E1000-WP: E1000 Edge Gateway with Wirepas Support
(Indoor Use)

OVERVIEW

The Cassia Networks™ E1000-WP Gateway is a long-range IoT gateway that supports both Bluetooth protocol and Wirepas protocol at the same time. There are two Bluetooth radio chips inside E1000-WP and two subtypes of E1000-WP:

1) E1000-WP1: the first Bluetooth radio chip (chip 0) of E1000-WP is configured to support Bluetooth protocol, and the second Bluetooth radio chip (chip 1) of E1000-WP is configured to support Wirepas protocol.

2) E1000-WP2: both Bluetooth radio chips of E1000-WP are configured to support Wirepas protocol.

The E1000-WP is an industry-leading, enterprise IoT edge gateway. Its patented Bluetooth and Wirepas long-range, edge computing, and remote control of up to 20 Bluetooth low-power devices (and 100s in broadcast mode) deliver unparalleled enterprise Bluetooth and Wirepas IoT network value. The E1000-WP is designed specifically for enterprise IoT applications such as industrial IoT automation, connected health, asset-tracking as well as smart cities and buildings which require robust IoT edge network capabilities.

The E1000-WP Edge gateway intelligently aggregates, secures, analyzes, and relays data from diverse Bluetooth and Wirepas sensors at the edge of the network. This unique capability delivers real-time business insights and pervasive data obtained from innovative applications used in enterprise Bluetooth and Wirepas IoT settings.

The E1000-WP's enterprise Bluetooth IoT capabilities do not require costly changes to existing Bluetooth low-power devices. Furthermore, the E1000-WP is not dependent on Bluetooth 5.0 or Mesh. Its patented smart antenna delivers a range optimized for horizontal use. The E1000-WP is also a protocol gateway translating between the Bluetooth protocol and Internet protocol (IP). It supports Ethernet, Wi-Fi 2.4GHz and 5GHz, or cellular USB modem as an IP backhaul. As a result, end devices are remotely accessible and controllable via an Internet application.

Wirepas is a wireless protocol providing decentralized mesh network technology. It provides many benefits for enabling the implementation of large-scale IoT applications. Wirepas not only offers unlimited scale, coverage, and density, but it also offers high reliability and availability. The Wirepas devices are easy to install and maintain with a low cost of ownership. The E1000-WP acts as an Internet gateway in the Wirepas mesh network. It helps complement the coverage and reliability of the Wirepas network with Cassia's patented long-range technology and enterprise-level functions. For commercial deployment, Cassia signed SPLA with Wirepas. It allows Cassia to sell E1000-WP (running Wirepas Massive) to customers who are Wirepas licensees

The E1000-WP's compact design is ideal for indoor usage. It easily attaches to ceilings and/or walls using an included mounting kit. It can also be placed on a flat surface such as a counter space. The E1000-WP power options include a Micro USB adapter plug or Power over Ethernet (PoE).

The Cassia RESTful APIs enable the integration of proprietary Bluetooth end devices to the E1000-WP without requiring any changes to them. In addition, the Cassia IoT Access Controller (AC)

provides easy-to-use device management at scale. The Cassia IoT AC eases deployment and manages hundreds of Cassia gateways and thousands of connected devices from a single user interface.

UNIQUE BENEFITS

Supporting Wirepas Mesh Protocol
The E1000-WP gateway can act as an Internet gateway in the Wirepas mesh network. The E1000-WP also helps to complement the coverage and reliability of the Wirepas network with Cassia's patented long-range technology and enterprise-level functions. A user can order E1000-WP with dual Wirepas sink/chip only, or opt for an E1000 with a Wirepas sink/chip and a Bluetooth chip.

Reliable long-range Bluetooth, Seamless Coverage
With its smart antenna and RF management technology, the E1000-WP delivers wall-penetrating Bluetooth coverage of up to 1000 ft /300 meters and extends the range of Wirepas up to 1640 ft / 500 meters in a line-of-sight open space environment. The E1000-WP's long-range capability increases "connection density" and reduces cost, allowing solution providers to deploy seamless Bluetooth coverage.

Remote Access and Control
The E1000-WP connects low-power devices and uploads the aggregated device data to the AC via LAN or Internet allowing them to be controlled remotely.

Edge Computing
Custom applications run inside a container (Linux Ubuntu OS) within the gateway resulting in reduced latency and cloud costs, customized command and control, and better data management.

Easy Integration
Cassia's E1000-WP provides a set of RESTful APIs that developers can easily integrate into their native mobile apps or cloud applications. The E1000-WP also provides extended range and rousting capabilities which don't require any costly changes to the Bluetooth end devices.

Easy Setup and Management
Cassia's E1000-WP comes with Wi-Fi hotspot mode which improves the user's overall setup experience when performing an initial installation without network access. The E1000-WP can be managed by the Cassia IoT AC. Administrators can quickly provision and check the status of all gateways in their network. Status data includes connected and/or identified sensors, throughput, CPU consumption, device location, container status, and more.

Room-based Location Tracking
Together with the Cassia IoT AC, the E1000-WP tracks and reports the location of Bluetooth low-power devices, providing geolocation data in real-time.

Tx Power

Based on the country code selected, the Bluetooth transmit power and Wi-Fi transmit power is limited to the maximum value allowed by the country.

Flexible Deployment

In a network-restricted environment, the E1000-WP is configurable to a "Stand-Alone Mode," where data is sent directly to a local third-party application server. In a remote management scenario, the "AC Manage Mode" sends data to a remote third-party application via the Cassia IoT AC.

Pure Scan and High-Speed Multiple Connection Mode

The Bluetooth chips can be configured as pure scan or high-speed multiple connection mode. Pure scan mode offers the best scan performance in high-noise floors and situations with a large number of Bluetooth devices. High-speed multiple connection mode optimizes the connection performance when receiving data from multiple Bluetooth devices simultaneously.

Bluetooth Roaming

Bluetooth roaming occurs when a Bluetooth device switches its association to the Bluetooth gateway with a stronger Bluetooth signal when moving from the coverage area of one Bluetooth gateway to the next. Unlike Cellular and Wi-Fi, Bluetooth protocol has no inherent roaming support, and Bluetooth end devices can't initiate a roaming handoff. Cassia invented fast and secure Bluetooth roaming technology to solve this problem without requiring changes to the Bluetooth protocol and/or end devices.

ADVANCED FEATURES

Processor & Memory

- CPU: 4 core ARM Cortex-A5, up to 1.5GHz
- 256MB RAM DDR3, 4GB eMMC storage

Bluetooth

- One Bluetooth low energy chip: Nordic nRF52832 or none
- Bluetooth version: 4.0/4.1/4.2, 5 compliant
- Connections: up to 20 connections
- Frequency: 2.400 to 2.483 GHz
- Data rates: up to 1Mbps
- Tx power: Configurable in 3~19dBm (limited by local regulatory requirements)
- Rx sensitivity: -105dBm
- Antenna Gain: 5dBi peak

Wirepas

- Wirepas sink/chip: one or two nRF52840
- Frequency: 2.400 to 2.483 GHz
- Maximum Tx power for the US: 20 dBm (FCC)
- Maximum Tx power for the EU: 10 dBm (ETSI)

Wi-Fi (802.11 a/b/g/n/ac)

- Frequency: 2.4 GHz and 5GHz ISM band
- Mode: Wi-Fi client or hotspot (for setup only)
- Tx power: 12.5 to 17.5dBm for 2.4GHz band, 8.5 to 15.5dBm for 5GHz band
- Rx sensitivity: -96 to -71dBm for 2.4GHz band, -91 to -71dBm for the 5GHz band, depending on the modulation
- Antenna: Integrated dual-band

Multiple Roles

- Supports peripheral, central, broadcaster, and observer roles, and plays multiple roles simultaneously.

Security Services

- Supports Bluetooth 4.2 security standards
- Bluetooth Secure Simple Pairing (Just Works, Passkey Entry, Legacy OOB, Secure OOB, Numeric Comparison)

- WPA2 enterprise security (PEAP-MSCHAPv2, EAP-TLS, EAP-TTLS)
- Advanced 128bit AES encryption
- Password-protected gateway web console
- Communication between the Cassia IoT AC and the gateway is based on DTLS 1.2 over UDP
- MQTT communication encryption between Cassia gateway and broker. Supports gateway to AC MQTT option
- Firmware is signed by certificate to ensure authenticity
- Supports HTTPS access to Cassia RESTful API and gateway web console
- Dedicated SSL private key and certificate import option

Power Interface

- Power-over-Ethernet (PoE): 802.3af/at compliant source
- Micro-USB, multi-plug adapter + plugs
  Input: 100-240V (50-60Hz), 0.6A
  Output: DC 5V, 2A
  IMPORTANT: Limited to one power source at a time (PoE or Micro-USB)
- Power consumption: up to 2.5W for normal usage; cellular USB modem adds up to an additional 2.5W

Other Interfaces

- 10/100 BASE-T Ethernet (RJ-45) uplink
- Reset button
- LED lights: Wi-Fi / BT / System / Power / Ethernet
- USB 2.0 (used for cellular USB modem)

Mechanical

- Dimensions:
  164 mm (W) x 164 mm (L) x 62 mm (D)
  6.45 inch (W) x 6.45 inch (L) x 2.44 inch (D)
- Weight: 410 g / 14 oz

Environmental

- Operating:
  - Temperature: 0°C to +40°C (+32°F to +104°F),
  - Humidity: 0% to 90% non-condensing
- Storage and transportation:
  - Temperature: -40°C to +70°C (-40°F to +158°F)

Mounting

- Wall or ceiling mounting kit included

Certification

- FCC (US), IC (Canada), CE (Europe), BQB, TELEC (Japan), CB, SRRC (China), RCM (Australia & New Zealand), NBTC (Thailand), SIRIM (Malaysia), RoHS, China RoHS, REACH, WPC (Indian), SDPPI (Indonesia), NTC (Philippines)

Warranty

- 1-year limited hardware warranty