

groov180–280 VAC Input Modules

Features

- > 12 or 24 channels per module
- > Module cover with LED indicates module status
- > Touch-sensitive pad triggers display of module information on *groov* EPIC® processor's display
- > Operating temperature: -20 to 70 °C
- > UL Hazardous Locations approved and ATEX compliant
- > Guaranteed for life

DESCRIPTION

groov I/O modules are part of the *groov* EPIC® (Edge Programmable Industrial Controller) system. Wired directly to field devices (sensors and actuators), *groov* I/O translates the electrical signals from those devices into the digital language computers understand—so you can monitor and control devices and use their data wherever you need it, in your local computer network or in cloud services.

These *groov* AC input modules sense status from devices that use a 180–280 VAC /VDC signal.

You can sense status from up to 24 devices using a 24-channel module, or up to 12 devices using a 12-channel module.

Choose the module you need based on your requirements:

- The **GRV-IACHV-24** module provides 24 channels per module. Field devices are isolated from the logic side of the module, but channels are not isolated from each other: they share a common connection inside the module.
- The **GRV-IACIHV-12** module provides 12 channels per module, with channel-to-channel isolation.
- The **GRV-IACHVS-24** and the **GRV-IACIHVS-12** modules provide input state only, offering a lower cost option for projects that require only on/off status.

See "Features and Specifications" on page 2 for more information.

Wiring is simplified with a top-mounted connector, which provides spring-clamp terminals for common and field wiring. The connector is held in place by a single, captive retention screw but can be removed with the field wiring intact for wiring in advance or easier module field replacement.

A swinging, two-position cover protects wiring from inadvertent contact, as does the dead-front design. The two positions of the cover offer the option of more space to accommodate larger wire. The module cover provides a touch-sensitive pad; touch the pad and the *groov* EPIC processor displays information about the module, including specifications and a wiring diagram.



GRV-IACHV-24 module



GRV-IACIHV-12 module

The module pivots into place and is held securely in place by a captive retention screw.

groov I/O modules are hot swappable (which means they can be installed or removed without turning off power to the unit) and self-identifying—as soon as you mount the module to the chassis, it communicates to the processor and identifies itself.

Each *groov* I/O module cover provides a large module LED to indicate module health at a glance. Discrete modules also include channel-specific LEDs that display the on/off status of each channel.

All *groov* power supplies, voltage converters, pass-through power adapters, I/O modules, and processors are UL/cUL listed and compliant with the ATEX, Low Voltage, and EMC CE and UKCA directives. Each module is factory tested twice before shipment and most modules are guaranteed for life.

Part Numbers

Part	Description
GRV-IACHV-24	AC input, 24 channels, 180–280 VAC / VDC
GRV-IACHVS-24	AC input, 24 channels, 180–280 VAC / VDC, on/off state only
GRV-IACIHV-12	AC input, 12 channels, 180–280 VAC / VDC, channel-to-channel isolation
GRV-IACIHVS-12	AC input, 12 channels, 180–280 VAC / VDC, channel-to-channel isolation, on/off state only

FEATURES AND SPECIFICATIONS

Features

Compare 180–280 VAC input module features:

Feature	GRV-IACHV-24	GRV-IACHVS-24	GRV-IACIHV-12	GRV-IACIHVS-12
Number of channels	24	24	12	12
Channel-to-channel isolation			●	●
On/off state	●	●	●	●
On/off latching	●		●	
On/off totalization	●		●	
Frequency measurement	●		●	
Period measurement	●		●	
Pulse measurement	●		●	

Specifications

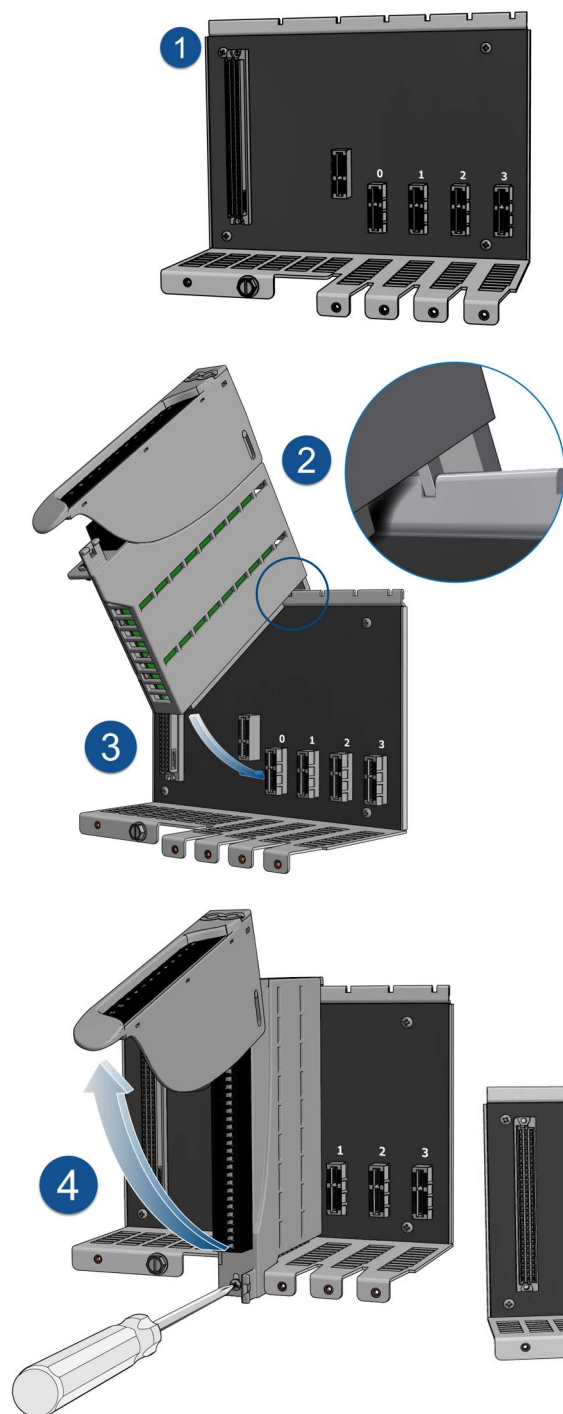
Specification	GRV-IACHV-24	GRV-IACHVS-24	GRV-IACIHV-12	GRV-IACIHVS-12
Nominal Input Voltage Range (RMS)	180–280 VAC / VDC	180–280 VAC / VDC	180–280 VAC / VDC	180–280 VAC / VDC
Turn-on Voltage	180 VAC / VDC	180 VAC / VDC	180 VAC / VDC	180 VAC / VDC
Turn-off Voltage	35 VAC / VDC	35 VAC / VDC	35 VAC / VDC	35 VAC / VDC
Input Impedance (± 5%)	532 kOhms	532 kOhms	271 kOhms	271 kOhms
Operating Frequency	40 Hz to 400 Hz or DC	40 Hz to 400 Hz or DC	40 Hz to 400 Hz or DC	40 Hz to 400 Hz or DC
Isolation (field-to-logic)	300 VAC, 1500 V Transient			
Isolation (channel-to-channel)	N/A	N/A	300 VAC working	300 VAC working
Number of Channels	24	24	12	12
Chassis Power Consumption	1.0 W	1.0 W	1.0 W	1.0 W
Minimum <i>groov</i> EPIC Firmware Version	1.0.0	1.0.0	1.0.0	1.0.0
Minimum PAC Project Version	10.0000	10.0000	10.0000	10.0000
Wire Size	28–14 AWG	28–14 AWG	28–14 AWG	28–14 AWG
Torque, connector screw	2.5 in-lb (0.28 N-m)	2.5 in-lb (0.28 N-m)	2.5 in-lb (0.28 N-m)	2.5 in-lb (0.28 N-m)
Torque, hold-down screw	3.5 in-lb (0.4 N-m)	3.5 in-lb (0.4 N-m)	3.5 in-lb (0.4 N-m)	3.5 in-lb (0.4 N-m)
Temperature (operating)	-20 °C to +70 °C	-20 °C to +70 °C	-20 °C to +70 °C	-20 °C to +70 °C
Temperature (storage)	-40 °C to +85 °C	-40 °C to +85 °C	-40 °C to +85 °C	-40 °C to +85 °C
Relative Humidity (non-condensing)	5–95%	5–95%	5–95%	5–95%
Agency Approvals	UL/cUL (Class 1 Div. 2) ^a ; CE, ATEX(Category 3, Zone 2), RoHS; DFARS; CB Scheme; UKCA			
Warranty	Lifetime	Lifetime	Lifetime	Lifetime

a. For use in hazardous locations, equipment must be mounted in an enclosure that meets the requirements of the National Electrical Code, ANSI/NFPA 70, and ANSI/ISA-61010-1 (82.02.01).

MOUNTING

Mount *groov* I/O modules onto a *groov* EPIC chassis (see [groov EPIC Chassis Data Sheet](#), form 2247). To learn the names and physical features of the parts of the module, see "Description of Module Parts" on page 16.

Installing the module



The numbers on the diagrams correspond to the numbered steps in these instructions.

CAUTION: For electrical safety, de-energize field devices wired to the terminal connector before starting.

1. Orient the *groov* EPIC chassis so that the module connector numbers are right-side up, with module connector zero on the left, as shown in the diagram.
2. Hold the module at a 45° angle, lining up the alignment tab on the back tip of the module with the slot at the back of the chassis.
3. Pivot the front of the module down to the module connector on the chassis. Push to snap the module into the connector.
4. Swing the module cover up so you can access the module retention screw. Secure the module into position by tightening the module retention screw.

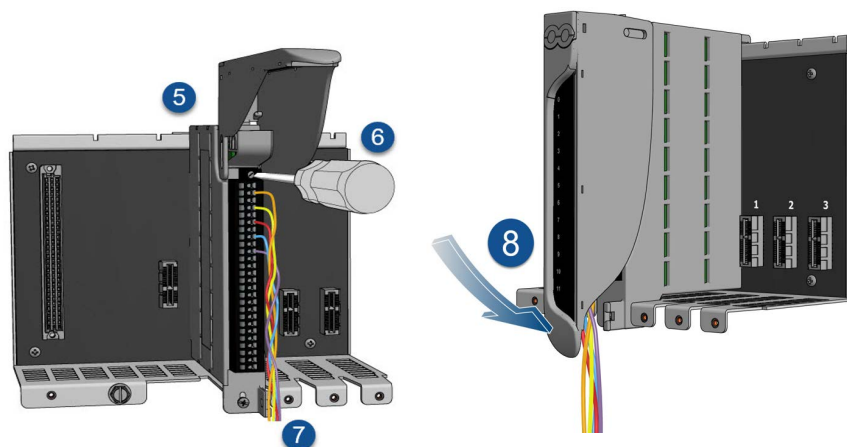
CAUTION: Do not over-tighten. See the torque specs in the Specifications table.

5. If the module does not have a terminal connector, install one.
6. Secure the terminal connector by tightening the terminal connector screw.

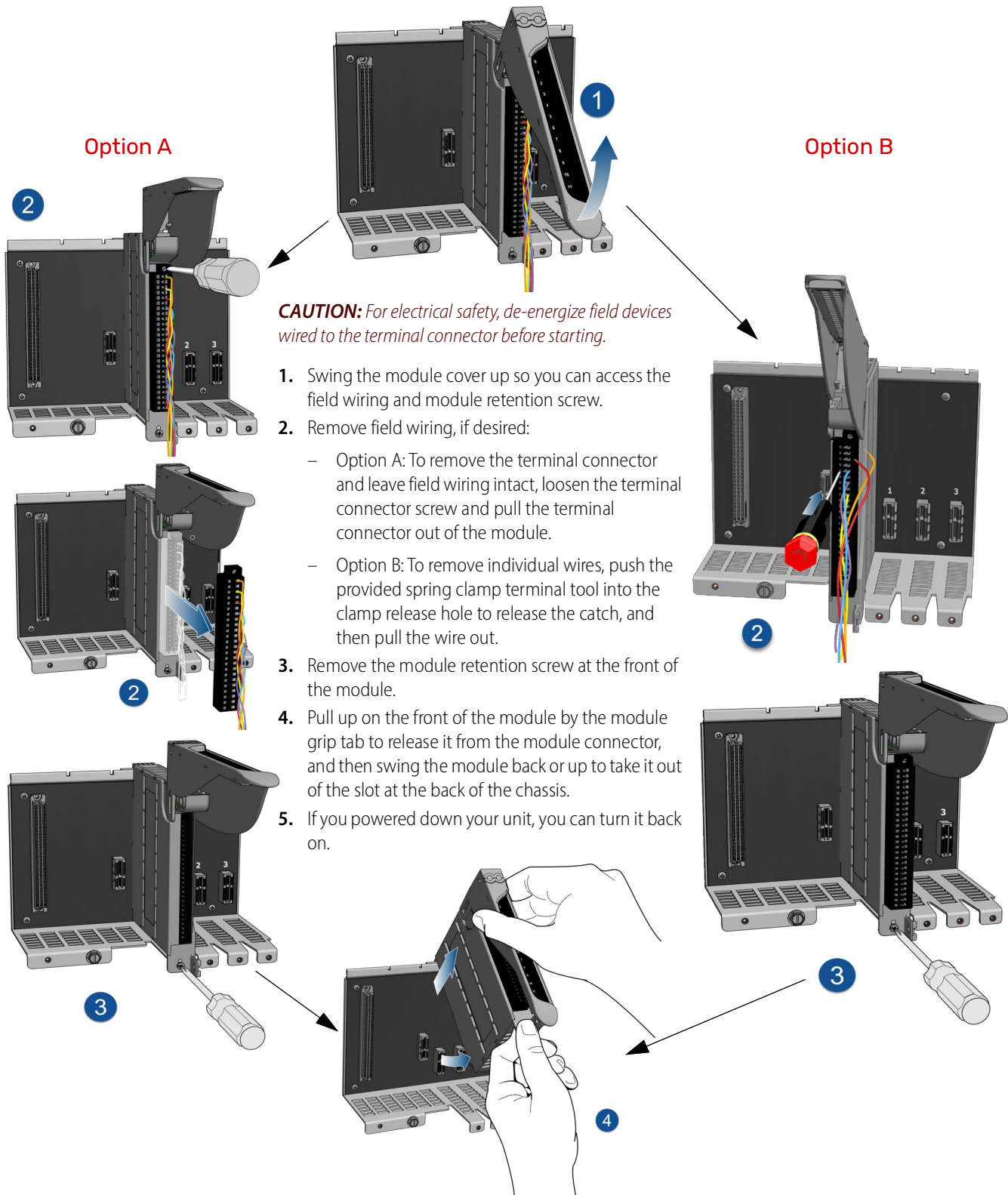
CAUTION: Do not over-tighten. See the torque specs in the Specifications table.

7. Follow the wiring instructions in the Pinout and Wiring section to wire your field devices to the channels on the terminal connector.
8. When wiring is complete, swing the module cover back down to cover the wires. If the wires are too thick to close the module cover easily, lift the module cover, then raise the back of the module cover up to the higher position. Swing the module cover back down to cover the wires.

When you are done installing modules and wiring, if you powered down your unit, you can turn it back on.



REMOVING THE MODULE



PINOUT AND WIRING

Before you begin wiring, do the following tasks:

- It may be easier to insert wires if you remove the terminal connector from the module. To remove the terminal connector, loosen the terminal connector screw at one end of the connector, then pull the connector straight out to remove it from the module.
- If you have never used a spring-clamp wiring system, take a moment to familiarize yourself with the diagram below. Insert the spring-clamp terminal tool in the clamp release hole. Insert field wires in the field wiring holes.
- If you look into the field wiring hole, you will see a highly reflective surface. If you can see that surface, that means that the clamp is closed.

Follow these instructions to connect your field wires to the module:

1. Orient the module or terminal connector to match the wiring diagrams on the following page.
2. To make it easier to handle the spring-clamp terminal tool and the field wires, secure the module by doing one of the following:
 - If you are working with the terminal connector while it is attached to the module, make sure the module is screwed securely to the chassis.

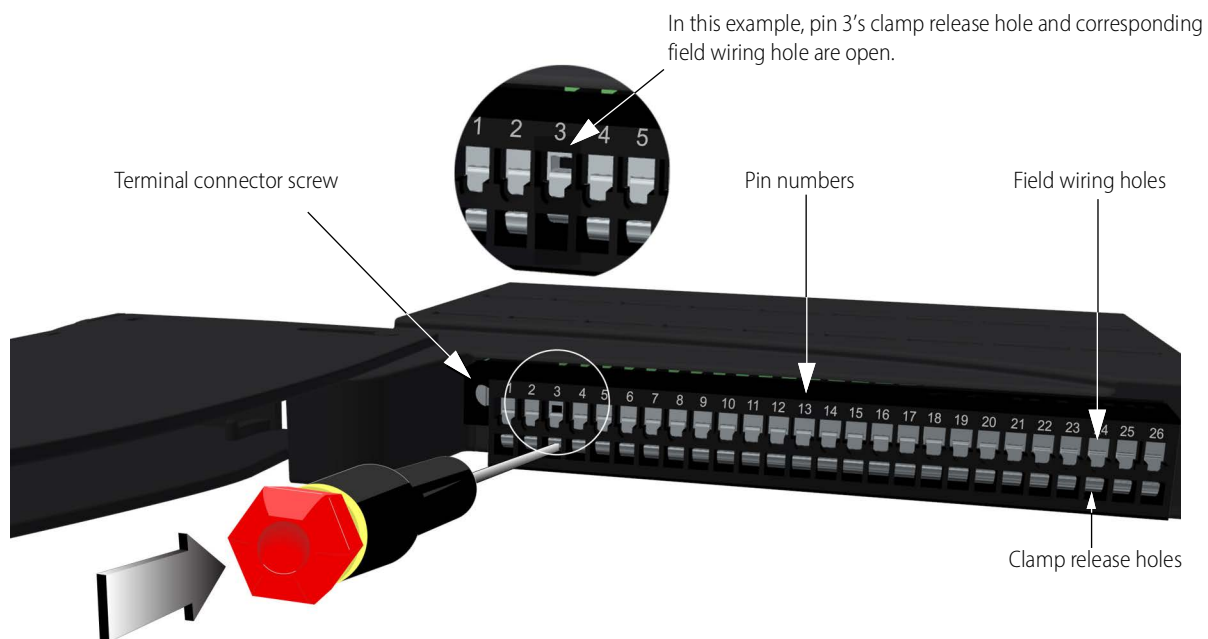
- If you are working only with the terminal connector, secure the terminal connector with a clamp.

3. Insert the spring-clamp terminal tool into the clamp release hole, then press and hold down the tool to open the clamp. Look into the field wiring hole. If it is dark, the clamp is open. You can go to [step 4](#). If you can still see the highly reflective surface, gently push down again and maintain downward pressure on the spring-clamp terminal tool. Look into the field wiring hole. If it is dark, the clamp is open.

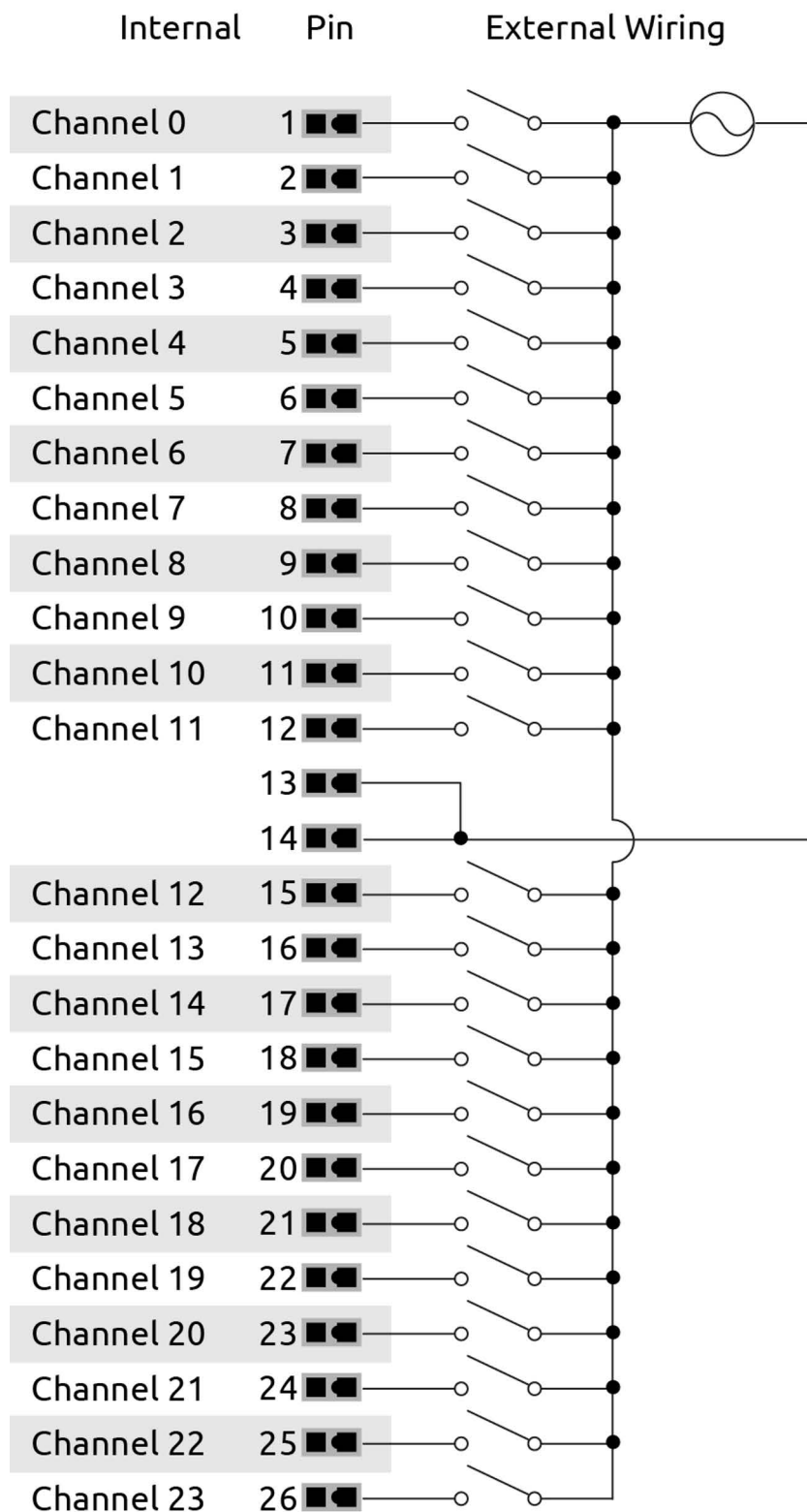
Note: If you push down too hard, the spring-clamp terminal tool might pop out of the clamp release hole.

4. Insert the wire into the field wiring hole until it meets complete resistance. Then pull out the spring-clamp terminal tool.
5. Test that the wire is secure by gently pulling on it. If the wire pulls out, repeat steps 3 and 4.

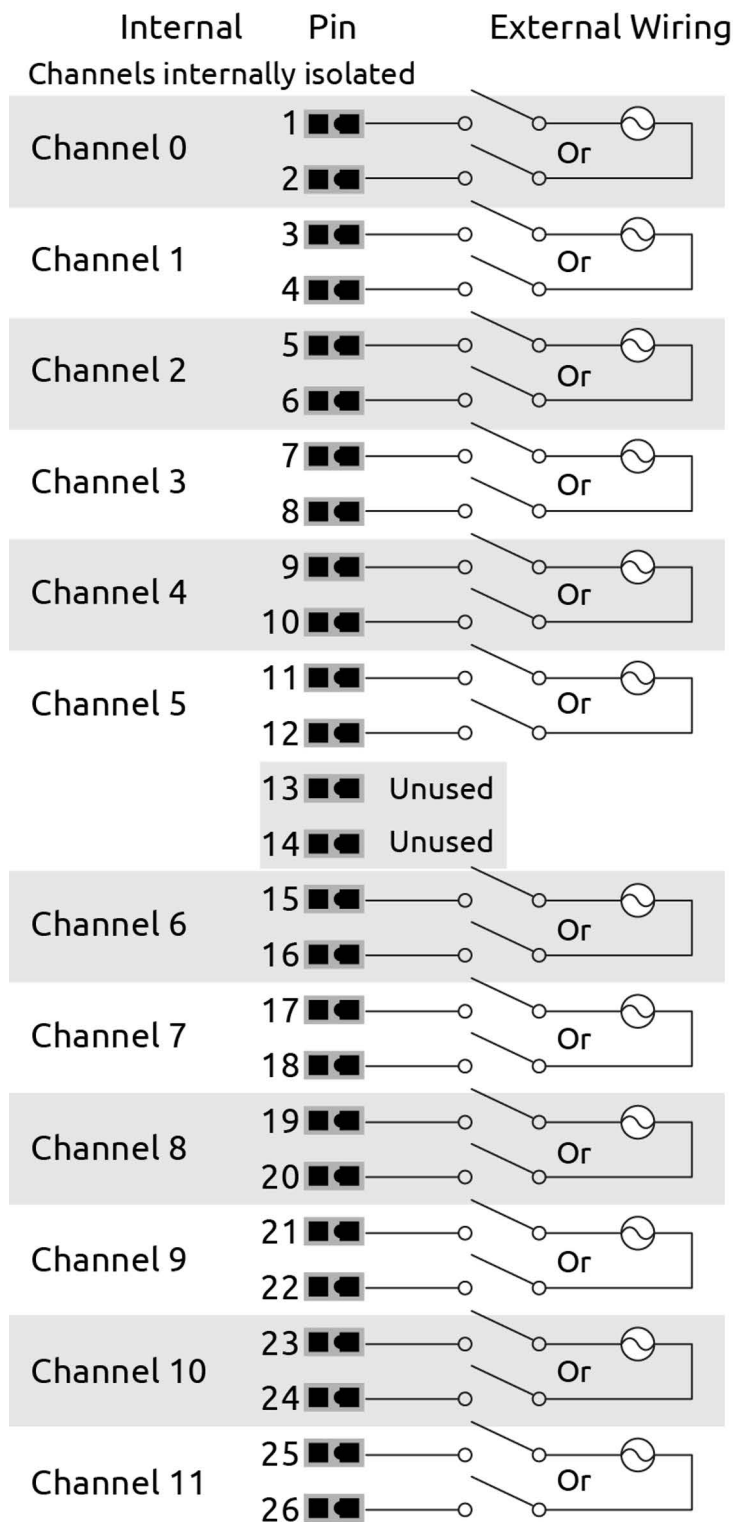
To remove a wire, push the spring-clamp terminal tool into the clamp release hole as described in [step 3](#) above, and then pull the wire out.



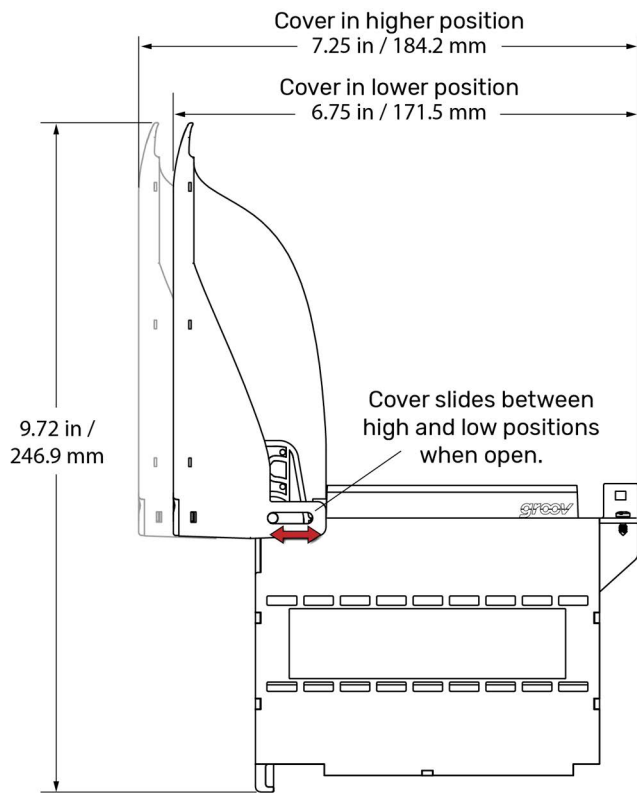
WIRING: GRV-IACHV-24, GRV-IACHVS-24



WIRING: GRV-IACIHV-12, GRV-IACIHVS-12



DIMENSIONS: GRV-IACHV-24, GRV-IACHVS-24, GRV-IACIHV-12, GRV-IACIHVS-12

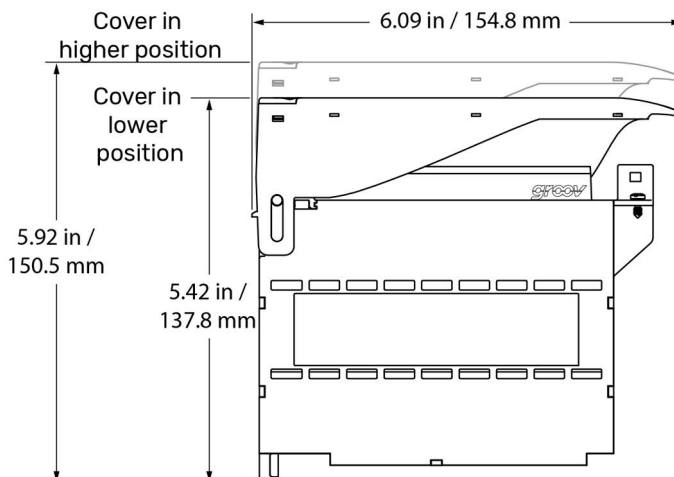
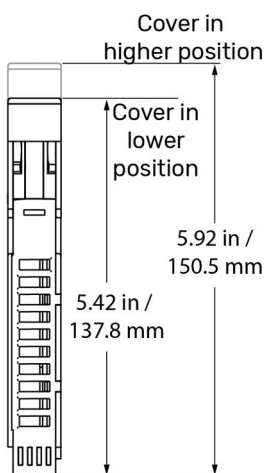


The module cover pivots and can be adjusted to two different heights (positions). The higher position provides more space to accommodate thicker wires.

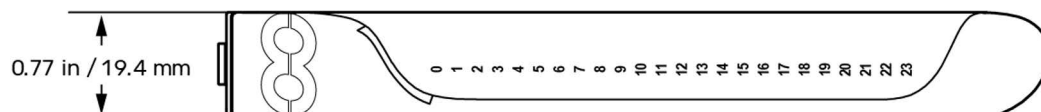
To switch between higher and lower position, open the cover to at least a 45° angle. Grasp the hinged end of the module cover and do one of the following:

- Pull up on the back hinge to slide it to the higher position.
- Push down on the back hinge to slide it to the lower position.

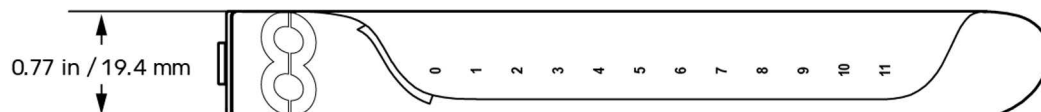
You cannot switch between the higher and lower positions while the cover is closed.



GRV-IACHV-24 and GRV-IACHVS-24 module

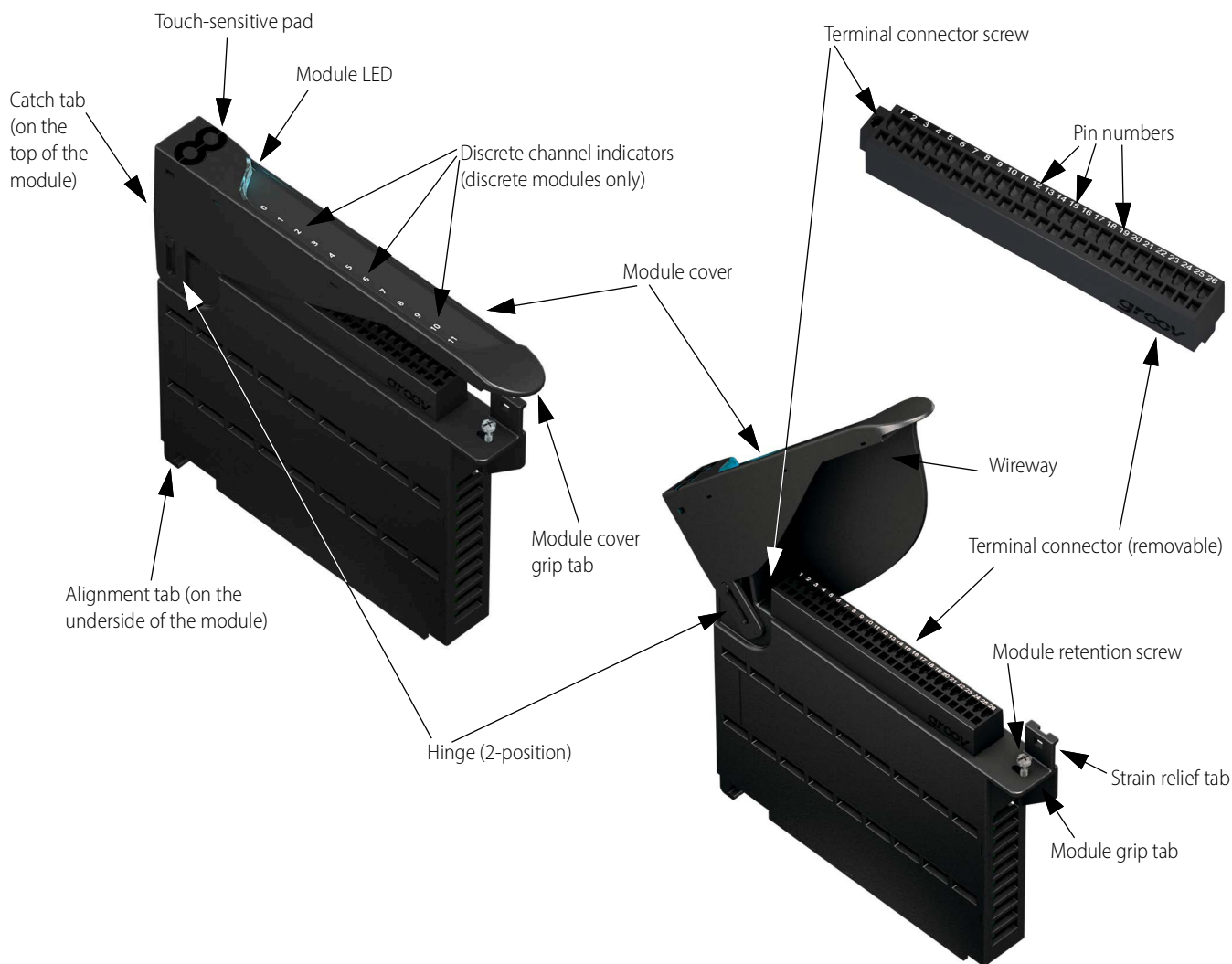


GRV-IACIHV-12 and GRV-IACIHVS-12 module



DESCRIPTION OF MODULE PARTS

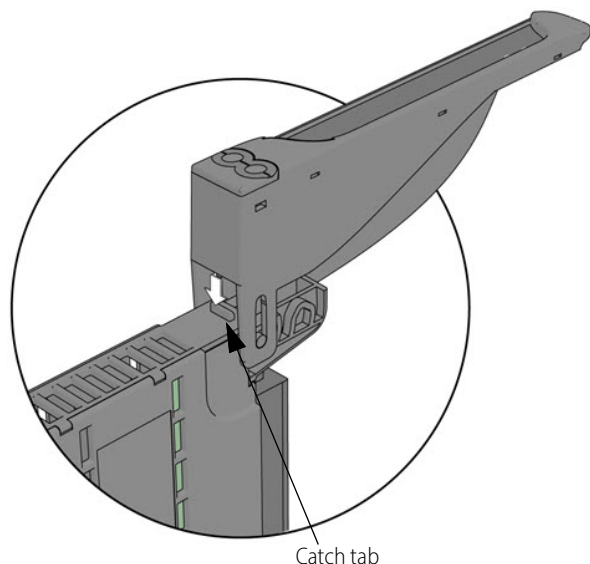
The following diagram identifies the parts of the modules. The installation instructions in the documentation rely on these terms to describe how to handle the module.



Some parts offer unique features:

- **Module LED:** Provides a visual indication of the health of the module. For example, if it is blue, the module is operating normally. If it is blinking blue, the module's information is being displayed on the *groov* EPIC processor's screen. For a complete list of the various colors that this LED might display, see the [groov EPIC User's Guide](#) (form 2267).
- **Hinge and Wireway:** These two features work together to provide more space for wires. The hinge can be adjusted between a lower position and a higher position. The wireway is the space underneath the module cover. To increase this space, you can raise the hinge to the higher position.
- **Touch-sensitive pad:** Offers a convenient way to display the module's information on the *groov* EPIC processor. Press on the pad for approximately two seconds and the processor displays that module's information on the screen, as well as changing the module LED to a blinking blue light.
- **Catch tab:** Located at the top of the module, the catch tab provides a place for the cover to "catch" or stop. This prevents the

cover from closing so that you can work on attaching or detaching wires to the terminal connector.



- **Strain relief tab:** This tab offers a way to collect wires into a bundle and secure them to the module. Attaching the wires to the strain relief tab can help hold the wires in a semi-fixed position, preventing them from interfering while you work on a nearby module. It also prevents strain on the part of the wire attached to the terminal connector.

Collect the wires into a bundle, pull a zip tie through the hole in the tab, wrap the zip tie around the bundle and tab, then clip the excess zip tie.

