



Virtual Access
GW2020 Series Router
Quick Start Guide

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1 Preface

1.1 About this document

This Quick Start Guide explains how to set up and configure a 3G/4G connection on a Virtual Access GW2020 Series router.

Images in this document show the GW2021 model. LEDs on other models may vary.

For more detailed configuration information, read the [GW2020 Series User Manual](#).

1.2 Safety instructions

The router is complicated electronic equipment that may be repaired only by authorised and qualified personnel.

- Do not try to open or repair the router yourself.
- Do not place the router in a damp or humid place.
- Do not stack the router.
- The router should be used in a sheltered area, within a temperature range of 0°C to 40°C.
- Do not expose the router to direct sunlight.

HIGH VOLTAGES

Under no circumstances is the router to be operated with the cover removed.

DANGEROUS SUBSTANCES

Semiconductor devices contain dangerous substances, such as beryllium and arsenic. Electronic devices must not be opened. If they become damaged, they must only be handled using protective gloves. If the substances inside the electronic devices come into contact with broken skin or wounds, hospital care must be sought immediately. Electronic components must be disposed of as hazardous toxic waste and must not be incinerated.

1.3 Electrical safety

The GW2020 Series router is a class I/II apparatus.

We recommend that an AC surge arrestor is installed in the AC outlet to which this equipment is connected.

Plug in the power supply into a socket outlet that is installed near the equipment and is easily accessible.

1.4 Wireless safety

Wireless routers incorporate a wireless radio module. Ensure the antenna is positioned at least one metre away from you and other people in normal operation.

If in a hospital or health care facility, do not use the router in areas where guidelines to switch off mobiles phones are posted. Medical equipment may be sensitive to RF energy.

The operation of cardiac pacemakers, other implanted medical equipment and hearing aids can be affected by interference from wireless routers when placed close to the device. People with pacemakers are advised to keep the wireless router away from the pacemaker while it is on.

Do not operate your wireless router in the presence of flammable gases, fumes or potentially explosive atmospheres. Wireless routers should not be used anywhere that blasting operations are taking place.

Wireless routers operate using radio signals and cellular networks cannot be guaranteed to connect in all possible conditions. Therefore, you should not rely solely on any wireless device for life-critical communications.

1.5 Product disposal



The United Kingdom and Republic of Ireland are under an obligation to minimise the disposal of Waste Electrical and Electronic Equipment (WEEE) in domestic waste and encourage recycling, recovery and environmentally sound disposal. Virtual Access is committed to promoting the reuse, recycling and recovery of WEEE by contributing to the appropriate compliance schemes.

Our product packaging is marked with the crossed out wheeled bin symbol to indicate that the product must not be disposed of in domestic waste but disposed of through an approved WEEE take back scheme. For details of your local collection facilities, please contact your local authority.

Virtual Access WEEE registration number: WEE/CA2530XZ.

2 Introduction

The GW2020 Series can contain either a 3G or 4G wireless modem. The modem together with a SIM card establishes a WAN connection to the Internet or private network.

3G is the third generation of mobile phone standards and technology. It is based on the International Telecommunication Union (ITU) family of standards under the International Mobile Telecommunications programme, IMT-2000.

3G and 4G technologies enable network operators to offer users a wider range of more advanced services while achieving greater network capacity through improved spectral efficiency. Services include wide-area wireless voice telephony, video calls, and broadband wireless data, all in a mobile environment.

Data bearers are frame protocols that transport data streams. The GSM (3G) modem supports GPRS, EDGE, HSDPA, HSUPA, UMTS and CSD. The 4G modem supports 4G frequencies and falls over to 3G, GPRS and EDGE technologies.

2.1 4G LTE

4G LTE is the fourth generation of mobile communication technology standards. It is a successor to 3G and provides greater bandwidth.

2.2 GPRS

GPRS (General Packet Radio Service) uses packet-switched technology to transmit small bursts of data. The 3G or 4G modem on the GW2020 Series supports multi-slot class 6, which allows a maximum data rate of 384Kbps class 3. The maximum data rate available to the 3G or 4G modem depends on provisioning by the network operator.

2.3 HSPA+

High-Speed Packet Access + is an improvement on UMTS with achievable download speeds of 21Mbps.

2.4 HSDPA

HSDPA (High-Speed Downlink Packet Access) uses circuit-switched technology to transmit data at speeds of up to 7.2Mbps.

2.5 HSUPA

HSUPA (High-Speed Uplink Packet Access) is a 3G mobile protocol with uplink speeds of 5.76Mbps.

2.6 UMTS

UMTS (Universal Mobile Telecommunications System) is a third generation technology providing higher transfer rates.

2.7 EDGE

EDGE uses the same frequencies as GPRS but offers better speeds. It is used when the signal strength for 3G or 4G is not sufficient.

2.8 CSD in EGSM900/GSM1800 MHz

CSD (Circuit-Switched Data) mode enables the 3G modem to transmit data over the EGSM (Extended Global System for Mobile communications) frequency or the GSM frequency. The modem behaves as a dual-band mobile phone behaves.

3 Getting started

3.1 Serial number

When you receive your GW2020 Series router package retain the outer packaging. The label containing the model number, serial number (S/N) and part number (P/N) is located on the side of the packaging box.

Each GW2020 Series router is assigned a unique serial number. Record your device serial number on your warranty card or somewhere you can easily access it. You must reference your unique serial number (S/N) when you contact your distributor or Virtual Access support for installation and configuration confirmation or should you request service on the device.



Figure 1: The GW2021 label showing the serial number

Unpack the contents. There is a matching label located on the bottom of the router.

3.2 Inserting the SIM card

1. Ensure the unit is powered off.
2. Hold the SIM card with the chip side facing down and the cut corner top left.
3. Gently push the SIM card into SIM slot 1 until it clicks in.
4. To remove the SIM card, gently push the SIM card. The card will click out.

3.3 Connecting the antenna

The GW2020 Series router is shipped with one antenna suitable for the model you ordered. If you require antenna diversity, contact your reseller.

Screw the antenna into the back MAIN SMA connector.

3.3.1 Antenna diversity

The GW2020 Series router has an AUX connector for connection of a second antenna to allow for antenna diversity. Antenna diversity helps improve the quality and reliability of a wireless link by mitigating problems associated with multipath distortion.

Multipath distortion is a form of RF interference that occurs when a radio signal has more than one path between the receiver and the transmitter. It commonly occurs when there is no clear line of sight between the transmitter and receiver and instead the signal is reflected off hard surfaces such as shelves, ceilings and walls.

3.4 Connecting the power supply

1. Plug the power cable into an electrical socket suitable for a DC12V/1A power supply.
2. The router initialises. The Power LED lights green, the CONFIG LED flashes, and all the LEDs temporarily light in sequence. Then the router activates.

4 LED behaviour

4.1 Main LED behaviour

The GW2020 Series router has single colour LEDs for power, config and signal strength. When the router is powered on, the LED is green.



Figure 2: Power and config LED activity on a GW2021 model: power and config are on

The possible LED states are:

- Off
- Flashing slowly
- Flashing quickly
- On

Booting		The GW2020 router takes approximately 2 minutes to boot up. During this time, the power LED is SOLID. Other LEDs display different diagnostic patterns. When start up is complete all LED activity will stabilise, indicating the unit is ready.
Power LED	On	Power
	Off	No power/boot loader does not exist
Config LED	On	Unit running a valid configuration file
	Flashing slowly	Unit running in recovery mode (5 Hz)
	Flashing quickly	Unit running in factory configuration (2.5 Hz)
SIM LEDs	On	SIM selected and registered on the network
	Off	SIM not selected or SIM not inserted
	Flashing	SIM selected and not registered on the network
Signal LEDs	None	PPP not connected or signal strength $\leq -113\text{dBm}$
	1	PPP connected and signal strength $\leq -89\text{dBm}$
	2	PPP connected and signal strength between -89dBm and -69dBm
	3	PPP connected and signal strength $> -69\text{dBm}$

Table 1: LED behaviours and meanings

Note: When PPP is not connected, none of the signal LEDs will light regardless of signal strength.

4.2 Ethernet port LED behaviour

The Ethernet port has two LEDs: a LINK LED (green) and an ACT LED (amber). When looking at the port, the LED on the left hand side is the LINK LED, and the ACT LED is on the right hand side.



Figure 3: Ethernet LED activity on the rear of a GW2021 router

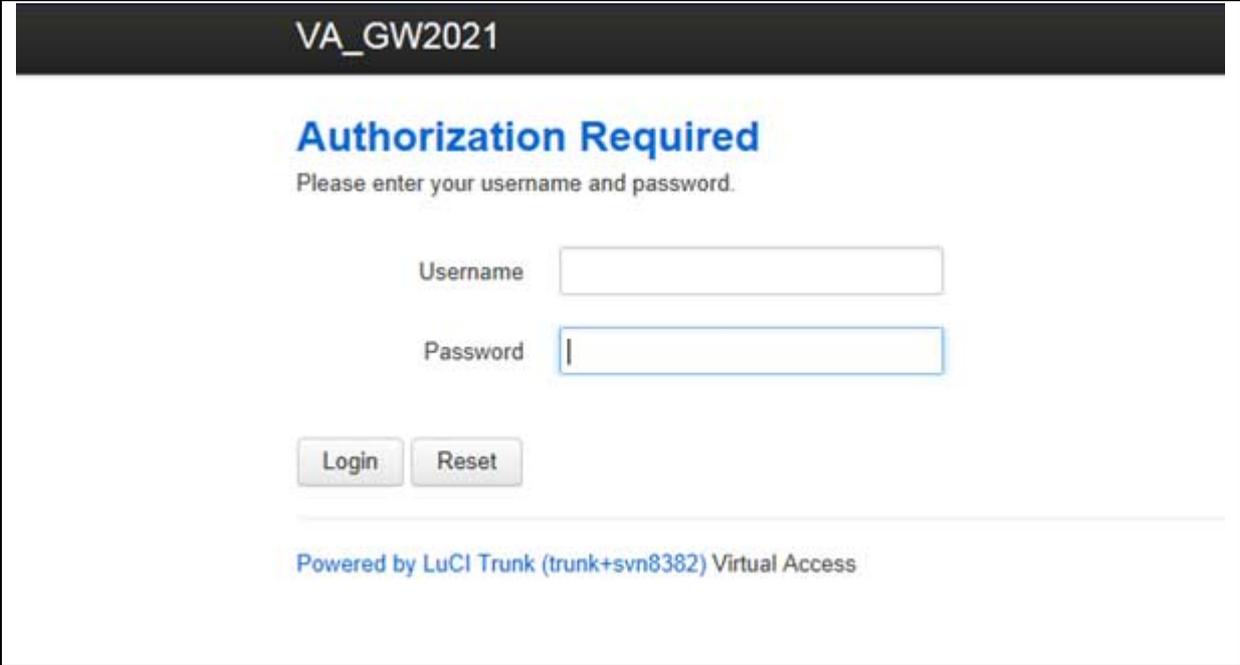
Link LED (green)	Off	No physical Ethernet link detected
	On	Physical Ethernet link detected
ACT LED (amber)	Off	No data is being transmitted/received over the link
	Flashing	Data is being transmitted/ received over the link

5 Configuring the GW2020 Series router for 3G/4G access

1. Ensure the SIM is inserted into SIM 1 slot and that the power is connected to the router.
2. To connect to the router's web page, either set your computer network interface card to point to 192.168.100.1/24 as a gateway or set the card to receive an IP via DHCP.
3. When the router has booted up, browse to 192.168.100.1 and enter the default user name and password.

User name: root

Password: admin



VA_GW2021

Authorization Required
Please enter your username and password.

Username

Password

Login Reset

Powered by LuCI Trunk (trunk+svn8382) Virtual Access

Figure 4: The GW2021 login page

4. Click **Login**.

If the router is operating in its factory configuration mode, a warning message appears explaining that after you have made changes, you must switch the router to config 1 for the changes to take effect.

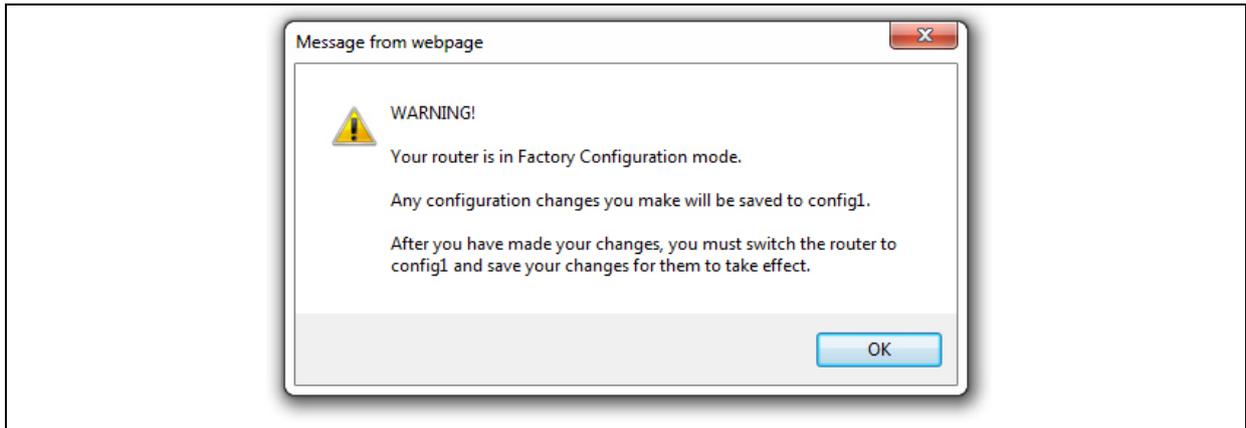


Figure 5: The router is operating in factory configuration mode

5. Read the message and click **OK**.
6. To configure any relevant interface, go to the top menu, select **Network -> Interfaces**.



Figure 6: The GW2021 interfaces menu

7. Click **Edit** on WAN or LAN to make your changes. For WAN connectivity, the Common Configuration page appears.

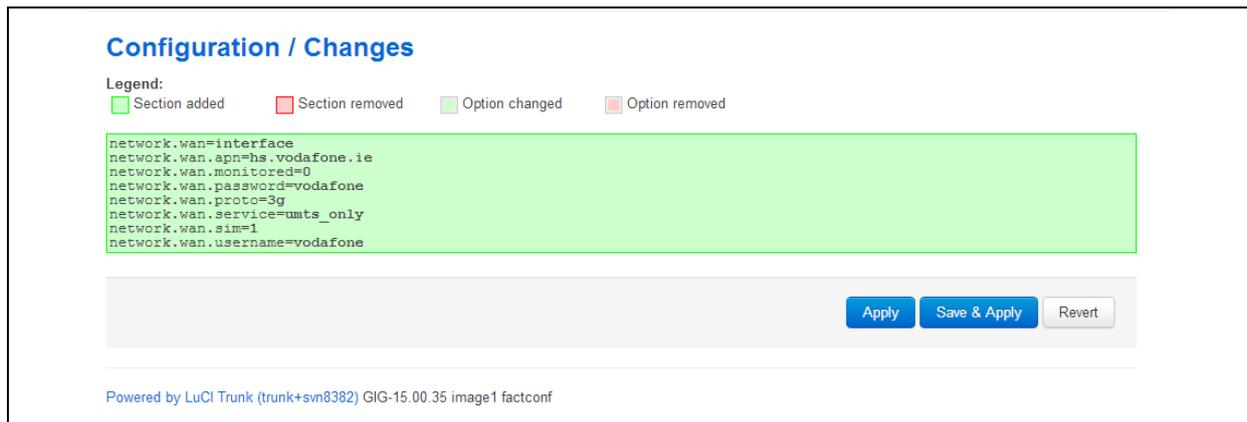
Figure 7: The common connectivity page

8. Ensure you have selected the General Setup tab.
9. For single SIM implementation, in the SIM drop down menu, select **SIM 1**.
10. Enter the APN information and the PAP/CHAP username and password.
11. Click **Save & Apply**.
12. To enable a 3G/4G connection to connect on boot up, select the **Advanced Settings** tab.
13. Select **Bring up on boot**.
14. Click **Save**.
15. When you have made all your changes, you can view a change summary by clicking **UNSAVED CHANGES** in the top menu.



Figure 8: The unsaved changes button in the top menu

A list of unsaved changes appears.



16. To save the changes, click **Save & Apply**.

17. When the changes have been saved, you can switch the router's configuration file to config1.

18. Click **System -> Backup/Flash Firmware**.

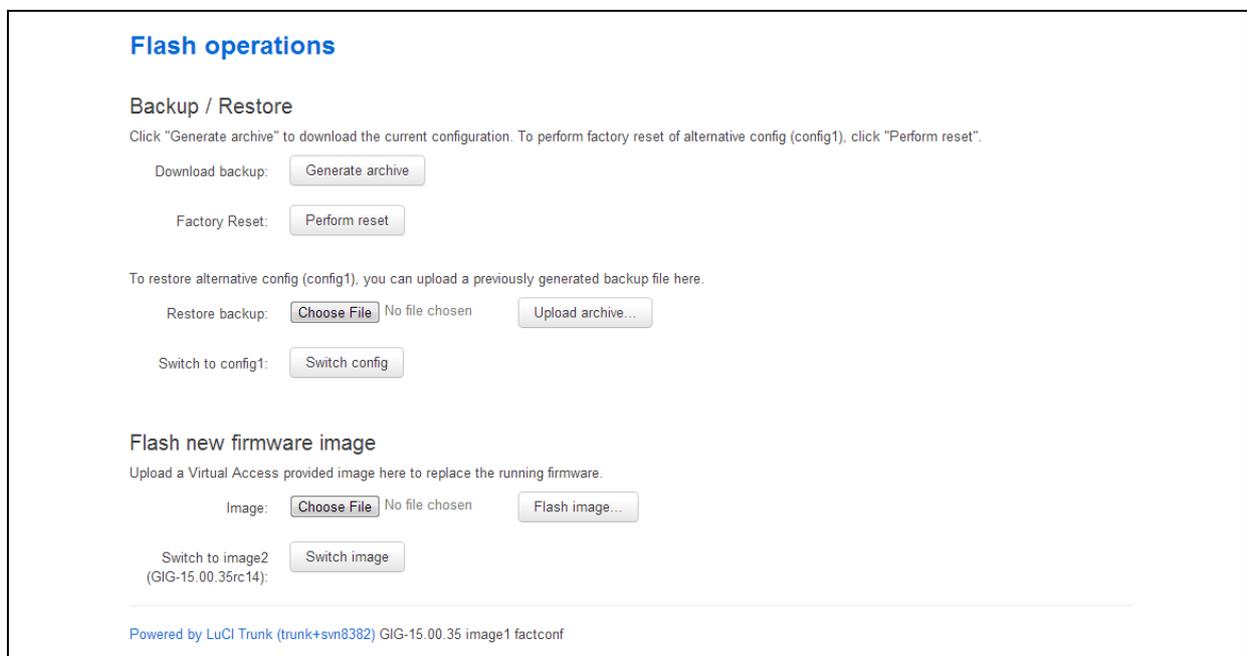


Figure 9: The flash operations page

19. In the Flash operations page, click **Switch config**. A rebooting message appears.

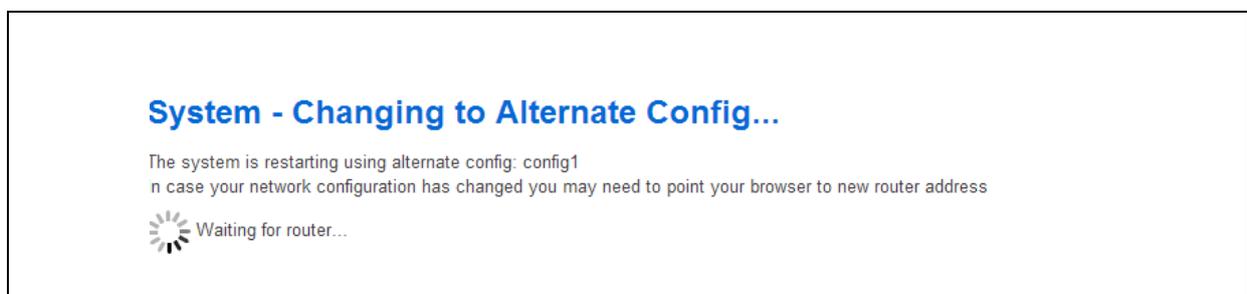


Figure 10: The rebooting message

The router will reboot into config1.

20. To check for connectivity, return to the top menu, and select **Network -> Interfaces**. The WAN interface will show receive and transmit packets and an IP address.

WAN LAN

Interfaces

Interface Overview

Network	Status	Actions
LAN eth0	Uptime: 0h 7m 59s MAC Address: 00:E0:C8:10:03:E7 RX: 300.73 KB (2574 Pkts.) TX: 372.19 KB (1121 Pkts.) IPv4: 192.168.100.1/24	Connect Stop Edit Delete
WAN 3g-wan	Uptime: 0h 0m 0s RX: 149.39 KB (411 Pkts.) TX: 78.49 KB (616 Pkts.) IPv4: 78.152.227.151/32	Connect Stop Edit Delete

Add new interface...

Figure 11: The interfaces overview page

21. To view 3G/4G connectivity information, select **Status -> Mobile Stats**. The Mobile/3G information page appears.

Mobile/3G Information

The mobile module is reporting the following information.

Area Code	8CA2
Cell ID	000BAA7E
Data Network Status	1, Home network
GPS Position	n/a
GPS Status	n/a
IMEI	n/a
IMSI	n/a
Last Network Error	n/a
Network Status	1, Home network
Operator	0,0,"O2 IRL",2
Phone Number	n/a
SIM In	yes
SIM Slot	1
SIM1 ICCID	8935302102100237914
SIM2 ICCID	n/a
Signal (dBm)	-67
Tech Code	6
Technology	UTRAN w/HSUPA and HSDPA
Temperature (C)	37

Figure 12: The mobile/3G information page

6 Firmware updates information

To obtain firmware updates for your GW2020 Series router, contact your reseller.

7 Troubleshooting

Problem	Possible causes	Solution
I cannot access the GW2020	The configured IP address or subnet, or both on your PC is incorrect.	Change the IP on your PC to contact the GW2020 on 192.168.100.1/24
	The GW2020 is not running its factory configuration.	Check the config LED status. Flashing indicates its running its factory configuration. If it is solid, hold in the reset button for between 3 and 15 seconds and then release.
I cannot access the WAN network after manual configuration	The SIM is not inserted.	Power off the GW2020, insert the SIM card and then power on the GW2020.
	The APN is incorrect.	Check you have configured the correct APN.
	SIM username or password, or both are incorrect.	Check the correct SIM username and password settings.
	There is a connection failure.	Check the status of Connection Monitor. From the Start page, browse to >Advanced > Connection monitor .
The router performance is slow.	There is poor 4G/3G signal strength.	Check the signal strength. From the Start page, browse to Status > Mobile Stats . Move the GW2020 to a better location and recheck signal strength.