

X2000-WP: X2000 Gateway with Wirepas Support (Optimized for Industrial IoT)



OVERVIEW

The Cassia Networks™ X2000-WP Gateway is a long-range IoT gateway that supports both Bluetooth protocol and Wirepas protocol at the same time and is optimized for industrial IoT applications. There are two Bluetooth radio chips inside X2000-WP and two subtypes of X2000-WP:

- 1) X2000-WP1: the first Bluetooth radio chip (chip 0) of X2000-WP is configured to support Bluetooth protocol, and the second Bluetooth radio chip (chip 1) of X2000-WP is configured to support Wirepas protocol.
- 2) X2000-WP2: both Bluetooth radio chips of X2000-WP are configured to support Wirepas protocol.

The X2000-WP features a ruggedized enclosure, integrated TPM chip, larger RAM, and various enhancements and delivers cost-effective connectivity for demanding indoor/outdoor enterprise Bluetooth and Wirepas IoT environments.

The X2000-WP IoT gateway supports Power over Ethernet (PoE) and 12V DC. The X2000-WP easily attaches to a pole or a wall with an included mounting kit, or it can be placed on a flat surface with an optional desktop stand kit. The all-weather-proof, IP66-rated X2000-WP gateway is ideal for manufacturing facilities, schools and corporate campuses, shipyards, and outdoor plant facilities.

The X2000-WP1 extends Bluetooth range up to 400 meters for Bluetooth 4 and 1 kilometer for Bluetooth 5 (using radio chip 0) in a line-of-sight open space environment using Cassia patented technologies. The X2000-WP1 also enables remote control of up to 20 Bluetooth Low Energy devices (and hundreds in broadcast mode) without requiring any changes to Bluetooth end devices.

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 X2000-WP acts as an Internet gateway in the Wirepas mesh network and 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 X2000-WP (running Wirepas Massive) to customers who are Wirepas licensees. The X2000-WP1 and X2000-WP2 can extend the range of Wirepas up to 200 meters and 500 meters in a line-of-sight open space environment, respectively.

The X2000-WP acts as an Internet Gateway in conjunction with Cassia's IoT Access Controller (AC) for easy deployment and management. 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 X2000-WP gateways and connected end devices (see Figure 1 below).

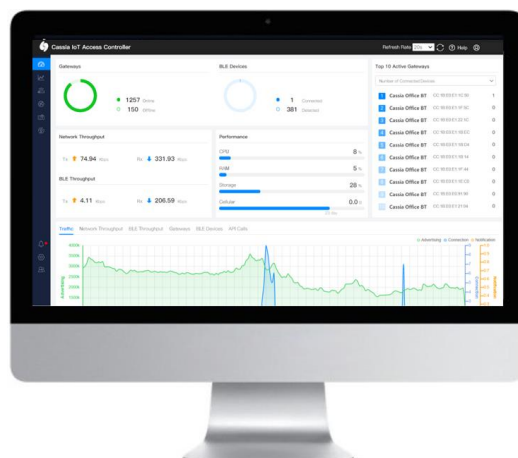


Figure 1 - Cassia IoT Access Controller (AC)

UNIQUE BENEFITS

Supporting Wirepas Mesh Protocol

The X2000-WP gateway can act as an Internet gateway in the Wirepas mesh network. The X2000-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 X2000-WP with dual Wirepas sink/chip only, or opt for an X2000 with a Wirepas sink/chip and a Bluetooth chip.

Reliable Long-Range and Seamless Coverage

The X2000-WP1 gateway delivers Bluetooth coverage of up to 400 meters with Bluetooth 4 or up to 1 kilometer with Bluetooth 5 (using radio chip 0) in open space direct line of sight using Cassia patented technologies. The X2000-WP1 can extend the range of Wirepas up to 200 meters (using radio chip 1) in a line-of-sight open space environment. The X2000-WP2 can extend the range of Wirepas up to 200 meters (for radio chip 1) and up to 500 meters (for radio chip 0) in a line-of-sight open space environment.

Remote Access and Control

The X2000-WP 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-WP 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-WP 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-WP's Wi-Fi hotspot mode improves the setup experience when performing an initial installation without network access. The X2000-WP 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

In conjunction with the Cassia IoT AC, the X2000-WP tracks and reports the location of Bluetooth Low Energy devices, providing real-time geolocation data. It is ideal for digital health and 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 Bluetooth gateway to another.

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

- One Bluetooth low energy chip: nRF52840 or none
- Version: Bluetooth Low Energy 4.0/4.1/4.2/5.0
- Connections: up to 20 connections
- Frequency: 2.400 to 2.483 GHz
- Data rates: up to 2Mbps
- Tx power: configurable in 3~19dBm (limited by local regulatory requirements)
- Rx sensitivity: -105dBm
- Antenna Gain: 5.7dbi vertical polarized
- Optional: can connect to external 2.4GHz antennas with N-type male connector

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)
- Optional: can connect to external 2.4GHz antennas with N-type male connector

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)
- Wi-Fi WPA2 enterprise security (PEAP-MSCHAPv2, EAP-TLS, EAP-TTLS)
- Advanced Bluetooth 128bit AES encryption
- Password-protected gateway web console page
- Communication between the 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
- Storage and transportation:
Temperature: -50°C to +70°C (-58°F to +158°F)
- Wind resistance:
Up to 85-MPH sustained winds
Up to 135-MPH wind gusts
- 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 (plan): NBTC (Thailand), SDPPI (Indonesia), WPC (India), PTA (Pakistan)

Warranty

- 1-year limited, replacement hardware warranty