

groov EPIC PROCESSOR

Features

- > Web-based commissioning, troubleshooting, and *groov*® View HMI display with built-in security and authentication
- > High-resolution LCD display with touch capability
- > Dual independent Gigabit Ethernet ports
- > Dual USB ports for serial communications, touchscreen monitors, or WiFi adapter
- > Supports up to 16 *groov* I/O modules
- > *groov* Manage, *groov* View, Node-RED, and Ignition Edge® software
- > UL Hazardous Locations approved and ATEX compliant

DESCRIPTION

The Edge Programmable Industrial Controller is an embedded Linux®, real-time controller with gateway functions.

The modern design of the *groov* EPIC processor offers a condensed and sturdy unit that features a resistive-touch, high-resolution LCD display. The LCD display lifts to provide easy access to the power button, power supply connectors, network interfaces, ports, and status LEDs.

- Dual, independent Gigabit Ethernet network interfaces enable the processor to maintain separate connections to your back office network and your controls network.
- Dual USB ports extend the capabilities of the processor so it can handle serial communications, communicate with touchscreen monitors, or connect to your network with approved WiFi adapters.
- HDMI port displays configuration and *groov* View HMI on an external large screen, which is also useful for OEM applications where the EPIC system is built into a machine.

The processor can operate through a wide range of operating temperatures (-20 to 70 °C) and with its sturdy design, it can be used in a large variety of applications and operating environments. It runs on an industrial, quad-core ARM® processor with a real-time, open-source Linux operating system.

Software tools include:

- *groov* Manage for browser-based management of your *groov* EPIC system
- *groov* View for building and viewing custom operator interfaces for local, mobile, and browser-based devices



GRV-EPIC-PR1 processor

- PAC Project™ Basic Software Suite for developing control programs and a traditional HMI (plus available Shell access for custom applications you write)
- Node-RED for creating simple logic flows using pre-built nodes
- Ignition Edge® from Inductive Automation® for connecting to Allen-Bradley®, Siemens®, and Modbus®/TCP devices via OPC UA, and for efficient IIoT communications using MQTT with Sparkplug payload

You can run complex control programs on the *groov* EPIC processor developed with PAC Control or your own custom applications.

The *groov* Manage app is your central command to your *groov* EPIC system, helping you configure, troubleshoot, and commission your controller, I/O modules, and network interfaces. The consistency in interface design between the *groov* Manage app running on the *groov* EPIC processor and the *groov* Manage app running on your computer, smartphone, or tablet ensure a seamless experience between devices. You don't have to remember to do something different for each device to achieve the same result.

groov View offers easy browser-based development of a custom HMI with trending, events, and user notification. Communications are secured with user authentication and encryption. And, because the

Part Numbers

Part	Description
GRV-EPIC-PR1	On-the-rack controller for the <i>groov</i> EPIC system.

Preliminary



HMI is independent of operating system, what you build can be viewed on any authorized device.

The *groov* EPIC system

The GRV-EPIC-PR1 is part of the *groov* EPIC system, which provides a complete control and communications system at the network's edge, including:

- **I/O.** Connect to field devices and translate their electrical signals into the ones and zeros that computer systems understand.
- **Control.** Automate equipment and systems at the network's edge. Use the included flowchart-based control development software, or build your own custom program.
- **Data handling.** Acquire, move, and share data from industrial systems, legacy equipment, business and IT systems, and the cloud.
- **Visualization.** Securely monitor, control, and use data as you need it—locally, on premises, or from anywhere using an

authorized mobile device, computer, or anything with a web browser.

The *groov* EPIC system builds on decades of field-proven design and modern open standards to give you reliable industrial automation plus a full Internet of things (IoT) communication structure, built-in.

The system includes processor, software, I/O modules, chassis, and power supply.

The chassis holds the power supply, processor, and other I/O modules you need for your application. See the chassis data sheet (form 2247).

Power supplies are available for AC power, DC conversion, and pass-through connections from a power supply you already own. See the power supplies data sheet (form 2246).

The I/O modules connect a variety of field devices to your *groov* EPIC system. The following table lists the available I/O modules and the form numbers to learn more about them.

Module description	Part numbers	Form number
<i>groov</i> 85–140 VAC Input Modules	GRV-IAC-24, GRV-IACI-12, GRV-IACS-24, GRV-IACIS-12	2226
<i>groov</i> 120–280 VAC Input Modules	GRV-IACHV-24, GRV-IACIHV-12, GRV-IACHVS-24, GRV-IACIHVS-12	2222
<i>groov</i> 6–32 VDC Input Modules	GRV-IDC-24, GRV-IDCS-24, GRV-IDCI-12, GRV-IDCIS-12	2236
<i>groov</i> 2.5–16 VAC VDC Input Modules	GRV-IACDCTL-24, GRV-IACDCTLS-24	2237
<i>groov</i> Analog Input Module	GRV-IMA-24	2239
<i>groov</i> Analog Thermocouple/Millivolt Module	GRV-ITMI-8	2240
<i>groov</i> Analog Voltage Input Module	GRV-IV-24	2241
<i>groov</i> 12–250 VAC Output Modules	GRV-OAC-12, GRV-OACI-12, GRV-OACS-12, GRV-OACIS-12	2231
<i>groov</i> 5–60 VDC Output Modules	GRV-ODCI-12, GRV-ODCIS-12	2238
<i>groov</i> DC Output Sourcing Module	GRV-ODCSRC-24	2242
<i>groov</i> Analog Voltage and Current Output Module	GRV-OVMALC-8	2244
<i>groov</i> Mechanical Relay Output Module	GRV-OMRIS-8	2243

Preliminary

INSTALLING AND REMOVING THE PROCESSOR

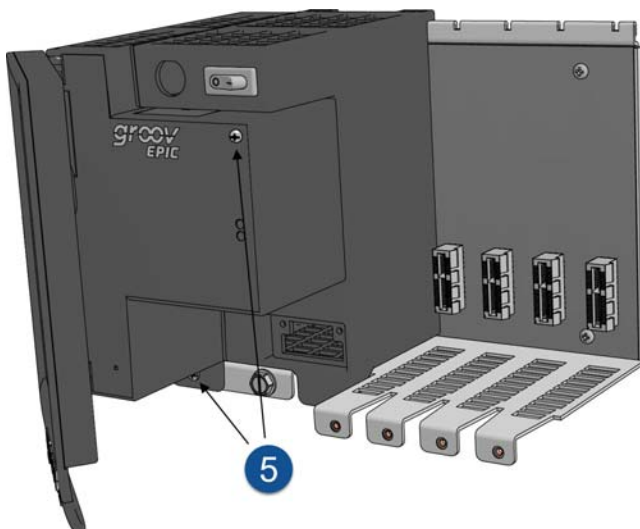
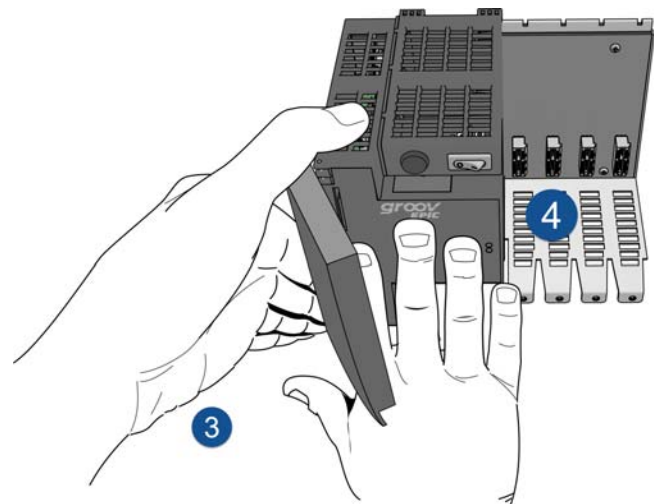
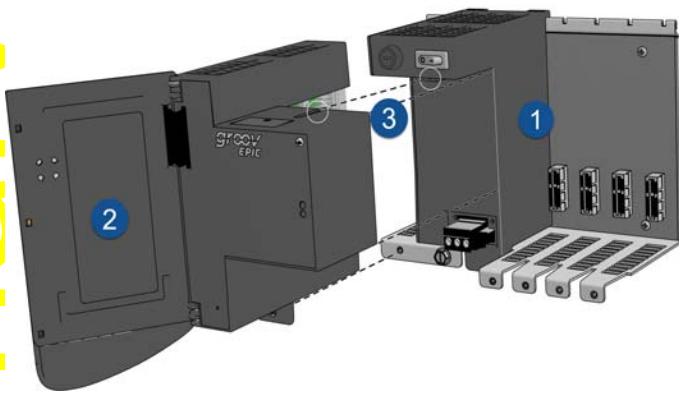
Installing the processor

1. Make sure you installed the power supply according to the directions in the power supplies data sheet (form 2246).
2. Lift the LCD display so you can see the gap on the processor.
3. Hold the processor by the sides, with both hands, and make sure that the gap on the processor aligns with the tab on the power supply.
4. Guide the processor straight onto the power supply, pushing until you feel the processor slide firmly into the chassis and the processor resists further pressure.

You can push on the processor to ensure that it is firmly inserted.

IMPORTANT: Do not push on the LCD display.

5. Tighten the retention screws that attach the processor to the power supply and the chassis to the recommended torque listed in "Specifications" on page 5.
6. Close the LCD display.



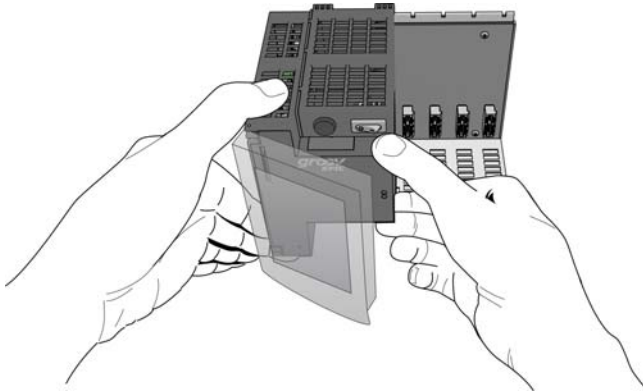
Preliminary

Removing the processor

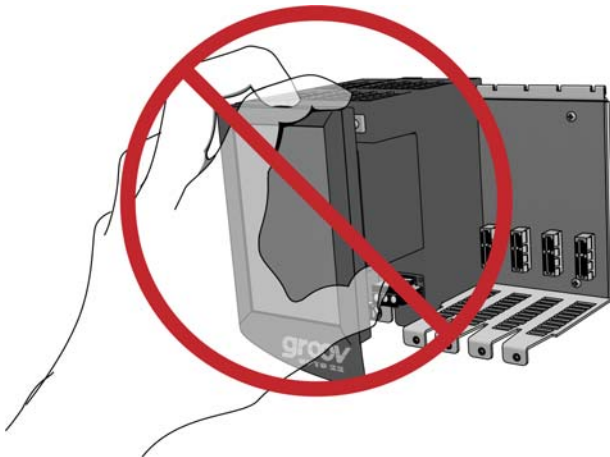
1. Turn off the unit.

IMPORTANT: Do not attempt to remove the processor and power supply as a single unit.

2. Lift the LCD display so that you can access the retention screws.
3. Remove the retention screws that attach the processor to the power supply and the chassis.
4. Grab the processor with both hands, one hand on the left side and the other hand at the top.



IMPORTANT: Do not attempt to remove the processor by grasping the screen.



5. Pull the processor straight out. Do not wiggle the processor.
6. Close the LCD display.

Preliminary

SPECIFICATIONS

Specification	GRV-EPIC-PR1
Power requirements	7.1 W typical, 9.1 W max.
Memory	2 GB RAM, 6 GB user space
Backup battery for real-time clock	BR2032
Screen size and resolution	5 inches diagonal; 800 x 480 pixels
Ethernet Communication (wired)	Two independent 10/100/1000 Mbps RJ-45 connectors, each with a separate IP address (separate subnets)
Ethernet Communication (wireless)	802.11 b/g/n (optional; requires purchase of a third-party commercial USB WiFi adapter that has been tested and approved by Opto 22)
Security (wireless)	WEP64 WEP128 WPA PSK (also called WPA Personal) WPA2 PSK (also called WPA2 Personal)
USB	USB 2.0 (two: used for backing up, restoring, WiFi, and connecting to serial devices via a USB-to-serial converter with an FTDI chipset)
HDMI	Type A
Torque, bottom hold-down screw	3.5 in-lb (0.4 N-m)
Torque, top hold-down screw	1.5 in-lb (0.17 N-m)
Operating temperature	-20 °C to +70 °C
Storage temperature	-40 °C to +85 °C
Relative Humidity	5–95%
Agency approvals and certifications	UL/cUL (Class 1 Div. 2); CE, ATEX (Category 3, Zone 2), RoHS; DFARS

Preliminary

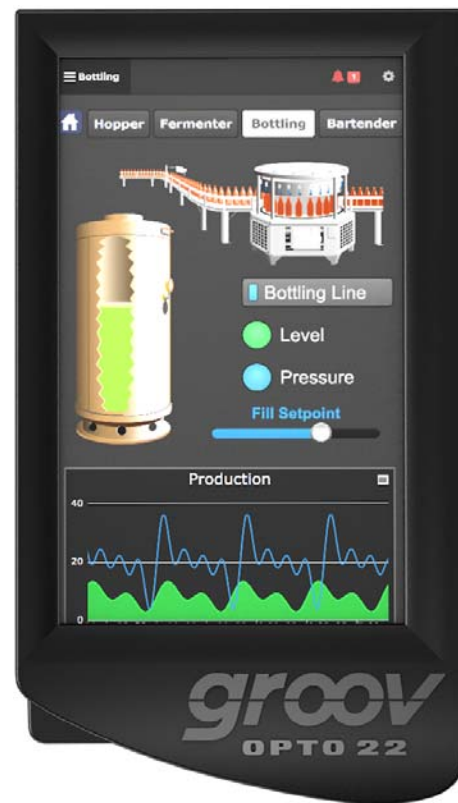
LCD DISPLAY

The LCD display features resistive-touch capability, which means you can manipulate the display with gloved fingers or a stylus (not included).

The LCD display is your window to the world inside the processor. From the display you can:

- Configure and troubleshoot the I/O modules mounted on the chassis.
- Configure the Ethernet network interfaces, configure your firewall, and create rules to control access to the ports.

- View the current state of input modules and set the state of output modules.
- Access a library of information about all of the *groov* modules available through Opto 22, including specifications and wiring diagrams.
- Review logs for troubleshooting.
- View your *groov* View HMI.



Preliminary

LEDs, NETWORK INTERFACES, AND PORTS

This diagram describes the LEDs, network interfaces, and ports on the *groov* EPIC processor. All of these interfaces and indicators are easily accessed by lifting the LCD display. When the LCD display is closed, it does not interfere with cables connecting the PR1 to external devices such as a remote monitor.

Independent Ethernet network interfaces

The Ethernet network interfaces are independent, which means they are not connected internally. Each requires its own IP address.

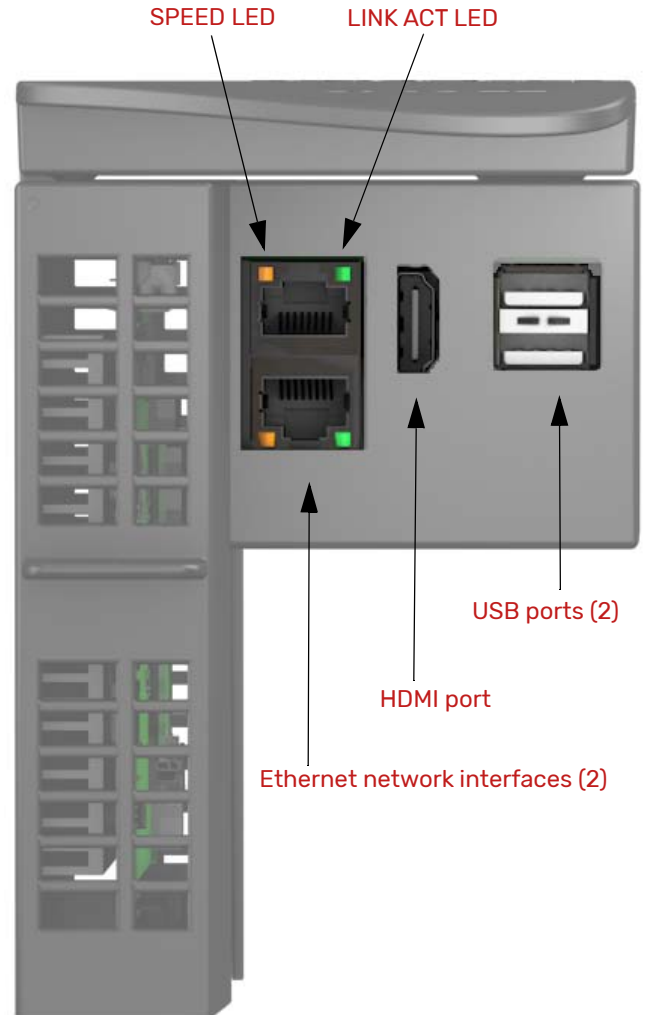
LEDs

LED	Indicates
SPEED LED	Indicates link speed
LINK ACT LED	Indicates links status or activity
POWER (shown below)	Indicates status of power (on, outside normal range, or battery low)
STATUS (shown below)	Indicates whether the unit is running with full functionality.

Ports

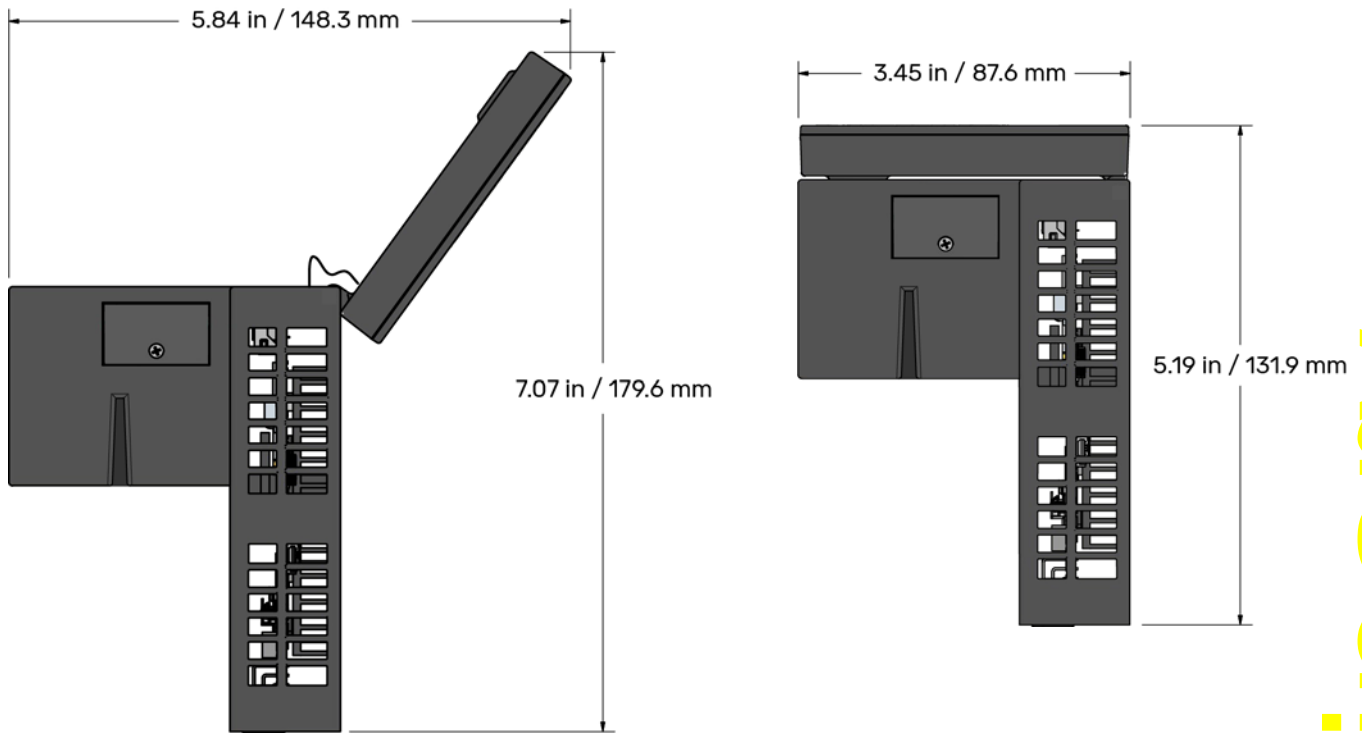
The HDMI port offers a connection to a remote monitor, such as an HDMI-ready touch-screen monitor, so that you can display *groov* Manage or your *groov* View HMI on a large screen.

The two USB ports offer ways to extend the capabilities of your PR1 with serial communications or WiFi. You can connect a compatible WiFi adapter so that you can access your I/O unit through WiFi.

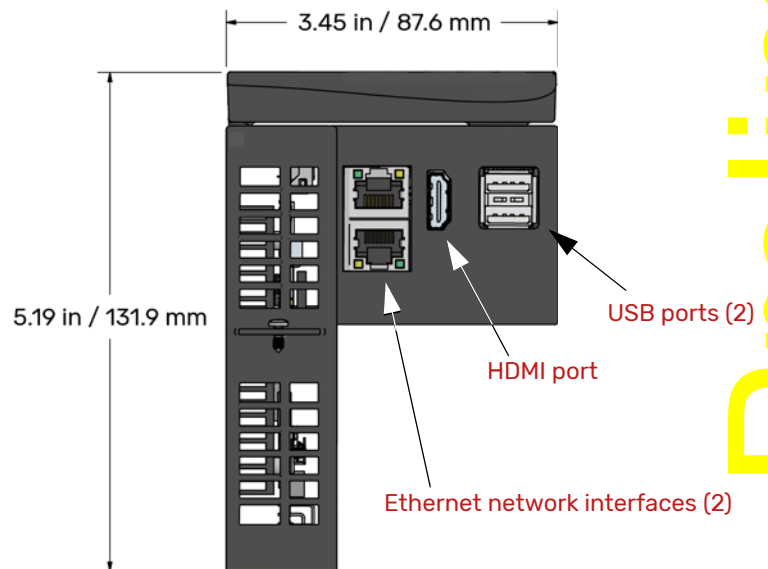


Preliminary

DIMENSIONS: GRV-EPIC-PR1

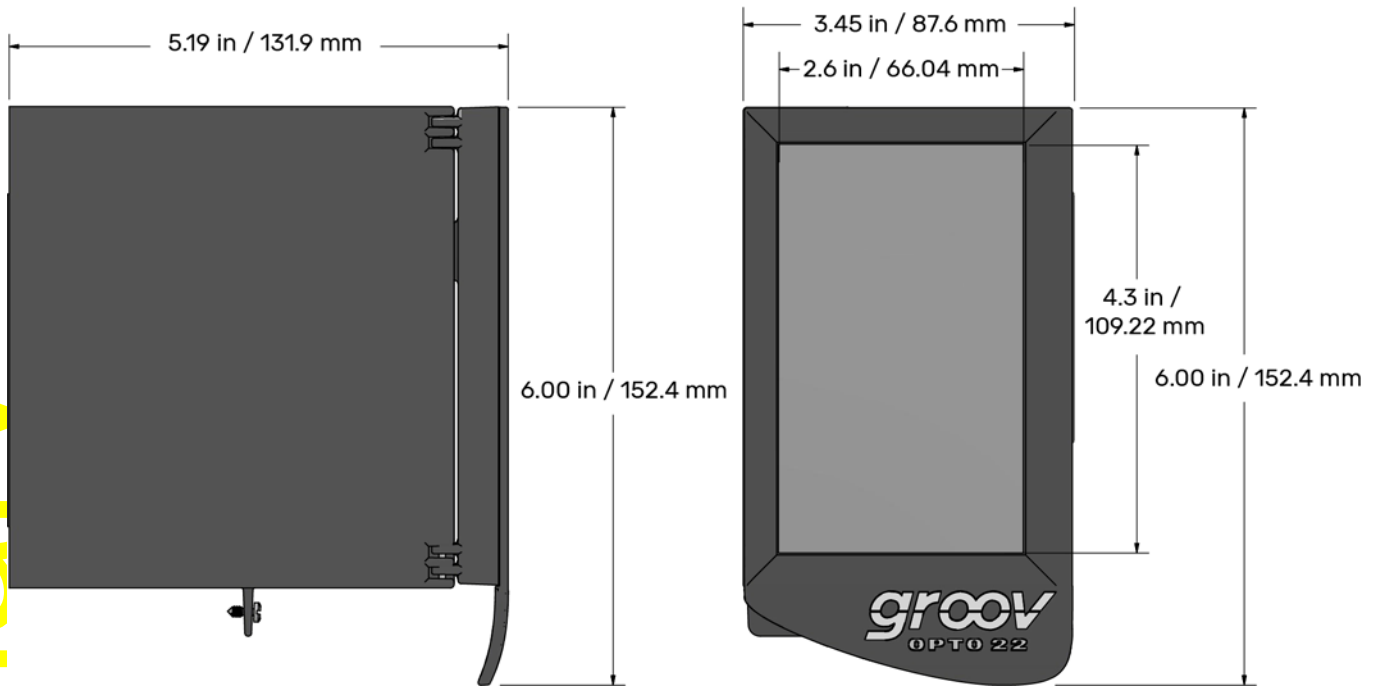


The processor features an LCD display that swings open and closed. The diagram above shows the LCD display open to its fullest extent. The diagrams on the right show the LCD display closed.



Preliminary

Preliminary



HARDWARE ARCHITECTURE

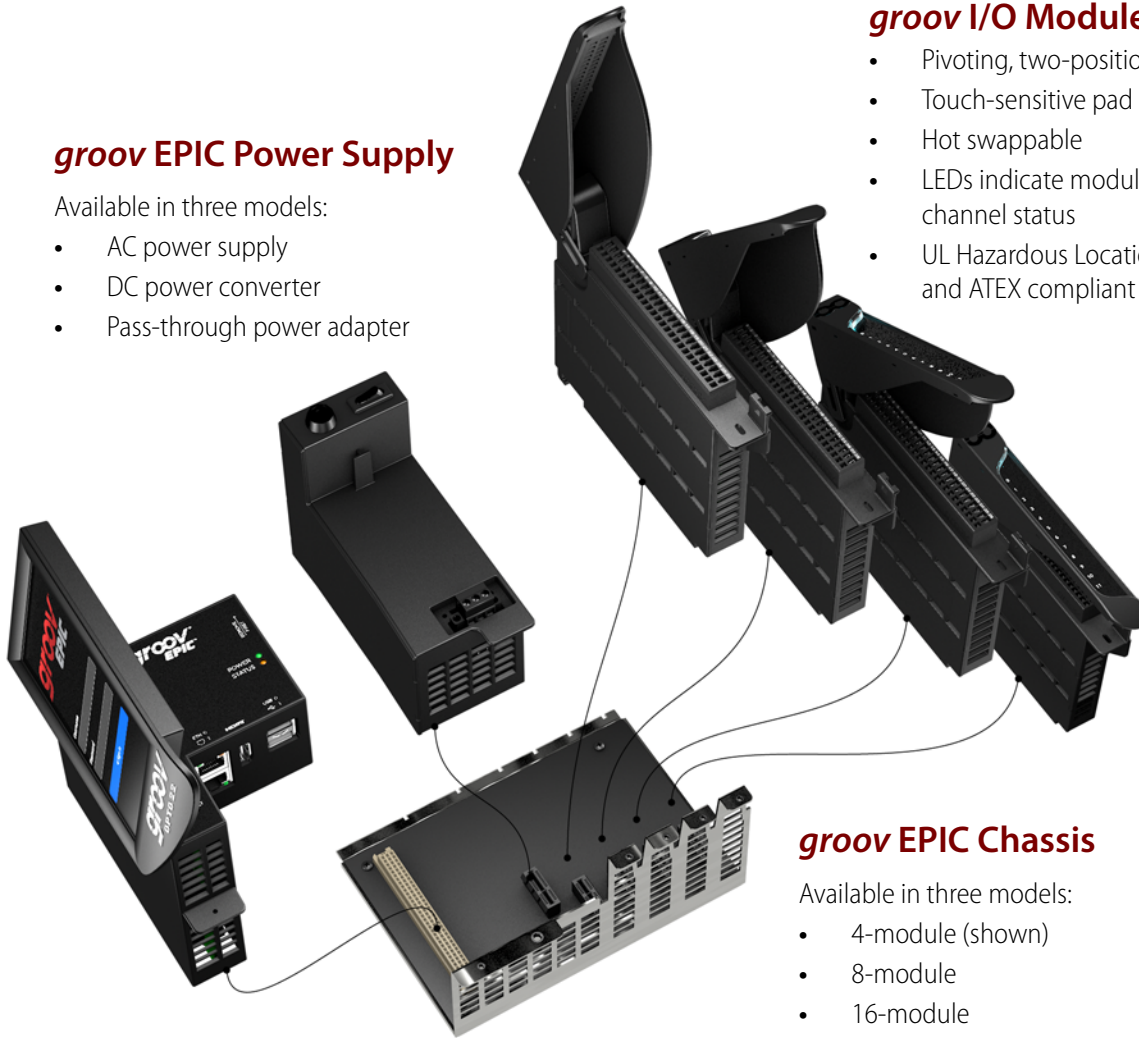
groov EPIC Power Supply

Available in three models:

- AC power supply
- DC power converter
- Pass-through power adapter

groov I/O Modules

- Pivoting, two-position cover
- Touch-sensitive pad
- Hot swappable
- LEDs indicate module health and channel status
- UL Hazardous Locations approved and ATEX compliant



groov EPIC PR1 Processor

- Web-based commissioning, troubleshooting, and *groov* View HMI display
- *groov* Manage, *groov* View, Node-RED, and Ignition Edge software
- LCD touch display
- Dual USB ports for serial communications, touchscreen monitors, or WiFi adapters
- HDMI port for external monitors, regular or touchscreen
- Dual independent Gigabit Ethernet network interfaces
- Supports up to 16 *groov* I/O modules

groov EPIC Chassis

Available in three models:

- 4-module (shown)
- 8-module
- 16-module

Preliminary