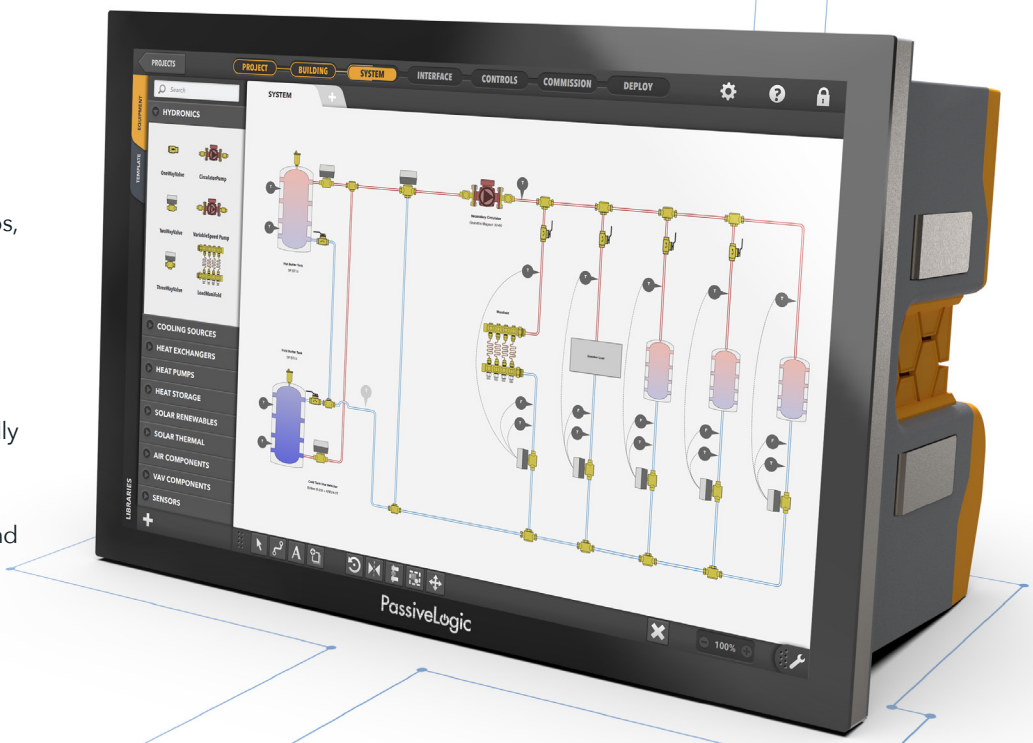
PassiveLogic®

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

Hive Controller

The PassiveLogic® Hive™ controller is the central hardware platform that deploys Quantum™ digital twins to enable real-time autonomous control right inside your building. Design custom digital twins in Autonomy Studio™ and bring any size project to life with the Hive. The onboard edge-based AI Quantum engine makes real-time control decisions based on your building's underlying physics and dynamics. As the first full-stack automation solution, the Hive controller 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 building—one device replaces a catalog of single-purpose controllers.



One Box. One Complete Solution.

The Hive controller is a fully customizable, pre-manufactured integrated control panel that serves as both an autonomous control engine and user access point (at your fingertips, with the built-in capacitive touch screen). Each Hive contains an edge-based AI Quantum 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 VPN. Thoughtfully designed to solve common problems that installation technicians and building owners confront, the Hive self-manages its Ethernet and wireless networks, pinpoints and fixes wiring mistakes, validates control logic, and solves difficult integration issues.

All Intelligence on Board. Welcome to the Edge.

The Hive controller brings lightning-fast edge computing into your building—raising the bar for speed, reliability, and security that cloud-only solutions can't match. The Hive can also securely connect to the cloud for remote access, digital twin syncing, and more. The onboard Quantum 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.

The built-in Autonomy Studio software allows you to import existing building drawings and transform them into an autonomous building system. Draw or upload your building's schematics and floor plans or quickly scan your building with Quantum Lens™. The Hive controller then generatively designs the control topology and interfaces, automatically point-maps, and generates accurate sensor fusion from the building's underlying physics.

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Display	
Size (diagonal)	10.1" capacitive touch screen
Resolution (pixels)	1920 x 1200
Slide-up screen	Screen slides up to reveal 8 PassiveLogic Cell module bays
Network	
Enhanced Bluetooth Mesh	100 ft (30 m) maximum mesh hop
WiFi	Proprietary VPN network
Ethernet	4-port industrial switch (10/100MB)
Connectivity Options	
Protocols built in	BACnet/IP, BACnet/IPv6, BACnet/SC, 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 85W (no Cell modules), up to 4 Amps at 24VAC or 7 Amps at 120/240VAC line-to-neutral (depending on installed Cell modules)
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 clamp system
Surface mounting	Hive Enclosure™

Generative Design. Autonomous Building Control.

Hive Controller

The PassiveLogic Ecosystem

Build: Guided Installation | Automated Commissioning
The underlying physics-based Quantum Engine, together with the adaptable Cell® modules, software defined I/O, guided wiring, automated I/O testing, and built-in validation shortens commissioning time by up to 90%. Additionally, a mesh network of Hive controllers and sensors auto-configures—no networking expertise required.

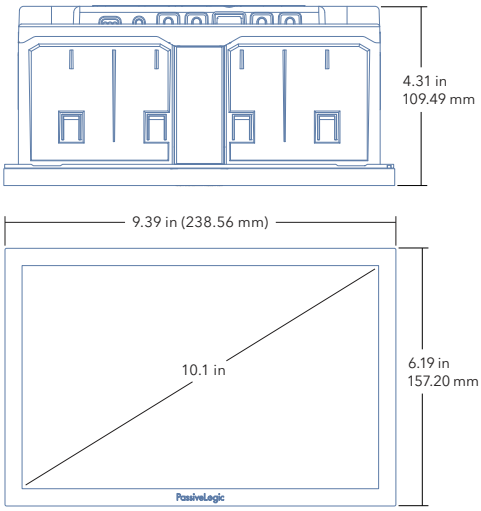
Operate: Autopilot Control | Comfort Management
Our Quantum Engine's physics-informed AI continuously commissions your building. Rather than spending weeks manually tuning control sequences to meet changing set points, our physics-based comfort models automatically compute the perfect control path for every zone. Control decisions are based on a complete model of human comfort, taking into account factors like radiant temperature, humidity, and air movement.

Maintain: Building Analytics | Issue Management
PassiveLogic provides actionable information, not merely data—with a level of depth that other analytics platforms can't match. The Hive Quantum Engine generates deep insights about your building, not just historical trends. By introspecting the underlying physics of a building, it can provide information on not only what happened, but also how, why, and what will happen to enable efficient issue and energy management.

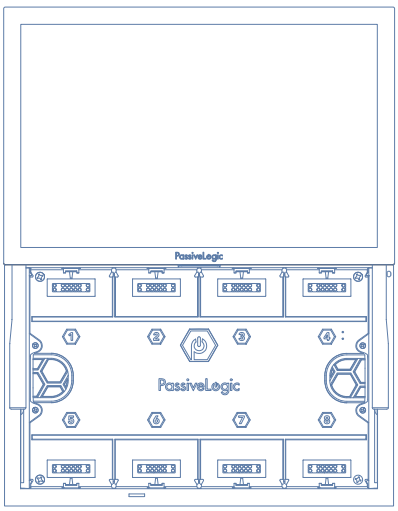
Manage: Portfolio Management | API for Buildings
PassiveLogic's ecosystem significantly reduces time-consuming integration efforts and eliminates institutional expertise barriers, enabling anyone to design, build, and manage their own autonomous control system. Our API for buildings also enables plug-and-play services for analysis, energy monitoring, work order management, building alerts, building supply inventory, and more to empower facility managers and owners with the data they need to increase profitability and reduce reliance on third-party expertise.

Patents: www.passivelogic.com/patents.

Screen down: top, front



Screen up: front



Screen up: back