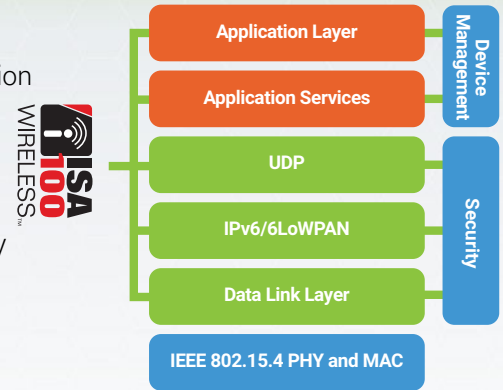# WISA2 ISA100 Wireless Module

PRODUCT OVERVIEW – Empower your IoT connected field instrument with ISA100 Wireless compliant mesh connectivity and security. The WISA2 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 WISA2 wireless module runs a WCI certified, ISA100 Wireless communication stack. The WISA field instrument implementation includes all the components needed to develop and certify an ISA100 Wireless field instrument. The WISA2 wireless module is also offered in ISA100 Wireless and WirelessHART dual-boot mode.

FEATURE	BENEFIT
Centero's 2nd generation WISA wireless module	Drop-in replacement for the WISA radio module
ISA100 Wireless certified communication stack	Guaranteed interoperability with other vendor's field instruments and gateways
Designed specifically for integration in intrinsically safe instruments	Can be integrated in intrinsically safe certified field instrument for deployments in hazardous areas
Router and I/O device roles	Dynamic device types and roles allow for optimal network topologies
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
Market leading sensitivity of -104 dBm	Increased link budget results in extended indoor/outdoor range
State-of-the-art security	Includes Silicon Labs' PSA Level 3 certified Secure Vault™ which is the highest level of IoT security protection
AI/ML capabilities	Includes a dedicated AI/ML hardware accelerator
On-chip over-the-air (OTA), secure upgrades	ISA100 Wireless 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
Optimized for battery and harvested powered operation	Prolonged product battery life
Configurable and accessible via feature rich API	Swift integration within product with minimal learning curve for complex IoT technologies
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 needs

Connectivity and Networking

((• ISA100 Wireless certified communication stack

((• 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

((• Includes native 6LoWPAN/IPv6 connectivity and addressing

((• ISA100 Wireless compliant application layer data modeling

((• Support for legacy application layer tunneling such as MODBUS, HART or Foundation Fieldbus

((• Two-layered MAC/Transport security construct
   o MAC: IEEE 802.15.4 based security including AES-128 encryption and authentication
   o Transport: ISA100 authentication and AES-128 encryption

((• Dynamic device types and roles allow for optimal network topologies
   o Router
   o I/O (end) device
   o Router and I/O (end) device

Target Vertical Markets and Applications

The ISA100 Wireless certified communication stack along with its wireless performance make the WISA2 module the market leading solution for ISA100 Wireless 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
((• ISA100 Wireless 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 ISA100 Wireless/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 ISA100 Wireless communication stack
GPIOs	5 (dedicated)
ADC Inputs	3 inputs

RADIO	
Operating Frequency	ISM 2400 – 2475 MHz
Transmit Power	-10 to +8 dBm (programmable)
Sensitivity (1% PER)	ISA100 Wireless: -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	ISA100 Wireless: 250 Kbps (IEEE 802.15.4) Bluetooth Low Energy: 1 Mbps and 2 Mbps
RF Link Budget	ISA100 Wireless: 120 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)	0.75 miles (1200 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	ISA100 Wireless and BLE: 23 mA @ 0dBm, 59 mA @ +10 dBm, 119 mA @ 16 dBm, 145 mA @ 18 dBm
Receive Current	ISA100 Wireless (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

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

Parameters and Performance Metrics

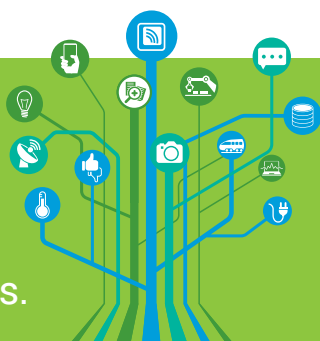| ORDERING INFORMATION	
Product	Part Number
WISA2 Wireless Module	CW-24-200-ISA1
Dual-Boot ISA100 Wireless and WirelessHART™ module	CW-24-200-DB

RELATED PRODUCTS		
Product	Part Number	Description
WCI ISA100 Wireless Rapid Development Kit	ISA100RDKEN	ISA100 Wireless Development Kit – includes ISA100 Enterprise Source Code Package
ISA100 Wireless SAFE+ Development Kit	ISA100SRDK	ISA100 Wireless Development Kit for Safety Applications – includes ISA100 Wireless SAFE+ Enterprise Source Code Package
UNISON ISA100 Wireless Field Gateway	NIO200IAG-C1D2/ATEX	ISA100 Wireless Field Gateway, Wi-Fi Mesh+ connectivity, UL C1D2/ATEX certified
UNISON ISA100 Wireless Field Gateway	NIO200IRDK	ISA100 Wireless Field Gateway, No Wi-Fi
UNISON ISA100 Wireless Field Access Point	NIO200IDR- C1D2/ATEX	ISA100 Wireless Backbone Router, Wi-Fi Mesh+ connectivity, UL C1D2/ATEX certified
UNISON SAFE ISA100 Wireless Field Gateway	NIO200SAG-C1D2/ATEX	ISA100 Wireless Safe Gateway for safety applications – includes PROFINET
UNISON Wireless Network Manager	WNM-Lxx-ISA	ISA100 Wireless Network Manager
UNISON Wireless Field Network Manager	WFNM-LBA-ISA	ISA100 Wireless Field Network Manager – with remote antenna options
ISA100 Wireless AIM Steam Trap and Valve Monitoring Starter Kit	SK-AIM-ISA100	ISA100 Wireless Starter Kit
ISA100 Wireless Compliance Kits	STK and DTK	WCI (Wireless Compliance Institute) Device Test Kit and Stack Test Kit

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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