X2000 Enterprise Bluetooth Gateway

(Optimized for Industrial IoT)

OVERVIEW

The Cassia Networks™ X2000 is a long-range Bluetooth gateway optimized for industrial IoT. It features a ruggedized enclosure, integrated TPM chip, more power/Wi-Fi/antenna options, larger RAM and various enhancements. TheX2000 supports Bluetooth Low Energy (BLE) 5.0. It extends Bluetooth's range up to 1 kilometer and enables remote control of up to 40 Bluetooth Low Energy devices (and hundreds in broadcast mode) without requiring any changes to end devices. The X2000 acts as an Internet Gateway in conjunction with Cassia's IoT Access Controller (AC) for easy deployment and management.

OVERVIEW

The Cassia X2000 enterprise Bluetooth gateway delivers cost-effective connectivity for demanding indoor/outdoor enterprise Bluetooth IoT environments. It supports Power over Ethernet (PoE) and 12V DC. The X2000 easily attaches to a pole or wall with an included mounting kit, or it can be placed on a flat space with an optional desktop stand kit. The all weather-proof, IP66-rated X2000 gateway is ideal for manufacturing facilities, school and corporate campuses, shipyards and outdoor plant facilities.

The X2000 extends Bluetooth connectivity up to 400 meters for Bluetooth 4 and 1 kilometer for Bluetooth 5 in open space direct line of sight using a patented filtering and smart antenna array. Furthermore, the range extension does not require replacing existing Bluetooth low power end devices, nor is it dependent on Bluetooth Mesh. In bi-directional mode, the X2000 can pair and connect up to 40 end devices. While in broadcast/advertising mode, it can listen to hundreds of end devices. Cassia's X2000 can be used as a protocol gateway, which translates between Bluetooth protocol and IP protocol. The X2000 Internet Protocol (IP) backhaul options include Ethernet, 2.4/5GHz Wi-Fi and USB cellular modem. As a result, end devices are remotely accessible and controllable via an Internet application.

The Cassia IoT Access Controller (AC) provides an easy-to-use device management platform. The IoT AC user interface simplifies the deployment and management of thousands of Cassia X2000 gateways and connected end devices (see Figure 1 below).
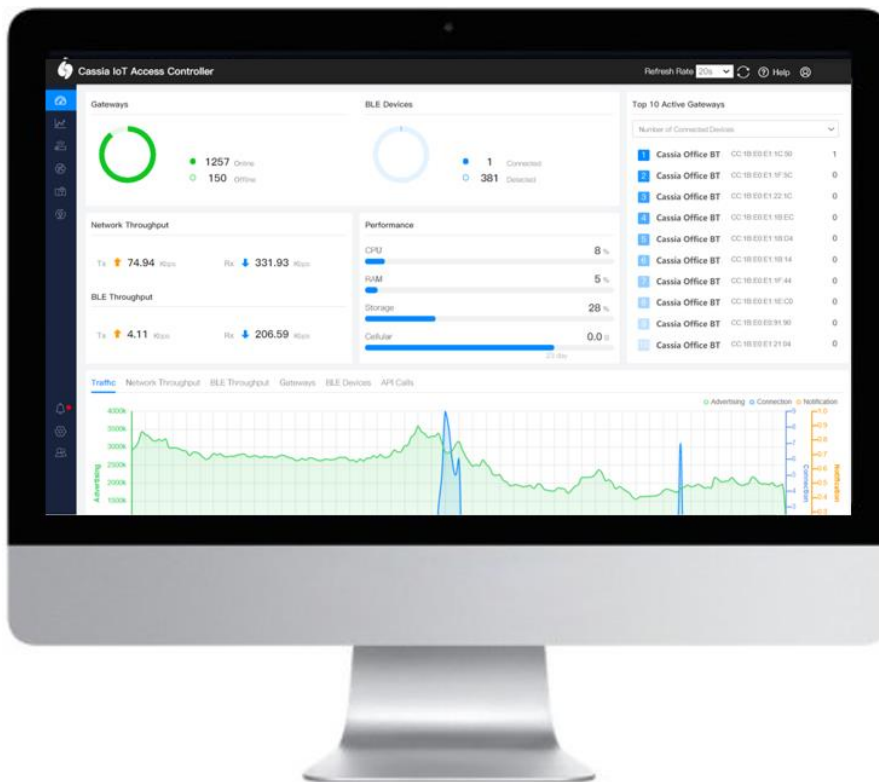

Figure 1 - Cassia IoT Access Controller (AC)

UNIQUE BENEFITS

Reliable Long-Range Bluetooth, Seamless Coverage

The X2000 gateway delivers Bluetooth coverage of up to 400 meters with Bluetooth 4 or 1 kilometer with Bluetooth 5 in open space direct line of sight via the default omni-directional antenna along with radio frequency filtering and management for seamless coverage.

Remote Access and Control

The X2000 gateway connects to end devices and uploads the aggregated device data to the Cassia IoT AC via a LAN or the Internet, which enables remote control of BLE end devices.

Edge Computing

The X2000 can run an application within a container (Linux Ubuntu OS), which provides edge benefits such as reduced latency and cloud costs as well as customized IoT applications and data management.

Cost-Savings and Easy Integration

Using Cassia's RESTful APIs, developers can easily integrate end devices with the X2000 and AC for native mobile apps or cloud applications. The X2000 does not require costly custom end devices or any changes to existing end devices. In addition, with a high number of end connections per gateway, enterprises benefit from significantly reduced deployment and equipment costs.

Easy Setup and Management

The X2000's Wi-Fi hotspot mode improves the setup experience when performing an initial installation without network access. The X2000 is managed by the Cassia IoT AC allowing administrators to quickly provision and check the status of all gateways in an enterprise Bluetooth IoT network.

Bluetooth Location Tracking

Together with the Cassia IoT AC, the X2000 tracks and reports the location of BLE devices, providing real-time geolocation data. It is ideal for digital health as well as personnel and asset-tracking applications.

Bluetooth Roaming

Cassia's patented Bluetooth Roaming technology allows the seamless authentication and mobility of Bluetooth devices from one Cassia gateway to another.

Flexible Deployment

In network-restricted environments, the X2000 gateway is configurable to a "Stand-Alone Mode" where data is sent directly to a local third-party application server. In a remote management situation, the X2000 in "AC Manage Mode" sends data to a remote third-party application via the Cassia IoT AC.

Pure Scan & 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.

ADVANCED FEATURES

Processor & Memory

- CPU: 4 core ARM Cortex-A5, up to 1.5GHz
- RAM: 1GB DDR3 (approximately 700MB for container)
- Storage: 4GB eMMC

Bluetooth

- Bluetooth low power chip: 2x nRF52840
- Version: Bluetooth Low Energy 4.0/4.1/4.2/5.0
- Connections: Up to 40 connections
- Frequency: 2.400 to 2.483 GHz
- Data rates: up to 2x2Mbps
- Tx power: configurable in 3~19dBm (limited by local regulatory requirements)
- Rx sensitivity: -105dBm
- Antenna Gain: 5.7dbi vertical polarized

- Optional: use two external Bluetooth antennas with N-type male connectors

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

- Frequency: 2.4GHz and 5GHz ISM band
- Mode: Wi-Fi client or hotspot (for setup only)
- Tx power:
  12.5 to 17.5dBm for 2.4GHz
  8.5 to 15.5dBm for 5GHz
- 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

- TPM (Trusted Platform Module) chip-based security
- 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 page
- Communication between gateway and AC is based on TLS 1.2 (MQTT) or DTLS 1.2 (CAPWAP)
- 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 options

Power Interface

- Power over Ethernet: 802.3af/at compliant source

- Optional: 12V DC power adapter

- Power consumption: up to 2.5W for normal usage; USB cellular modem adds an additional 2.5W

Other Interfaces

- 10/100 BASE-T Ethernet (RJ-45) uplink

- LED lights: BT/AC/4G/Wi-Fi/Ethernet/System/Power

- Reset button

- USB 2.0 with reset circuit (can be used for optional USB cellular modem)

Mechanical

- Dimensions:

  186mm (W) x 159mm (L) x 254mm (H)

  7-5/16 inch (W) x 6-1/4 inch (L) x 10 inch (H)

- Weight: 1450 g / 51 oz

Environmental

- Operating:

  Temperature: -40°C to +65°C (-40°F to +149°F)
  Humidity: 0% to 90% non-condensing

- Wind resistance:
  Up to 85-MPH sustained winds
  Up to 135-MPH wind gusts

- Storage and transportation:

  Temperature: -50°C to +70°C (-58°F to +158°F)

- IP rating: IP66

Mounting

- Wall or pole mounting kit included

- Optional: desktop stand kit

Certifications

- Available: FCC (US), IC (Canada), CE (Europe), SRRC (China), China RoHS, CB, RoHS, REACH, RCM (Australia & New Zealand), TELEC (Japan), BQB, CRC (Colombia), NCC & BSMI (Taiwan), ANATEL (Brazil), ICASA & NRCS (South Africa), SUBTEL (Chile), IMDA (Singapore), SIRIM (Malaysia), NRTA (Egypt), IFT & NYCE (Mexico)

- Available in 2024: NBTC (Thailand), SDPPI (Indonesia), WPC (India), PTA (Pakistan)

Warranty

- 1-year limited, replacement hardware warranty