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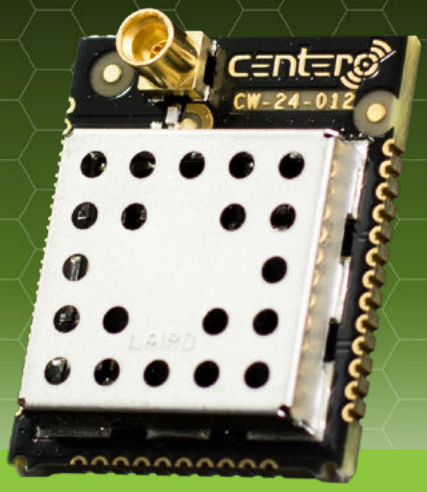


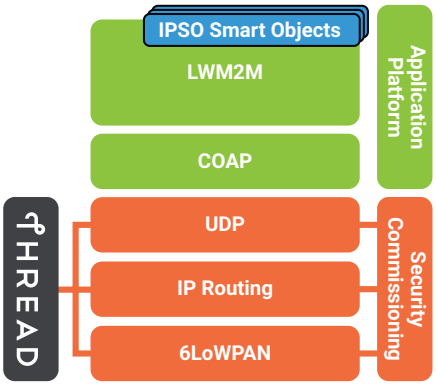
WEE Thread Wireless Module

PRODUCT OVERVIEW – Empower your IoT connected device with Thread compliant wireless mesh connectivity and security. The WEE OEM wireless module is a key component of Centero's FabriK Thread compliant communication platform for the emerging Commercial, Industrial and Medical Internet of Things. It is designed for swift hardware and firmware integration in products without the need of an in-depth understanding of novel and complex IoT technologies.

KEY FEATURES AND BENEFITS

FEATURE	BENEFIT
Based on NXP's third-generation KW21D512 SiP	Complete, low power, 2.4 GHz radio frequency transceiver, 32-bit ARM core based MCU, hardware acceleration for both the IEEE 802.15.4 MAC and AES security
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 in products with minimal learning curve for complex IoT technologies.
Dual Personal Area Network (PAN) support in hardware	Can actively participate in multiple RF networks
Optimized for battery and harvester powered operation	Prolonged product battery life
Market leading sensitivity of -108 dBm	Increased link budget results in extended indoor/outdoor range
Multiple reception modes	Dynamically adaptive to range requirements
Miniaturized surface mount form factor	Suitable for real estate constrained products
Adjustable RF output power	Minimal power consumption adaptive to needs
On-chip OTA and serial firmware upgrades	No need for external memory results in low product cost and size

CONNECTIVITY AND NETWORKING



- IEEE 802.15.4 PHY/MAC wireless connectivity
- Thread certified networking, security and commissioning
- Includes native 6LoWPAN/IPv6 connectivity and addressing
- OMA LWM2M based application layer device connectivity and management
- IPSO Smart Object compliant application data modeling
- COAP modeled resources
- Two-layered MAC/Transport security construct
  - MAC: IEEE 802.15.4 based security including AES-128 encryption
  - Transport: DTLS based security
- Mesh routing ensures path redundancy and optimal data reliability
- Dynamic device types and roles allow for optimal network topologies
  - Leader, Router and REED (Router Eligible End Device)
  - End Device and Sleepy End Device
  - Border router
  - Commissioner
- Architected and designed for low-latency monitoring and control automation

TARGET VERTICAL MARKETS AND APPLICATIONS

The WEE module can be deployed in any IoT project large and small. The Thread compliant stack along with the size makes the WEE module a viable solution for your connected products.

- **Home Automation**
- **Commercial and Street Lighting**
- **Building Automation**
- **Industrial Automation**
- **Connected Healthcare**
- **Connected Appliances**

PARAMETERS AND PERFORMANCE METRICS

GENERAL	
Chipset	NXP KW21D512 featuring an advanced hardware crypto engine
Memory	512 KB of Flash, 64 KB of RAM
On-board RF FEM (Front-end-module)	Adjustable output power and multiple LNA based reception modes
Serial Data Interfaces	UARTs (2), SPI, I2C
GPIOs	5 (dedicated)
ADC Inputs	3 inputs

RADIO	
Operating Frequency	ISM 2400 – 2475 MHz
Transmit Power	-10 to +14 dBm (programmable)
Sensitivity (1% PER)	-108 dBm
RX Modes	Bypass, Low-gain, High-gain
Data Rate	250 Kbps (IEEE 802.15.4)
RF Link Budget	122 dB
Indoor/Urban Range	1000 ft (300 m)
Outdoor Range (Line of Sight)	1.2 miles (2000 m)
Antenna Port	MMCX or external antenna port (50 Ω)

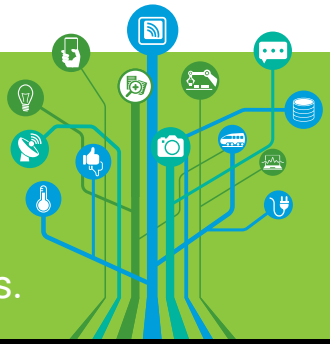
ELECTRICAL	
Supply Voltage	3.2 – 4.2 V
Regulated Voltage Output	3.0 V (max 25 mA)
Transmit Current	37 mA @ 0dBm, 57 mA @ +14 dBm
Receive Current	18 mA (Bypass), 22 mA (Low Gain), 28 mA (High Gain)
Sleep Current	2 µA

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

CERTIFICATIONS	
US and Canada	Yes
European Union	Yes

RELATED PRODUCTS	
Product	**Part Number**
YarN Thread Development Kit	CE-KIT-01
WHeeL Thread Border Router	CE-THRD-BRD-01
SPiN Development Kit Board	CE-SPiN-THRD-01
WEE Support Board	CS-CW-24-01
Mikrobus WEE Adaptor	CE-MKRB-01
X-Mikrobus WEE Adaptor	CE-SPiN-AD-02

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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