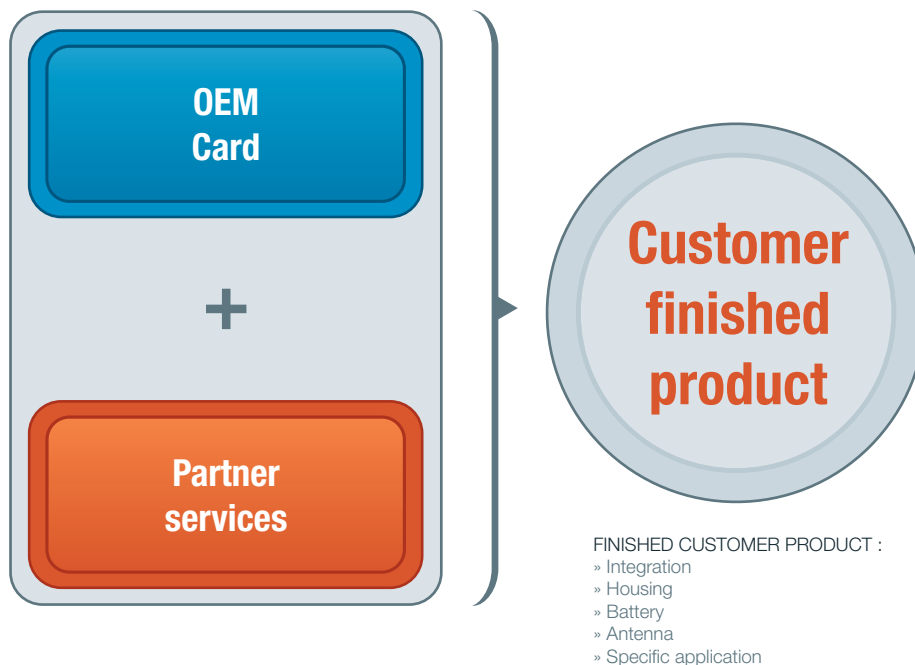
SDK

- Level 1 support : Basic requests
 - » Included in the package.
- Level 2 support: Training (standard and specific)
- Level 3 support: Development Level (beginner and advanced)
- Maintenance
- Evolution / upgrades
 - » Additional upgrades: rate for one year.

● Coronis Integration Strategy: Partner program

Coronis is part of an Ecosystem of qualified Wavenis partners, offering a wide range of possibilities for new product development. This Ecosystem ensures manufacturers and integrators access to the most appropriate outside developers in case such services are required.

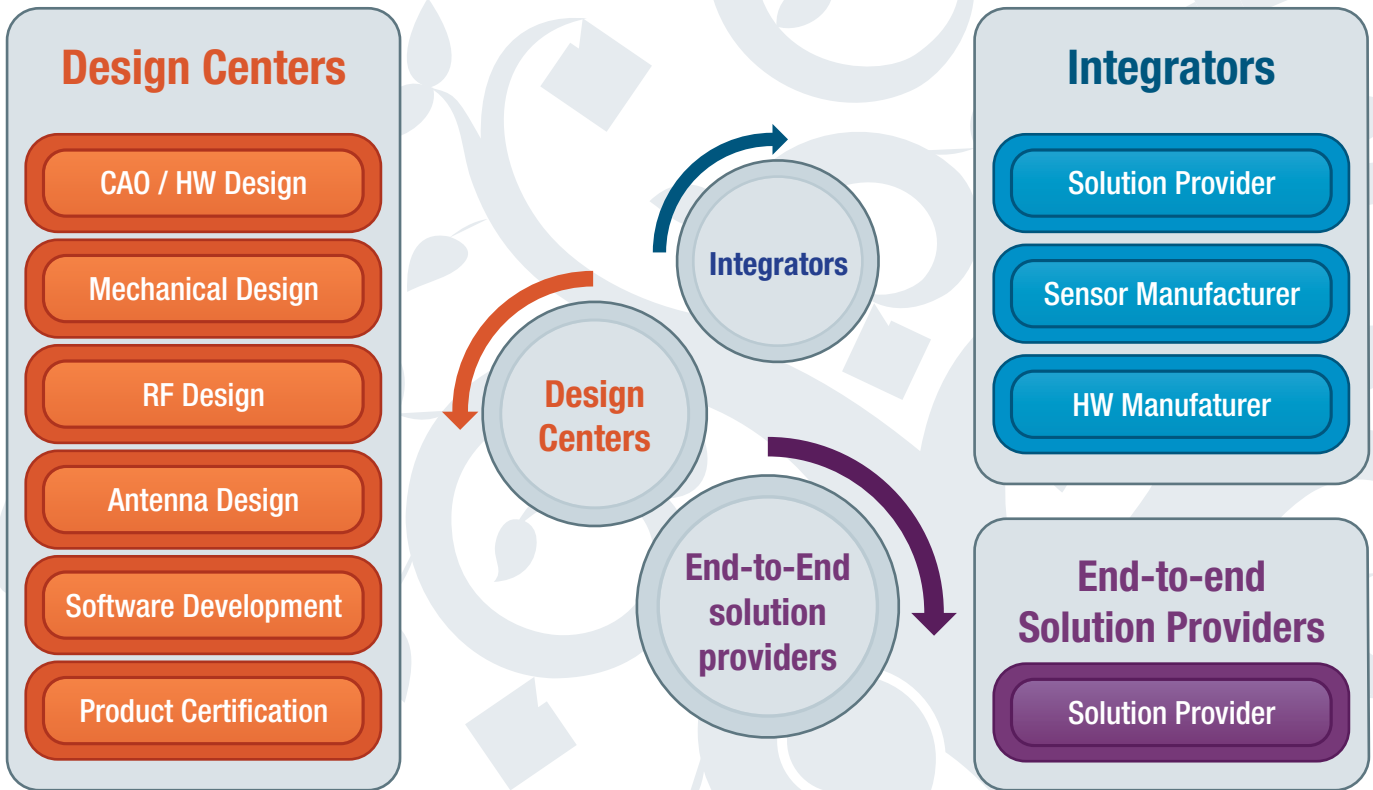
Depending on your technical need, you can have access to recognized design partners for any step of your product development phases from design (HW, FW, mechanical) to production process.



Advantages of the Wavenis ecosystem include :

- Secure development by approved Wavenis / Coronis partners:
 - » Design for manufacturability, testing, and reliability.
 - » Optimized development process to ensure partner intervention and secure cycle.
- Cost control
- Fastest time to market
- Ensuring the best integration / performance possible
- Functional specifications-based development process

The figure below summarizes the partner ecosystem:



Depending on your need and the required skills, Coronis offers project management services in order to establish the link between these partners upon request.

Hardware – RF Design

Coronis provides a user guide and an integration rules guide for RF radio modules to ensure optimal performance in final products.

- Design Office dedicated to customized electronic systems.
 - » Radio design – frequency, analog, and digital
 - » Board development
- Test Office for product validation

Antenna Design

The antenna is a key part of performance in final products based on Wavenis wireless technology, and Coronis is highly attentive to this aspect of product development. Special support is provided to optimize the antenna design process.

- Design Office dedicated to customized antennas
 - » Designing custom antennas or choosing the right antenna on the market to meet your needs
 - » Antenna selection (Helix, dipole, patch, PCB, etc) for your specific integration
 - » Antenna modeling and simulation to reduce the prototyping phase and simplify antenna type selection
 - » Measurement and qualification of antenna performance
 - » Pre-certification measurement of final integrated product

Mechanical Design

Mechanical design is an important part of product development, either from scratch or for design modification of existing product. Coronis leverages a pool of experienced and qualified design partners offering the following services:

- 3-D modeling based on provided functional specifications
- Prototype manufacturing (stereo-lithographic casing) for mechanical validation, integration tests, and functional radio tests (antenna + radio operation)
- Mould design, manufacturing, and materials selection to meet your needs, from silicon to steel depending on cost-quantity considerations.

Firmware development

Coronis has extensive experience with Wavenis-related firmware and application design. We will be pleased to work with you on aspects such as firmware development and porting the protocol stack to new microcontroller environments. For specific services, Coronis will find the best Wavenis Ecosystem partner to meet your needs quickly.

Certification guidelines

Coronis products work with several leading international certification laboratories. We will be pleased to provide you with support and training on certification processes for worldwide sub-GHz ISM frequency bands (433MHz, 868 MHz, 869 MHz, 915 MHz) upon request.

coronis

 wireless platforms



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