

DrayTek

Vigor 2820Vn ADSL Router Firewall



- ADSL/ADSL2+ and Broadband Router
- Dual-WAN ports for ADSL or cable modem or both
- 3G (Cellular) Modem support
- Comprehensive and Robust Firewall
- Twin VoIP ports with PSTN passthrough ('V' models only)
- Content Filtering (by matched keyword or data type)
- SurfControl Web Site Category Filtering
- Ethernet and WLAN Virtual LAN segmentation (common/distinct)
- Configurable QoS Features (For traffic prioritisation)
- VPN Dial-in/dial-out with VPN hardware co-processor
- 802.11n Draft 2.0 Wireless LAN ('n' models only)
- Gigabit Ethernet LAN Port for LAN Server connectivity
- USB Port for Printer or 3G Modem
- Highly configurable but easy to install and monitor

Overview

Vigor 2820Vn ADSL Router Firewall

The Vigor 2820Vn is DrayTek's latest premium ADSL and broadband router/firewall family, featuring an entirely new stylish case design and new DrayOS 3 operating system. Packed with features, the Vigor 2820 offers truly comprehensive ADSL connectivity and security.

Compatible with all variants of ADSL (including ADSLMax and ADSL2+) the Vigor 2820 can also be used for cable-modem and leased line applications thanks to its additional WAN port (Ethernet). A Gigabit Ethernet port on the LAN side provides high speed connectivity for your server (or uplink to a larger Ethernet Switch). Security features include content filtering, web application controls and a new object based firewall management system.

Robust & Comprehensive Firewall

As with previous DrayTek firewalls, security is taken seriously on the Vigor 2820 Series. The firewall features measures for protection against attacks including DoS (Denial of Service) attacks, IP-based attacks and access by unauthorised remote systems. Wireless, Ethernet and VPN are also protected by various protection systems (see later). A new DrayTek object-based firewall allows even more setup flexibility than ever, enabling you to create combinations of users, rules and restrictions to suit multi-departmental organisations.

Content control features of the firewall allow you to set restrictions on web site access, blocking download of certain file types, blocking specific web sites, blocking IM/P2P applications or other potentially harmful or wasteful content. Using the **SurfControl** site categorisations enable you to block whole categories of web sites (e.g. gambling, pornography etc.), subject to subscription

Dual-WAN Load Balancing & Backup

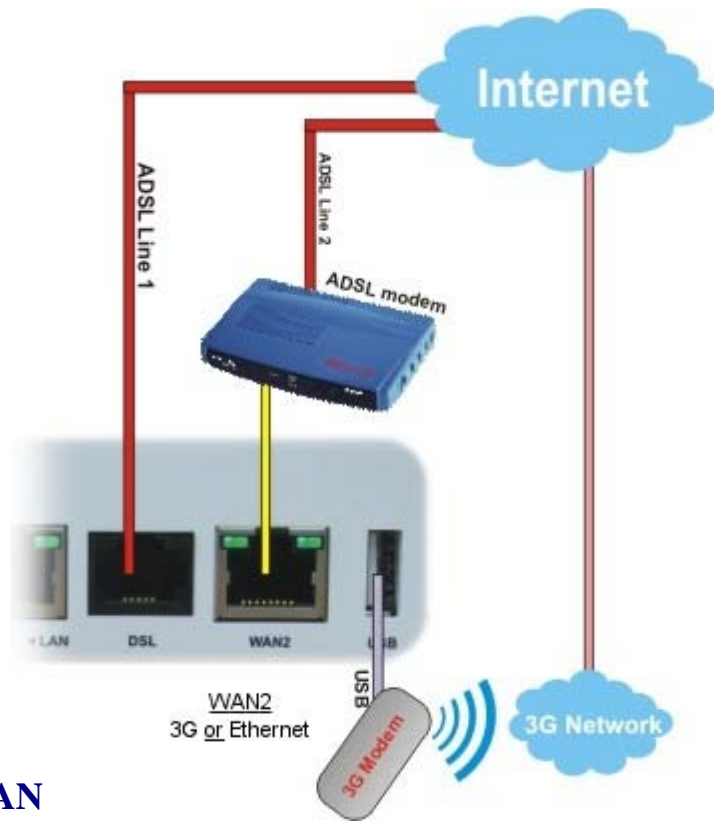
As well as the primary ADSL interface, the Vigor 2820 features a secondary WAN port for Internet access. This is an Ethernet interface and can connect to a second ADSL modem, cable modem or any other Ethernet-based Internet feed. The secondary interface can be used either for **WAN-Backup** or **load balancing**.

WAN-Backup provides contingency (redundancy) in case of your primary ADSL line or ISP suffering temporary outage. Internet Traffic will be temporarily routed via the secondary Internet access. When normal services is restored to your primary ADSL line, all traffic is switched back to that.

If you don't have ADSL, the Ethernet WAN port can instead be used as your primary/only Internet connection (using NAT) so the same router can be used for either ADSL or Ethernet Internet connections.

The USB port provides an alternative connection method (Firmware Upgradable) for Internet backup by connecting to a compatible USB modem (or cellphone) for access to the high speed **3G cellular networks** from UK providers such as Vodafone, Orange, 3 and T-Mobile. If you don't have ADSL at all, the USB/3G access method can be used as your primary/only Internet connection, ideal for temporary locations, mobile applications or where broadband access is not available.

Note : For WAN2 you can use either a Ethernet or USB 3G connection but not both at the same time.



Wireless LAN

Wireless LAN

The Vigor2820Vn features the latest 802.11n Draft 2.0 wireless LAN specification and has been certified by the WiFi alliance for cross compatibility and WiFi compliance (including WPA/WPA2 and WMM).

802.11n Draft 2.0 provides a total wireless bandwidth of up to 300Mb/s using new methods such as packet aggregation and channel bonding. Throughput depends on your own environment (factors such as obstructions, number of hosts and distance all make a significant difference), but actual transfer speeds of 100Mb/s are achievable (based on our real world tests). In addition, 802.11n Draft 2.0 provides greater coverage and resilience to interference compared to previous wireless standards thanks to the MIMO technology and the Vigor's triple-antennae diversity arrangement. This offset arrangement of aerials provides offset paths between hosts so that interference can be overcome.

Wireless Security is comprehensive too; the Vigor 2820 Series provides several independent levels of security including encryption (up to WPA2), authentication (802.11x) and methods such as MAC address locking and DHCP fixing to restrict access to authorised users only. The Web interface lets you see how many and which clients are currently connected as well as their current bandwidth usage. An 'instant' block lets you disconnect a wireless user temporarily in case of query. The Wireless VLAN facility allows you to isolate wireless clients from each other or from the 'wired' LAN.

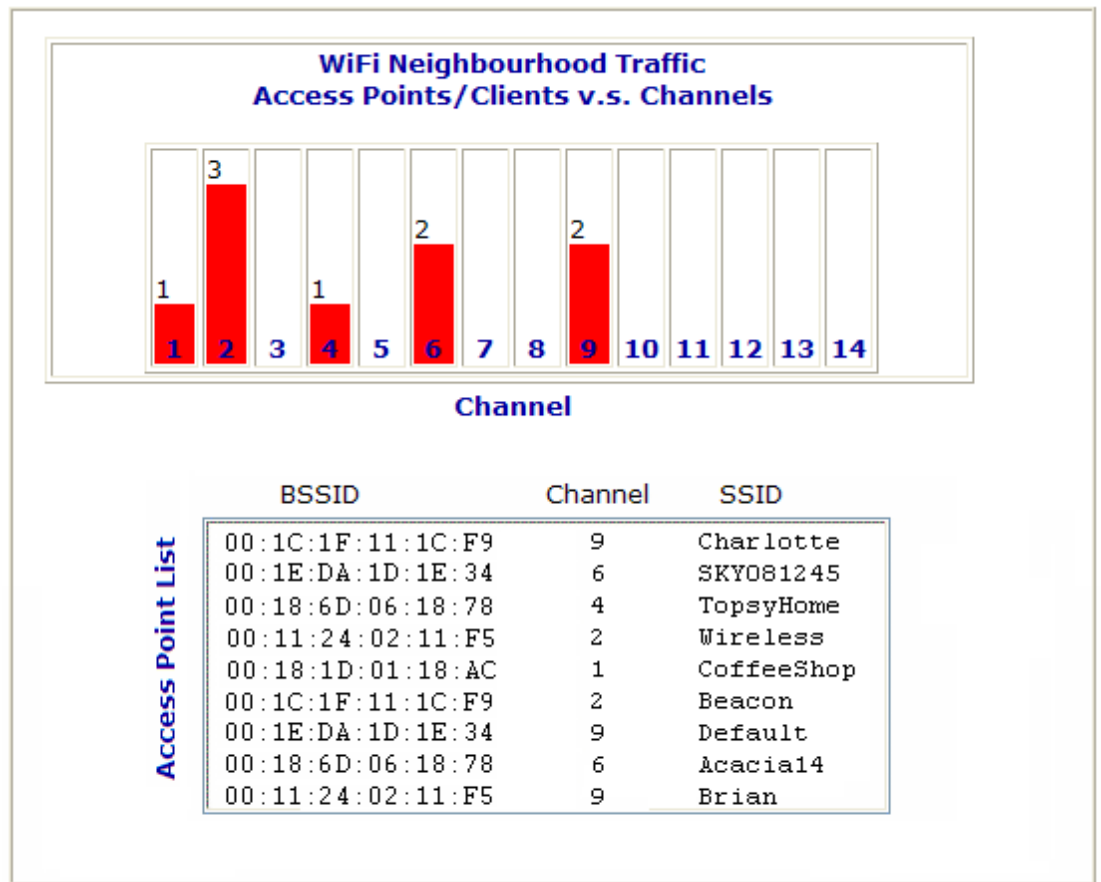
The Multiple SSID features enable you to have up to four distinct or common virtual wireless access points. For example, you could have one for company usage, with access to your company LAN and another for public access which allows internet surfing only. Setting up wireless security is made easier thanks to the WPS feature (WiFi protected setup) whereby your client PC can get it's security keys by pressing a button on the front of the router.

Your laptop PC's built-in wireless may not support 802.11n Draft 2.0 wireless, in which case you will need to add a new wireless LAN interface such as the [Vigor N61](#) USB adaptor. Click on 'accessories' for details.

For specialist or more demanding coverage applications, [optional aerials](#) can be used with the Vigor 2820 to potentially increase the range of wireless coverage (depending on environment) or provide directional coverage in order that your wireless transmission is focussed and concentrated into one direction only, for example into a room or across open space. With the increasing popularity of wireless LANs, you will want to choose the least congested wireless channel (Nos. 1-13) for yours. The Vigor can scan and provide a list of all devices in the vicinity so that you can choose the best channel (see screenshot below).

- 802.11n Compliant (Draft 2.0)
- WiFi Alliance Approved
- Latest 'MIMO' Technology with three aerials (2T3R)
- Packet Aggregation and Channel Bonding
- Optional Higher Gain or directional aerials available

- Also Compatible with 802.11b and 802.11g Standards
- Active Client list in Web Interface
- Wireless LAN Isolation (from each other and/or wired LAN)
- 64/128-bit WEP Encryption
- WPA/WPA2 Encryption
- WPS - WiFi Protected Setup for client security setup - (Firmware Upgradable, ETA April 2008)
- Switchable Hidden SSID
- Restricted access list for clients (by MAC address)
- Time Scheduling (WLAN can be disabled at certain times of day)
- Access Point Discovery
- WDS (Wireless Distribution system) for Bridging and Repeating
- 802.1x Radius Authentication
- Wireless Rate-Control
- Automatic Power Management
- 802.11e WMM (Wi-Fi Multimedia)



Above : The Vigor2820n provides a local survey of other access points so that you can choose the least congested channel.

Important Note : Wireless performance (speed and range) always depends on your specific environment and will vary considerably. Factors affecting performance include wireless traffic, other networks nearby, site construction, walls, ceilings and other electronic equipment nearby. The product may not be upgradable to future 802.11n Draft standards or be compatible with products from other manufacturers. Speeds quoted are the maximum wireless capacity, including RX/TX capacity, protocol overheads and all clients/hosts connected.

WDS

Wireless LAN WDS Facility

Vigor 2820 'n' models support a system called **WDS** (Wireless Distribution System) which enables you to use the wireless capability to bridge to another network, within wireless range. You need an additional compatible wireless router for this of course. Here is a simple example:



With WDS bridging, both networks should be within the same logical IP subnet (IP address range). Once set up, all of the PCs on both sides of the link can access each other, across the wireless bridge. Local wireless devices such as a laptop can continue to use their local access point.



An additional mode, as shown above, called 'repeating', allows you to set up a third station. In the diagram below, the router at 'B' is set up in repeating mode, relaying traffic between LANs at A and C. Therefore, all three physical networks can communicate with each other over the wireless links.

Voice-over-IP

Voice-over-IP Features

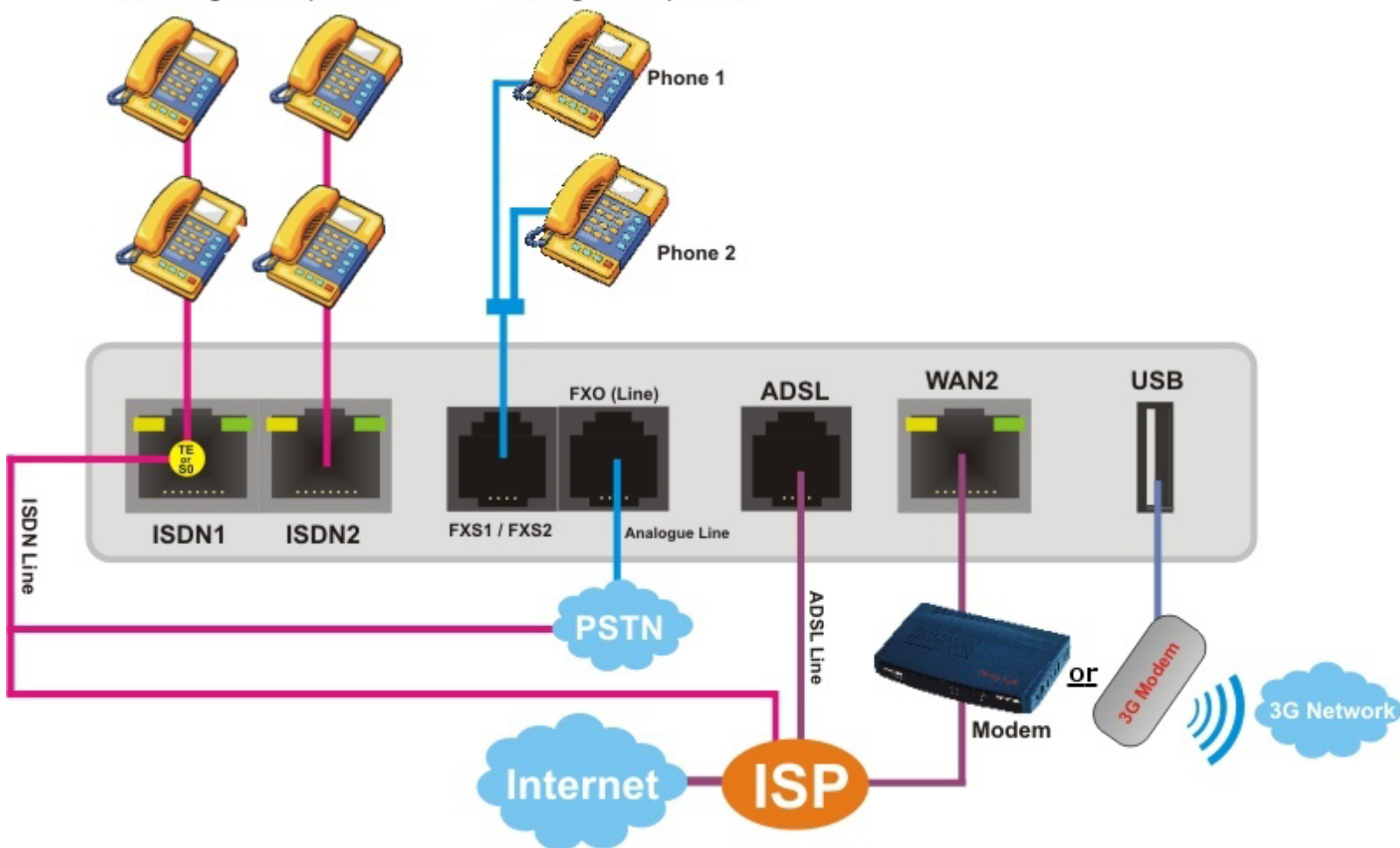
The Vigor 2820Vn builds on the established DrayTek VoIP pedigree by adding even more new features. Twin analogue phone ports and an FXO analogue line port provide full PSTN and VoIP integration on the same phones, via both the Internet and your regular analogue line. The two phones can be used independently and simultaneously for both incoming and outgoing calls.

As well as the two telephone ports, a third port, the FXO (Line) port, connects into your regular analogue line (PSTN/POTS*). This then gives the telephones access to your analogue line to allow you to make calls as well as your VoIP facility (you can select the PSTN line instead of VoIP by dialling #0). Incoming calls are automatically switched through to your telephone(s) (either one or both) so that each phone can be used for both VoIP and POTS calls. Both telephones plugged into your router have access to VoIP and your analogue line. In addition, using the 'Digit-Map' facility you can set rules about particular call destinations using either the POTS line or your SIP/VoIP service. For example, local calls can be routed via your PSTN line (if you have a free calls package for example) whereas international calls can go via your preferred VoIP provider; there is flexibility to have several digit-map rules.



ISDN Digital Telephones

Analogue Telephones



The above diagram should be used as a working schematic only, rather than an exact representation of the unit's connectivity and should be viewed with these notes: ISDN is not currently available on this model. The USB port can be used for a compatible 3G modem or a shared compatible printer connection. The secondary WAN Port ('WAN2') can be used for connection to any Ethernet feed for load balancing or Internet backup. You cannot use both WAN2(Ethernet) and USB for 3G at the same time. The LAN Ports are not shown on this diagram.

*POTS = **P**lain **O**ld **T**elephone **S**ervice - The traditional analogue phone voice line in your home/office, e.g. B.T. That line may also be carrying your ADSL data signal.

• VoIP Features :

- Two 'FXS' Phone Ports
- One 'FXO' Line Port for connection to analogue (POTS) line
- Automatic phone switch-over for incoming calls on either PSTN or VoIP
- Hotline (Dial preset number when handset lifted)
- Digit-Map facility for LCR selection
- Protocols: SIP, RTP / RTCP
- 12 SIP Registrar Accounts (for up to 12 VoIP providers)
- G.168 Line Echo-cancellation
- Automatic Gain Control
- Jitter Buffer (125ms)
- Voice Codecs:
 - G.711 A / μ Law
 - G.723.1
 - G.726
 - G.729 A / B
- VAD / CNG
- Tone Generation: DTMF , Dial , Busy , Ring Back , Call Progress
- DTMF Transmission: In Band / Out Band (RFC-2833) / SIP info
- FAX / Modem Support G.711 Pass-through
- T.38 for FAX
- Supplemental Services (Dependent on ITSP):
 - Caller ID
 - Call Hold / Retrieve
 - Call Waiting
 - Call Waiting with Caller ID
 - Call Transfer
 - Call Forwarding (Always , On Busy and On No Answer)
 - DND (Do not Disturb)
 - Call Barring (Incoming / Outgoing)
 - MWI (Message Waiting Indicator) (RFC-3842)

3G Cellular Data Features

The Vigor 2820 Series's USB port can host a compatible 3G modem or cellphone for access to the cellular network for full Internet Access. Most UK networks now provide high speed HSDPA data connections at up to 3.6Mb/s download speed. The 3G connection can be used as your primary/only Internet access, or as backup to your main ADSL line connection. This is not only ideal for homes or offices which don't want to pay fixed line + broadband rental, but also for temporary locations, or those to where fixed lines aren't available.

With the Wireless LAN equipped models of the Vigor 2820 series, your local users can be connected wirelessly to the router, so instant free 'hotspots' can be deployed quickly and easily. Mains power is required for the router's PSU, but this could be from a mobile generator or equivalent so you need to plan for this.

Supported 3G Modems / Phones

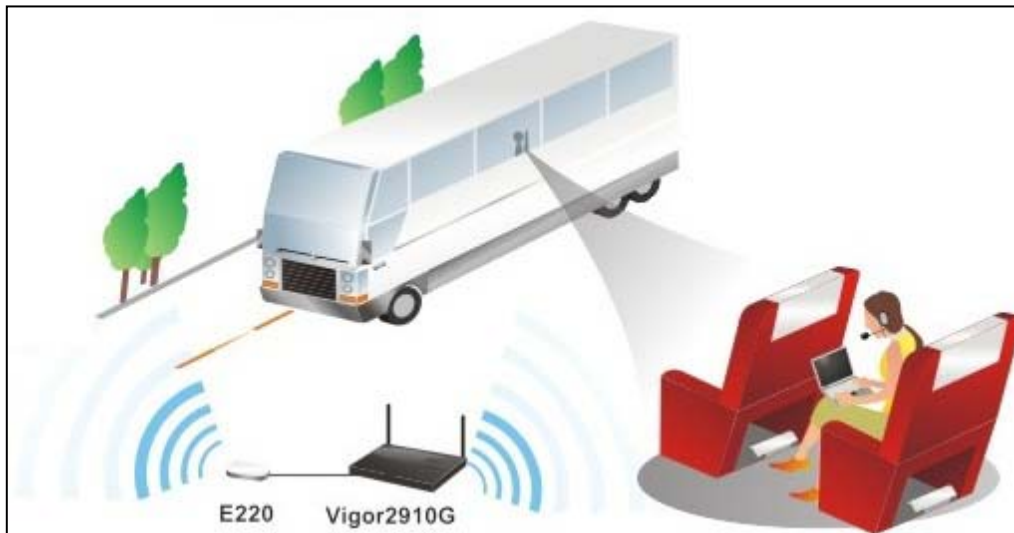
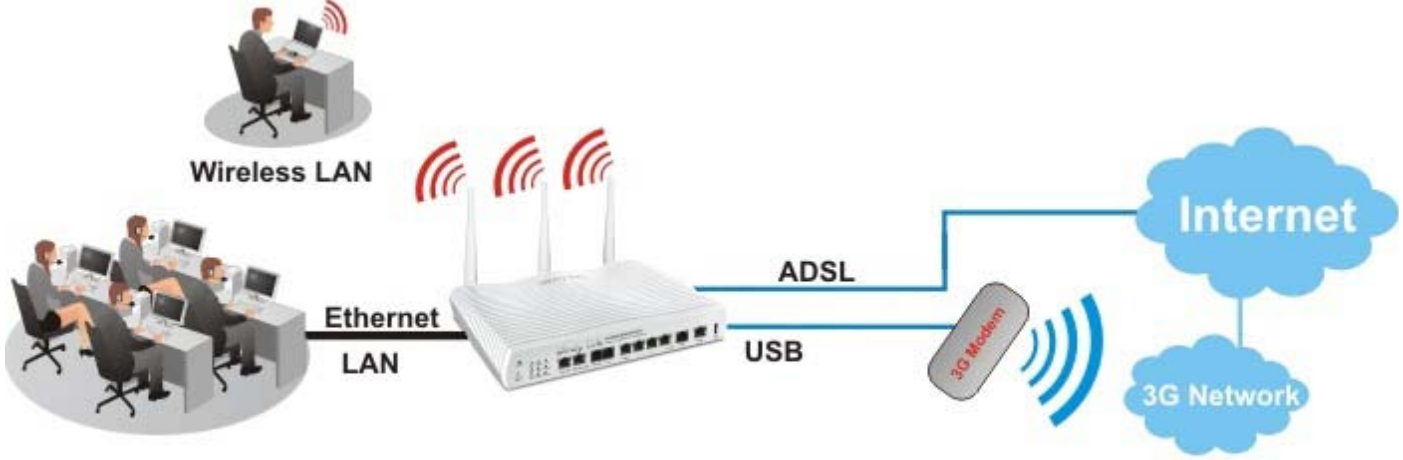
- Huawei E156G
- Huawei E160G
- Huawei E169G (K3520)
- Huawei E172
- Huawei E220
- Huawei E226
- Huawei E230
- Huawei E270
- Huawei E272
- Nokia N70
- Nokia N95
- Nokia 6233
- Nokia N73
- Nokia E65
- Option Globesurfer iCon 7.2 (not '225' or '7.2s)
- Sierra Aircard 876u
- Sierra 875U
- Telstra HSDPA USB Modem
- 4G System XSPlug P3
- MomoDesign MD-@
- Benq EF91
- LG U8380
- Telstra Next G 3G USB
- Bandrich Bandlux C100
- Bandrich Bandlux C100S
- Bandrich Bandlux C120
- Amoi H01
- Aiko 76E
- BigPond Next G
- C-Motech D-50
- ASUS T500 Modem
- Zapp Telemodem Z020
- ZTE AC8700 3G
- ZTE MF622
- Additional Modem Support is added continuously or you can request specific models.



A USB connection cable is required for your phone (not supplied).

The Vigor 2820 and 3G cellular modem setup is ideal for:

- Backup to your primary Internet feed (ADSL, cable etc.)
- Providing lower cost broadband than a fixed line solution
- Areas without fixed line broadband access
- Compatible with a wide range of 3G modems/phones
- Temporary Locations
- Mobile Homes
- Locations on the move - coaches, trains
- Fairgrounds & temporary exhibitions
- Outdoor locations (the router and modem itself must be indoors!)
- Disaster Planning & High Availability



Example Use : Installation in a mobile café or moving bus

Note: DrayTek have no control over local network/provider operations, changes in network facilities/tariffs nor make any claim over specific network compatibility. Please assure yourself that the router will be compatible with your chosen cellular network and provider and that you have adequate signal coverage before committing to any contract term. Please also ensure that your chosen provider and the tariff allows access to all of your required applications (e.g. VPN, VoIP, Messaging etc.) as many packages exist, some blocking certain data types.

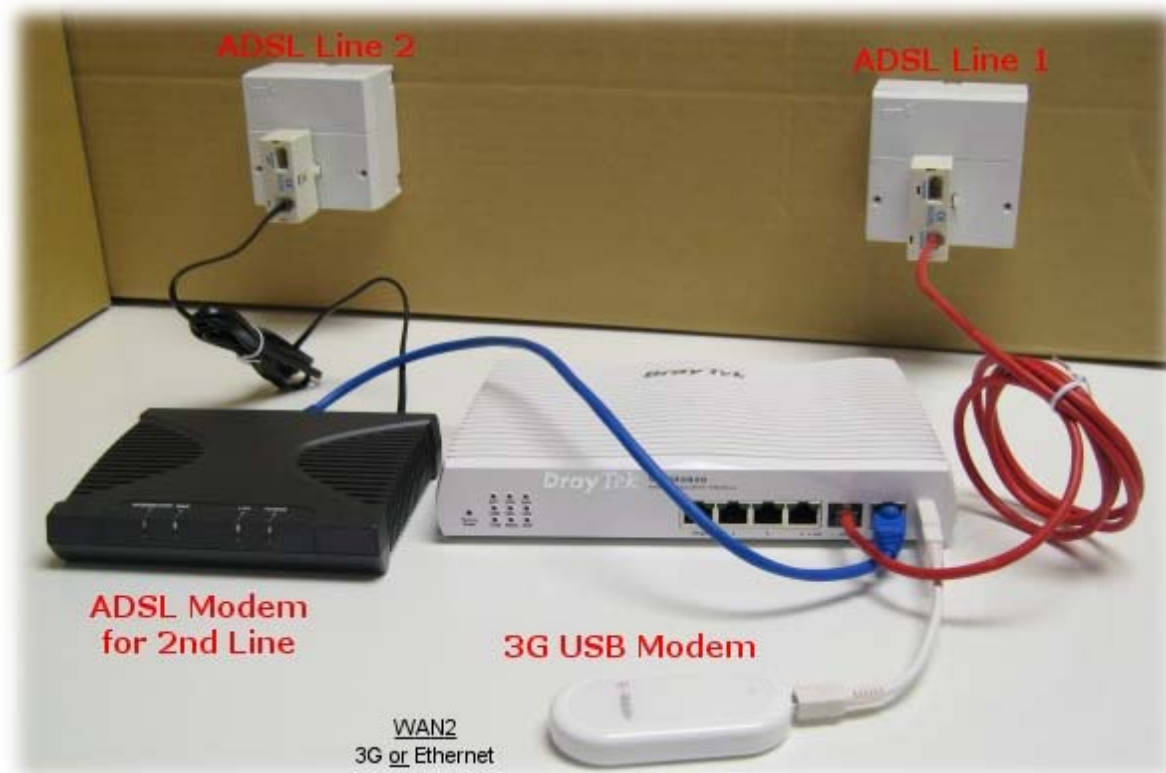
Vigor 2820 Series Detailed Specification

- Physical Interfaces:
 - LAN Ports (Switch)
 - 1 X Gigabit Ethernet (1000Mb/s) Ports
 - 3 X Megabit (100Mb/s) Ports
 - Port-Based VLAN (Inclusive/Exclusive Groups)
 - WAN Ports:
 - ADSL Port Compliant with:
 - ANSI T1.413 Issue2
 - ITU-T G.992.1 G.dmt (ADSL)
 - ITU-T G.992.2 G.lite
 - ITU-T G.992.3 ADSL2
 - ITU-T G.992.5 ADSL2+
 - Annex L (READSL)
 - Annex M
 - Secondary WAN Port : 10/100 Base-TX Ethernet for load balance and WAN failover
 - USB Port for 3G Cellular Modem or Printer
 - VoIP: 2-port FXS Phone Ports (Vigor2820Vn only)
- Load Balance/Failover Features:
 - Outbound Policy-Based Load-Balance
 - WAN Connection Fail-over
 - BoD (Bandwidth on Demand)
- Vigor 2820 ATM Protocols (DSL):
 - RFC-2684/RFC-1483 Multiple Protocol over AAL5
 - RFC-2516 PPP over Ethernet
 - RFC-2364 PPP over AAL5
 - PPPoE pass through LAN/WLAN
 - PPPoE/PPPoA Relay
 - Transparent bridge for MPoA
 - Multiple PVC support for Triple Play Applications (up to 8 simultaneous)
- Wireless LAN Features ('n' Models Only):
 - 802.11n Compliant (Draft 2.0)
 - Latest 'MIMO' Technology with three aerials (2T3R)
 - Multiple SSID : Create up to 4 virtual wireless LANs (independent or joined)
 - Packet Aggregation and Channel Bonding
 - Optional Higher Gain or directional aerials available - [Click Here](#).
 - Compatible with 802.11b and 802.11g Standards
 - Active Client list in Web Interface
 - Wireless LAN Isolation (from VLAN groups and wired Ethernet interfaces)
 - 64/128-bit WEP Encryption
 - WPA/WPA2 Encryption
 - Switchable Hidden SSID
 - Restricted access list for clients (by MAC address)
 - Time Scheduling (WLAN can be disabled at certain times of day)
 - Access Point Discovery
 - WDS (Wireless Distribution system) for WLAN Bridging and Repeating (Firmware Upgradable)
 - 802.1x Radius Authentication
 - Wireless Rate-Control
 - Automatic Power Management
 - 802.11e WMM (Wi-Fi Multimedia)
- VoIP Features (Vigor2820 'V' Models only):
 - Protocols: SIP, RTP / RTCP
 - 12 SIP Registrar Accounts (for up to 12 VoIP providers)
 - Line port for PSTN Passthrough (integrates POTS line)
 - Auto-fallback to PSTN under power/Internet failure
 - G.168 Line Echo-cancellation
 - Automatic Gain Control
 - Jitter Buffer (125ms)
 - Voice Codecs:
 - G.711 A / μ Law
 - G.723.1
 - G.726
 - G.729 A / B
 - VAD / CNG
 - Tone Generation: DTMF , Dial , Busy , Ring Back , Call Progress
 - DTMF Transmission: In Band / Out Band (RFC-2833) / SIP info
 - FAX / Modem Support G.711 Pass-through
 - T.38 for FAX

- Supplemental Services:
 - Caller ID
 - Call Hold / Retrieve
 - Call Waiting
 - Call Waiting with Caller ID
 - Call Transfer
 - Call Forwarding (Always , On Busy and On No Answer)
 - DND (Do not Disturb)
 - Call Barring (Incoming / Outgoing)
 - MWI (Message Waiting Indicator) (RFC-3842)
 - Hotline (Dial preset number when handset lifted)
- WAN Protocols (Ethernet):
 - DHCP Client
 - Static IP
 - PPPoE
 - PPTP
 - L2TP *
 - BPA
- Firewall & Security Features:
 - CSM (Content Security Management):
 - URL Keyword Filtering - Whitelist or Blacklist specific sites or keywords in URLs
 - Block Web sites by category (e.g. Adult, Gambling etc. Subject to subscription)
 - Prevent accessing of web sites by using their direct IP address (thus URLs only)
 - Blocking automatic download of Java applets and ActiveX controls
 - Blocking of web site cookies
 - Block http downloads of file types :
 - Binary Executable : .EXE / .COM / .BAT / .SCR / .PIF
 - Compressed : .ZIP / .SIT / .ARC / .CAB/ .ARJ / .RAR
 - Multimedia : .MOV / .MP3 / .MPEG / .MPG / .WMV / .WAV / .RAM / .RA / .RM / .AVI / .AU
 - Time Schedules for enabling/disabling the restrictions
 - Block P2P (Peer-to-Peer) file sharing programs (e.g. Kazza, WinMX etc.)
 - Block Instant Messaging programs (e.g. IRC, MSN/Yahoo Messenger etc.)
 - Multi-NAT, DMZ Host
 - Port Redirection and Open Port Configuration
 - Policy-Based Firewall
 - MAC Address Filter
 - SPI (Stateful Packet Inspection) with new FlowTrack Mechanism
 - DoS / DDoS Protection
 - IP Address Anti-spoofing
 - E-Mail Alert and Logging via Syslog
 - Bind IP to MAC Address
- Bandwidth Management:
 - QoS
 - Guaranteed Bandwidth for VoIP
 - Class-based Bandwidth Guarantee by User-Defined Traffic Categories
 - DiffServ Code Point Classifying
 - 4-level Priority for each Direction (Inbound / Outbound)
 - Bandwidth Borrowed
 - Temporary (5 minute) Quick Blocking of any LAN Client
 - Bandwidth / Session Limitation
- Network/Router Management:
 - Web-Based User Interface (HTTP / HTTPS)
 - CLI (Command Line Interface) / Telnet / SSH*
 - Administration Access Control
 - Configuration Backup / Restore
 - Built-in Diagnostic Function
 - Firmware Upgrade via TFTP / FTP
 - Logging via Syslog
 - SNMP Management with MIB-II
 - TR-069
 - TR-104
- VPN Facilities:
 - Up to 32 Concurrent VPN Tunnels (incoming or outgoing)
 - Tunnelling Protocols: PPTP, IPSec, L2TP, L2TP over IPSec
 - IPSec Main and Aggressive modes
 - Encryption : MPPE and Hardware-Based AES / DES / 3DES
 - Authentication : Hardware-Based MD5 and SHA-1
 - IKE Authentication : Pre-shared Key and X.509 Digital Signature
 - LAN-to-LAN & Teleworker-to-LAN connectivity
 - DHCP over IPSec
 - NAT-Traversal (NAT-T)
 - Dead Peer Detection (DPD)
 - VPN Pass-Through

- Network Features:
 - DHCP Client / Relay / Server
 - Dynamic DNS
 - NTP Client (Synchronise Router Time)
 - Call Scheduling (Enable/Trigger Internet Access by Time)
 - RADIUS Client
 - DNS Cache / Proxy
 - Microsoft™ UPnP Support
- Routing Protocols:
 - Static Routing
 - RIP V2
- Operating Requirements:
 - Rack Mountable (Optional Vigor 2820 mounting bracket required)
 - Wall Mountable
 - Temperature Operating : 0°C ~ 45°C
 - Storage : -25°C ~ 70°C
 - Humidity 10% ~ 90% (non-condensing)
 - Power Consumption: 18 Watt Max.
 - Dimensions: L240.96 * W165.07 * H43.96 (mm)
 - Operating Power: DC 15V (via external PSU, supplied)
 - Warranty : Two (2) Years RTB
 - Power Requirements : 220-240VAC

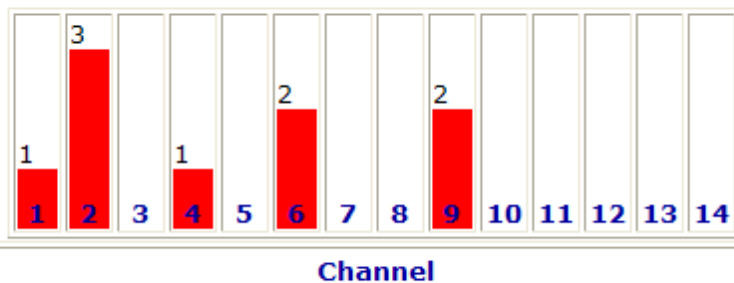
Load Balancing Setup with two ADSL lines



Load Balancing Setup with two ADSL lines or One ADSL line and 3G modem. Note: You can only have one secondary WAN method configured.

Wireless LAN Access Point Scanning

**WiFi Neighbourhood Traffic
Access Points/Clients v.s. Channels**



Access Point List

BSSID	Channel	SSID
00:1C:1F:11:1C:F9	9	Charlotte
00:1E:DA:1D:1E:34	6	SKY081245
00:18:6D:06:18:78	4	TopsyHome
00:11:24:02:11:F5	2	Wireless
00:18:1D:01:18:AC	1	CoffeeShop
00:1C:1F:11:1C:F9	2	Beacon
00:1E:DA:1D:1E:34	9	Default
00:18:6D:06:18:78	6	Acacia14
00:11:24:02:11:F5	9	Brian

Accessories

Rack Mounting Kit



The RM1 Rackmount Bracket enabled you to fit any Vigor2820 series router into a standard 19" rack or cabinet. The bracket takes up one rack slot (1U). The front mounted sockets remain fully accessible. For wireless models, we then recommend extension aerials (or aerial extensions).