WirelessHART

centero

WiHART2 Wireless Module

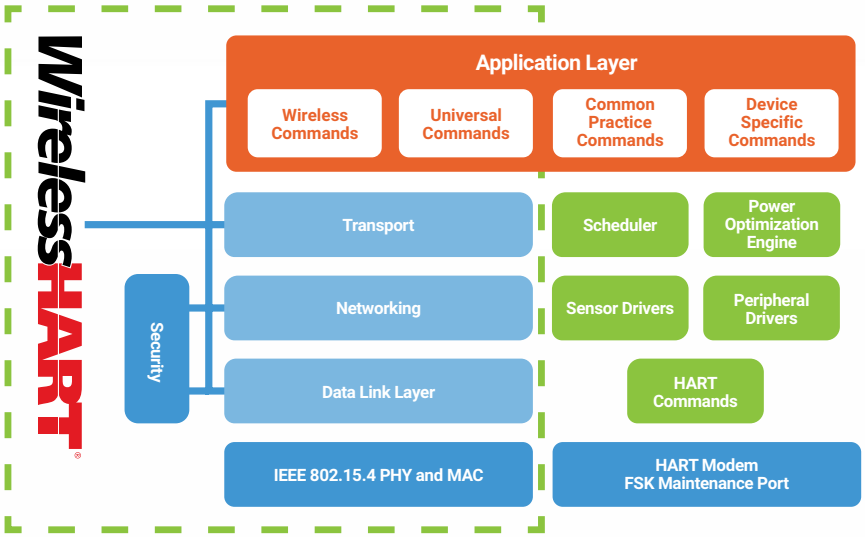
PRODUCT OVERVIEW – Empower your industrial IoT connected field instrument with WirelessHART compliant mesh connectivity and security. The WiHART2 OEM wireless module is a key component of Centero's standards compliant offering for the Industrial Internet of Things. It is designed for swift hardware and firmware integration within products without the need of an in-depth understanding of novel and complex IoT technologies. The communication stack and reference field instrument implementation are compliant to the HART 7.6 specification. The WiHART certifiable field instrument implementation includes all the components needed to develop and certify a WirelessHART instrument, including all mandatory Universal, Common Practice and Wireless commands and an FSK HART maintenance port. The WiHART2 wireless module is also offered in WirelessHART and ISA100 Wireless dual-boot mode.

FEATURE	BENEFIT
Centero's second generation WiHART wireless module	Drop-in replacement for the WiHART radio module
WirelessHART™ (Fieldcomm) certifiable field instrument implementation	Guaranteed interoperability with other vendor's WirelessHART compliant field instruments and gateways
Wireless multi-protocol features	Includes support for WirelessHART (IEEE 802.15.4) as well as Bluetooth Low Energy (BLE 5.3)
HART/WirelessHART compliance	Implementation compliant to the HART 7.6 standard specifications
Designed specifically for integration in intrinsically safe instruments	Can be integrated in intrinsically safe certified field instrument for deployments in hazardous areas
Market leading sensitivity of -104 dBm	Increased link budget results in extended indoor/outdoor range
Based on Silicon Labs' EFR32MG24 chipset	Complete, low power, 2.4 GHz SoC, 32-bit ARM core based MCU, hardware acceleration for both the IEEE 802.15.4 MAC and AES security
State-of-the-art security	Includes Silicon Labs' Secure Vault™, a PSA Level 3 certification which is the highest level of IoT security protection
AI/ML capabilities	Includes a dedicated AI/ML hardware accelerator
Over-the-air, secure upgrades	WirelessHART communication stack can be upgraded wirelessly via a secured, authenticated mechanism
On-board regulator provides power for external circuitry	No need for additional external voltage regulation results in low product cost and size
Configurable and accessible via feature rich API	Swift integration within product with minimal learning curve for complex IoT technologies
Optimized for battery and harvested powered operation	Prolonged product battery life
Ready for automated assembly	Offered in JEDEC compliant trays for automated pick-n-place assembly
Miniaturized surface mount form factor	Suitable for real estate constrained products
Adjustable RF output power	Minimal power consumption adaptive to optimizing battery life

Connectivity and Networking

- WirelessHART (Fieldcomm) certifiable field instrument implementation
- Extensively tested for interoperability with third-party WirelessHART™ gateways
- Includes full set of mandatory Universal, Common Practice and Wireless commands
- Implementation includes a fully compliant HART modem and FSK maintenance port as well as sensor and peripheral drivers and power optimization engine
- Market leading average current draw results in typical field instrument battery life of 3 - 10 years depending on data communication schedule
- Supports additional product differentiators such as low power optimizations and enhanced discovery process
- Architected and designed for low-latency monitoring and control automation
- Support for monitoring and control loops
- Mesh routing ensures path redundancy and optimal data reliability
- TDMA based wireless communication scheduling with guaranteed latency
- Frequency hopping ensures robustness to interference
- Two-layered MAC/Network security construct

WiHART Field Instrument Reference Implementation



Target Vertical Markets and Applications

The WirelessHART™ compliant communication stack along with its wireless performance make the WiHART2 module the market leading solution for connected field instruments and products.

MARKET VERTICALS

- **Process Automation**
- **Condition Monitoring**
- **Oil and Gas**
- **Safety Applications**
- **Predictive Maintenance**
- **Petrochemical**
- **Factory Automation**

APPLICATIONS AND USE CASES

- **Pressure, temperature and flow transmitters**
- **Vibration and condition monitors**
- **Corrosion monitors**
- **Gas, flame and smoke detectors**
- **Emergency alerting instruments – beacons and sounders**
- **HART/WirelessHART™ adapters**
- **Steam trap monitors**
- **Safety relief valve monitors**
- **Valve controllers and positioners**
- **Tank level monitors**

Parameters and Performance Metrics

GENERAL	
Chipset	Silicon Labs MG24 chipset featuring multi-protocol WirelessHART™/ IEEE 802.15.4 and BLE support, Secure Vault™, AI/ML hardware accelerator
Memory	1536 KB of Flash, 256 KB of RAM
Serial Data Interfaces	UARTs (2) – for data interface with WirelessHART communication stack
GPIOs	5 (dedicated)
ADC Inputs	3 inputs

RADIO	
Operating Frequency	ISM 2400 – 2475 MHz
Transmit Power	-10 to +8 dBm (programmable) – 10 dBm max for WirelessHART
Sensitivity (1% PER)	WirelessHART: -104 dBm for 250 Kbps O-QPSK DSSS Bluetooth Low Energy: -97 dBm for 1 Mbps GFSK, -94 dBm for 2 Mbps GFSK
Data Rates	WirelessHART: 250 Kbps (IEEE 802.15.4) Bluetooth Low Energy: 1 Mbps and 2 Mbps
RF Link Budget	WirelessHART: 114 dB Bluetooth Low Energy: 113 dB for 1 Mbps, 110 dB for 2 Mbps
Indoor/Urban Range	1000 ft (300 m)
Outdoor Range (Line of Sight)	0.56 miles (900 meters)
Antenna Port	MMCX connector or external RF port

ELECTRICAL	
Supply Voltage	2.9 – 4.2 V
Regulated Voltage Output	3.0 V (max 25 mA) if VCC > 3.2 V, VCC-200mV non-reg if VCC <3.2 V
Transmit Current	WirelessHART and BLE: 23 mA @ 0dBm, 59 mA @ +10 dBm, 119 mA @ 16 dBm, 145 mA @ 18 dBm
Receive Current	WirelessHART (IEEE 802.15.4): 11.5 mA Bluetooth Low Energy: 7.5 mA for 1 Mbps PHY, 8.5 mA for 2 Mbps PHY
Idle Current	4.5 mA
Sleep Current	2 µA

Parameters and Performance Metrics

ENVIRONMENTAL AND MECHANICAL	
Operating Temperature	-40 - +85 °C
Humidity	90% (non-condensing)
Form Factor	Surface mount - castellated
Dimensions	1.0 x 0.8 x 0.2 inches (20.5 x 25.5 x 5.25 mm)

CERTIFICATIONS	
US and Canada	Certified
European Union	Certified
UK	Certified
Japan	Pending
South Korea	Certified

ORDERING INFORMATION	
Product	**Part Number**
WiHaRT Wireless Module	CW-24-200-WH
Dual-Boot WirelessHART and ISA100 Wireless module	CW-24-200-DB

RELATED PRODUCTS		
Product	**Part Number**	**Description**
WiHaRT Development Kit	WIHARTRDKES	WirelessHART Development Kit – WiHART Enterprise Source Code Package
SafeHART Development Kit	SAFEHARTRDKES	SafeHART Development Kit – SafeHART Enterprise Source Code Package
INTREPID NIO200HAG	NIO200HAG-C1D2	INTREPID WirelessHART Field Gateway, Wi-Fi Mesh+ connectivity, UL C1D2 certified
INTREPID NIO200HAG	NIO200HAG-ATEX	INTREPID WirelessHART Field Gateway, Wi-Fi Mesh+ connectivity, ATEX certified
INTREPID NIO200HRDK	NIO200HRDK	INTREPID WirelessHART Field Gateway, No Wi-Fi
INTREPID WFNM	WFNM-LBA-WIHART	INTREPID WirelessHART Field Network Manager

Centero is a provider of wireless technologies, products and services for the Internet of Things.

Centero is a privately owned technology company headquartered in Atlanta, Georgia. We are the forefront of the Industrial Internet of Things revolution which is transforming a wide array of vertical markets. Centero offers end-to-end, standards-based communication platforms that are swiftly integrated into novel or existing products.

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