

PassiveLogic Hive Platform



Installation Guide

The PassiveLogic Hive™ is the heart of our autonomous ecosystem, replacing traditional control panels. The Hive runs a physics-based digital twin of your building, systems, weather, and occupancy to enable generative design and real-time autonomy. Instead of waiting for the cloud, the Hive makes AI decisions at the edge with the compute power of its 8-core NVIDIA Jetson Orin, optimizing controls for comfort and energy efficiency.

The Hive is a customizable, pre-manufactured control panel with a touch screen. It serves as a place to land all of your wired sensors and controllables with the 48 universal, software-defined terminals or 24 relays, and it does automated I/O testing. It's also an IoT gateway for a multitude of wireless devices, has a 4-port Ethernet switch, and creates a self-managing wired and wireless private network. PassiveLogic's Cell® I/O modules snap in to connect wired devices, using toolless lever-lock terminals. The Hive's sliding screen locks in place to protect all of the low and high voltage wiring. Built-in power monitoring and status LEDs support our continuous commissioning features.

Designed to solve millions of control challenges, this compact, full-stack, modular automation device is a general solution that can replace innumerable single-purpose control boxes. Its secure private network isolates IoT devices from the local network. Adding Hive controllers for more I/O combines their power into a single, distributed computation engine.

Use Creator™ on the Hive screen to draw your digital twin, or scan your building with the Lens™ iPhone app. The software then generates the control design, guides the wiring process, creates accurate sensor fusion using the underlying physics, and displays building data. Our Quantum API for buildings lets you set up custom queries, such as system state, energy monitoring, and building alerts.



Hive Specifications

Display

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

Network

Wireless	Bluetooth range: Up to 100 ft (30 m)
Ethernet	Stand-alone private network & isolated IoT network, 4-port industrial switch (10/100MB)

Connectivity Options

Protocols	BACnet/IP, Modbus TCP
Protocols w/Multi Cell	1-Wire protocol

Cell Module Bays

The Hive includes 8 Cell[®] module bays, allowing you to mix and match different types of Cell modules for your different applications, or run with none at all, depending on the needs of your system.

Multi™ Cell module	6 multi-function terminals, universal software-defined I/O
Relay™ Cell module	3 single-pole, single-throw, normally open relays

Powering the PassiveLogic Hive

Power draw	Up to 4A @ 24VAC nominal. Max load 98 VA.
Input voltage	24VAC, 16-20 AWG
Stripping length	5 mm

Environmental Operating Conditions

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

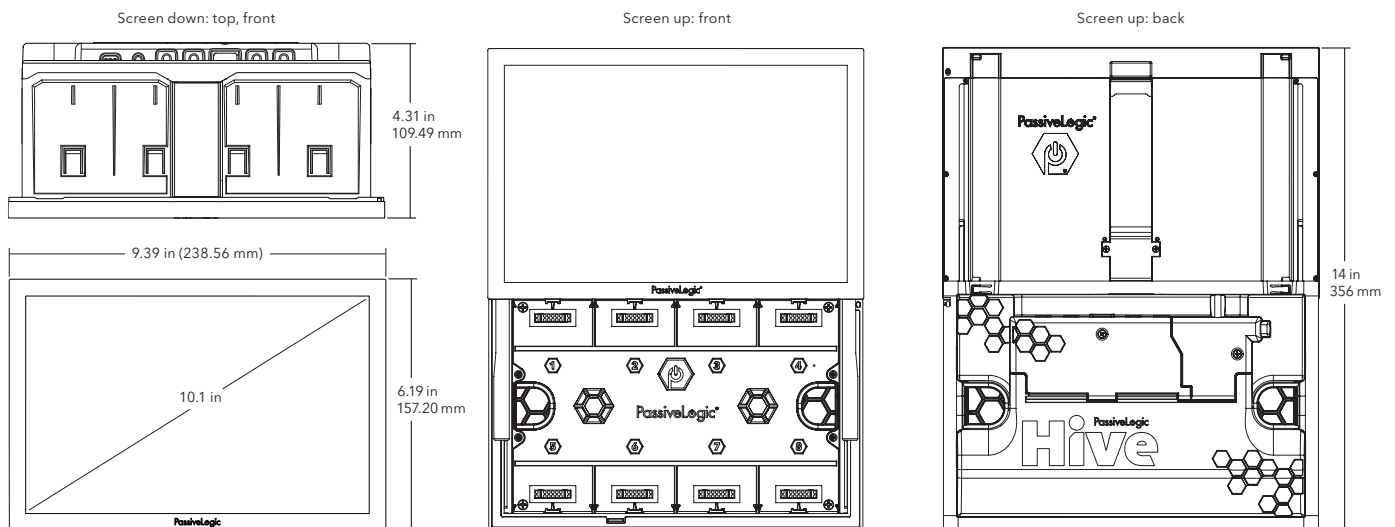
Mechanical

Height Width Depth (screen down)	6.19 in (157.20 mm) 9.39 in (238.56 mm) 4.31 in (109.49 mm)
Weight	3.4 lb (1550 g)

Mounting Options

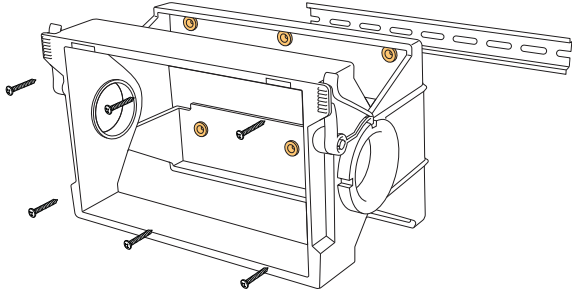
Surface mount	Mount with pivot frame accessory. Use 6 fasteners appropriate for the surface.
DIN rail mount	Mount with pivot frame accessory. Make sure panel or enclosure has adequate ventilation. Use 6 fasteners appropriate for the surface behind the DIN rail.

Dimensions

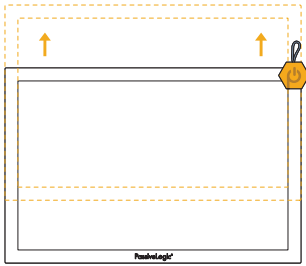


How to mount the Hive

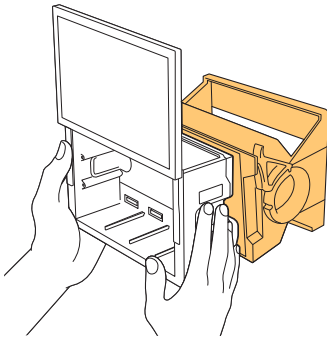
1. Turn off power before installing. Level and install the pivot frame using the 6 screw holes on the back, with fasteners appropriate for the surface. (Optional) For DIN rail, rest the top of the slot on the rail, then install 6 fasteners in the surface.



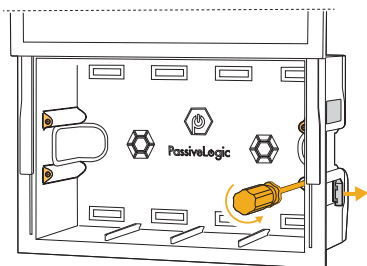
2. With the Jewel magnet key in place, slide up the screen of the Hive until fully extended. Make sure you hear the latch pin click before sliding up.



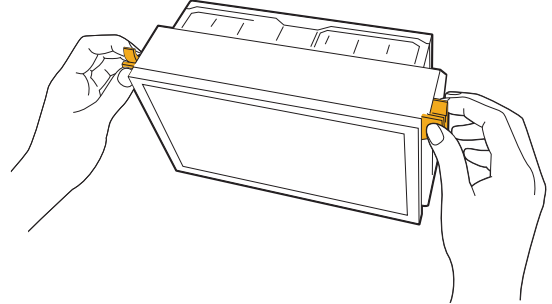
3. Insert the open Hive into the pivot frame.



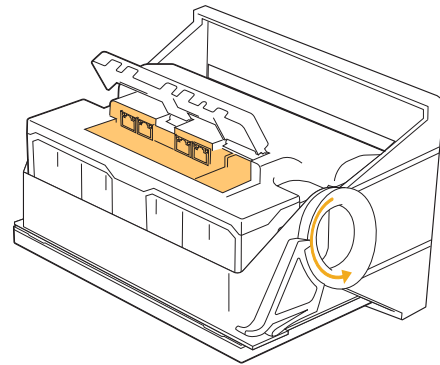
4. To clamp the Hive onto the pivot frame, hand-tighten the four screws clockwise using a #0 Phillips head screwdriver. Avoid over-tightening.



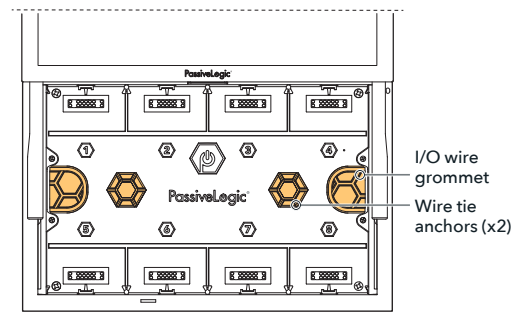
5. Close the Hive screen. Pinch the pivot levers on the side of the frame and rotate the top of the Hive toward you.



6. Connect 24VAC power, Ground, and Ethernet to the Hive, opening the back doors of the Hive with a #0 Phillips head screwdriver (see next page.)

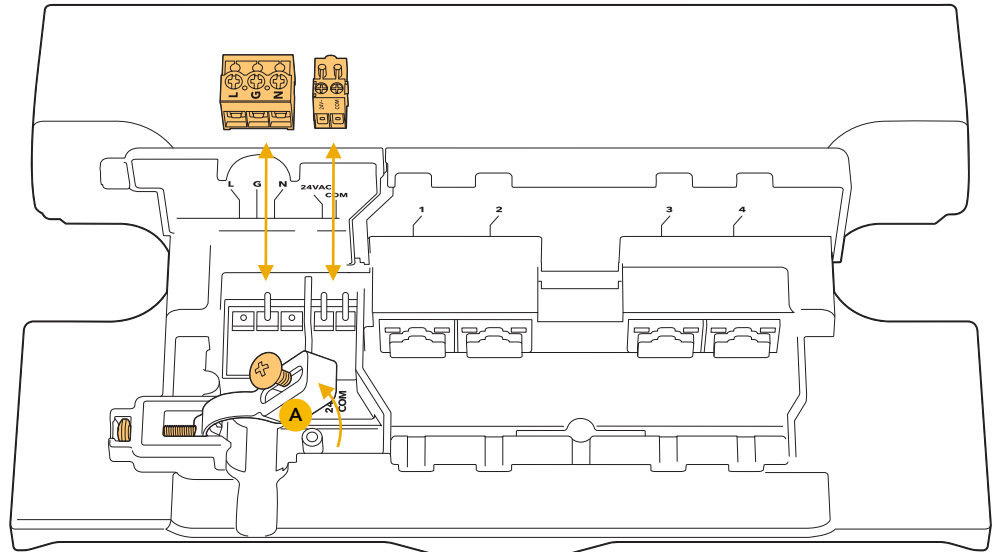


7. To run I/O wires into the Hive, rotate it upright, open the screen, and feed the wires through the side grommets of the Hive. You can secure them to the anchors inside, using zip ties. Following your control design, connect I/O to Cell modules (see page 7).

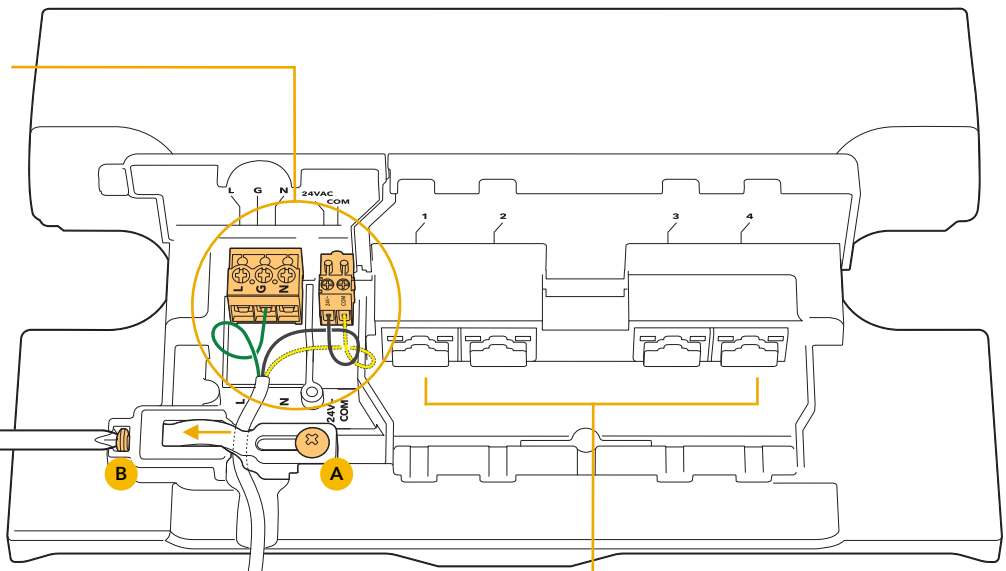


Wiring Hive Power & Ethernet

1. Open the wire clamp by loosening screw **A**. Remove the connectors for easier wiring.



2. Attach wires to connectors, allowing enough length for a service loop. Insert your cable under the wire clamp.
3. Replace screw **A** loosely.
4. Tighten wire clamp with screw **B** to secure your cable, for strain relief.



5. Tighten screw **A** to secure wire clamp.
6. Insert Ethernet cables as needed.

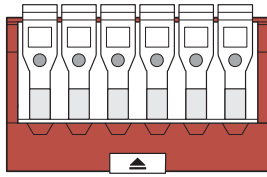
Hive and Hive Mini controllers create a private, stand-alone network. We recommend a ring topology for maximum resiliency, enabling redundant communication paths for both wired and wireless systems.

Hives and Hive Minis also serve as distributed wireless access points for Sense Nano sensors.

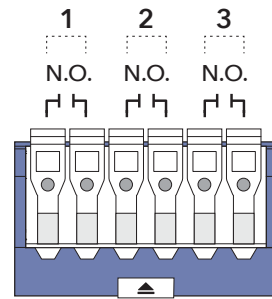
7. Following your control design, install and wire Cell I/O modules.

⚠ WARNING: This is a Class II electrical product. Use a Class II or Class III rated transformer, dedicated to a single PassiveLogic Hive controller. The PassiveLogic Hive controller must be grounded to a reliable earth ground. Email info@passivelogic.com for additional safety guides.

Cell Module Specifications



Multi Cell



Relay Cell

Multi Cell Contacts

Type	6 universal software-defined terminals, allowing flexible terminal assignments (including Com) for easier wiring and configuration.
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Multi Cell Input per Terminal

Voltage	0-24VAC, 0-24VDC, continuously monitored
Resistance	0-1MΩ, auto-ranging
Current	0-20mA

Multi Cell Output per Terminal

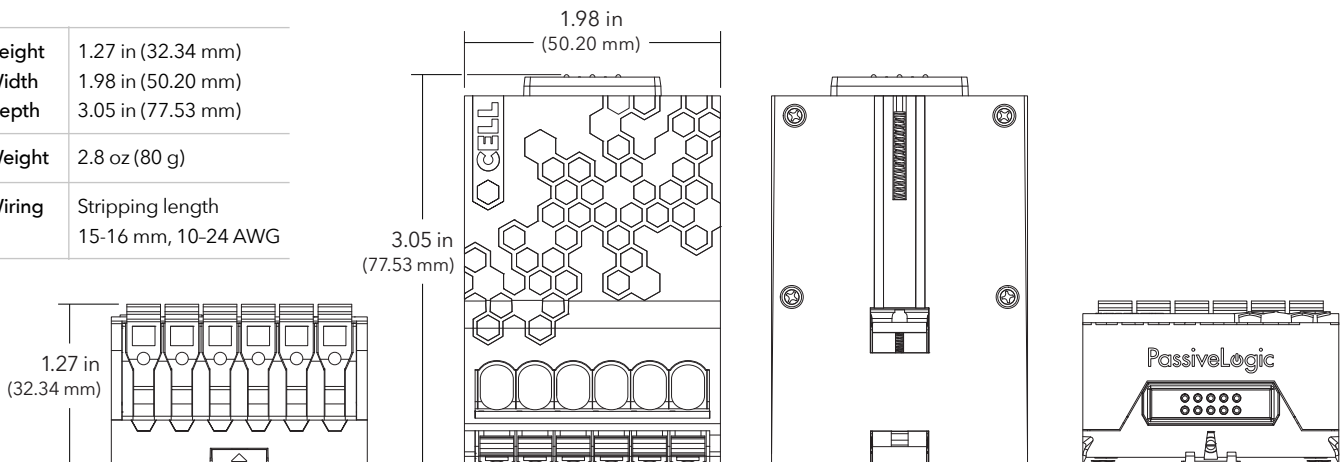
Protocols	1-Wire
0-24VDC analog output	0-24VDC (programmable), 40mA per channel <ul style="list-style-type: none"> 4-20mA 0-10VDC Powering devices up to 24VDC and 40mA
12VDC output	12VDC, 500mA per channel
AC output	24VAC, 500mA per channel
Ground	All software-defined and individually groundable

Relay Cell Contacts

Type	3 single-pole, single-throw, normally open (N.O.) relays, distributed across the 6 terminals in the configuration shown above.
Maximum amperage	10A per terminal pair (Take all proper safety precautions)
Voltage	24VAC/30VDC
Power monitoring	Monitors AC voltage and current, and DC power, for the contacts of each relay
Supported devices	Motors, fans, pumps, lighting, and many more

Dimensions

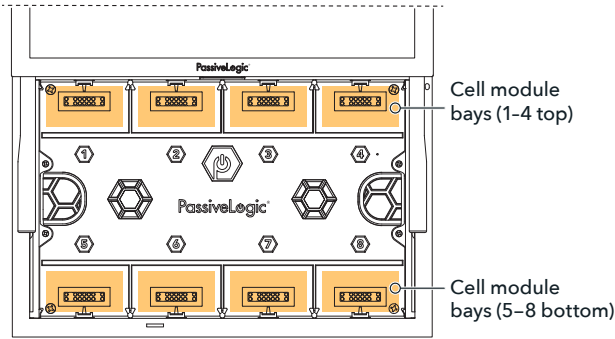
Height	1.27 in (32.34 mm)
Width	1.98 in (50.20 mm)
Depth	3.05 in (77.53 mm)
Weight	2.8 oz (80 g)
Wiring	Stripping length 15-16 mm, 10-24 AWG



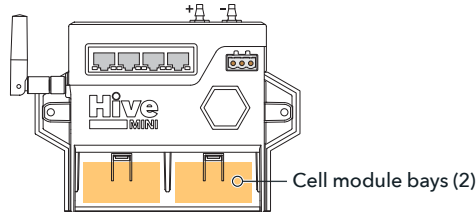
Installing Cell Modules

Cell I/O modules are where you land field wiring from sensors and controlled devices, allowing the Hive and Hive Mini to read inputs and drive outputs.

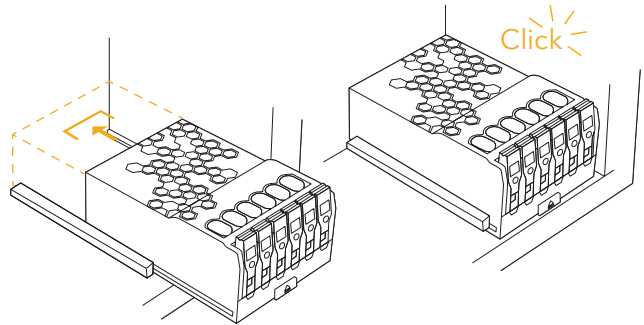
Hive controller (screen up)



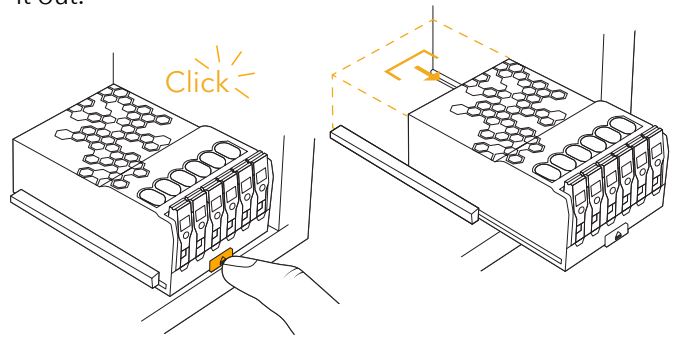
Hive Mini controller



To **insert** a Cell module into a module bay, align the grooves along the base of the Cell with the guides on the bay, then push until it clicks into place.



To **remove** a Cell module, press the release button at the bottom center of the Cell to unlock it, then slide it out.

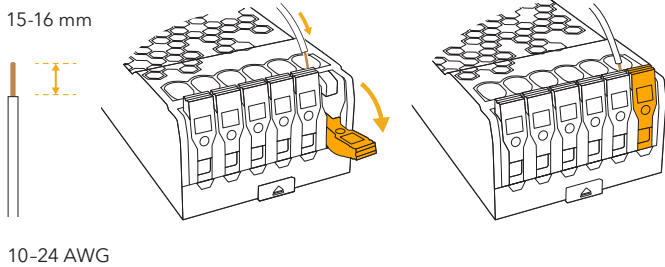


Wiring I/O

Using the lever-lock terminals

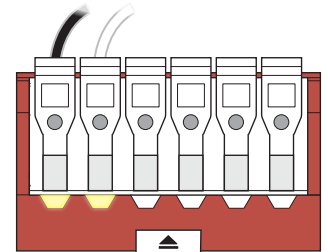
Cell modules incorporate toolless lever-lock terminals.

- To **add** a wire, simply flip open the terminal lever, insert the appropriately stripped wire, then close the terminal lever.
- To **remove** a wire, reverse the process.



Verifying connections (LED indicators)

LEDs show the status of the physical wiring as compared to the intended design in your digital twin.



LED	Wiring status
Off	Empty: This terminal is not used in your current design.
White	Unverified: The expected wire connection is in process of being verified. If this persists, check wiring.
Green	Verified: The wiring on this terminal is fulfilled and is verified to be functioning as expected.
Red	Error: Examples of error states include over voltage detected, device not connected, transient errors, previously verified connection no longer responding, or need to check wiring.

Wiring Example

The PassiveLogic Hive is designed to handle millions of building control applications. This section highlights a few examples.

Mechanical RTU control, valves, and temperature sensor

Multi Cell terminals are software defined, so wiring placement is flexible.

