

PC-200

Energy Monitoring Power Conditioner and Controller 200



- Rack-mountable power conditioner and controller
- Eight switched rear panel outlets and one unswitched front panel outlet
- Adjustable turn-on delay and remote switching
- Built-in current sensing and energy monitoring, plus line voltage monitoring
- Professional grade surge protection
- UL® 1449 Type 3 Listed
- Thermal breaker overload protection
- Adjustable over voltage and under voltage cutoff
- EMI and RFI noise filtering
- Wiring fault detection
- Ambient temperature sensing and over temperature cutoff
- Ping monitoring (device lockup detection and reboot)
- Built-in energy usage and event logging
- Front panel main power switch and status indicators
- Setup and operation via web browser
- Integrates with Crestron® control system via Ethernet or Cresnet® network
- Remote management via myCrestron, Crestron Fusion® software, or SNMP
- Protection status contact closure output

The PC-200 is a professional grade, rack-mountable power conditioner designed to provide 120 VAC power distribution, switching, surge protection, noise filtering, and energy monitoring for Crestron® control systems, AV systems, computers, and other equipment. Eight switched outlets are provided on the rear panel, and a single unswitched convenience outlet is provided on the front. All nine outlets are protected, filtered, and monitored. The switched outlets are arranged in four banks of two, and three of the banks have adjustable turn-on delay settings when controlled from the front panel power switch. The same three outlet banks are also individually controllable via a control system to enable selective switching of devices, on/off power sequencing, load-shedding, and other custom power control functionality.¹

Built-in RMS voltage and current monitoring enables logging and reporting of the line voltage, current, power, and energy usage at the input. An external temperature sensor is included to monitor heat conditions within the equipment rack or room. Network connectivity allows for setup and operation using a web browser, with extensive custom control and monitoring capabilities enabled through integration with a Crestron control system, the myCrestron residential monitoring service, the Crestron Fusion® enterprise management service, or an SNMP client.^{1,2}

Power Conditioning

The PC-200 includes the following power conditioning features to maximize overall system performance:

- **Surge Protection:** Provides protection against surges and spikes in the AC power line caused by lightning and other electrical disturbances
- **Under/Over Voltage Cutoff:** Shuts off power to the rear panel outlets if the line voltage strays beyond the normal operating range, which is adjustable
- **Thermal Breaker:** Disrupts power to all outlets in case of an overload condition
- **EMI/RFI Noise Filtering:** Prevents electromagnetic and radio frequency interference that can negatively impact sound and video quality
- **Wiring Fault Detection:** Detects faulty wiring of the incoming AC power line and shuts off power to the rear panel outlets until the fault is corrected³

Four Stage Turn-On Delay

The switched outlets on the PC-200 rear panel are arranged in four banks, with two outlets per bank. When operated by its front panel power switch, the first bank turns on immediately, while the other three banks can be configured to turn on in any order according to the delay time set for each bank. Delayed turn-on is initiated by turning on the front panel power switch or by applying power to the main line input following a power outage or through an externally switched circuit.

Each bank is independently adjustable to provide up to 10 seconds of delay before turning on, ensuring that the connected equipment gets powered up in proper order with sufficient time for stabilization. The staged turn-on delay helps to prevent transients that can damage components and potentially trip the main circuit breaker. It can also help to prevent audible pops and thumps through connected audio equipment at power-up.

Remote Controlled Switched Outlets

When connected to the network, three of the four outlet banks on the PC-200 rear panel can be turned on or off independently using a web browser or control system. The fourth bank is always on as long as the front panel switch is turned on. This energy-saving feature allows select components to be powered down when not needed.

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Through integration with a control system, custom functionality can be programmed to enable control from a touch screen, keypad, remote, or mobile device. Sequential power-up and power-down functionality can be enabled through control system programming. For systems employing a backup generator or UPS, load-shedding can be performed to shut down unnecessary components during a power outage.¹

Energy Monitoring

By sensing the incoming line voltage and the total device load, the PC-200 provides solutions for monitoring, automating, and troubleshooting a system:

- Voltage monitoring allows fluctuations in the power line to be tracked and logged, helping to identify and document problems with the power utility or building wiring.
- Energy monitoring provides the real power consumption (watts), current draw (amps), and energy usage (watt-hours) for all of the connected devices combined.
- By connecting and testing one component at a time, the PC-200 allows inefficient equipment to be identified and replaced.
- High inrush current devices can be identified to assist in optimizing the configuration of power sequencing schemes.
- Overall energy usage can be tracked and logged to identify trends and reform energy-wasting behaviors.
- System usage can be tracked to inform the scheduling of maintenance and future purchasing decisions.
- An alert notification can be sent if there is a sudden or abnormal drop in current draw, potentially indicating a device has been shut off improperly or disconnected (effective only when outlets are switched on).

Ambient Temperature Sensing

The PC-200 offers a complete equipment protection solution by monitoring the ambient temperature within the equipment cabinet or room to prevent overheating. The included temperature sensor connects to the rear of the PC-200 and features a choice of magnetic or adhesive mounting for easy placement within a typical equipment rack enclosure.

The over temperature cutoff threshold can be set to shut down power to the system if conditions exceed a safe operating temperature. Through a control system, the temperature measurement can be utilized to regulate the operation of cooling fans or air-conditioning equipment to keep equipment running cool.

Ping Monitoring

The PC-200 can be configured to detect an unresponsive device by sending it a ping command at regular intervals. If the ping request is not returned after four tries, the outlet bank feeding the monitored device cycles off and on to reboot

the device, quickly restoring normal operation without requiring any intervention.

Built-In Logging

Events such as power surges, over/under voltage conditions, over temperature conditions, ping failures, outlet switching activity, and sudden changes in current draw can all be logged as they occur. Event logging documents the time and cause of problems and to track system usage. All sensor readings are logged at a configurable interval as short as five seconds providing a minimum of one week's worth of data. Logs can be retrieved periodically to record a detailed history of events and energy usage over time.

Remote Management and Control

The PC-200 integrates neatly into any system or facility. Used alone, it can be set up and managed through a web browser. It can also be configured to send email notifications in case of certain specified events. Integration with the myCrestron residential monitoring service provides a cloud based solution for homeowners to monitor and manage the PC-200 as part of a complete Crestron home automation system.

Additionally, Crestron Fusion provides an enterprise solution for corporations and universities to manage rooms using the PC-200 throughout a building or campus. Built-in SNMP support enables integration with third-party IT management software, allowing network administrators to manage one or many networked power conditioners in an IT-friendly format.

The PC-200 can also be integrated with a Crestron control system via Ethernet or the Cresnet® network to enable control and monitoring through a touch screen, handheld remote, or mobile device.^{1,2}

UL 1449 Certified

The PC-200 has been tested and certified by UL as compliant with the UL® 1449 safety and performance standard for surge protective devices (SPD).

Specifications

Power Conditioner

Maximum Output Current, Total	15 A @ 120 VAC
Maximum Output Current, Per Outlet/Bank	15 A @ 120 VAC (subject to a maximum total output current of 15 A for all outlets combined)
Filtration	40 dB @ 100 kHz, 50 dB @ 300 kHz, with 50 Ω load
Surge Protection Modes	L-G, L-N, N-G
Surge Protection Shutoff	Shuts off rear outlets if surge protection is compromised
Energy Dissipation	2000 J per mode
Clamping Voltage	370 V
Clamping Time	1 ns
Wiring Fault Detection	Shuts off rear outlets if a wiring fault is detected at the input ³
Voltage Sensing Range	90 to 160 V rms \pm 1%, measured at input
Current Sensing Range	0.4 to 15 A rms \pm 1% (resistive), measured at input
Ambient Temperature Sensing Range	13 to 221 \pm 4 $^{\circ}$ F (-25 to 105 \pm 2 $^{\circ}$ C)
Under Voltage Cutoff	Adjustable 90 to 110 V, shuts off rear outlets if input drops below set value
Over Voltage Cutoff	Adjustable 130 to 147 V, shuts off rear outlets if input exceeds set value
Over Temperature Cutoff	13 to 221 $^{\circ}$ F (-25 to 105 $^{\circ}$ C), shuts off rear outlets if input exceeds set value
Turn-On Delay Adjustment	0.1 to 10 seconds, adjustable per each of rear outlet banks "DELAYED ON 1 - 3"

Power

Line Power	15 A @ 120 VAC, 60 Hz
Cresnet[®] Power Usage	0 W

Communications

Ethernet	100 Mbps, auto-switching, auto-negotiating, auto-discovery, full/half duplex, TCP/IP, UDP/IP, CIP, DHCP, SSL, TLS, SNMP, web server, SMTP email client, web browser setup and control, Crestron [®] control system integration, Crestron Fusion [®] monitoring, myCrestron monitoring ²
Cresnet	Cresnet secondary mode

Connectors

120V~ 15A 60Hz	(1) Attached 9.8 ft (3 m) grounded AC power cord with NEMA 5-15P plug; Line power input
SWITCHED ON 1	(2) NEMA 5-15R AC power outlets; Locally switched 120 VAC power outlet bank
DELAYED ON 1-3	(6) NEMA 5-15R AC power outlets; Comprises three banks of two switched 120 VAC power outlets; Locally switched with adjustable turn-on delay per bank; Remote switchable per bank
TEMP	(1) 2-pin 3.5 mm detachable terminal block; Connection for external temperature sensor (included)
Y, Z, G	(1) 3-pin 3.5 mm detachable terminal block ; Cresnet secondary port
LAN	(1) 8-pin RJ-45 jack; 100Base-TX Ethernet port
G	(1) 6-32 screw, chassis ground lug
ALWAYS ON (front)	(1) NEMA 5-15R AC power outlet; Unswitched 120 VAC power outlet

Controls and Indicators

PWR	(1) Bicolor green/amber LED, indicates line power is present, illuminates amber when the power switch is off and while booting, illuminates green when the power switch is on and the unit is operating normally, turns amber if the rear outlets have been shut off due to a fault condition
FAULT	(1) Red LED, indicates any of the following fault conditions: surge protection is compromised, line and neutral are reversed, or no ground is detected ³
PROTECT	(1) Green LED, indicates surge protection is fully functional
SHUTDOWN	(1) Amber LED, indicates power to the rear outlets is shut off due to an over voltage, under voltage, line input miswire, missing ground, or compromised surge protection fault condition
HW-R	(1) Recessed push button, initiates a hardware reset of the internal CPU (does not affect outlets)
SETUP	(1) Recessed push button and red LED, for touch-settable ID (TSID) and Ethernet auto-discovery
Power Switch	(1) Rocker switch, "On" position initiates turn-on delay sequence to the rear panel outlets, "Off" position turns all rear outlets off immediately
THERMAL BREAKER (rear)	Disrupts power to all outlets in case of an overload condition, press to reset after overload condition is resolved
LAN (rear)	(2) LEDs, green LED indicates Ethernet link status, amber LED indicates Ethernet activity

Environmental

Temperature	32 to 113 °F (0 to 45 °C)
Humidity	10% to 90% RH (noncondensing)

Construction

Chassis	Steel, black finish
Front Panel	Extruded aluminum, black finish, polycarbonate label overlay
Mounting	1 RU 19 in. rack-mountable (rack ears included)

Temperature Sensor	Adhesive or magnetic mount, 9.8 ft (3.0 m) attached lead
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Dimensions

Height	1.73 in (44 mm);
Width	17.32 in (440 mm), 19.00 in (483 mm) with rack ears
Depth	10.56 in (269 mm)

Weight

8.2 lb (3.8 kg)

Compliance

UL® 1449 Type 3 Listed

Models

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Notes:

1. Crestron control system and custom programming sold separately.
2. Email notification and direct integration with myCrestron, Crestron Fusion, and SNMP will be enabled through a future firmware update. Alternately, these services can be integrated now through a Crestron control system with custom programming.
3. Detects most input line wiring faults. Does not detect neutral/ground reversal. Does not discern between ground connections at the AC power line, chassis, or connected equipment (a ground connection at any point will be detected by the PC-200 as normal). The installer is responsible for proper wiring and grounding of this and all connected equipment according to applicable electrical codes, accepted guidelines, and best practices. Proper wiring and function of the AC power source should be verified prior to connecting the PC-200 or any other equipment. Use of this product does not negate the responsibilities of the installer and end-user to exercise all appropriate and required measures for safe and reliable installation and operation.

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This product may be purchased from select authorized Crestron dealers and distributors. To find a dealer or distributor, please contact the Crestron sales representative for your area. A list of sales representatives is available online at www.crestron.com/How-To-Buy/Find-a-Representative or by calling 855-263-8754.

This product is covered under the Crestron standard limited warranty. Refer to www.crestron.com/warranty for full details.

The specific patents that cover Crestron products are listed online at patents.crestron.com.

Certain Crestron products contain open source software. For specific information, please visit www.crestron.com/opensource.

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