How can I keep using my B4RN service when I have a power cut?

Introducing the Powersolve

Micro Uninterruptible Power Supply (PUPS22/44)

Options start at approx. £50** supporting 3Hours of Router Wifi operation, with the largest system costing approx. £90 supporting 6 hours for Router Wifi operation.

**Special limitations may apply see FAQ question 2

This guide has been written by Phil Stone to help other B4RN customers. For the definitive and latest information always refer to www.powersolve.co.uk/pups22-44-series or ask for help via the B4RN IT club.

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What can I do to keep my B4RN router operating during a power failure?

If you are looking for a small, simple and effective way of keeping your router running for a few hours during a mains power failure then one answer is to use a dedicated Uninterruptible Power Supply (UPS) like the Powersolve PUPS22 or its bigger brother the PUPS44. These micro UPS and their associated power adapter cost approximately £75 and £90, they can power a B4RN Genexis DRG719 router for 3 hours and 6 hours respectively. These Direct Current (DC) mini-UPS replace the standard power adapters provided with the Genexis router. If a mains power cut occurs they instantaneously switch to providing power from their internal Lithium-ion battery pack. When mains power is restored the batteries are automatically recharged. They are called micro UPS because of their size compared to the much larger and traditional form of UPS that use lead acid batteries. The PUPS is available in 12V or 5V models. The Genexis routers supplied by B4RN, most of the analogue telephone adaptors provided by Vonage and many other small network devices are all compatible. Currently the only purchase route available is directly from the UK supplier, www.powersolve.co.uk, but its also worthwhile checking with the B4RN IT club to see if a group order is going to be raised. General purchasing advice is available on the page titled FAQs.

PUPS22

So how do you use a PUPS?

There are a few options depending on what combination of devices you wish to power, but the simplest example is just powering a B4RN Genexis router, with either a PUPS22 or PUPS44 supplying 12Volts DC.

Powersolve
AC/DC adapter

On Off

Led   IN
OUT
Powersolve PUPSS22/PUPS44

Genexis
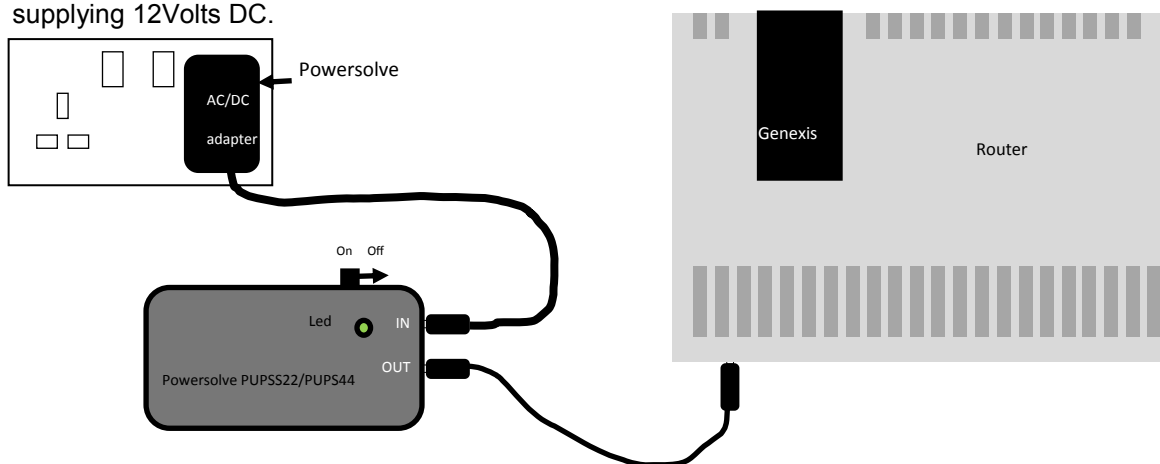
Router

PUPS44 Emergency power duration 6 **Hours Cost ~£90(inc Powersolve AC/DC Adapter)**

PUPS22 Emergency power duration **3 Hours Cost ~£75(inc Powersolve AC/DC Adapter)**

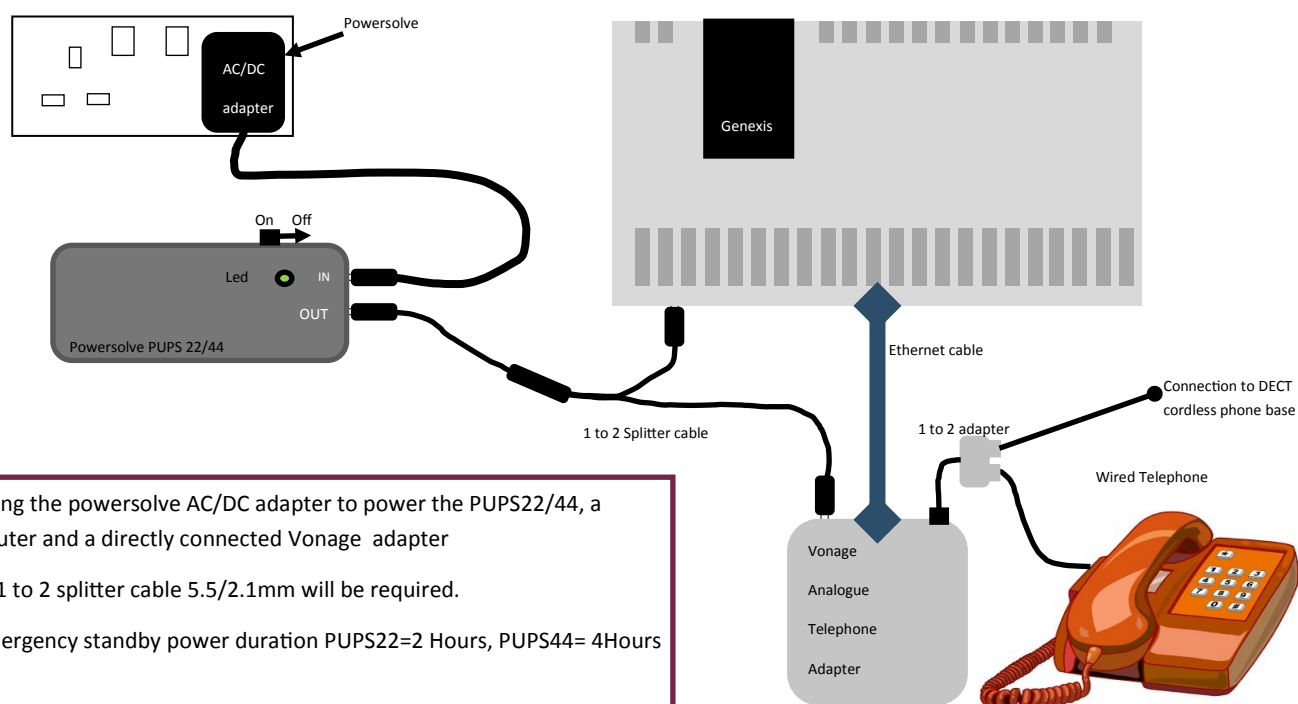**Useful Extra Info** Dimensions PUPS22 112mmL x 61mmW x 26mmH (43mmH PUPS44).

With the router powered you can use WiFi calling Apps like Vonage Extensions, or Skype to make telephone calls via your smartphone, so it isn't always essential to have the VoIP adaptor powered to still make and receive telephone calls.

Using a PUPS means my B4RN Genexis router has an emergency power supply, but how do I keep my VoIP telephone working as well?

Firstly, keeping the router powered during a power cut means that you can keep using Wi-Fi calling services like the Vonage Extension app on your smart mobile phone. However if you don't use WiFi calling, or just prefer using a traditional handset then the PUPS units can still provide a solution to keeping your VoIP service available.

Using a PUPS to power the Router and a Vonage Telephone Adapter.

The PUPS22 and 44 (both 12V DC) are capable of providing up to 24 Watts of power, this is sufficient to simultaneously power two small devices like a router and a linked Vonage adapter. All that is required is a method for splitting the supply. In the example below a wired telephone is linked to the Vonage box along with a DECT cordless phone base, when a power cut occurs only the wired phone will continue to work as a DECT phone relies upon its own separate power supply.

Powersolve

AC/DC adapter

On   Off

Led   IN

OUT

Powersolve PUPS 22/44

Genexis

Ethernet cable

Connection to DECT cordless phone base

1 to 2 adapter

1 to 2 Splitter cable

Wired Telephone

Vonage

Analogue

Telephone

Adapter

Using the powersolve AC/DC adapter to power the PUPS22/44, a Router and a directly connected Vonage adapter

A 1 to 2 splitter cable 5.5/2.1mm will be required.

Emergency standby power duration PUPS22=2 Hours, PUPS44= 4Hours

Useful Extra Info The power used by the Genexis router (@12Volts DC) varies between the 3 models deployed by B4RN and this is also true for the 3 different models of Vonage telephone adapter (2 use 12V DC and one requires a 5V supply) The actual amount of power required is dependent on how many tasks the router is running (Wi-Fi only operation uses approximately 25% less power than when ethernet links are active) and what telephone adapter is used.

Testing has shown that for a given mode of operation (e.g. Wi-Fi Only, or ethernet links active) the Genexis DRG719 uses slightly more power than the DRG739V2 and DRG7820. All the runtime figures quoted are based on the DRG719, users of the 739 and 7820 models should find the runtime is longer. Only the 12V DC Vonage adapters have been assessed of these the V22 uses more power than the smaller single line SL, the duration quoted assumes the V22 is being used.

The PUPS22/44 User Guide

The PUPS22/44 are designed to be simple plugin devices that can provide up to a maximum of 24Watts, e.g. 2Amps @12Volts DC. They are supplied with a short output cable to suit most common devices. The Genexis Routers, the Vonage V22 and SL adapters use a 12V DC supply with a 5.5/2.1mm jack. Powersolve will supply a compatible AC/DC adapter, however they state that the PUPS *"can be used with any approved AC-DC power adaptor which has sufficient output power to provide the load and charge the internal batteries of the UPS "*

The PUPS has two 5.5mm sockets, one labelled "IN" this connects the PUPS to the AC/DC adapter, the second labelled "OUT" connects the PUPS to the device requiring power e.g. Router.

The "ON/OFF" switch is used for enabling the UPS function, Moving the switch to OFF means that the UPS function, i.e. emergency power supply, is not operating. Moving the switch to ON means that the UPS function is operating. In order for the UPS to activate in the event of a power cut, the switch must be left in the ON position.

There is a small LED to give a visual indication of the mode of operation. When orange, the LED indicates that the batteries are re-charging e.g. the PUPS is taking power from the AC/DC supply as well as potentially providing power to the router. When lit green, the LED indicates that either the PUPS is switched ON, or the PUPS is connected to an AC/DC adapter that is providing power. Note, With the PUPS switched OFF, if it is connected to an AC/DC adapter that is switched on, the LED will be lit green.
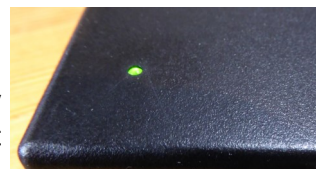
Recharging will only occur if there has been a power cut and the internal batteries have been used to keep the router powered. If the batteries have been completely exhausted after an extended power cut, recharging will typically take up to 6 hours. During normal operation the power used to keep the batteries topped up is negligible as the Lithium-ion batteries are very good at holding their charge.

The normal connection and power up sequence for a PUPS is as follows:

Mains wall socket OFF and plug in the AC/DC adapter. PUPS switch to OFF. Connect the AC/DC adapter to the PUPS "IN" socket. Connect the PUPS "OUT" socket to the device requiring power e.g. Router. Turn the Mains wall socket ON, the PUPS Led will light Green, and the router will start its own power up sequence. Turn the PUPS switch to ON, if the batteries require charging the LED will light Orange and then after they have fully charged will turn Green.

Useful Extra Info After your PUPS has been connected, its batteries are fully charged and the router has completed its start up sequence, you may wish to test your PUPS is working correctly. To do this, switch the power off at the mains wall socket to simulate a power cut. The PUPS should instantaneously switch to its internal batteries and keep the connected equipment running normally. If this does not happen make sure the PUPS switch is set to ON. If it fails to handle the power cut correctly, make sure that you are not trying to draw more that 2 Amps in total (e.g. check which equipment you have connected to the PUPS), if there is still a problem contact Powersolve or the B4RN IT club for some advice.

Some Frequently Asked Questions

Q1 How long will the PUPS provide emergency power for? The $64,000 question.

The truthful answer is it all depends upon what devices you have connected and how active the devices are. The PUPS22 has a usable capacity of 18.7WattHours and the PUPS44 37.4Watthours. The figures quoted in the guide have all been measured and repeated in the real world. So a PUPS22 **will** power a DRG719 (Wi-Fi only) for 3 Hours, connect a Vonage V22 to the router and PUPS22 and they will be kept powered for 2Hours, if however you really make the Wi-Fi circuit work (with multiple clients some distance from the router) or make and receive telephone calls using a wired handset connected to the Vonage V22, or have more than one directly wired handset, then the amount of power used will increase and so the duration of emergency power will be reduced. The DRG739V2 and DRG7820 use marginally less power than the DRG719 as does the Vonage SL compared to the V22, so if you have these models in your home you will see better performance for a given use. The PUPS44 will provide twice the duration for any given setup compared to the PUPS22.

Q2 Can I save money and use an AC/DC adapter that I already have rather than purchase one from Powersolve ?

To ensure that you can safely use the full power rating of the PUPS then you must use an AC/DC adapter with an equivalent rating to that provided by Powersolve see http://powersolve.co.uk/pups22-44-series. You may also need a plug/socket adapter to fit into the 5.5mm/2.5mm input jack of the PUPS.

One exception to this rule has been tested and is allowable (<u>only applicable to the **PUPS22 12Vdc**</u>) provided you understand the concepts and risks of downrating. You can reuse the Genexis AC/DC adapter (minimum rating 1500mA, ideally 2000mA version) with the PUPS22 provided **you <u>only</u> power the Genexis router and no other devices, this includes no additional devices connected to the router USB.** Using a 1500mA supply means the PUPS is effectively downrated to approx. 12 Watts, **failure to follow this limit risks equipment damage and potentially fire.**

Q3 Which Vonage analogue telephone adapters can be powered?

The Vonage V22 and the single line SL have both been tested and found to be compatible with the PUPS. The tests were undertaken with a single line active with a wired handset connected with a REN rating of 1, both the V22 and SL support up to REN 4 (typically 4 wired handsets), although the PUPS can meet this increased power demand it will shorten the duration of the emergency backup.

If you have the Grandstream HT802 for your Vonage service, you will have found that it uses a microUSB power input which is 5V DC. In this instance you will need a dedicated PUPS 5VDC variant and special power supply cable in addition to a PUPS 12V DC variant for your router. Check with B4RN/IT club for the latest information on supporting this device.

Q4 How much does it all cost? The £ costs quoted for a single unit delivered by Powersolve (Feb18) are

	PUPS22	PUPS44
PUPS	29.90	41.50
AC/DC Charger	15.21	18.34
Carriage	14	14
VAT20%	11.82	14.77
Total £	70.93	88.60

Sundry cables and optional adapter will cost ~£6,

A splitter cable from Amazon "SODIAL(R) 5.5x2.1mm 1 to 2 M/F DC Power Splitter Cable for Security CCTV Camera" £0.95

A 1 metre DC extension cable if the Router and Vonage adapter are not co-located longer versions are available From Amazon "kenable 5.5 x 2.1mm DC Power Plug to Socket CCTV Extension Lead Cable 1m" £2.12

A non standard power supply will require a plug adapter from Amazon e.g. "kenable DC Jack Plug Converter 5.5 X 2.1mm DC In Line Socket to 5.5mm x 2.5mm" £2.04