E1000 Bluetooth Edge Gateway

（Indoor Use）

The Cassia Networks E1000 is an industry-leading, enterprise Bluetooth IoT edge gateway. Its patented Bluetooth 1000-ft/300m range, edge computing and remote control of up to 40 Bluetooth low power devices (and 100s in broadcast mode) delivers unparalleled enterprise Bluetooth IoT network value.

The E1000 delivers data analytics and security to the edge of enterprise Bluetooth IoT networks. The E1000 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.

OVERVIEW

The Cassia E1000 Edge Bluetooth gateway intelligently aggregates, secures, analyzes and relays data from diverse 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 IoT settings.

The E1000's enterprise Bluetooth IoT capabilities do not require costly changes to existing Bluetooth low power devices.

Furthermore, the E1000 is not dependent on Bluetooth 5.0 or Mesh. Its patented smart antenna delivers range optimized for horizontal use. The E1000 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.

The E1000'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 power options include a Micro USB adapter plug or Power over Ethernet (PoE).

The Cassia RESTful APIs enable the integration of proprietary end devices to the E1000 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.

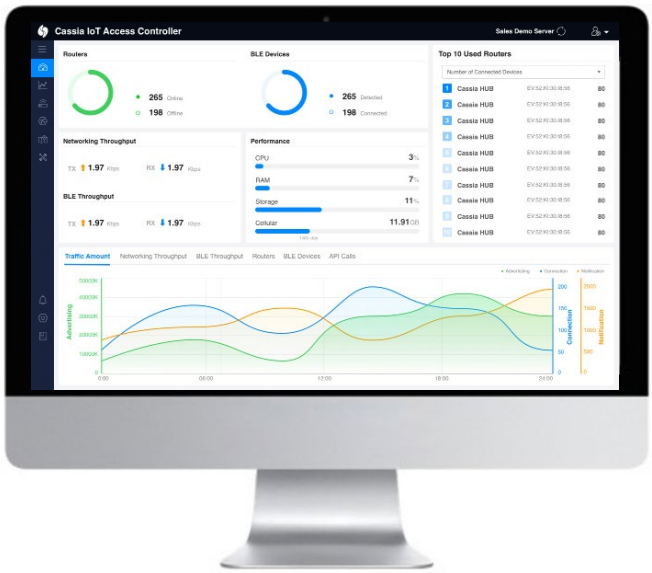

Figure 1 - Cassia IoT Access Controller (AC)

UNIQUE BENEFITS

Reliable long-range Bluetooth, Seamless Coverage

With its smart antenna and RF management technology, the E1000 delivers wall-penetrating Bluetooth coverage of up to 1000 ft /300 m in open space direct line of sight. Its long-range capability increases "connection density" and reduces cost, allowing solution providers to deploy seamless Bluetooth coverage.

Remote Access and Control

The E1000 connects Bluetooth 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 provides a set of RESTful APIs which developers can easily integrate into their native mobile app or cloud applications. The E1000 also provides extended range and routing capabilities which don't require any costly changes to the Bluetooth end devices.

Easy Setup and Management

Cassia's E1000 comes with Wi-Fi hotspot mode which improves the user's overall setup experience when performing an initial installation without network access.
The E1000 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 tracks and reports the location of Bluetooth low power devices, providing geolocation data in real-time.

Flexible Deployment

In a network restricted environment, the E1000 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.

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.

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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 floor 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 and Memory

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

Bluetooth

- Bluetooth low power chip: 2x Nordic nRF52832
- Bluetooth version: 4.0/4.1/4.2, 5 compliant
- Connections: Up to 40 connections
- Frequency: 2.400 to 2.483 GHz
- Data rates: up to 2x1Mbps
- Tx power: Configurable in 3~19dBm (limited by local regulatory requirements)
- Rx sensitivity: -105dBm
- Antenna Gain: 5dBi peak

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 5GHz band, depending on 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 pole 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

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