

BrainBox AI Stat 2

IT Requirements Guide

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Support Model

If you received this thermostat through your local sales representative or installer, please contact them first for support. If additional assistance is needed, reach out to BrainBox AI Support:

- **Phone:** 1-888-211-6789
- **Email:** support@brainboxai.com

Overview

The BrainBox AI Stat 2 is a family of three cloud-connected BACnet thermostats—**BBAI-STAT-2-215HW**, **BBAI-STAT-2-537HW**, and **BBAI-STAT-2-537MHCW**—that easily connect to your building's existing IT/OT networks and communicate with equipment using BACnet/IP over Wi-Fi 6 and BACnet MS/TP industry-standard protocols.

The device can be installed in any location with access to the required network, including control or equipment rooms, though in practice, most units are installed out in occupied spaces using their on-board sensors. Depending on the customer requirements, thermostats might operate based on remote sensing instead of standard on-board sensing options.

BrainBox AI Stat 2 connects to your building's network either by wired connection or wirelessly over Wi-Fi 6, depending on the model. From there, it communicates to the BrainBox AI cloud BMS through your building's internet connection (ISP) or, where cellular connectivity is used instead, through a secure APN, with BrainBox AI establishing a secure VPN connection on top either way. Cellular connectivity (via Cradlepoint) is coming soon and will be added in an updated version of this document, following the transition from current end-of-life cellular hardware to newly supported hardware.

Cybersecurity

BrainBox AI Stat 2 presents a low cybersecurity risk profile due to its streamlined design. This device does not store, process, or transmit sensitive customer or enterprise data. Cybersecurity considerations for the BrainBox AI Stat 2 product family therefore focus on network-level protection rather than device-level defenses. Recommended best practices include deploying the thermostats on segmented building automation networks, restricting unnecessary access, and conforming to site-specific IT security policies. By design, the BrainBox AI Stat 2 minimizes exposure, delivering reliable operation without adding unnecessary cybersecurity complexity.

IP allocation and network segmentation

- BrainBox AI Stat 2 has no Ethernet ports.
- Network connectivity is provided via Wi-Fi 6, which connects directly to the BrainBox AI Cloud BMS (AWS IoT Core) and can also carry BACnet/IP traffic when a comparable edge device is utilized.
- BACnet MS/TP is available separately over the wired RS-485 connection for BMS integration.
- Because a single Wi-Fi interface handles both cloud and BACnet/IP traffic, there's no physical segmentation between internet-facing and BMS-network traffic on that path.
- Any segmentation would need to happen at the network/VLAN level rather than via separate physical ports.
- BrainBox AI Stat 2 must be issued with a DHCP-assigned address for internet access (if using the building LAN).

- If connecting to an alternative IP-based BMS network, a unique static IP address on the BMS subnet must be issued.
- IP addresses can be on the same subnet or different subnets, depending on the building's IT network requirements.

Network requirements

BrainBox AI Stat 2 can operate in standalone mode using local control only, with no network connectivity or network configuration required. For networked deployments, BrainBox AI Stat 2 can connect directly to the cloud over Wi-Fi 6 using secure MQTT over TLS or integrate through an approved supervisory controller (Hub 7) using BACnet/IP over Wi-Fi or BACnet MS/TP with RS-485 cabling daisy-chained to a Hub 7.

This guide defines the applicable IT and OT network requirements for deploying BrainBox AI Stat 2 on a customer network, including wireless compatibility, security, IP addressing, firewall and port requirements, BACnet integration, signal-strength targets, network segmentation, and supervisory-controller connectivity.

For installation, connection, and device-configuration procedures, refer to the *BrainBox AI Stat 2 Installation and Configuration Guide*.

Wi-Fi

Parameter	Requirements
Radio band	• 2.4 GHz only. • Wi-Fi 6 (802.11ax), backward compatible with 802.11b/g/n. • The thermostat cannot join a 5 GHz-only network; a broadcast 2.4 GHz SSID must be available at the site. If one SSID serves both bands, disable band steering for the thermostat SSID during setup.
Security	• WPA2-Personal (AES) or WPA3-Personal (SAE); WPA2/WPA3 mixed mode is also supported for backward compatibility. • WPA3-Personal is recommended where the site network supports it.
Not supported	Open networks, WEP, WPA (TKIP-only), captive-portal networks, and enterprise (802.1X) authentication, unless explicitly approved by BrainBox AI.

IP addressing	DHCP. Confirm that the network segment (including any guest or IoT VLAN) has available leases for every thermostat on the site. A fixed IP address can be set from the thermostat configuration page when required by site IT.
Signal at the device	-67 dBm or better preferred; -70 dBm absolute minimum, -55 dBm is the ideal measured signal strength at the thermostat mounting location.
Access point capacity	Plan for no more than 30 total Wi-Fi client devices (of any type) per access point or router.
Internet access	Outbound access to BrainBox AI cloud endpoints: bbaistat.brainboxai.net and time.google.com. See Port requirements by connectivity type below.

Port requirements by connectivity type

At launch, the BrainBox AI Stat 2 connects to the BrainBox AI cloud BMS (AWS IoT Core) directly over Wi-Fi 6. All cloud connections are outbound initiated; no inbound rules are required. BACnet MS/TP and BACnet/IP integration through an approved supervisory controller (Hub 7) are not supported at launch and will be documented in a future revision of this guide.

For direct cloud connectivity, allow outbound access only to **bbaistat.brainboxai.net** (all device data, certificates, and firmware updates) and **time.google.com** (default SNTP time server). No separate certificate or firmware endpoint is currently used; a dedicated firmware endpoint may be introduced in a future revision of this guide.

Port/protocol	Direct cloud (AWS IoT Core)
MQTT 8883 TCP (mutual TLS)	Required, outbound to bbaistat.brainboxai.net
HTTPS 443 TCP (OTA)	Required, outbound to bbaistat.brainboxai.net
SNTP 123 UDP	Required, outbound to time.google.com (default SNTP server); configurable. Provisioning-critical
DNS 53 UDP	LAN resolver (outbound only if external)
DHCP 68 → 67 UDP (STA)	LAN only
Local services 443/5353/137 (listen)	LAN only, configuration and discovery
SoftAP DHCP 67 (listen)	Commissioning only

Note: BrainBox AI Stat 2 is a BTL-listed BACnet device designed to operate over BACnet/IP via Wi-Fi and BACnet MS/TP networks. Interoperability with third-party BACnet systems should be verified by the installing contractor, system integrator, or organization responsible for the integration.