Autonomous Control Platform. **Any Building, Any System, Any Topology.**

PassiveLogic Hive Controller

The PassiveLogic® Hive™ controller is our central hardware platform, where our physics-based Quantum™ digital twins enable generative design and real-time autonomous control right inside your building. Create custom digital twins and bring any size project to life with the PassiveLogic Hive. The onboard edge-based AI engine makes real-time control decisions based on the underlying physics and dynamics of your whole system. As the first full-stack automation solution, the PassiveLogic Hive platform sets a new industry standard, scaling to any project size or topology by providing all the intelligence, power, communication, and security you need to control your facility—one device replaces a whole catalog of single-purpose controllers.

One Box. One Complete Solution.

The PassiveLogic Hive controller is a fully customizable, pre-manufactured integrated control panel that serves as both an autonomous control engine and user access point (with the built-in capacitive touch screen). Each controller contains an edge-based AI engine, IoT gateway supporting up to 48 software-defined terminals, automated line testing, industrial networking with a 4-port Ethernet switch, and a built-in private network. Thoughtfully designed to solve common problems that installation technicians and building owners confront, the PassiveLogic Hive controller self-manages its network, pinpoints and fixes wiring mistakes, validates control logic, and solves difficult integration issues.

All Intelligence on Board. Welcome to the Edge.

The PassiveLogic Hive platform brings lightning-fast edge computing into your building—raising the bar for speed, reliability, and security that cloud-only solutions can't match. It can also securely connect to the cloud for remote access, digital twin syncing, Qortex AI conversations, and more. The onboard AI engine comes with an 8-core processor that can generate millions of control sequences per second and analyze the future implications of potential control paths to optimize comfort, energy use, and operational costs. Real intelligence, real insight, and real-time control right inside your building is finally a reality.

Just Draw. Don't Code.

Built-in software allows you to import existing designs and transform them into a 3D model. Draw or upload your building's schematics and floor plans, generate designs with Qortex, or quickly scan your facility with the Lens™ mobile app. The PassiveLogic Hive then generatively designs the control topology and interfaces, automatically point-maps, and generates accurate sensor fusion from the building's underlying physics. Once deployed, you also get no-code custom data charts and agentic AI.

PassiveLogic Hive Controller

PassiveLogic Hive Specifications

Display

Size (diagonal)	10.1 in (256.54 mm) capacitive touch screen
Resolution	1920 x 1200 pixels
Slide-up screen	Screen opens to reveal 8 PassiveLogic Cell module bays

Network

Enhanced wireless mesh	100 ft (30 m) maximum mesh hop
WiFi	Stand-alone private network
Ethernet	4-port industrial switch (10/100MB)

Connectivity Options

Protocols built in	BACnet/IP, BACnet/IPv6, Modbus TCP
Protocols w/Multi Cell	BACnet MS/TP, Modbus RTU, 1-Wire

Cell Module Bays

8 Cell® module bays (mix and match from 4 types of Cell modules)	
Multi™ Cell module	6 multi-function ports, general purpose I/O
Relay™ Cell module	3 single-pole, single-throw, normally open relays
Power™ Cell module	2 power control blocks (output equals input voltage)
Motor™ Cell module	2 DC motor control blocks

Environmental Operating Conditions

Operating temperature	-4 to 122°F (-20 to 50°C)
Storage temperature	-22 to 122°F (-30 to 50°C)

Power

Power draw	Up to 80W, up to 4 Amps at 24VAC, up to 7 Amps at 120VAC/240VAC
Low voltage	24VAC, connector accepts 16–26 AWG
High voltage	120VAC/240VAC, connector accepts 12–28 AWG

Mechanical

Height | Width | Depth (screen down)	6.19 in (157.20 mm) | 9.39 in (238.56 mm) | 4.31 in (109.49 mm)
Weight	3.0 lb (1400 g)
In wall mounting	Built-in wall clamping system
Surface mounting (optional)	On wall, channel strut, or DIN rail using accessories

The PassiveLogic Ecosystem

Build: Guided Installation | Automated Commissioning
The underlying physics-based Quantum engine, together with the multi-function Cell® modules, software defined I/O, guided wiring, automated I/O testing, and built-in validation shortens commissioning time by up to 90%. Additionally, the PassiveLogic network auto-configures—no expertise required.

Operate: Autopilot Control | Comfort Management
Our physics-informed AI comfort models continuously commission your building and automatically compute the perfect control path for every zone. Control decisions incorporate all 6 factors of human comfort, taking into account air temperature, radiant temperature, humidity, air flow, and more.

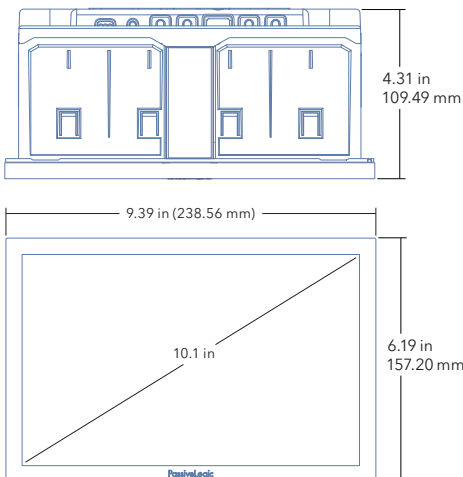**Maintain:** Building Analytics | Issue Management
PassiveLogic provides actionable information, not mere data—with a level of depth that other analytics platforms can't match. The Quantum engine generates deep insights about your building, not just historical trends. By introspecting the underlying physics of a building, it shows not only what happened, but also why.
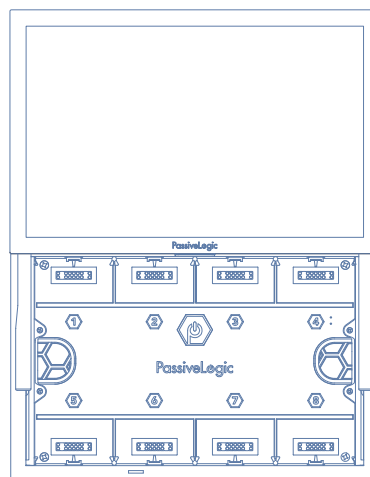
Manage: Portfolio Management | API for Buildings
PassiveLogic's ecosystem significantly reduces time-consuming integration efforts and eliminates institutional expertise barriers, enabling anyone to manage their own autonomous control system. Our API for buildings also enables plug-and-play services for analysis, energy monitoring, building alerts, and more to empower facility managers and owners with the data they need to increase profitability and reduce reliance on third-party expertise.

Screen down: top, front

4.31 in
109.49 mm

9.39 in (238.56 mm)

10.1 in

6.19 in
157.20 mm

Screen up: front

Screen up: back