

Installation & Operating Manual

Ver. 1.4.3

PowerLok Rack PDUs

POWERLOK
RACK POWER DISTRIBUTION

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Introduction

The innovative PowerLok Rack PDU is a next generation offering for the mission critical industry. All PowerLOK Rack PDUs are engineered, designed, tested, and manufactured in the United States. Our automated processes ensure that our customers' servers run reliably and efficiently in the highly competitive, 24/7 mission critical industry. PowerLok's quick-ship program makes configuring, ordering, and receiving Rack PDUs seamless and easy.

Safety Precautions

Specific safety precautions for this product are as follows:

- All precautions should be taken to guarantee a safe work and operational environment. General safety precautions must be observed during all aspects of operation of equipment described in this document. Failure to comply with the safety warnings, procedures, and guidelines presented in this document is in violation of the safety standards of design, manufacture, and intended use of this equipment.
- You are responsible for following the safety guidelines and warnings presented in this document for this equipment. Individuals using Gateview Rack PDUs are expected to follow all the noted warnings and safety precautions necessary for safe operation of the equipment in your environment. Gateview Technologies assumes no liability for failure to comply with these requirements.
- Rack PDUs are intended for indoor use only in a controlled environment that adhere to the operating temperatures within this manual. Any use outside of these constraints may void the warranty.
- Rack PDUs rated for 240/415VAC may be fitted with a NEMA L22-20 or L22-30 plug that is rated for a higher voltage. Caution must be taken to assure that the rating of the Rack PDU and the supply voltage match.
- **The total capacity of equipment connected to the Rack PDU CANNOT EXCEED the maximum load rating of the Rack PDU.**



DANGER

HAZARDOUS VOLTAGE, CURRENT, AND ENERGY LEVELS ARE PRESENT IN THIS PRODUCT. INTERNAL CIRCUITS CAN HAVE HAZARDOUS VOLTAGES PRESENT EVEN WITH PDU CIRCUIT BREAKERS IN THE OFF POSITION. DO NOT OPERATE THE PRODUCT WITH THE COVER REMOVED.

Professionals installing and operating Rack PDUs are advised of the following:

- Do not try to modify the Rack PDU in anyway, including the input plug, power whip and receptacles.
- Do not drill into or attempt to open any part of the Rack PDU enclosure. There are no serviceable parts inside the Rack PDU.
- Do not attempt to use the Rack PDU if any part of it is damaged.
- Rack PDUs rated 30A and greater contain magnetic-hydraulic circuit breakers. Circuit breaker equipped PDUs must be mounted vertically.
- Do not mount the Rack PDU to an unstable enclosure or surface.

Equipment grounding

To minimize electrical shock hazard, the Rack PDU chassis/enclosure is connected to the electrical earth ground pin of the Rack PDU plug. The input power cable must be plugged into an industry electrical code compatible receptacle which provides connection to the facility electrical safety ground.

Product Specifications

The following section gives the mechanical and electrical specifications of the Rack PDU.

Mechanical Specifications

Chassis dimensions in inches and (mm). See specifications for complete outline drawings.

Vertical PDU	Length	Width	Depth
24L	23.98 (609)	2.18 (55.37)	2.00 (50.80)
36L	35.98 (914)		
41L	40.98 (1041)		
46L	45.98 (1168)		
72L	72.00 (1829)		
82L	82.00 (2083)		

Electrical Specifications

PDU Utility Wiring Configuration	Line Current Rating	UL / CSA Line Current Rating*	Number of Wires	Wire Gauge	Operating Temperature
208V 1PH	20A	16A	3	12	0°C - 60°C (32°F - 148°F)
208V 1PH	30A	24A	3	10	
120V/208V WYE 3PH	20A	16A	5	12	
120V/208V WYE 3PH	30A	24A	5	10	
240V/415V WYE 3PH	20A	16A	5	12	
240V/415V WYE 3PH	30A	24A	5	10	
208/240V DELTA 3PH	30A	24A	4	10	
208/240V DELTA 3PH	35A	30A	4	8	
208/240V DELTA 3PH	50A	40A	4	6	
208/240V DELTA 3PH	60A	48A	4	6	

* Per the National Electrical Code (NEC) and Canadian Electrical Code (CEC) requirements, when in service, the line current is to be limited to 80% of the PDU's plug rating.

Rack PDUs rated 30A-60A line current contain 20A circuit breakers for receptacle group protection. The circuit breakers are UL-489 Listed and rated 5 or 10kAIC depending on model.

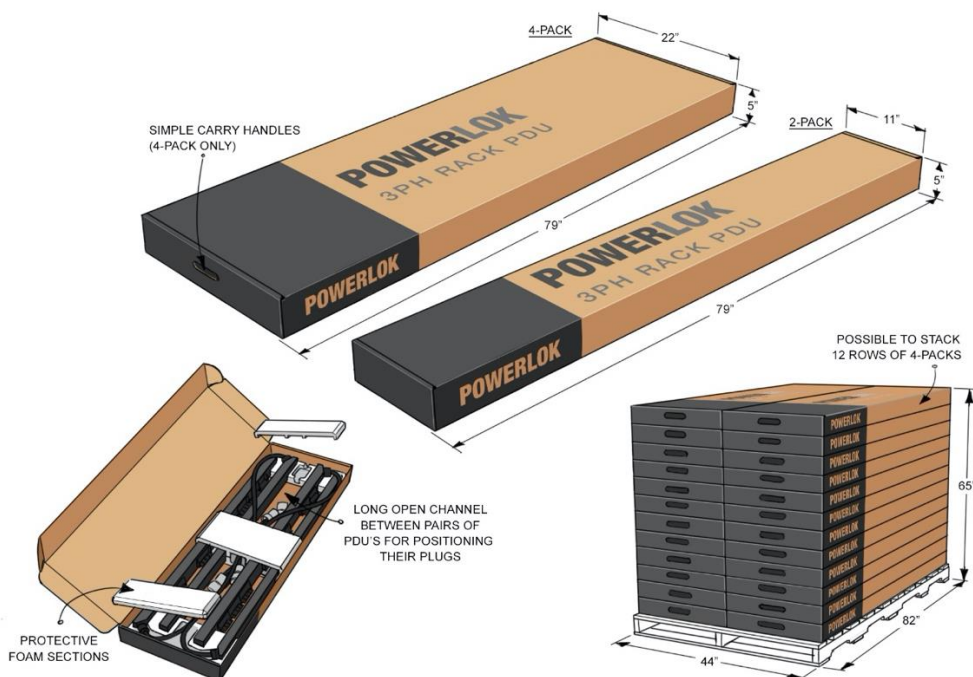
Packaging

Rack PDUs are shipped in molded 1.8 EPS foam and 200 double-wall corrugated cartons.

72L Package	Dimensions	Approx. Ship Weight	Lifting Handles	Maximum PDUs per pallet	Maximum height per 44" x 82" pallet
1-pack	80 x 11 x 5	17	No	48	65" (12 levels)
2-pack		35		96	
3-pack	80 x 22 x 5	52	Yes	72	
4-pack		68		96	

82L Package	Dimensions	Approx. Ship Weight	Lifting Handles	Maximum PDUs per pallet	Maximum height per 44" x 92" pallet
1-pack	90 x 11 x 5	19	No	48	65" (12 levels)
2-pack		37		96	

72L Packaging example:



Regulatory Compliance

Product Safety

Rack PDUs have been safety tested and certified to the following standards:

- USA UL 60950-1: 2nd edition October 2014
- CAN/CSA 22.2 No. 60950-1
- Canada ICES-003 (A) / NMB-003 (A)
- FCC Part 15 Class A compliant
- RoHS compliant
- NOM Addendum

USA Notification

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at their own expense.

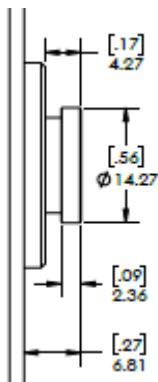
Canadian Notification

This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Installation

Installation of Rack PDUs into a server rack is performed by using the buttons that are already attached to the back surface of the Rack PDU. These buttons mate with keyhole slots located in the server rack.

Mounting button detail:



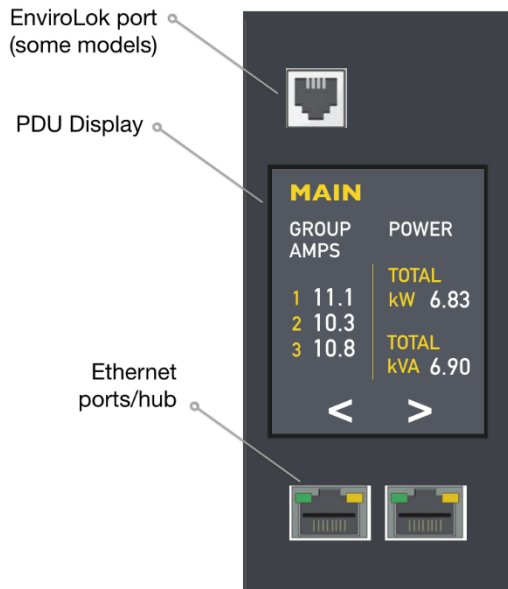
Key slot example:



Alternately, Rack PDU mounting buttons may be removed (attached with #6-32 screws) and a customer supplied bracket designed for Rack PDU mounting may be attached. The attachment screws can be re-used. A customer supplied #6-32 screw should not penetrate the Rack PDU chassis more than 1/8".

Power Monitoring

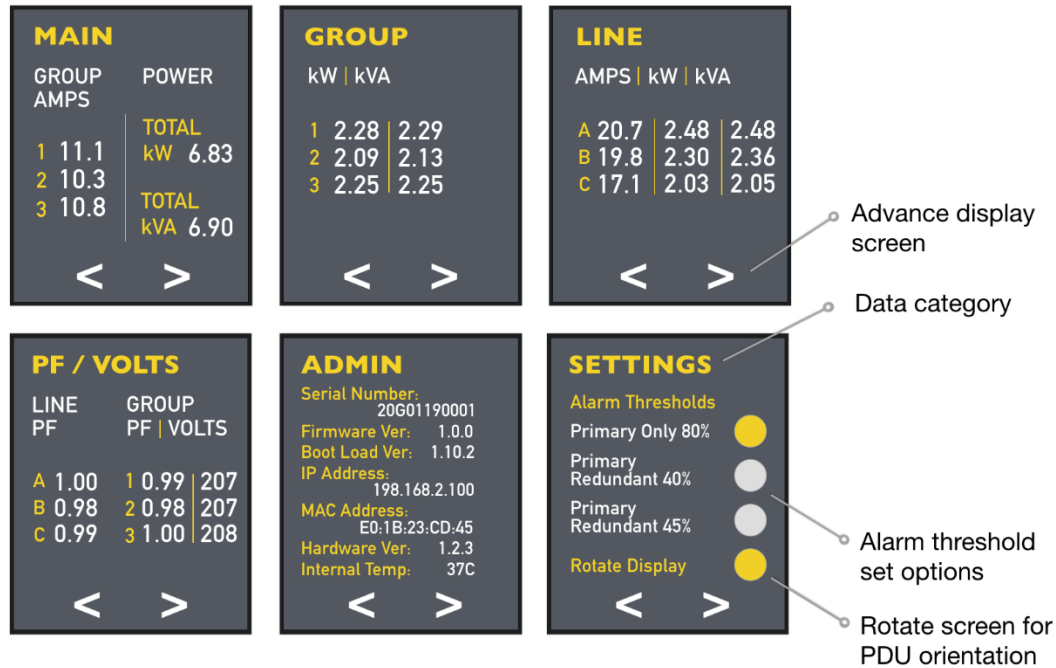
PowerLOK models with monitoring include a local touchscreen display and ethernet communication.



Monitoring accuracy

- Voltage: $\pm 0.5\%$ at nominal
- Current: $\pm 1.0\%$ of measurement from 250 mA – 1A
- Current: $\pm 0.5\%$ of measurement from 1A – 30A

The touchscreen can rotate 180 degrees. The illustration below is a 30A/208V 3PH Rack PDU example:



Ethernet Communication

The Rack PDU is equipped with two RJ45 10/100Base-T Ethernet ports to attach to an existing local area network (TCP/IP v4). This connection allows access to the Rack PDU via a web browser or SNMP client.

The PDU has two RJ45 connectors that are bidirectional; therefore, the user can connect to either of them to set up your PDU to the network. Furthermore, the user can connect to 12 PDUs in series by daisy chaining them.

The Rack PDU supports three methods of assigning the IP address, default gateway, and subnet mask.

Addressing mode	Description	Comment
Linked local	IPv4 link-local addresses are assigned to address block 169.254.0.0 - 169.254.255.255	This addressing mode supports attaching a host PC/laptop directly to the Rack PDU without requiring a switch, router or DHCP server.
Static IP	Default PDU network configuration IP address: 192.168.1.254 Subnet Mask: 255.255.255.0 Gateway: 192.168.1.1	The static IP information can be changed using a web browser.
DHCP	The Rack PDU network configuration information is provided by the DHCP server.	The local touchscreen display will publish the IP address assigned to the Rack PDU by the DHCP server.

Web Browser

The Rack PDU is equipped with a web server page accessible over IP. To access, open a browser window and enter the PDU IP address.

If the PowerLok web page does not appear, the PDU is not connected or the network does not recognize the PDU. See section: How to connect your PC/laptop with Linked local and Static IP option or call your network administrator.

For each data set, historical graphing or historical logs can be viewed.

Web page real time and historical graphing

PowerLOK Summary

Levels NOW (Real-time)

TOTAL kW / kVA	0.00 / 0.00
INTERNAL TEMP	35°C
GROUP AMPS	1 0.0
	2 0.0
LINE AMPS	0.0
GROUP kW / kVA	1 0.00 / 0.00
	2 0.00 / 0.00
GROUP PF / VOLTS	1 1.00 / 120.1
	2 1.00 / 119.6
LINE PF	1.00

Power Graphs / Log

Levels within each 3 hour time interval over past two week period

TOTAL kW / kVA ▾ GROUP kW / kVA ▾ GROUP AMPS ▾ GROUP PF / VOLTS ▾



INTERNAL TEMP ▾ LINE AMPS ▾ LINE PF ▾



Historical logs

In addition to graphing, PowerLOK also creates historical logs that can be viewed at various scales:

PowerLOK Summary

Levels NOW (Real-time)

TOTAL kW / kVA	0.00 / 0.00
INTERNAL TEMP	35°C
GROUP AMPS	1 0.0
	2 0.0
LINE AMPS	0.0
GROUP kW / kVA	1 0.00 / 0.00
	2 0.00 / 0.00
GROUP PF / VOLTS	1 1.00 / 120.1
	2 1.00 / 119.6
LINE PF	1.00

Power Graphs / Log

Levels within each 3 hour time interval over past two week period

TOTAL kW / kVA	GROUP kW / kVA	GROUP AMPS	GROUP PF / VOLTS
		1 2	
TODAY	aNaN:NaN	0 0	
-1 DAY	aNaN:NaN	0 0	
-2 DAYS	aNaN:NaN	0 0	
-3 DAYS	aNaN:NaN	0 0	
-4 DAYS	aNaN:NaN	0 0	
-5 DAYS	aNaN:NaN	0 0	
-6 DAYS	aNaN:NaN	0 0	
-7 DAYS	aNaN:NaN	0 0	
-8 DAYS	aNaN:NaN	0 0	
-9 DAYS	aNaN:NaN	0 0	
-10 DAYS	aNaN:NaN	0 0	
-11 DAYS	aNaN:NaN	0 0	
-12 DAYS	aNaN:NaN	0 0	
-13 DAYS	aNaN:NaN	0 0	
-14 DAYS	aNaN:NaN	0 0	
-15 DAYS	aNaN:NaN	0 0	

Log Scale

1 min.
10 min.
30 min.
1 hr.
2 hr.
4 hr.

INTERNAL TEMP

LINE AMPS

LINE PF

Admin section of the Web server

Admin

Admin

Model Number: POWERLOK

Serial Number: 20US0K15190001

Firmware Version: 0.0.3.rc02

FTP Enabled: ☐

IP Addressing Mode: ☒ Linked Local ☐ DHCP ☐ Static IP

IP Address: 192.168.29.101

Subnet Mask: 255.255.255.0

Default Gateway: 192.168.29.101

Apply

MAC Address: 70-B3-D5-A7-0F-AC

Hardware Version: 1.0.0

How to connect your computer with Linked local and Static IP option

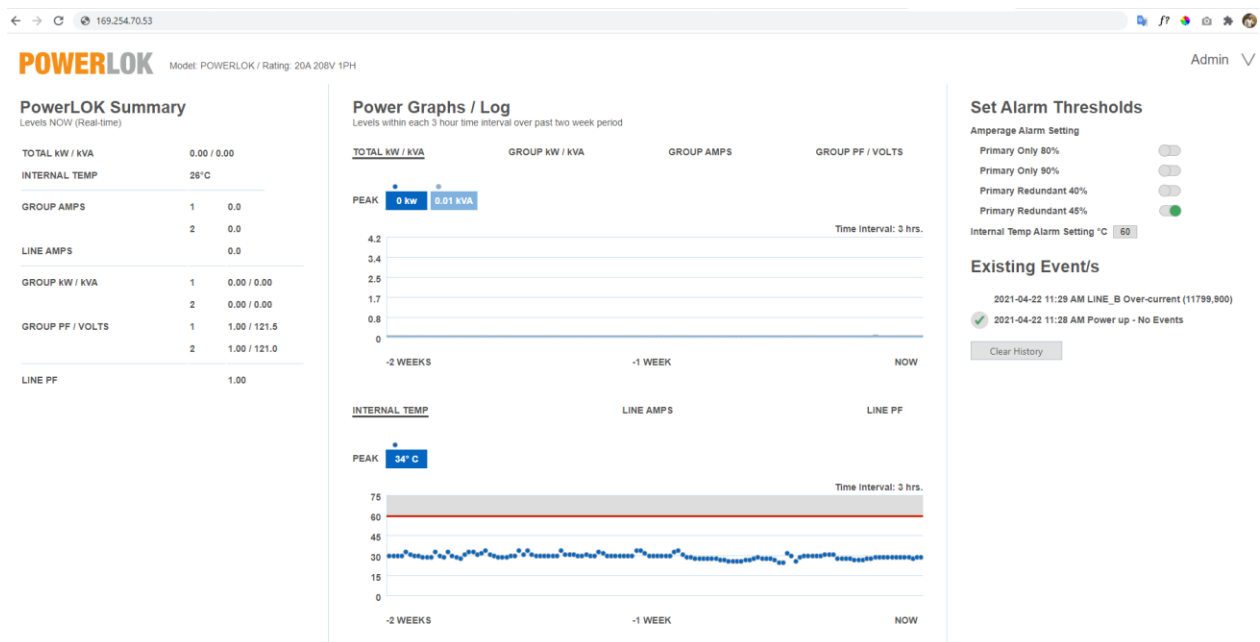
Linked local

Once the user is connected to the network, go to the touchscreen display to identify the assigned linklo IP address.

IPv4 link-local addresses are assigned to address block 169.254.0.0 - 169.254.255.255



Open a new browser tab and enter the linklo IP address: 169.254.70.53 to view the web server page as shown in the example below:

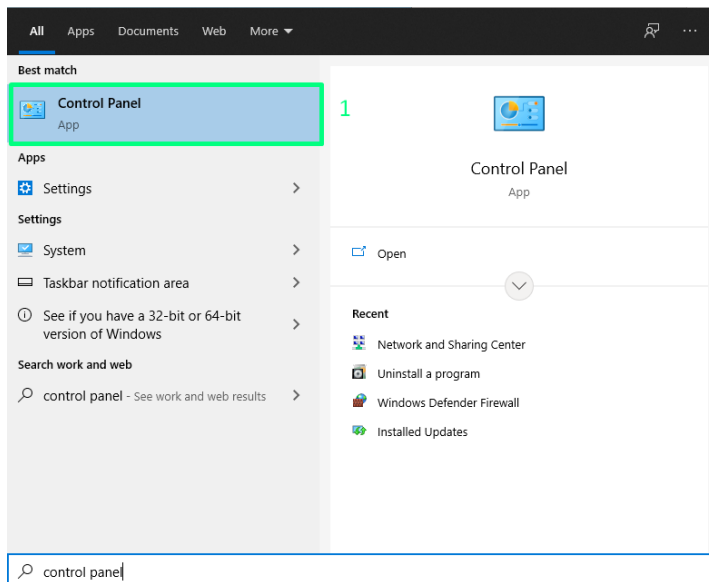


Static IP

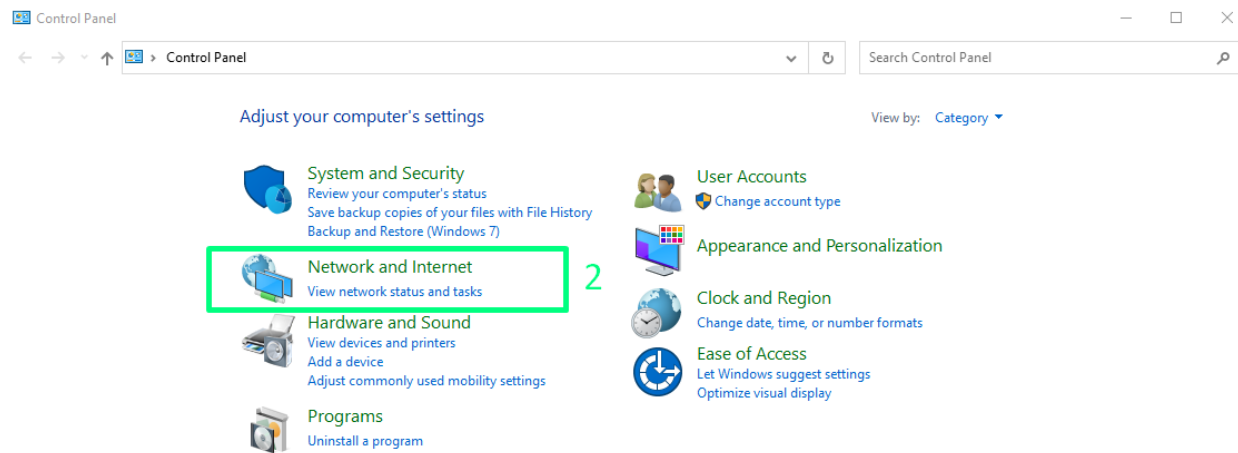
The following section describes how to set the user's computer for a static IP. The PDU has a static IP of 192.68.29.101 as shown in the touchscreen example below:



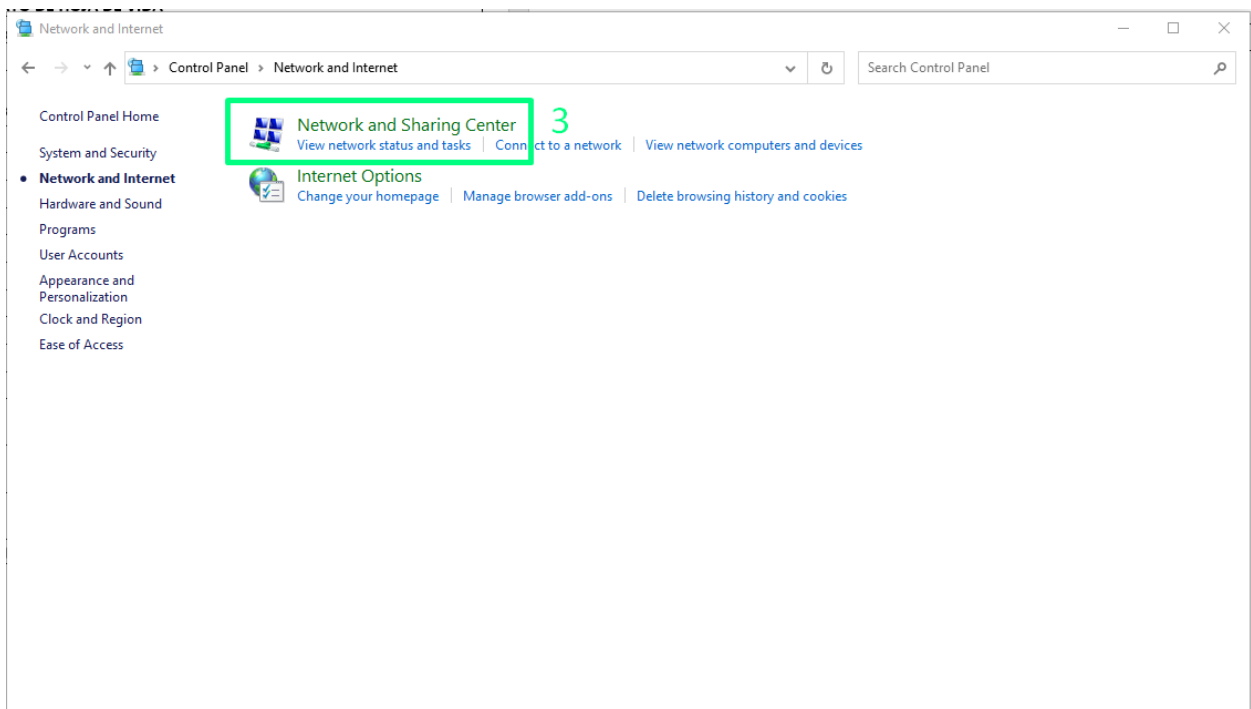
Step 1: Go to control Panel



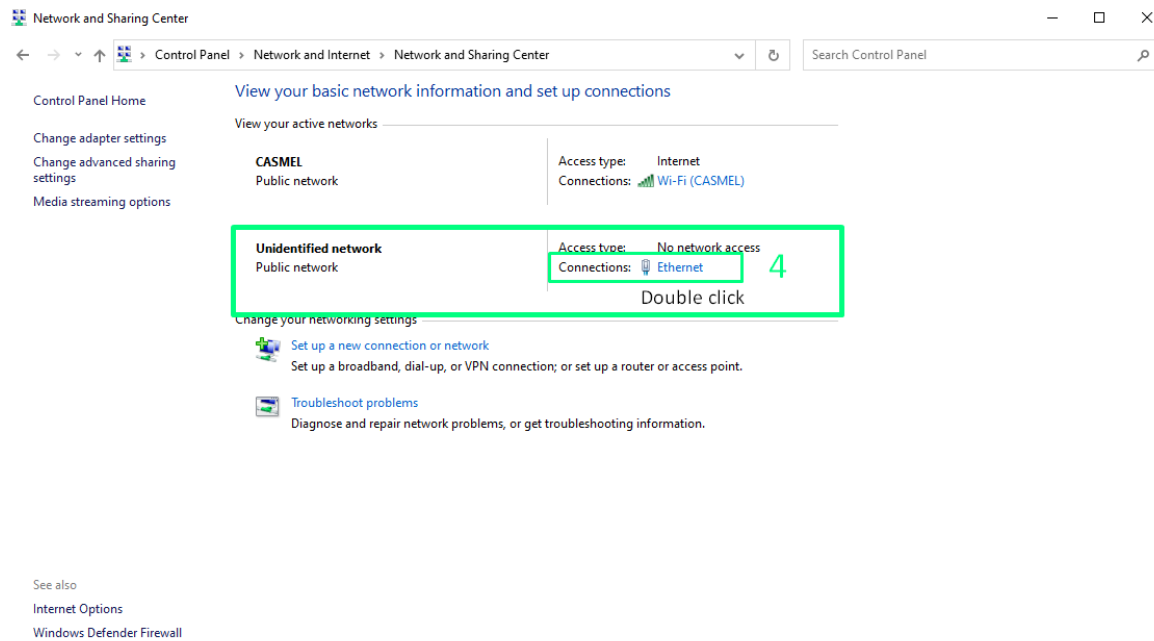
Step 2: Select network and internet



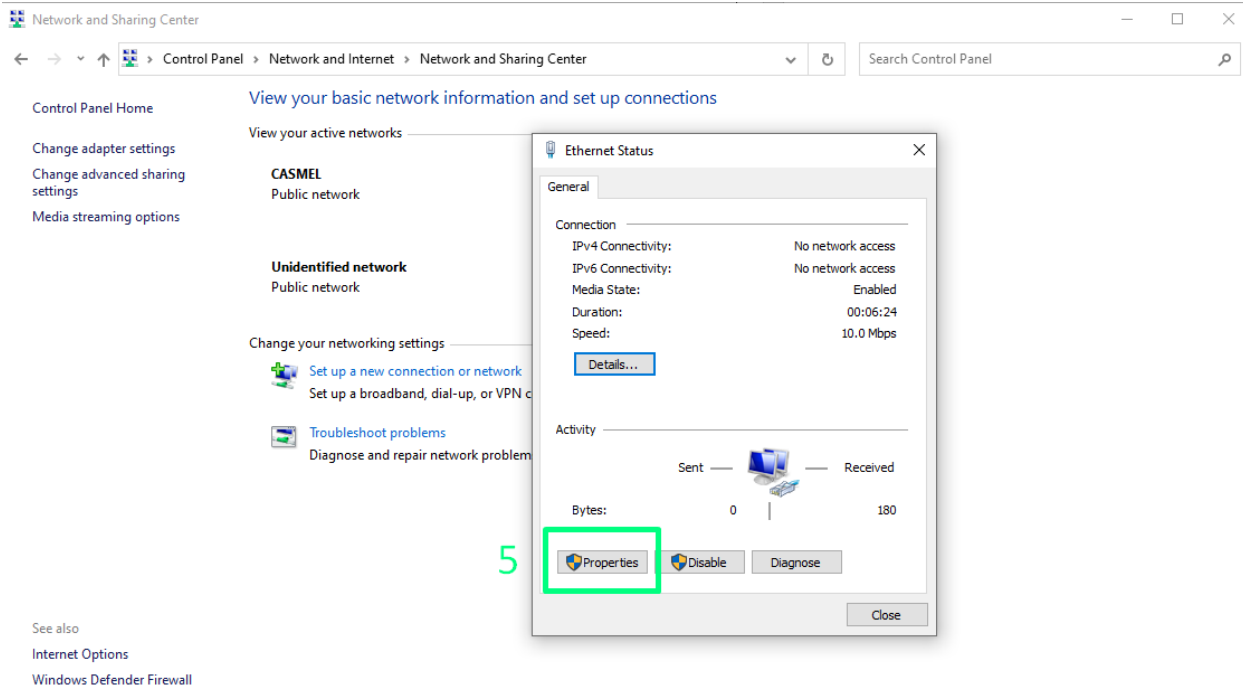
Step 3: Select Network and Sharing Center



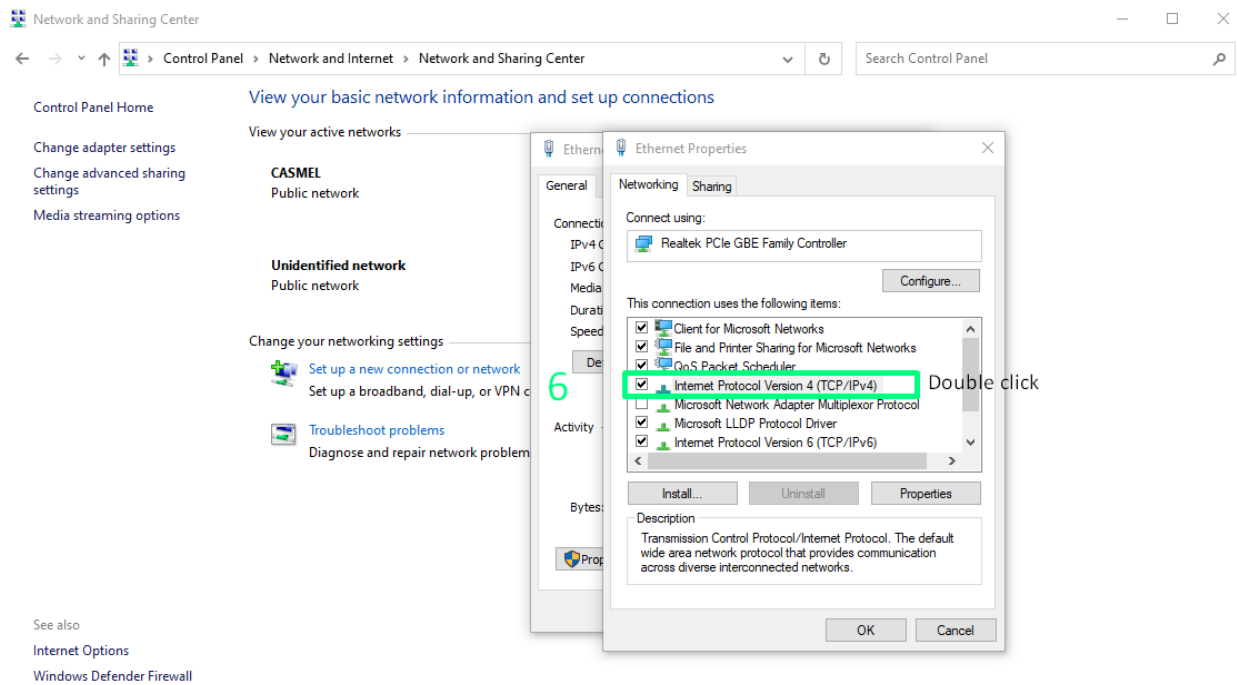
Step 4: Select Ethernet



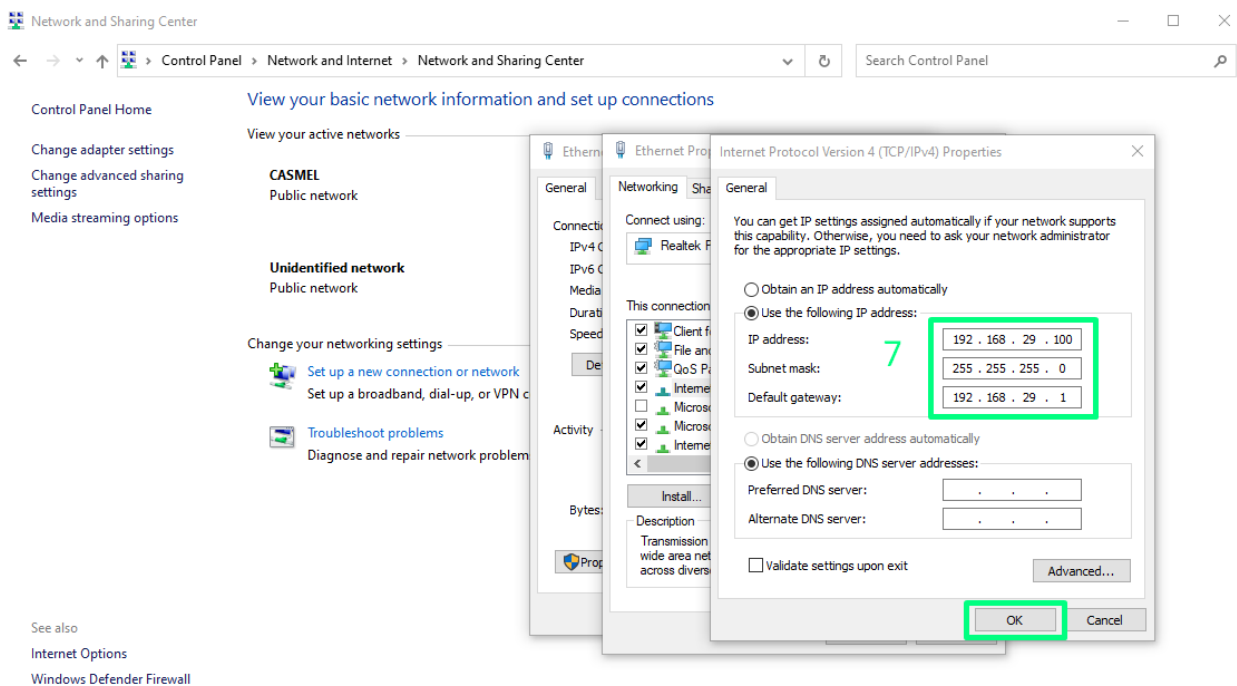
Step 5: Select Properties and then Options



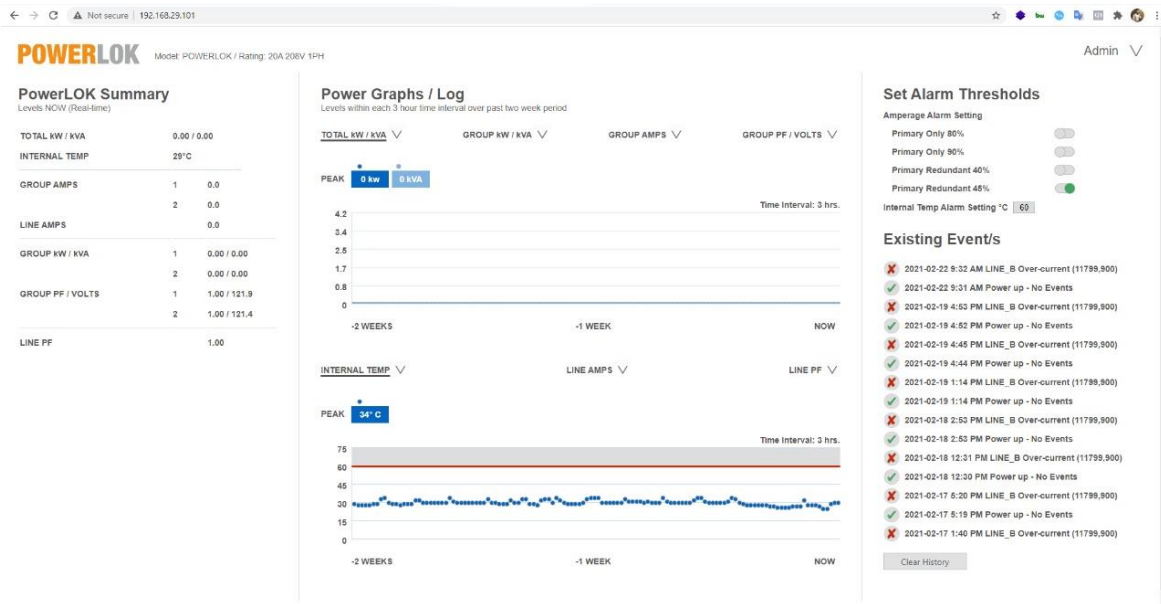
Step 6: Select Internet Protocol Version 4 (TCP/IPv4)



Step 7: Enter IP address, Subnet mask and Default gateway with numbers as shown and select OK.



This completes the necessary steps to configure for static IP. Open a browser and enter the static IP address to access the PowerLok web server as shown below:



How to setup the PDU with the Static IP to the router

To setup the PDU for your router follow these steps:

Step 1: Use the command prompt and type ipconfig to view the assigned IP address.

```

C:\Users\jua>ipconfig 1

Windows IP Configuration

Wireless LAN adapter Local Area Connection* 1:

    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix  . :

Wireless LAN adapter Local Area Connection* 2:

    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix  . :

Wireless LAN adapter Wi-Fi:

    Connection-specific DNS Suffix  . : tigoone.com.co
    IPv6 Address. . . . . : 2800:e2:27f:f8a2::3
    IPv6 Address. . . . . : 2800:e2:27f:f8a2:dce9:3afb:85db:8cbc
    Temporary IPv6 Address. . . . . : 2800:e2:27f:f8a2:c18d:e522:a940:7539
    Link-local IPv6 Address . . . . . : fe80::dce9:3afb:85db:8cbc%17
    IPv4 Address. . . . . : 192.168.1.54
    Subnet Mask . . . . . : 255.255.255.0
    Default Gateway . . . . . : fe80::c627:95ff:fe31:15d%17
                                192.168.1.254

Ethernet adapter Ethernet:

    Connection-specific DNS Suffix  . : fe80::2184:4447:d98d:d2cb%18
    Link-local IPv6 Address . . . . . : fe80::2184:4447:d98d:d2cb%18
    IPv4 Address. . . . . : 192.168.29.99
    Subnet Mask . . . . . : 255.255.255.0
    Default Gateway . . . . . : 192.168.29.0
  
```


Step 2: To setup the PDU with the IP address in the address block, I used: 192.168.1.10. To determine if the IP address is not in use, type arp-a command as shown below:

```

Command Prompt
Default Gateway . . . . . : 192.168.29.0

Ethernet adapter Bluetooth Network Connection:

Media State . . . . . : Media disconnected
Connection-specific DNS Suffix  . :

C:\Users\juant>arp -a 2

Interface: 192.168.1.54 --- 0x11
Internet Address      Physical Address      Type
192.168.1.254         c4-27-95-31-01-5d    dynamic
192.168.1.255         ff-ff-ff-ff-ff-ff    static
224.0.0.22            01-00-5e-00-00-16    static
224.0.0.251           01-00-5e-00-00-fb    static
224.0.0.252           01-00-5e-00-00-fc    static
239.255.255.250       01-00-5e-7f-ff-fa    static
255.255.255.255       ff-ff-ff-ff-ff-ff    static

Interface: 192.168.29.99 --- 0x12
Internet Address      Physical Address      Type
192.168.29.100        70-b3-d5-a7-0f-ac    dynamic
192.168.29.255        ff-ff-ff-ff-ff-ff    static
224.0.0.22            01-00-5e-00-00-16    static
224.0.0.251           01-00-5e-00-00-fb    static
224.0.0.252           01-00-5e-00-00-fc    static
239.255.255.250       01-00-5e-7f-ff-fa    static
255.255.255.255       ff-ff-ff-ff-ff-ff    static

C:\Users\juant>

```

Step 3: Open the web server using your IP address and open the Admin section to select Edit.

The screenshot shows the POWERLOK web interface. The top navigation bar includes the POWERLOK logo, the model name 'Model: POWERLOK / Rating: 20A 208V 1PH', and a user menu with the number '3' and the text 'Admin'. The main content area is divided into two sections. On the left is the 'PowerLOK Summary' section, which displays real-time data for various metrics. On the right is the 'Power Graphs / Log' section, which shows two line graphs: one for 'TOTAL kW / kVA' and another for 'INTERNAL TEMP'. The 'INTERNAL TEMP' graph shows a peak of 34°C. An 'Admin' panel is open on the right side of the screen, displaying device information such as Model Number, Serial Number, Firmware Version, and IP Address. A green box highlights the 'Admin' link in the top navigation bar, and another green box highlights the 'Edit' button within the Admin panel.

PowerLOK Summary	
Levels NOW (Real-time)	
TOTAL kW / kVA	0.00 / 0.00
INTERNAL TEMP	31°C
GROUP AMPS	1 0.0
	2 0.0
LINE AMPS	0.0
GROUP kW / kVA	1 0.00 / 0.00
	2 0.00 / 0.00
GROUP PF / VOLTS	1 1.00 / 121.3
	2 1.00 / 120.8
LINE PF	1.00

Admin	
Model Number:	POWERLOK
Serial Number:	20US0K15190001
Firmware Version:	0.1.0.rc02
FTP Enabled:	No
IP Addressing Mode:	Static IP
IP Address:	192.168.29.100
Subnet Mask:	255.255.255.0
Default Gateway:	192.168.29.100
MAC Address:	70-B3-D5-A7-0F-AC
Hardware Version:	1.0.0

Step 4: Enter your IP address, subnet mask and default gateway and then select Apply.

The screenshot shows the POWERLOK web interface. On the left is the 'PowerLOK Summary' section. In the center is the 'Power Graphs / Log' section with two line graphs: 'TOTAL KW / KVA' and 'INTERNAL TEMP'. On the right is the 'Admin' configuration panel. In the 'Admin' panel, the 'IP Address' field is highlighted with a green box and the number 4. The 'Subnet Mask' and 'Default Gateway' fields are also visible. The 'Apply' button is at the bottom of the IP configuration section.

PowerLOK Summary
Levels NOW (Real-time)

TOTAL kW / kVA	0.00 / 0.00
INTERNAL TEMP	31°C
GROUP AMPS	1 0.0
	2 0.0
LINE AMPS	0.0
GROUP kW / kVA	1 0.00 / 0.00
	2 0.00 / 0.00
GROUP PF / VOLTS	1 1.00 / 120.7
	2 1.00 / 120.2
LINE PF	1.00

Power Graphs / Log
Levels within each 3 hour time interval over past two week period

Admin

Model Number: POWERLOK
Serial Number: 20U50K15190001
Firmware Version: 0.1.0.rc02
FTP Enabled: ☐
IP Addressing Mode: ☒ Linked Local ☐ DHCP ☐ Static IP
IP Address: 192.168.1.10
Subnet Mask: 255.255.255.0
Default Gateway: 192.168.1.254
Apply
MAC Address: 70-B3-D5-A7-0F-AC
Hardware Version: 1.0.0

This should complete the necessary steps to configure for the router. Connect the PDU to the router, open a browser and enter the static IP address to access the PowerLok web server as shown below:

The screenshot shows the POWERLOK web interface. On the left is the 'PowerLOK Summary' section. In the center is the 'Power Graphs / Log' section with two line graphs: 'TOTAL KW / KVA' and 'INTERNAL TEMP'. On the right is the 'Set Alarm Thresholds' section. The 'Amperage Alarm Setting' section has four checkboxes: 'Primary Only 80%', 'Primary Only 50%', 'Primary Redundant 40%', and 'Primary Redundant 45%'. The 'Internal Temp Alarm Setting °C' is set to 60. The 'Existing Event/s' section has a 'Clear History' button.

PowerLOK Summary
Levels NOW (Real-time)

TOTAL kW / kVA	0.00 / 0.00
INTERNAL TEMP	29°C
GROUP AMPS	1 0.0
	2 0.0
LINE AMPS	0.0
GROUP kW / kVA	1 0.00 / 0.00
	2 0.00 / 0.00
GROUP PF / VOLTS	1 1.00 / 122.1
	2 1.00 / 122.7
LINE PF	1.00

Power Graphs / Log
Levels within each 3 hour time interval over past two week period

Set Alarm Thresholds

Amperage Alarm Setting

- Primary Only 80% ☐
- Primary Only 50% ☐
- Primary Redundant 40% ☐
- Primary Redundant 45% ☒

Internal Temp Alarm Setting °C: 60

Existing Event/s

Clear History

Firmware updating.

For firmware update, please contact tech support: support@gateview.com or visit our website and contact the support team from the live chat: <http://www.gateview.com/>

Firmware is upgraded locally through the ethernet port on the PDU.

For a current MIB (Management Information Base) list, please contact your PowerLOK reseller.

Limited Warranty

Warranty Replacement Procedure: All product warranty procedures are conditional upon the warranty information set forth in Gateview Technologies Terms and Conditions for a term of three (3) years from the shipment of the product. Gateview Technologies will provide a replacement product if it is defective in accordance with the following: This warranty does not apply to normal wear and tear or damage resulting from misuse, abuse, or neglect. No service or maintenance is required and there are no serviceable parts inside of the product. Do not attempt to open the Rack PDU or the customer will void the warranty.

The customer should ensure prior to use whether this product is suitable, adequate, or safe for the use intended. Since individual applications are subject to great variation, Gateview Technologies makes no representation or warranty as to the suitability or fitness of these products for any specific application and Gateview Technologies is not responsible for equipment damaged by incorrect communication on the part of the customer between the customer and Gateview Technologies.

The customer will incur the cost of shipping the defective product to Gateview Technologies, and, if a replacement is necessary, Gateview Technologies will reimburse the customer for shipping and subsequently ship a replacement product within fourteen (14) days of receipt of the defective product. If replacement of the product is not necessary, Gateview Technologies reserves the right to deny reimbursement for the shipping of the product returned from the customer.

Notices

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