

ProCurve Switch 5400zl/3500yl Series  
**Ordering Guide**



# Part 1: 5400zl chassis power supply selection (PoE)

The ProCurve Switch 5400zl/3500yl series can power any device that adheres to the IEEE 802.1af standard. In addition, devices using pre-standard Cisco PoE power can also be powered. The switches will automatically detect what type of power and how much is needed when a compatible device is plugged into the port.

There are two different power supplies available for the ProCurve 5400s. Both power supplies provide system power (the power needed to run the switch itself) and PoE power (the power sent down the Ethernet cable to power the device at the other end). The only difference between the two supplies is the amount of PoE power available from the supply. This will be discussed in Step 4 of the procedure below.

It is important to plan for peak PoE power needs so that sufficient power is available in the switch. When the peak power needs of the powered devices (PDs) connected to the switch exceed the PoE power available from the supplies, the PoE power priority in the switch is used to determine which ports lose PoE power. Consult the switch manual for a discussion of the PoE power priority capability. Ports that lose their PoE power will not be powered again to prevent them from turning on and off, unless the loss of power was due to a power supply failure. To avoid this situation, use this guide to correctly size the power supplies.

A PoE power configurator that automates some of the power supply selection is available at the ProCurve Networking Web site ([www.procurve.com](http://www.procurve.com)). For best results, use this guide in conjunction with the Web configurator.

Choosing the number and type of supplies that is best for your solution is a four-step process.

## Step 1: Determine your PoE power needs for the chassis.

Count the number of PDs and the PoE peak power each consumes. The actual peak power needed by a powered device should be available in the documentation or data sheet for that device. The 5400 and 3500 switches can allocate actual PD power rounded up to the nearest watt. Add up the total wattage needed. Also add 22 W for each Gigabit PoE module in the chassis. The first PD plugged into each module will release 17 W of this module allotment back to the switch PoE power pool. For this reason, it is recommended to have at least one PD plugged into each PoE module as PDs are added to the switch.

## Step 2: Determine your future power needs for the chassis, if any.

**PoE power:** If you would like to plan for future PoE power needs now, determine how much extra PoE power you might need. Add this to your figure from Step 1.

**Table 1.** Use this table to determine your PoE power needs from Steps 1 and 2.

Power-consuming items		Power needed
Powered devices at each wattage	_____ x 1 W =	_____ W
	_____ x 2 W =	_____ W
	_____ x 3 W =	_____ W
	_____ x 4 W =	_____ W
	_____ x 5 W =	_____ W
	_____ x 6 W =	_____ W
	_____ x 7 W =	_____ W
	_____ x 8 W =	_____ W
	_____ x 9 W =	_____ W
	_____ x 10 W =	_____ W
	_____ x 11 W =	_____ W
	_____ x 12 W =	_____ W
	_____ x 13 W =	_____ W
	_____ x 14 W =	_____ W
	_____ x 15 W =	_____ W
		<b>Subtotal:</b> _____ W
# of PoE modules in switch without a PD plugged in	_____ x 22 W =	_____ W
# of PoE modules in switch with a PD plugged in	_____ x 5 W =	_____ W
		<b>Subtotal:</b> _____ W
Future PoE wattage desired		<b>Subtotal:</b> _____ W
		<b>Total watts needed:</b> _____ W

### Step 3: Determine the level of redundant power desired.

See Table 2 for definitions of the different levels of redundancy.

**No redundancy:** Skip to Step 4.

**System power redundancy:** System power is the power needed to run the switching and routing functionality in the switch—essentially everything except PoE. One power supply is sufficient for full system power for the ProCurve Switch 5406zl chassis; two power supplies are required for the ProCurve Switch 5412zl. Full system power redundancy is achieved with two power supplies for the 5406 and four power supplies for the 5412.

Since there are only 2 power supply slots in the 5406, system power N+1 redundancy and full redundancy are equivalent. The 5412 can have system power N+1 with three supplies and full redundancy with four supplies.

**PoE power redundancy:** PoE power is the power necessary to power the external PDs connected to the switch. PoE power is independent from system power and is not used in powering the normal functions of the switch.

Determine the level of PoE power redundancy you desire. Table 2 has definitions for the different types of redundant power.

Currently, the switch does not automatically hold any PoE power in reserve for redundancy. Plan for the amount of power to be held in reserve, and keep the wattage needed for the level of redundancy desired in reserve by controlling the number of PDs on the switch.

**For no redundancy:** On failure of one power supply, PDs using PoE power equal to the PoE power available from the largest supply installed will have their PoE power turned off as the power supply losing power goes down. If after several seconds the switch determines that there is excess PoE power available with the remaining supply(ies), the number of ports that can be turned back on given the excess power available will have their power restored.

**For N+1 redundancy:** If N+1 redundancy is desired, hold the amount of PoE power available in the highest powered power supply in reserve.

## Definitions of redundant power

**Table 2.** Redundant power definitions

<b>Non-redundant power</b>	No power is held in reserve. For system power, if a power supply fails, some or all parts of the switch become inoperative. For PoE power, all power supplied by the available supplies can be used to power PDs. If a power supply fails, the amount of PoE power supplied by the failed supply is no longer available. The switch will turn off the number of PDs starting with the lowest PoE priority PD up to the wattage lost with the failed supply.
<b>N+1 redundancy</b>	For system power, one supply can fail and the entire switch remains functional. For PoE power, one power supply can fail without loss of power to any currently powered device. Under N+1, the switch will hold in reserve (not use) the amount of PoE power equal to the largest PoE supply. If a power supply fails, the reserve power is used to continue to power all PDs without interruption. N+1 redundancy may not protect against a failed external power main.
<b>Full redundancy</b>	For system power, one half of the power supplies can fail and the entire switch remains functional. For PoE power, one half of the power supplies can fail without power interruption to any connected nodes. The switch will hold at least one half of the PoE power available from all supplies in reserve to be used in case of power supply failures. Full redundancy would be used if protection from a failed external power main is desired.

**For full redundancy:** For full redundancy, hold half the amount of PoE power available in reserve if all power supplies in the switch provide the same level of PoE power. Determine full redundancy reserve power when unlike power supplies are installed by separating the installed power supplies into two columns so the total power in each column is as close in value as possible. Hold in reserve the amount of power from the column with the larger added power.

## Step 4: Choose your power supply(ies).

There are two power supplies available for the 5400 family of switches.

**Table 3. 5400 switch power supplies**

Product number	Supply	System power	PoE power	Power main requirements
J8712A	ProCurve Switch zl 875W Power Supply	600W	273W	110V @ 12A 220V @ 5.5A
J8713A <sup>1</sup>	ProCurve Switch zl 1500W Power Supply	600W	900W	220V @ 10A only

<sup>1</sup> Use of the J8713A changes the switch altitude specification from 15,000 ft. (4.6 km) to 10,000 ft. (3.1 km).

PoE power available from the power supplies is computed by adding the PoE power from all of the installed supplies. If PoE power redundancy is desired, take into account the amount of PoE power that needs to be held in reserve when calculating power needs.

**Though installing two different power supplies in the same chassis is a supported configuration, it is strongly discouraged,** particularly if some level of PoE power redundancy is wanted, since the amount of PoE power available on power supply loss may not be intuitive.

For example, if full PoE power redundancy is wanted using 875 W and 1500 W power supplies, the 1500 W supply should be held in reserve. This would mean that only 273 W of PoE power should be used normally. While it is tempting to add the two supplies and divide by two (using 585 W and keeping 585 W in reserve), if power is lost from one supply, the full 900 W of the 1500 W supply may be missing, with only the 273 W of the 875 W supply available. This is obviously not enough to keep the 585 W of the normal

environment up and running. Thus there is no redundancy for some of the PDs in this scenario, even though that was desired. This is not a concern if all supplies in the switch are the same power.

See Table 4 for the minimum and maximum power supply counts for the different 5400 switches.

**Table 4. Switch power supply capacities**

Product number	Product	Included supply	Min. # of supplies needed	Max. # of supplies possible	Max. # of supplies with the Power Shelf
J8697A	5406zl	None	1	2	4
J8699A	5406zl-48G	1 875 W	1	2	4
J8698A	5412zl	None	2	4	6
J8700A	5412zl-96G	2 875 W	2	4	6

Watch the amount of power drawn from the building power mains by the installed switch supplies. It adds up quickly. Refer to table 1 for incoming power requirements. If power redundancy is very important, split the available power supplies between two separate building circuits. If one power main goes down, you will still have the other one to power the switch.

Note that the 1500 W supply is 220 V only.

## PoE power levels

There are four PoE power levels defined by the PoE IEEE 802.1af standard.

**Table 5. IEEE 802.3af power classes**

IEEE 802.3af class	Power
0 (default)	15.4 W
1	4 W
2	7 W
3	15.4 W
4	Future
Cisco pre-standard	6.3 W

## Power cords

The power cords available for these switches are sized for the increased current that can be drawn meeting the needs of PoE. As a result, they are uncommon and it is recommended to have a few spares on hand. For more details, see Part 3 for the listing of power cords.

## ProCurve 620 Redundant/ External Power Supply

The ProCurve 620 Redundant/External Power Supply provides RPS and EPS power individually to two ProCurve 3500 switches or RPS to two ProCurve 6200 or ProCurve 2900 switches. The ProCurve 620 does not support the ProCurve 5400 switches.

**RPS power:** Connecting the RPS provides full redundancy for the connected switch's system power.

**EPS power:** The ProCurve 620 supply provides 398 W of additional PoE power to each of two connected ProCurve 3500 switches. For a ProCurve Switch 3500-24, the internal power supply can power all 24 ports at 15.4 W for PoE. The additional power available from the ProCurve 620 provides full redundancy for the PoE power.

If the ProCurve 620 is connected to a ProCurve Switch 3500-48, it allows all 48 ports to run at the full 15.4 W simultaneously but with no PoE power redundancy. The additional PoE

power from the ProCurve 620 could be used to provide full PoE power redundancy for 24 of the 48 ports, if that is needed, rather than additional power for the extra ports.

## ProCurve Switch zl Power Supply Shelf

The ProCurve Switch zl Power Supply Shelf (J8714A) provides two additional power supply bays for connection to one or two zl switches. Used for providing extra EPS (PoE) power to the zl switch, the extra PoE power can be used to power additional PDs beyond what can be powered by the internal switch supplies or, more commonly, to provide for larger redundant PoE power environments, such as large VoIP installations.

The Power Shelf accepts the same power supplies available for the zl switches and connects to the switches via 2 m EPS cables included with the Power Shelf. The extra PoE power available via the Power Shelf is determined by the power supplies installed in the Shelf. See the Power Shelf data sheet for more details.

## Part 2: Intelligent Edge/Premium Edge switches

There are two switch versions available for each of the ProCurve Switch 5400s, ProCurve Switch 3500yl-24G-PWR, and ProCurve Switch 3500yl-48G-PWR—the Intelligent Edge switch and the Premium Edge switch. All the 5400 and 3500 switches ship as Intelligent Edge switches. An Intelligent Edge switch can be upgraded to a Premium Edge switch via the optional Premium Edge license. Product numbers for the two Premium Edge license products are:

- J8993A ProCurve Switch 3500yl Premium Edge License
- J8994A ProCurve Switch 5400zl Premium Edge License

Each Intelligent Edge switch that is upgraded to a Premium Edge switch requires its own license product. Intelligent Edge switches can be upgraded at any time. A license can later be removed from a Premium Edge switch (making it an Intelligent Edge switch) and used to upgrade another Intelligent Edge switch of the same type to a Premium Edge switch.

The update process can be done manually through the MyProCurve Portal Web site using the registration ID included with the Premium Edge license, along with some information obtained from the switch to be upgraded. The portal will provide a license key that is entered into the switch being upgraded, making it a Premium Edge switch.

ProCurve Manager (PCM) or ProCurve Manager Plus can also be used to make the upgrade process a little easier. Provide the registration ID from the Premium Edge license and tell PCM which switch to upgrade. PCM will communicate with the MyProCurve Portal directly and upgrade the switch without user intervention.

## Intelligent Edge/Premium Edge contents

The 5400/3500 Intelligent Edge switches contain all the functionality that most customers need for an Intelligent Edge switch. See the 5400/3500 data sheets for a listing of the included features. Data sheets can be found at the ProCurve Networking Web site at: [www.procurve.com](http://www.procurve.com)

The Premium Edge switch contains all the features of the Intelligent Edge switch plus the following routing protocols:

- OSPF
- PIM Sparse
- PIM Dense
- VRRP

## Should you upgrade to a Premium Edge switch?

Choosing whether to upgrade to the Premium Edge switch from the Intelligent Edge switch is usually based on the intended use of the switch (see figure 1). Consider the Premium Edge switch if the 5400 or 3500 will be used as a Layer 3 routing distribution switch, or if full routing is desired in the wiring closet.

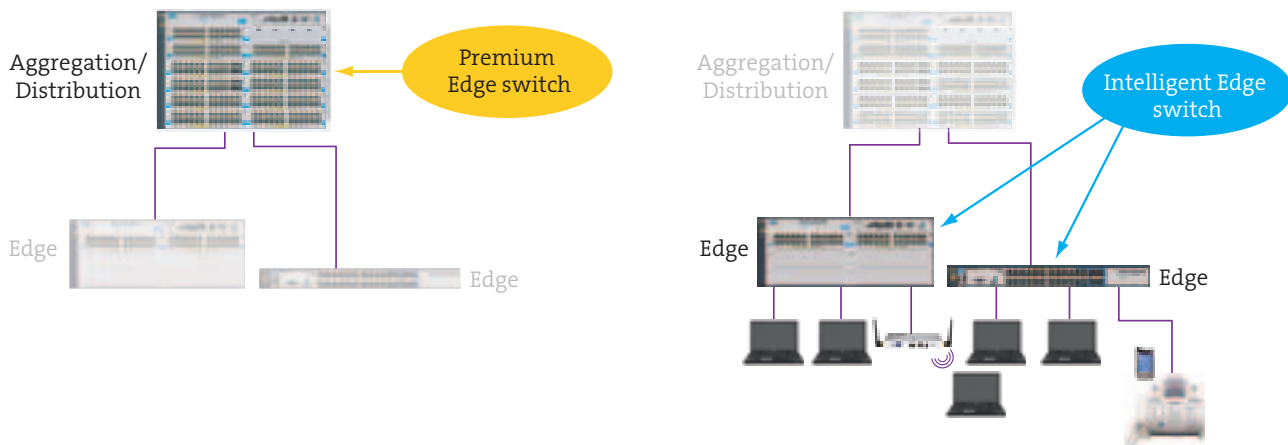
While the Intelligent Edge switch contains Routing IP (RIP) that could be used to route in a distribution environment, OSPF is a better choice in all but the smallest environments. RIP is included in the Intelligent Edge switches primarily to provide a way to get network traffic from one VLAN to another in small environments.

## Free software updates<sup>1</sup> for Intelligent Edge or Premium Edge switches

In keeping with the longstanding value ProCurve Networking provides in free software updates, both the Intelligent Edge switches and the Premium Edge switches can be updated with free software updates as they become available.

<sup>1</sup> Software updates are done on a best-effort basis without commitment for future functional enhancements.

**Figure 1: Common access control infrastructure**



## Part 3: Field-replaceable units

Two parts—the management module and the fan tray—for the 5400 switches are field-replaceable, meaning the customer can keep a spare onsite and replace the part themselves if the need arises. The switches are covered by a lifetime warranty with next-business-day replacement, so keeping spare parts on hand is best for customers who desire the minimum amount of possible downtime if a problem arises.

In addition, rack-mounting kits are available for 10K four-post racks and other four-post racks using the standard EIA unit of measurement.

All of these parts are available through the HP Parts Web site (<http://parts.hp.com>), except the 10K Rack Rail Kit, which should be ordered through the normal ordering process.

### Spare management module

While past experience on other ProCurve switches has shown an extremely low failure rate on the management functionality, there may be some customers who would like to have a spare management module on hand. Upon failure, the management module can be swapped out to restore switch functionality. Installing the new management module will cause the switch to reboot.

The spare management module does not contain a compact flash unit because this will be installed from the original board to bring customer configurations and switch software to the new management module. The compact flash can be ordered separately, if desired.

	Part number
Switch 5400 Management Module	J8726-61001
Management Module Compact Flash	5070-1056

### Fan tray

Switch 5400 fan trays can be hot-swapped as long as the new tray is installed within three minutes of the previous tray being removed.

Replacing the Switch 3500 or Switch 6200 fan tray requires that the switch be removed from the rack, power removed, and the top of the switch opened.

	Part number
Switch 5406 Fan Tray	J8697-60005
Switch 5412 Fan Tray	J8698-60005
Switch 3500/6200 Fan Tray	5069-8589

### Rack-mounting kit

The switches normally ship with rack-mounting “ears” that allow installation into a two-post, 19-inch datacomm rack.

	Part number
Switch 5406 rack mounting kit	5069-8561
Switch 5412 rack mounting kit	5069-8562
Switch 3500/6200 rack mounting kit	5069-5705
Switch zl Power Supply Shelf rack mounting kit	5070-3028

If installation into a 10K four-post 19-inch rack or a four-post rack meeting the standard EIA unit of measurement is desired, a rack-mounting kit is available providing rails that give sturdy support for the switch along its entire length.

	Part number
For 5400—10K Rack Rail Kit Assembly	356578-B21
For 3500/6200—10K Rack Rail Kit Assembly	356578-B21

For transporting switches in a rack, please see the *Installation Guide* for more instructions.

## RPS/EPS Cables

The ProCurve 620 Redundant/External Power Supply and the ProCurve Switch zl Power Supply Shelf use cables to individually connect the RPS (620 only) and EPS (PoE) power to the target ProCurve zl or yl switches. The same cable is used for either RPS or EPS power. The ProCurve 620 comes with four of these cables and the Power Shelf comes with two, which are the respective maximum number of cables usable for each of these units. If a spare cable is desired, use the following product number.

Note: Even though the RPS/EPS cables are interchangeable between the ProCurve 620 and Switch zl Power Shelf, the 620 does not support the zl switches, while the Power Shelf only works with the zl switches.

	Part number
Switch zl and yl RPS/EPS cable	5070-0102

## Power cords

The power cords available for these switches are sized for the increased current that can be drawn meeting the needs of PoE. As a result, these power cords may not be found in a typical environment and power cords “borrowed” from other products will not work in most instances. Having some spare power cords on hand may be a good idea. They can be purchased through the HP Parts Web site at: <http://parts.hp.com>.

	ProCurve 620 Red/Ext Power Supply	ProCurve Switch 3500yl/6200yl	ProCurve Switch 5400zl	
			875 W supply	1500 W supply
Australia/ New Zealand	8121-0871	8120-5335	8120-5335	8121-0871
China	8121-0924	8120-8385	8120-1034	8121-0924
Continental Europe	8120-6352	8120-5336	8120-5336	8120-6899
Denmark	8120-6897	8120-5340	8120-5340	8120-6897
Israel	8121-1010	8121-1009	8121-1009	8121-1010
Japan	8120-6903	8120-5342	8120-5342	8120-6903
South Africa/ India	8121-0915	8120-5341	8120-5341	8121-0915
Switzerland	8121-0916	8120-5339	8120-5339	8120-6897
Taiwan	8121-0968	8121-0967	8121-0941	8120-6903
Thailand	8121-0922	8121-0671	8121-0671	8121-0675
U.K./Hong Kong/ Singapore	8121-0907	8120-5334	8120-5334	8120-6898
U.S./Canada/ Mexico	8120-6361	8121-0973	8121-0973	8120-6903 <sup>1</sup> 8120-6893 <sup>2</sup>

<sup>1</sup> Twist-lock: NEMA L6-20P shipped standard with the 1500 W power supply.

<sup>2</sup> Non-locking: NEMA 6-20P



**For more information**

To learn more about ProCurve Networking,  
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