



VBrick IP TVGateway

VBrick IP TVGateway v1.0 Admin Guide



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FCC Part 15

DVB-S/S2 only. This equipment has been tested and found to comply with the limits for Class A digital device, pursuant to Part 15 of the FCC rules, Class A for OC-3C Interface, Class A for the SDI Interface. 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. This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations. Cet appareil numérique de la Classe A respecte toutes les exigences de règlement sur le matériel brouilleur du Canada.



VBrick declares that this product conforms to the following certificate standards for electromagnetic emissions when installed according to the manufacturer's specifications: EN 55022:2006; EN 55024:1998, A1:2001, A2:2003; EN 61000-3-2:2005; EN 61000-3-3:1995, A1:2001, A2:2005.

About VBrick Systems

Founded in 1997, VBrick Systems, an ISO 9001 certified vendor, is a privately held company that has enjoyed rapid growth by helping our customers successfully introduce mission critical video applications across their enterprise networks. Since our founding, VBrick has been setting the standard for quality, performance and innovation in the delivery of live and stored video over IP networks—LANs, WANs and the Internet. With thousands of video appliances installed world-wide, VBrick is the recognized leader in reliable, high-performance, easy-to-use networked video solutions.

VBrick is an active participant in the development of industry standards and continues to play an influential role in the Internet Streaming Media Alliance (ISMA), the MPEG Industry Forum, and Internet2. In 1998 VBrick invented and shipped the world's first MPEG Video Network Appliance designed to provide affordable DVD-quality video across the network. Since then, VBrick's video solutions have grown to include Video on Demand, Management, Security and Access Control, Scheduling, and Rich Media Integration. VBrick solutions are successfully supporting a broad variety of applications including distance learning and training, conferencing and remote office communications, security, process monitoring, traffic monitoring, business and news feeds to the desktop, webcasting, corporate communications, collaboration, command and control, and telemedicine. VBrick serves customers in education, government, healthcare, and financial services markets among others.

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IP TVGateway v1.0 Admin Guide

Preface

This manual explains how to set up, use and manage the VBrick IP TVGateway. This manual is intended for use by systems integrators or systems administrators who are installing and setting up VBrick products. The manual assumes that readers are familiar with installing and configuring network-based products. The information in this document is available on the IP TVGateway Product CD. It is also available online at www.VBrick.com/documentation

Using this Guide

This documentation in this document is arranged as follows. Some of it is reference material; some of it is how-to material for specific use cases. For best results, please take a few moments to familiarize yourself with the way the information is organized.

1. TVGateway Overview	Provides a brief introduction to the TVGateway and its features and functions.
2. Getting Started	Provides a quick overview of the steps you will need to perform in order to configure and use the TVGateway.
3. Physical Interfaces	Describes the physical characteristics of the available TVGateway modules.
4. Management Interfaces	Explains how to use the Web Management interface and the Admin interface.
5. General Device Management	Explains how to manage the attributes of the device that are not associated with streaming.
6. Using the Admin Interface	Explains how to use the Admin interface to show diagnostics, set the Admin password, etc.
7. Scanning for Channels	Explains how to scan your broadcast source for available channels.
8. Configuring the Channels	Explains how to select and configure the available channels you want to stream,
9. Streaming the Channels	Explains how to start or stop streaming, view stream status, change the stream configuration, etc.
10. Status Monitoring	Explains how to check the operating status of the TVGateway.
11. Troubleshooting	Explains how to install the TVGateways in the 1, 3, or 10-slot chassis that are available.
12. Installation	Provides troubleshooting tips and appendices with signal levels, pinouts, and other reference material.

Getting Help

If you can't find the information you need in this document, or from your reseller, you can contact VBrick Support Services on the [web](#), by [e-mail](#), or by calling **1-203 303-0222**. For

faster service, be sure to have your VBrick product serial number or support contract number. Support Services can usually answer your technical questions in 24 business hours or less. Note that all VBrick documentation is posted on the web. For more information about any VBrick product, go to www.vbrick.com/documentation

Related Publications

- VEMS Portal Server Admin Guide
- VBrick AmiNET130 Set Top Box Quick Start
- VBrick Multi-Format Set Top Box Quick Start

Font Conventions

Arial bold is used to describe dialog boxes and menu choices, for example: **Start > All Programs > VBrick**

`Courier fixed-width font` is used for scripts, code examples, or keyboard commands.

Courier bold fixed-width font is used for user input in scripts, code examples, or keyboard commands.

This bold black font is used to strongly emphasize important words or phrases.

Folder names and user examples in text are displayed in this sans serif font.

User input in text is displayed in this bold sans serif font.

Italics are used in text to emphasize specific words or phrases.

Environmental Awareness

At VBrick, we believe that the same ethics and principles that guide our daily business decisions should be applied to our communities and to the environment. Running our company with a "green" conscience is good for the environment and good for business. We design superior quality, high performance, and energy-efficient products. We're working to conserve energy and reduce waste and are exploring how we can contribute to sustainable energy development. You can help by recycling batteries and other consumables and by finding new and better ways to protect and preserve our environment.

Safety Precautions

USA and Canada

There is always a danger present when using electronic equipment. Unexpected high voltages can be present at unusual locations in defective equipment and signal distribution systems. Become familiar with the equipment and observe the following precautions:




- Every precaution has been taken in the design of your system to ensure that it is as safe as possible. However, safe operation depends on you.
- Always be sure your equipment is in good working order. Ensure that all points of connection are secure to the chassis and that protective covers are in place.
- Never work alone when working in hazardous conditions. Always have another person close by in case of an accident.
- Always refer to the manual for safe operation. If you have a question about the application or operation call VBrick for assistance.

-
- Never allow your equipment to be exposed to water or high moisture environments. If exposed to a liquid, remove power and send unit to be serviced by a qualified technician.

There are no instructions specifically for service personnel in this document. There are no user serviceable parts inside any VBrick product. To prevent electric shock or fire hazard, do not remove cover. Refer service to qualified service personnel. Keep the following recommendations in mind at all times:

- Do not use this apparatus near water.
- Clean only with dry cloth.
- Do not block any ventilation openings. Install in accordance with the instructions contained in this manual.
- Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
- Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
- Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
- Only use attachments/accessories specified by the manufacturer.
- Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.
- Unplug this apparatus during lightning storms or when unused for long periods of time.
- Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.
- Do not expose this apparatus to dripping or splashing and ensure that no objects filled with liquids, such as vases, are placed on the apparatus.
- To completely disconnect this apparatus from the AC Mains, disconnect the power supply cord plug from the AC receptacle.
- The mains plug of the power supply cord shall remain readily operable.

EU and Others

-  There are no user serviceable parts inside any VBrick product. To prevent electric shock or fire hazard, do not remove cover. Refer service to qualified service personnel.
-  For 230/240 volt operation, be sure to use a harmonized grounded 3-conductor cord, rated 6 Amp minimum. Use a suitable cord for connection to the equipment and terminating in an IEC approved plug. This equipment relies upon a safety earth for operation, ensure that you always use a power cord with appropriate earth and that the inlet to which is inserted also has the appropriate earth. If in any doubt about the earth provision in your building consult a qualified electrician
-  Use only the dedicated power supply or cord supplied for your device.

- ⚠ The VBrick products use ventilation holes for cooling. None of the ventilation holes should be blocked. Keep all materials at least 5cm away from all the ventilation holes.
- ⚠ Do not expose the product to any rain or moisture.
- ⚠ Do not use the product near a naked flame e.g. a candle.
- ⚠ The operating conditions of the product should be 0°C-40°C with a Relative Humidity of 5 – 95%. The product should not be operated outside of these conditions.

Norway And Sweden

Equipment connected to the protective earthing of the building installation through the mains connection or through other equipment with a connection to protective earthing – and to a cable distribution system using coaxial cable, may in some circumstances create a fire hazard. Connection to a cable distribution system has therefore to be provided through a device providing electrical isolation below a certain frequency range (galvanic isolator, see EN 60728-11).

Norsk

Utstyr som er koplet til beskyttelsesjord via nettplugg og/eller via annet jordtilkoplede utstyr – og er tilkoplede et kabel-TV nett, kan forårsake brannfare. For å unngå dette skal det ved tilkopling av utstyret til kabel-TV nettet installeres en galvanisk isolator mellom utstyret og kabel-TV nettet.

Svenska

Utrustning som är kopplad till skyddsjord via jordat vägguttag och/eller via annan utrustning och samtidigt är kopplad till kabel-TV nät kan i vissa fall medföra risk för brand. För att undvika detta skall vid anslutning av utrustningen till kabel-TV nät galvanisk isolator finnas mellan utrustningen och kabel-TV nätet.

Glossary

The following terms and definitions are used in this document:

DHCP	Dynamic Host Configuration Protocol, a protocol used to allocate IP addresses to devices on an IP network.
DVB	Digital Video Broadcasting, a suite of internationally accepted open standards for digital television transmission over terrestrial, cable, and satellite networks.
DVB-S/S2	Digital Video Broadcasting standards for Satellite delivery.
DVB-T/T2	Digital Video Broadcasting standards for Terrestrial delivery.
FEC	Forward Error Correction
IGMP	Internet Group Management Protocol, a protocol used to manage multicast traffic on an IP network.
IP	Internet Protocol, a protocol used for communicating data across a network using the Internet Protocol Suite, also referred to as TCP/IP.
MPEG	A family of compression methodologies for audio and video.

MPEG Transport Stream	A communications protocol enabling multiplexing of digital audio, video and data which is specified in MPEG-2 Part 1, Systems (ISO/IEC standard 13818-1).
NTP	Network Time Protocol, a protocol for synchronizing the clocks of computer systems.
PID	Packet ID, identifies a particular stream of data (e.g. video, audio, etc) within an MPEG Transport Stream.
RTP	Real-time Transport Protocol, a protocol used to carry real time data on an IP network.
SAP	Session Announcement Protocol, a protocol used to advertise the presence of multicast sessions on an IP network.
SNMP	Simple Network Management Protocol, a protocol used to manage devices on an IP network.
TFTP	Trivial File Transfer Protocol, a simple file transfer protocol used on IP networks.
UDP	User Datagram Protocol, a transport protocol in the TCP/IP suite that provides a connectionless transport mechanism with low overhead.

TVGateway Overview

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TVGateway Overview

Use the VBrick TVGateway to receive the complete channel set from a range of different broadcast multiplexes and simultaneously stream each channel onto a high bandwidth network. Each channel is automatically announced on the network using the information contained in the digital broadcast for easy viewing on VBrick set top boxes and PC video clients. For the purposes of this manual, "IP TVGateway" refers to a single IP TVGateway module in 1, 3, or 10-slot chassis (for more information see [Troubleshooting](#) on page 45). Each module is a separate entity and is configured and managed independently from any other modules in the chassis. The following IP TVGateways are currently available.

- Dual DVB-S/S2
- Dual DVB-T/T2

For the most part all of these devices are operated and managed in the same way. Each module has some of its own unique features and management requirements which are identified and highlighted in the document. Table 1 shows compatibility between the TVGateway and other VBrick devices.

Table 1. IP TVGateway Compatibility †

Product	Version
VEMS ††	5.4
VOD-W	5.4
H.264/MPEG-2 STB	1.2.3
Multi-Format STB	1.0
NVR 10/40	5.4
StreamPlayer	5.2

† Use version shown or higher.

†† Not compatible with VEMS Mystro 6.x.

Network Considerations

The IP TVGateway transmits audio/video using IP multicast. In order for this to work satisfactorily, it is vital that the network switches are multicast-enabled in order to prevent unwanted flooding of traffic on the network. For these purposes, "Multicast-enabled" is understood to mean that all network switches carry out IGMP snooping, and one switch must function as the IGMP querier. VBrick TVGateways support version 2 of IGMP.

Channel Announcement

The TVGateway announces the list of channels it is streaming via the SAP protocol. This enables the VBrick VEMS Portal Server to automatically discover and connect to the available channels on the network.

Device Administration

A TVGateway can be configured and managed using one of the following mechanisms:

- **Web Interface** – Allows full configuration of device capabilities.
- **Admin Interface** – Allows fundamental capabilities of the device to be configured through the serial admin port.

Software Upgrade

This is the first release of the IP TVGateway and there is currently no upgrade. However VBrick may periodically update the software from time to time with new features and enhancements. To check for IP TVGateway software updates, contact your certified reseller or VBrick Support Services.

Getting Started

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Getting Started

This section is a brief overview of the steps required to install and configure the TVGateway.

1. Installing the TVGateway

Before using the TVGateway, it must be powered on and connected to the network and the terrestrial or satellite. This process is described in the installation guide for the chassis and also in Physical Interfaces on page [Physical Interfaces](#) on page 5.

2. Configuring the IP address of the TVGateway

By default, the TVGateway requires a DHCP server to be available on the network to assign it an IP address. There are two methods of assigning a static IP address to the TVGateway, if required:

- Temporarily set up a DHCP server on an isolated network. Once an IP address is assigned to the TVGateway, you can configure a static IP address using the Web Management Interface. For more information, see [Configuring IP Address Settings](#) on page 10.
- Use the Admin Interface to configure the IP address. For more information, see [Using the Admin Interface](#) on page 17.

3. Naming the TVGateway

Provide a name for the device so you can easily identify it in the future. This can be done using the web management interface (see page [Naming the TVGateway](#) on page 9).

4. Scanning for Channels

Scan the terrestrial, satellite, cable, or ASI source to discover details of the available channels. This is done on a per-tuner basis and is described in [Scanning for Channels](#) on page 19.

5. Configuring the Channels

Once you have successfully scanned for channels, select the channels you want to stream, again on a per-tuner basis. This is described in [Configuring the Channels](#) on page 29.

6. Streaming the Channels

You are now ready to stream channels onto the network. See Streaming on page [Streaming the Channels](#) on page 33 for details on this final step.



Physical Interfaces

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Physical Interfaces

IP TVGateway blades can operate in one of the following chassis. See [Troubleshooting](#) on page 45 for more information.

- 1-slot Chassis
- 3-slot Chassis
- 10-slot Chassis

The blade AV interfaces are on the rear panel, while the edge connector enables access to the network and admin ports via the chassis front panel connections. The installation guide for each chassis describes the connection of the cards to the power supply, the network and to a PC via serial connection. This section describes the connections required to connect the TVGateway to the terrestrial or satellite source for the Dual DVB-S/S2 and the Dual DVB-T/T2.

Dual DVB-S/S2

The dual satellite (DVB-S/S2) TVGateway shown in Figure 1 has two tuners, numbered 0 and 1, each with IN and OUT female F-type connector inputs. Connect the satellite dish LNB to the TVGateway using the F-type connector marked **IN**. The satellite dish should be installed by a professional installer, ensuring that the signal levels conform to the requirements listed in [Recommended Signal Levels](#) on page 48.



Figure 1. Dual DVB-S/S2 IP TVGateway

Dual DVB-T/T2

The dual DVB-T/T2 IP TVGateway shown in 7 has two tuners, numbered 0 and 1, each with female IEC IN connectors and male IEC OUT connectors. To connect to the TVGateway,

connect fly-leads from the antenna to the tuner inputs. This can be direct from the antenna or via a splitter in order to connect to multiple TVGateway tuners. Where the feed is split, use an active splitter to avoid loss of signal strength. The cabling from the drop should be installed by a professional installer, ensuring that the signal levels conform to the requirements listed in [Recommended Signal Levels](#) on page 48.



Figure 2. Dual DVB-T/T2 IP TVGateway

Management Interfaces

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Management Interfaces

The TVGateway has three management interfaces. Each encoding module in a chassis must be configured independently.

- Web Management Interface
- Admin Interface

Web Management Interface

You can manage all TVGateway functions using the Web Management Interface. The Web Management Interface can be used with Microsoft Internet Explorer, Mozilla Firefox and Apple Safari browsers. You can launch and view the Web Management Interface by typing the IP address of the TVGateway directly into your browser:

▼ Use the Web Management Interface as follows:

1. When prompted, enter the correct username and password. The default login details are:

Username: admin

Password: labrador



Figure 3. Login Window

Note: The administrator can change the admin password using the Web Management Interface. For more information refer to [Using the Admin Interface](#) on page 17.

2. The Web Management Interface opens in your browser, as shown in Figure 4.



Figure 4. TVGateway Web Management Interface

3. Click on the TVGateway name on the left-hand tab to display the TVGateway menu.
 In the above example, it is a [g4210xxxxx](#) DVB-S2 satellite TVGateway with dual tuners, **Tuner 0 DVB-S2** and **Tuner 1 DVB-S2**. As shown in Figure 4, there are pages that apply to the TVGateway, while clicking on the tuner names expand the menus associated with the individual tuner configurations.
4. Navigate through the pages, changing settings where required.
5. Click **Apply** on each page to save your changes.

Note For more information on how to use the Web Management Interface to configure the TVGateway, see [General Device Management](#) on page 9.

Admin Interface

In certain circumstances, it may not be possible to manage a TVGateway via its web interface. For these situations, a text based admin interface is provided that is available via the serial interface (marked 'admin' on the chassis front panel) or via telnet. Refer to [Using the Admin Interface](#) on page 17 for more information.



Figure 5. Admin Interface

General Device Management

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General Device Management

This section of the manual describes how to manage attributes of the TVGateway not associated with streaming. For example, find out how configure IP addressing and how to upgrade firmware. All procedures described in this section assume that you are running the web management interface as described in [Management Interfaces](#) on page 7.

Naming the TVGateway

The TVGateway can be assigned a name and location. This name can be used to identify the device. By default, the name is the last 6 characters of the TVGateway serial number and the location is "Default."

- ▼ To specify the name and location:
 1. Click the TVGateway name to expand the main menu.
 2. Click **General**.
 3. Enter the name and location as required in the **Name** and **Location** fields.
 4. Click the **Apply** button.

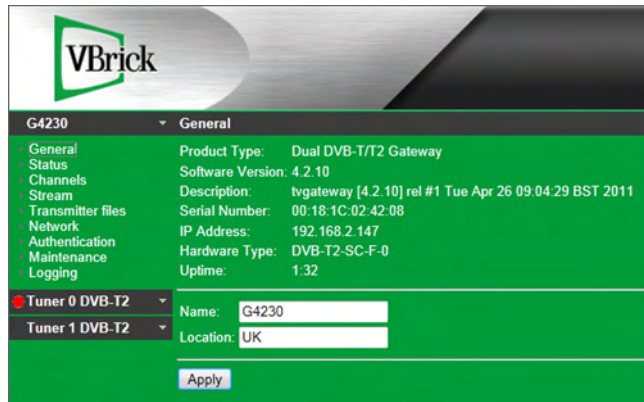


Figure 6. General Page – Dual DVB-T/T2

Changing the Admin Password

By default, a username/password pair of `admin/labrador` is required to gain access to the Web Management Interface and the Admin Interface. You can change the admin password if required.

▼ To change the admin password:

1. Click the TVGateway name to expand the main menu.
2. Click **Authentication** to display the Authentication page as shown in Figure 7.

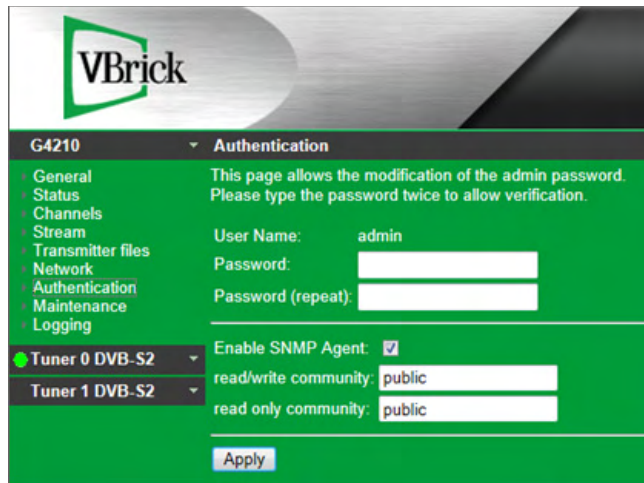


Figure 7. TVGateway Authentication Page

3. Enter the new password in both **Password** fields.
4. Click the **Apply** button.

Configuring Network Settings

Configuring IP Address Settings

You can configure the TVGateway to obtain an IP address automatically using DHCP, or you can specify static addressing information, such as IP address, subnet mask and default gateway. The default is **Automatically using DHCP**.

Note Changes to IP addressing take place immediately on clicking **Apply** and the device will start using the new IP address. No reboot is necessary.

▼ To configure the device to be allocated an IP address automatically:

1. Click the TVGateway name to expand the main menu.
2. Click **Network** to display the **Network** page as shown in Figure 8.

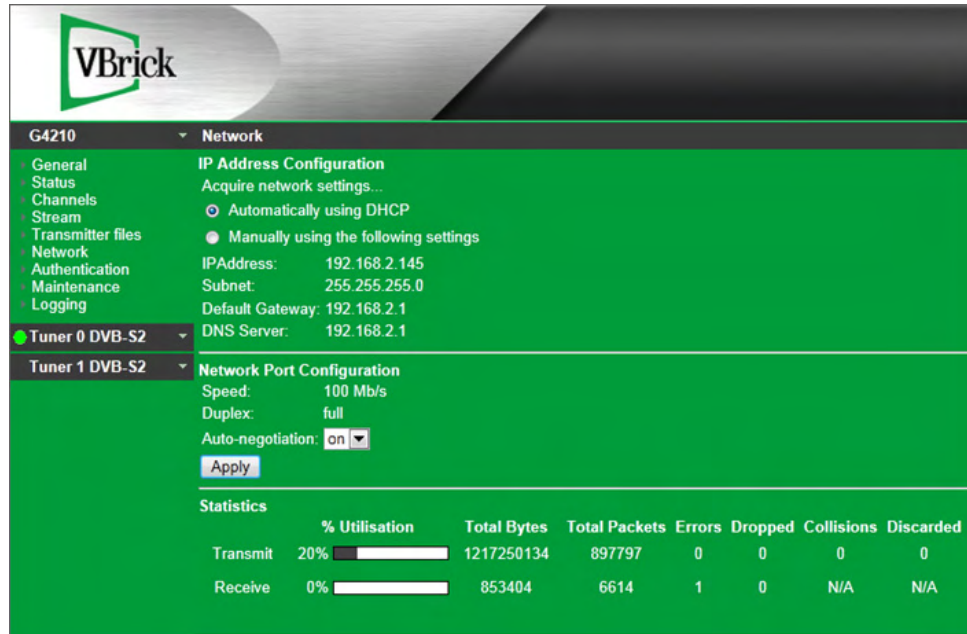


Figure 8. IP TVGateway Network Page

3. In the IP Address Configuration section, select **Automatically using DHCP**.
 4. Click the **Apply** button.
- ▼ To configure a static IP address:
1. Click the TVGateway name to expand the main menu.
 2. Click **Network** to display the Network page.
 3. In the IP Address Configuration section, select **Manually using the following settings**.
 4. Enter the required values for IP Address, Subnet, Default Gateway and DNS Server in the respective entry fields.
 5. Click the **Apply** button.

Configuring Ethernet Settings

The TVGateway can automatically negotiate any combination of 10/100 Mb/s and half/full duplex with an Ethernet switch. Auto-negotiation is enabled by default. It is possible to disable auto-negotiation and run the interface with fixed settings of 100Mb/s full duplex (100FD).

Note It is important to ensure the TVGateway settings match the settings on the switch port to which it is connected. For example, if auto-negotiation is enabled on the TVGateway, it must also be enabled on the switch. If auto-negotiation is disabled, a fixed setting of 100FD must be configured on the switch. Failure to do this may result in dropped packets, which in turn, may cause poor quality video output at the client device.

- ▼ To enable/disable auto-negotiation:
1. Click the TVGateway name to expand the main menu.
 2. Click **Network** to display the Network page.

3. In the Network Port Configuration section, choose **on** or **off** from the **Auto-negotiation** dropdown dropdown list.
4. Click the **Apply** button.

Maintenance Tasks

This section describes the following tasks that can be used to maintain the TVGateway.

Setting the TFTP server

The TVGateway uses TFTP to download new firmware releases and transmitter files. For this to operate correctly, the TVGateway must be configured to communicate with the TFTP server.

- ▼ To specify a TFTP server IP address:
 1. Click the TVGateway name to expand the main menu.
 2. Click **Maintenance** to display the Maintenance page as shown in Figure 9.

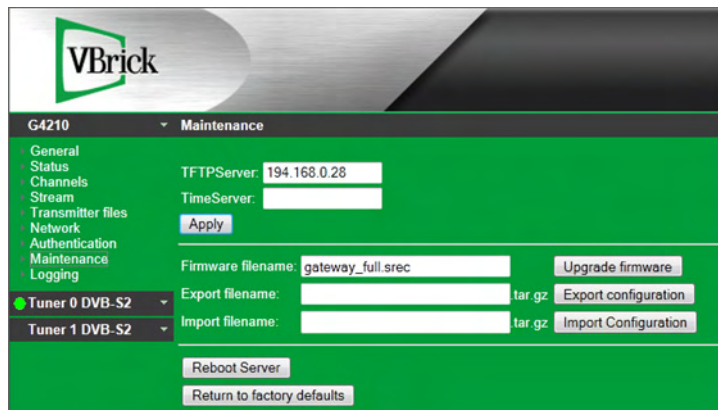


Figure 9. Web Interface Maintenance Page

3. Enter the IP address of the TFTP server in the **TFTP Server** field.
4. Click the **Apply** button.

Specifying a Time Server

The TVGateway uses NTP to maintain accurate time on the device using the time server specified. This is useful when examining the device log file as accurate time information is attached to log messages. A time server is supplied to the device by the DHCP server is used unless the administrator has already specified a time server.

- ▼ To specify a time server:
 1. Click the TVGateway name to expand the main menu.
 2. Click **Maintenance** to display the **Maintenance** page as shown in Figure 9.
 3. Enter the IP address or the host name of the time server in the **Time Server** box.
 4. Click the **Apply** button.

Restarting the TVGateway

You can restart the TVGateway at any time.

- ▼ To restart the TVGateway:
 1. Click the TVGateway name to expand the main menu.
 2. Click **Maintenance** to display the Maintenance page.
 3. Click the **Reboot Server** button.
 4. Click **OK** in the pop up window to reboot, or **Cancel** to abort the operation.

Upgrading the IP TVGateway Firmware

Warning Do not switch the IP TVGateway off while the upgrade process is running. The process takes several minutes, during which time the LED flashes alternately slow and fast.

- ▼ To upgrade the TVGateway to a new version of firmware:
 1. Ensure that the TFTP server is running.
 2. Ensure that the `gateway_full.srec` firmware file is hosted correctly in the root directory of the TFTP server.
 3. Click the TVGateway name to expand the main menu.
 4. Click **Maintenance** to display the Maintenance page.
 5. Ensure that the TFTP Server address is configured correctly (see [Setting the TFTP server](#) on page 12).
 6. Ensure the **Firmware filename** is named correctly (by default `gateway_full.srec`). If not, ensure that it matches the name of the firmware file, if this is different.
 7. Click the **Upgrade firmware** button.
 8. The firmware is downloaded from the TFTP server and copied to flash and the TV gateway restarted. This process requires several minutes.

Restoring the TVGateway to Factory Default Settings

You can return the TVGateway to its factory default configuration.

Note If you restore the TVGateway to factory default settings, all previously saved settings are lost. You can however restore these if you have saved your configuration as described below in [Exporting/importing Configuration Settings](#).

- ▼ To restore the TVGateway factory default settings:
 1. Click the TVGateway name to expand the main menu.
 2. Click **Maintenance** to display the Maintenance page.
 3. Click the **Return to factory defaults** button.

Exporting/importing Configuration Settings

Once you have configured the TVGateway, you can store your configuration settings in a single file. You can use the file to restore your settings should you need to. You can also use a saved configuration to replicate identical settings on multiple devices.

Note Device naming and IP addressing information is not exported/imported. This means that a configuration file can be imported to multiple units.

-
- ▼ To export configuration settings:
 1. Ensure the TFTP server is running.
 2. Click the TVGateway name to expand the main menu.
 3. Click **Maintenance** to display the Maintenance page.
 4. Ensure that the **TFTP Server** address and write permissions are configured correctly (see [Setting the TFTP server](#) on page 12).
 5. Enter a name for your configuration archive in the **Export filename** box.
 6. Click the **Export Configuration** button.
 7. The configuration file is uploaded from the TVGateway to the root directory of the TFTP server.
 - ▼ To import configuration settings:
 1. Ensure the TFTP server is running.
 2. Ensure the configuration file is located in the root directory of the TFTP server.
 3. Ensure the **TFTP Server** address is configured correctly.
 4. Click **Maintenance** to display the Maintenance page.
 5. Enter the name of the configuration archive in the **Import Filename** box.
 6. Click the **Import Configuration** button.
 7. The configuration archive is downloaded from the TFTP server to the TVGateway.

Logging

The TVGateway saves historical information about internal events within the device to its log file. This can be useful in troubleshooting problems with the device. It is also possible to send these log messages to a remote syslog server.

Viewing the Local Log File

All log file information is automatically saved locally.

- ▼ To view the log file:
 1. Click the TVGateway name to expand the main menu.
 2. Click **Logging** to display the Logging page as shown in Figure 10.



Figure 10. TVGateway Logging Page

3. Click the **Show log** button to display in the browser window.

Configure Remote Logging

To send device log information to a remote server, you need to install a syslog server application on the remote server. Then set up the remote logging function on the TVGateway as described below.

- ▼ To configure remote logging:
 1. Click the TVGateway name to expand the main menu.
 2. Click **Logging** to display the Logging page.
 3. Select Local and Remote logging.
 4. In the **Syslog server** field enter the IP address or host name of the syslog server where the log files are to be stored.
 5. In the **Syslog port** field enter the port number on the syslog server (default value is 514).
 6. For **Logging level**, select an option ranging from **0-Emergency** to **7-Debug** (0 represents the least debug information and 7 represents the most).
 7. Click the **Apply** button.



Using the Admin Interface

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Using the Admin Interface 17

Using the Admin Interface

In certain circumstances it may not be possible to manage an IP TVGateway via the Web Management Interface. For these situations a text based admin interface is provided which is available via the serial interface (marked 'admin' on the chassis front panel) or via telnet. See [Admin Interface Connection](#) for details of how to connect to the serial admin port.

Admin Interface Function

Once connected, log in to the Admin Interface using the following details. When successfully logged in, the Admin Interface Main Page is displayed, as shown below:

Username: admin

Password: labrador (default admin password for the Web Management Interface)

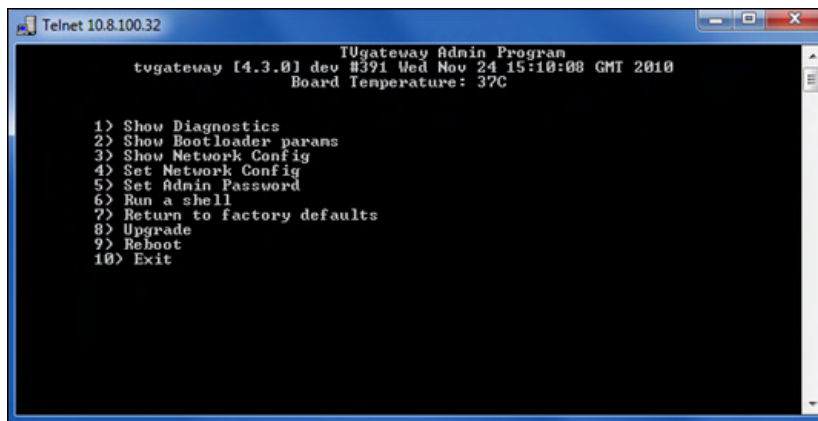


Figure 11. Admin Interface Main Page

The following options are provided:

1) Show Diagnostics	These pages allow the administrator to read the log file and view processes running on the device. The CAM menu can also be accessed here on TVGateways with a CAM slot.
2) Show Bootloader Params	This page displays the type and revision of the device, as well as its MAC address.
3) Show Network Config	This page displays the IP addressing information of the device.

4) Set Network Config	This page allows the administrator to set the IP address of the device.
5) Set Admin Password	Allows the administrator to change the admin password for both serial and web interfaces.
6) Run a shell	This allows the administrator to run a shell as admin.
7) Return to factory defaults	This page allows the administrator to set all configurations to factory defaults.
8) Upgrade	This allows the administrator to specify the TFTP server and initiate a firmware upgrade.
9) Reboot	Reboots the TVGateway.
10) Exit	Exits the Admin Interface Main Page.

Scanning for Channels

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Scanning Overview

This section explains how to scan your broadcast source for available channels. DVB-S/S2 and DVB-T/T2 signals consist of television and radio channels gathered together into bundles called multiplexes. Each multiplex is transmitted on a separate frequency, or for satellite (DVB-S/S2), a combination of frequency and signal polarisation. A TVGateway, in common with all set top boxes, must tune to the transmission frequency to access the channels in a multiplex. One tuner is required for each required multiplex.

The basic procedure for installing a TVGateway is for each tuner to scan the signal at its input and identify the frequencies/multiplexes present. From the list of scanned multiplexes, choose the particular multiplex you want to receive on each tuner. After selecting a suitable multiplex, the required channels can be selected and subsequently streamed to the Ethernet interface. As one tuner is required for each multiplex, additional tuner(s) are needed if the required channels are not available on a single multiplex.

The way in which a tuner scans its broadcast source depends on the TVGateway type and the information defining the source of the available TV services. [Scan Resources](#) contains some useful tips on how to find information which will help you decide what to scan.

▼ The following steps are common across all types of TVGateway:

1. Before scanning, check the **clean scan** box if you want to delete all channels already associated with this tuner.
2. Choose what to scan by following the instructions in the sections below.
3. Click the **start** button.
4. Wait for the scan to complete. The moving progress bar indicates that the scan is active. If the scan is successful, all channels found are listed on this page.

Scanning Terrestrial Channels (DVB-T/T2)

In order to successfully receive and stream DVB-T channels, the input signal level and quality must meet the requirements specified in [Recommended Signal Levels](#). There are two types of DVB-T scan: Basic scan and Advanced scan.

Basic Terrestrial Scan

The basic scan provides the ability to scan all frequencies listed in a transmitter file, or to select individual frequencies from this list. The DVB-T/T2 TVGateways are supplied with the following transmitter files:

au-All
fr-All
nz-All
uk-All
uk-CrystalPalace
uk-PontopPike

These lists may also be appropriate to other locations but you can also add additional transmitter files using the **Transmitter Files** page. Refer to [Transmitter File Format](#) for file format information.

- ▼ To scan all frequencies in a transmitter file:
 1. Click on the required tuner name to expand its menu.
 2. Click **Scan** to display the **Scan Tuner 0** or **Scan Tuner 1** page as shown in Figure 12.

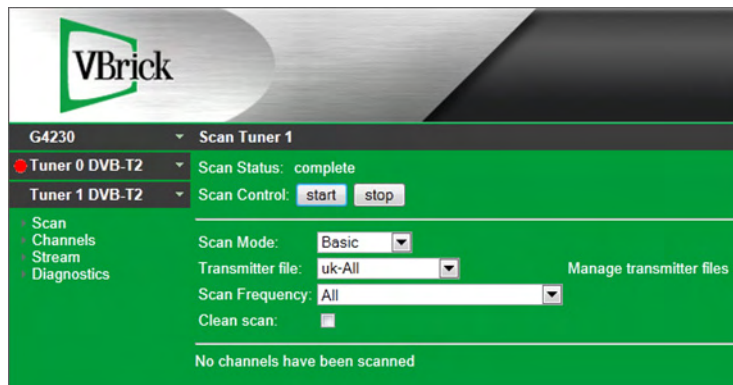


Figure 12. TVGateway Terrestrial Scan

3. From the **Scan Mode** dropdown list, select **Basic**.
 4. From the **Transmitter file** dropdown list, select a transmitter file.
 5. Select **All** from the **Scan Frequency** drop down list.
 6. If you want to delete all existing channels for this tuner before performing the scan, check the **Clean scan** checkbox.
 7. Click the **start** button.
 8. The scan starts and a progress bar is shown before results are displayed on the screen. For more information, see [Interpreting Scan Results](#) on page 26.
- ▼ To scan an individual frequency from a transmitter file:
 1. Click on the required tuner name to expand its menu.
 2. Click **Scan** to display the **Scan Tuner 0** or **Scan Tuner 1** page, as shown in Figure 12.
 3. From the **Scan Mode** dropdown list, select **Basic**.
 4. From the **Transmitter file** dropdown list, select a transmitter file.
 5. Select the frequency you want to scan from the **Scan Frequency** list.

The **Scan Frequency** drop down list allows you to choose a single frequency from the previously selected transmitter file.

6. If you want to delete all existing channels for this tuner before performing the scan, check the **Clean scan** checkbox.
7. Click the **start** button.
8. The scan starts and a progress bar is shown before results are displayed on the screen. For more information, see [Interpreting Scan Results](#) on page 26.

Advanced Terrestrial Scan

The advanced scan provides the ability to scan an individual frequency by specifying the details of that frequency.

- ▼ To carry out an advanced scan:
 1. Click on the required tuner name to expand its menu.
 2. Click **Scan** to display the **Scan Tuner 0** or **Scan Tuner 1** page, as shown in Figure 12 .
 3. From the **Scan Mode** dropdown list, select **Advanced**.
 4. Enter the frequency of the multiplex in the **Frequency** field, making sure to select the correct units of frequency from the dropdown list.
 5. Select the bandwidth from the **Bandwidth** dropdown list (default is 8Mhz).
 6. Specify the settings for **FEC high**, **FEC low**, **Modulation**, **Transmission Mode**, **Guard Interval** and **Hierarchy**. These fields are pre-populated with the values of the last scan. These settings can all be left at **Auto** (default).
 7. If you want to delete all existing channels for this tuner before performing the scan, check the **Clean scan** checkbox.
 8. Click **Start**.
 9. The scan starts and a progress bar is shown before results are displayed on the screen. For more information, see [Interpreting Scan Results](#) on page 26.

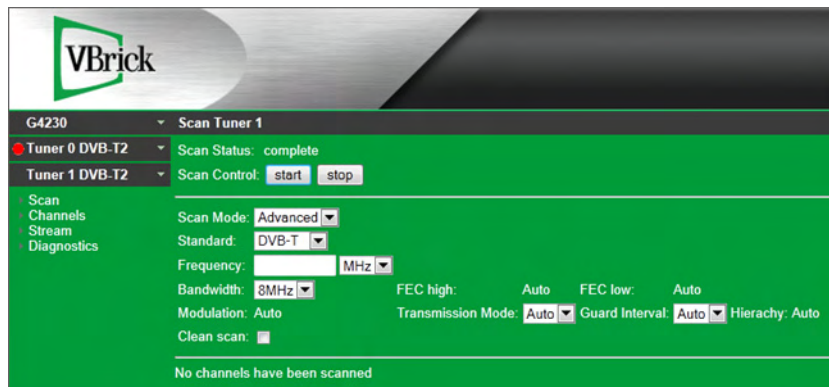


Figure 13. Advanced DVB-T/T2 Scan Page

Scanning Satellite Channels (DVB-S/S2)

In order to successfully receive and stream DVB-S channels, the input signal level and quality must meet the requirements specified in [Recommended Signal Levels](#). There are two types of DVB-S/DVB-S2 scan: Basic Scan and Advanced Scan.

Basic Satellite Scan

The basic scan provides the ability to scan all frequencies listed in a transmitter file for a satellite, or to select individual frequencies from this list. By default, the DVB-S/S2 TVGateways are supplied with the following transmitter files:

```
E_019.2_Astral  
E_028.2_Astra2_Eurobird1  
W_005.0_Atlanticbird3  
W_030.0_Hispasat  
E_007.0_EutelsatW3A  
E_023.5_Astral_3  
E_042.0_Turksat_1C_2A  
W_007.0_Nilesat_101_102_AB4  
E_013.0_Hotbird  
E_026.0_Badr_3_4 W_000.8_Thor  
W_008.0_Atlanticbird2_Telecom2D
```

These lists may also be appropriate for other satellites but you can also add additional transmitter files using the Transmitter Files page. Refer to [Transmitter File Format](#) on page 49 for file format information.

Note Scanning an entire satellite can be a slow process. If you know the frequency and polarisation of the multiplex for the required channels, you can save time by scanning only that specific frequency.

- ▼ To scan all frequencies on a particular satellite:
 1. Click on the required tuner name to expand its menu.
 2. Click **Scan** to display the **Scan Tuner 0** or **Scan Tuner 1** page as shown in Figure 14.

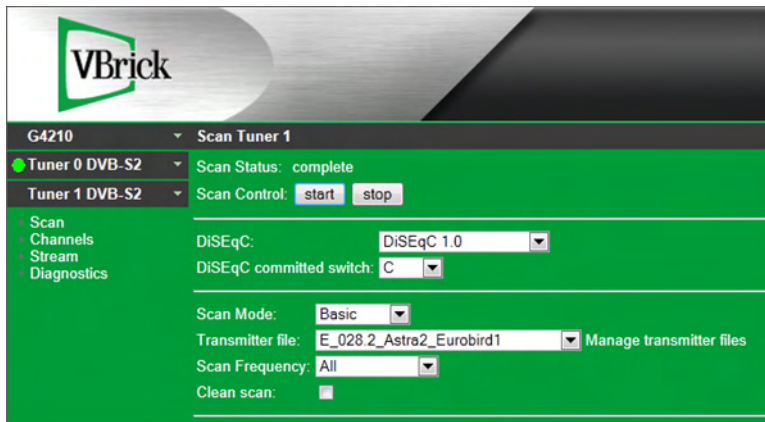


Figure 14. TVGateway Satellite Scan

3. From the **Scan Mode** dropdown list, select **Basic**.
4. From the **Transmitter file** dropdown list, select a transmitter file.
5. Select **All** from the **Scan Frequency** drop down list.
6. Select the required DiSEqC switch position from the **DiSEqC** dropdown menu. (For more information refer to [Configuring the DiSEqC Switch Position](#) on page 24.)
7. If you want to delete all existing channels for this tuner before performing the scan, check the **Clean scan** checkbox.

8. Click the **Start** button.
 9. The scan starts and a progress bar is shown before results are displayed on the screen. For more information, see [Interpreting Scan Results](#) on page 26.
- ▼ To scan an individual frequency from a satellite:
1. Click on the required tuner name to expand its menu.
 2. Click **Scan** to display the **Scan Tuner 0** or **Scan Tuner 1** page as shown in Figure 14.
 3. Select the required DiSEqC switch position from the **DiSEqC** dropdown menu. (For more information refer to [Configuring the DiSEqC Switch Position](#) on page 24.)
 4. From the **Scan Mode** dropdown list, select **Basic**.
 5. From the **Transmitter file** dropdown list, select a satellite.
 6. From the **Scan Frequency** list dropdown list, select the frequency/polarisation you want to scan.
The **Scan Frequency** drop down list allows you to choose a single frequency from the previously selected transmitter file.
 7. Click **Start**.
 8. The scan starts and a progress bar is shown before results are displayed on the screen.

Advanced Satellite Scan

The advanced scan provides the ability to scan an individual multiplex by specifying the details of that multiplex. In order to carry out such a scan, the following information is required: **frequency, polarisation, symbol rate** and **FEC**.

It is also possible to attempt to scan beyond the individual frequency specified, by enabling the **Scan using NIT** option. This reads the NIT (Network Information Table) found on the specified frequency and scans all frequencies listed therein.

Choosing the **Manual LNB Downmix** option allows some more specialized options to be configured. The TVGateway assumes LNB local oscillator frequencies of 9.75GHz and 10.6GHz for transmission frequencies below/above 11.7GHz respectively. If the LNB in use does not use these local oscillator frequencies, the frequency can be manually specified. The TVGateway also assumes that it should disable/enable the 22kHz tone to the LNB for transmission frequencies below/above 11.7GHz respectively. Again, this can be manually configured.

- ▼ To carry out an advanced scan:
1. Click on the required tuner name to expand its menu.
 2. Click **Scan**.
 3. Select the DiSEqC switch position from the **DiSEqC** dropdown menu. (For more information, refer to [Configuring the DiSEqC Switch Position](#) on page 24.)
 4. From the **Scan Mode** dropdown list, select **Advanced**.

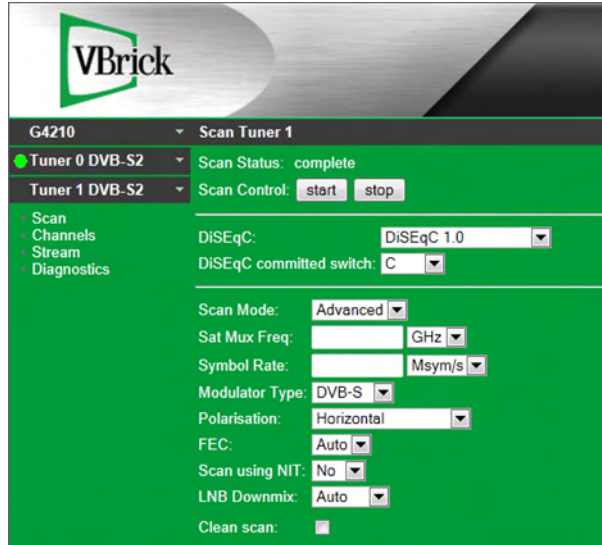


Figure 15. Advanced Satellite Scan

5. Enter the frequency in the **Sat Mux Freq** field, making sure to select the correct units of frequency from the dropdown list.
6. Enter the symbol rate in the **Symbol Rate** field, making sure to select the correct units from the dropdown list.
7. Select an option from the **Modulator Type** dropdown list.
8. Select an option from the **Polarisation** dropdown list.
9. Select an option from the **FEC** dropdown list.
10. If you want to use the information in the NIT to scan multiple frequencies, select **Yes** from the **Scan using NIT** dropdown list.
11. If you want to specify the LNB local oscillator frequency, choose **Manual** from the **LNB Downmix** dropdown list and enter the frequency in kHz in the **LNB Osc Freq** field.
12. To specify the use of the 22kHz tone to the **LNB Downmix**, select either **Off (low band)** or **On (high band)** from the **22kHz tone** dropdown list.
13. If you want to delete all existing channels for this tuner before performing the scan, check the **Clean scan** checkbox.
14. Click **Start**.
15. The scan starts and a progress bar is shown before results are displayed on the screen. For more information, see [Interpreting Scan Results](#) on page 26.

Configuring the DiSEqC Switch Position

DiSEqC (**D**igital **S**atellite **E**quipment **C**ontrol) is a communication protocol for use between a satellite receiver and a multi-dish switch, which enables the satellite receiver to choose between multiple satellites attached to that switch. It also enables the steering of a motorized dish. If your satellite equipment is connected to the TVGateway through a DiSEqC switch, it is necessary to configure the required input prior to starting a scan. This is done using the **DiSEqC** settings on the Scan page. Configuration of the DiSEqC settings is common to all types of satellite scan described above. The VBrick TVGateway support the versions of DiSEqC listed in Table 2.

Note If your satellite equipment is not connected through a DiSEqC switch, the DiSEqC version described in the following procedure can be left at the default value of None.

Table 2. DiSEqC Version Details

DiSEqC Version	Description
1.0	Enables switching between up to 4 satellite sources on a committed switch
1.1	Adds to 1.0 the ability to switch between up to 16 satellite sources on an uncommitted switch. Uncommitted switches can also be daisy-chained from committed switches.
1.1 + Goto X	Adds to 1.1 the ability to steer a motorized dish to a satellite at a particular longitude.
1.2	Adds to 1.1 the ability to steer a motorized dish to a stored position number.

Notes

- DiSEqC 2.x switches are backwards-compatible with DiSEqC 1.x satellite receivers. The TVGateway can therefore operate with DiSEqC 2.x switches. To configure the DiSEqC settings before starting a scan, follow the instructions below.
- Motorized dishes require some time to move to a new position therefore more than 30 seconds may elapse before a scan starts if using one of the motorized dish options.

▼ To select the required satellite input using DiSEqC 1.0:

1. Select **DiSEqC 1.0** from the **DiSEqC** dropdown menu.
2. Select a switch (**A, B, C** or **D**) from the **DiSEqC committed switch** dropdown menu.

Note The DiSEqC switch inputs may be numbered rather than lettered. In this case, position A would correspond to the lowest numbered position. For example, if the switch is labelled with positions 0 – 3, position A corresponds to position 0, position B to position 1, and so on.

▼ To select the required satellite input using DiSEqC 1.1:

1. Select **DiSEqC 1.1** from the **DiSEqC** dropdown menu.
2. Select a committed switch position as for DiSEqC 1.0 if required.
3. Select a switch (1 to 16) from the **DiSEqC uncommitted switch** dropdown menu.

▼ To steer a motorized dish to a particular longitude using DiSEqC 1.1 + Goto X:

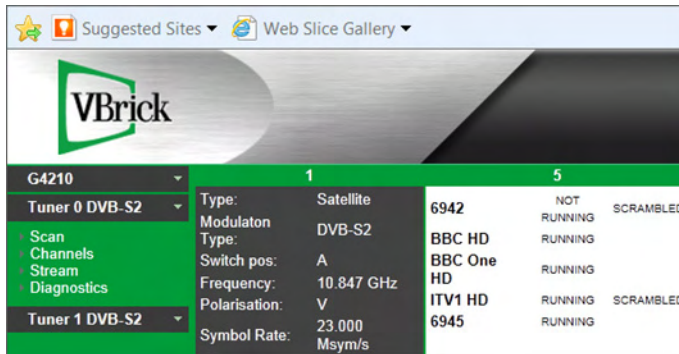
1. Select **DiSEqC 1.1 + Goto X** from the **DiSEqC** dropdown menu.
2. Select committed and non-committed switch positions as for DiSEqC 1.0 and 1.1, if required.
3. Enter the geographic coordinates of the satellite dish location in the **Ground Station** fields.
4. Enter the satellite longitude position in the **Satellite Longitude** field.

Note The geographic coordinates are required in order for the TVGateway to calculate the correct angle offsets for the dish. It is up to the administrator to make sure that it is possible to receive the signal from the required satellite from this location and using this dish.

- ▼ To steer a motorized dish to a stored position using DiSEqC 1.2:
 1. Select **DiSEqC 1.2** from the **DiSEqC** dropdown menu.
 2. Select committed and non-committed switch positions as for DiSEqC 1.0 and 1.1, if required.
 3. Enter the required position number as specified by your satellite installer in the **Stored Position #** field.

Interpreting Scan Results

For all types of TVGateway, the scan process produces a list of one or more discovered multiplexes, including the frequency and other details used in scanning. If the scan of a frequency was successful, the channels found on that frequency are listed. If unsuccessful, the message **No channels found** is displayed alongside the frequency. An example of a successful scan of a single satellite frequency is shown below:



G4210		1	5
Tuner 0 DVB-S2	Type: Satellite	6942	NOT RUNNING SCRAMBLED
Scan Channels	Modulator Type: DVB-S2	BBC HD	RUNNING
Stream	Switch pos: A	BBC One HD	RUNNING
Diagnostics	Frequency: 10.847 GHz	ITV1 HD	RUNNING SCRAMBLED
Tuner 1 DVB-S2	Polarisation: V	6945	RUNNING
	Symbol Rate: 23,000 Msym/s		

Figure 16. Successful Satellite Scan Results

Managing Transmitter Files

The TVGateway is configured by default with some commonly used transmitter files for terrestrial and satellite sources. These files list the frequencies in use on the particular transmitter and allow for straightforward scanning of the available channels. It is possible to upload configuration files for additional transmitters/satellites to the TVGateway. These files may be supplied to you by your VBrick reseller, or you can build your own files using the format information available in [Transmitter File Format](#). The TVGateway uses TFTP to acquire transmitter files, so a TFTP server is required on your network in order to get a new file onto the unit. For more information, refer to [Setting the TFTP server](#) on page 12. The transmitter files are managed from the Transmitter Files page on the Web Management Interface (see Figure 17).

Note If you have upgraded the TVGateway from an older version of firmware, the previous transmitter files are still listed in order to retain any user-configured files. It is advisable to update the transmitter files to the currently shipped versions using the **Restore default transmitter files** button. (This deletes any user-configured files). Clicking the **Return to factory defaults** button on the Maintenance page also has the same effect.

Adding/Deleting Transmitter Files

- ▼ To add a new transmitter file to the TVGateway:
 1. Ensure that the TFTP server is running.
 2. Ensure that the transmitter file is hosted correctly in the root directory of the TFTP server.
 3. Click the gateway name to expand the menu and click **Transmitter files**, or, click on the tuner name label to expand the tuner menu, click **Scan**, and click the **Manage transmitter files** link to display the Transmitter Files page as shown in Figure 17.



Figure 17. Transmitter Files Page

4. On the Transmitter Files page, ensure that the **TFTP Server** address is configured correctly (see [Setting the TFTP server](#) on page 12 for details on how to change this)
 5. Enter the name of the file in the **Transmitter filename** field.
 6. Click the **Import** button.
 7. The file is retrieved from the TFTP server and on completion of the upload, is available for use on the **Scan** page.
- ▼ To delete a transmitter file from the TVGateway:
 1. Click on the required tuner name to expand its menu.

-
2. Click **Scan** and click the **Manage transmitter files** link to display the Transmitter Files page.
 3. Check the box next to the relevant **Filename**.
 4. Click the **Delete files** button.

Configuring the Channels

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Configuring Channels

The process of successfully scanning a transmitter will result in a list of channels from which the channels to be streamed onto the network can be selected. Channels are grouped by multiplex, with each multiplex carried on a particular transmission frequency. A multiplex contains a variable number of TV and radio channels. A tuner tunes to one frequency, and so can only stream channels from one multiplex at any time. This section describes the information displayed in the channel list, and explains how to select and configure the channels that you want to stream.

Checking the Channel List

The channels discovered by the scan process are listed on a per-tuner basis.

▼ To see the channel list for a tuner:

1. Click on the required tuner name to expand its menu.
2. Click **Channels** to display the **Channels Tuner 0** or **Channels Tuner 1** page as shown below in Figure 18.

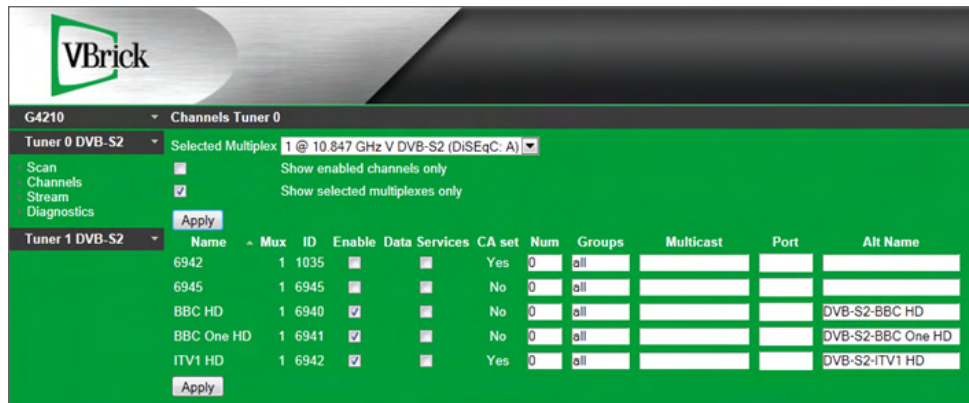


Figure 18. Channels Tuner Page

-
- Click on the headings to sort the list, helping you to find the specific channels you want to stream. For example, click on **Name** to sort the channels in alphabetical order. The information displayed about each channel is as follows:

Table 3. Channel description

Field	Description
Name	The name of the channel
Multiplex (Mux)	The reference number of the multiplex containing this channel.
ID	The service ID of the channel.
CA set	If set to Yes, this field indicates that the channel may be scrambled (this bit is read from the Transport Stream SDT). Some broadcast multiplexes do not use the Conditional Access bit as expected, so this information is displayed as a hint only.

Selecting a Multiplex

Once you have identified the channels you want to stream you will know the multiplex reference number for the channels. You must select this multiplex so that the TVGateway knows which frequency to tune to.

- ▼ To select a multiplex:
 - Click on the required tuner name to expand its menu.
 - Click **Channels** for the desired tuner to display the **Channels Tuner 0** or **Channels Tuner 1** page as shown in Figure 18.
 - Select the required multiplex from the **Selected Multiplex** dropdown list.
 - Click **Apply**.

Selecting Channels

Now that you have selected a multiplex, you can select the particular channels on that multiplex which you want to stream.

- ▼ To select channels:
 - Click the **Channels** page for the desired tuner.
 - Check the box entitled **Show selected multiplexes only** to see at a glance only the channels on the selected multiplex.
 - Check the box in the **Enable** column for all channels you wish to stream.
 - Click **Apply**.

Advanced Channel Configuration

Once you have selected channels as described above, you are ready to start streaming. However you may wish to configure some details of these channels first. The parameters which can be configured are described in Table 4.

- ▼ To configure channels:
 - Click on the **Channels** page for the desired tuner.
 - Check the boxes **Show selected multiplexes only** and **Show enabled channels only** to see at a glance the enabled channels.

3. Configure channel details as appropriate. Refer to Table 4 for a description of configurable options.
4. Click **Apply**.

Table 4. Channel Configurable Options

Parameter	Description
Number	Channel numbers are typically given as 3 digit numbers e.g.101. This information will be used to order the channel list in any VBrick receiver equipment or software used to view channels. With a DVB-T unit the gateway automatically populates this field with the Logical Channel Numbers (LCN) from the DVB stream to number the channels. These can be changed to any required value.
Enable	Selecting this option enables the channel for streaming.
Groups	The available channels across a network of VBrick devices can be split into groups of similar type. For example, you might have a group of Sports channels and a group of Children's channels. Channels are assigned to group(s) by VBrick Encoders and TVGateways. The groups are included as part of the SAP announcements sent by these devices. This allows VBrick set top boxes and PC clients to list only channels in a particular group or groups. This field is a comma-separated list of groups to which the channel is a member. The default value is "all," meaning that the channel is a member of all groups.
Multicast address	By default the TVGateway is configured to automatically assign a multicast address to each channel. It is also possible to configure multicast addresses manually. This is a global setting which is described Streaming the Channels on page 33. If manual multicast addressing is in use, you must configure the multicast address you wish to use for the channel; these must be unique across the network. If required, a unicast address can also be entered here, allowing the stream to be directed to a single endpoint.
Port	By default, each channel is streamed using the destination port number configured in the stream parameters (see Streaming the Channels on page 33). If manual multicast addressing is in use (see above), the destination port can optionally be specified on a per-channel basis. If this field is left blank, the default port will be used.
Alternative Name	This allows you to override the name of the channel used in channel announcements. This name will be displayed in the channel list on VBrick set top boxes and PC clients.
Data PIDs	The TVGateway automatically streams all video, audio and subtitle PIDs associated with a selected channel. The Data PID checkbox enables any data services associated with the channel (for example interactive TV) to also be streamed.

Streaming the Channels

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Making Changes to the Stream	35
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Overview

Once you have scanned for channels and selected the channels you want to stream, the final task is to set up streaming on the device. In many circumstances, the default settings will be suitable but there are a number of configurable parameters which are described in [Advanced Stream Configuration](#) on page 37.

Note When changing any settings related to streaming, it is necessary to re-start streaming for these changes to take effect.

Configuring Startup Mode for Tuners

The TVGateway default configuration is not to stream on boot (startup). However, you can enable this on a per-tuner basis. This ensures the TVGateway starts streaming after a power outage.

▼ To configure startup mode for a tuner:

1. Click on the required tuner name to expand its menu.
2. Click **Stream** to display the **Stream Tuner 0** or **Stream Tuner 1** page as shown in Figure 19.

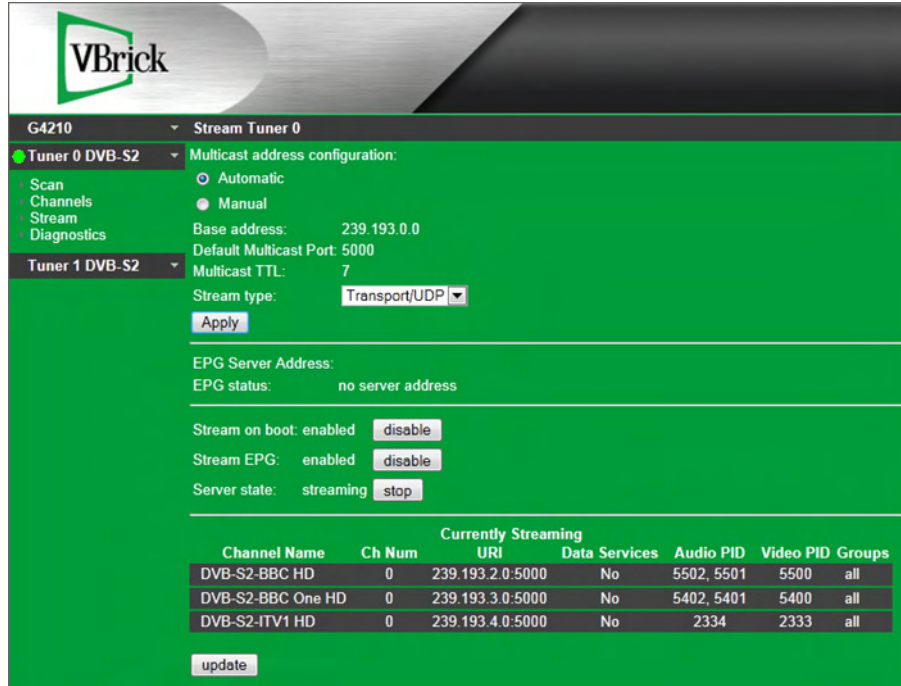


Figure 19. Tuner Stream Page

- For **Stream on boot**, click the **enable** or **disable** button, as required.
Note: When **Stream on boot** is disabled, the **enable** button is displayed. When **Stream on boot** is enabled, the **disable** button is displayed.
- Click **update**.

Starting/Stopping Streaming

It is possible to start/stop streaming on all tuners and also on a per-tuner basis. When the TVGateway has started streaming, the channels streaming are listed on the global **Stream** page, and also on a per-tuner basis on the **Stream** page for each tuner as shown in [Viewing Streaming Status](#) on page 35. You can now view the TV channels on VBrick set top boxes and PC clients.

Note It is important to correctly configure the traffic smoothing setting in order to ensure the best picture quality. Refer to [Advanced Stream Configuration](#) on page 37 for more detailed information.

- ▼ To control streaming on a tuner:
 - Click on the required tuner name to expand its menu.
 - Click **Stream** to display the tuner **Stream Tuner 0** or **Stream Tuner 1** page as shown in Figure 20.
 - In the **Server state** section, click the **start** or **stop** buttons to start or stop the tuner stream.
- ▼ To control streaming on all tuners:
 - Click on the TVGateway name to open its menu.
 - Click **Stream** to display the TVGateway **Stream** page as shown in Figure 20.

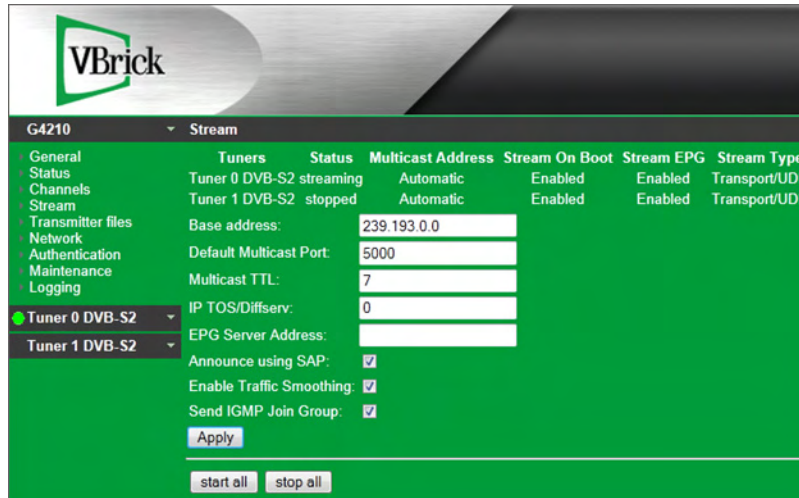


Figure 20. Global Stream Page

3. Click either the **start all** or **stop all** buttons to start or stop all streams.

Making Changes to the Stream

The **update** button on the global **Stream** page allows you make changes to the stream content without stopping it. You can change any of the parameters on a tuner **Channel** page, such as the channel number, group name, Name, or add and remove channels, all without stopping the stream.

1. To make changes to the stream:
2. Click on the required tuner name to expand its menu.
3. Click **Channels**.
4. Locate the channel you want to add, remove, or edit and make the changes, for example tick the **Enable** box to add the channel.
5. Click the **Apply** button.
6. Click on the TVGateway name to open its menu.
7. Click **Stream**.
8. Click the **update** button below the list of Currently Streaming channels.
9. Confirm the Currently Streaming list is updated and displays your changes.

Viewing Streaming Status

You can display the list of all channels streaming from the TVGateway, and you can also view this information on a per-tuner basis.

- ▼ To display all the channels streaming on this TVGateway:
 1. Click on the TVGateway name to open its menu.
 2. Click **Stream** to view the TVGateway **Stream** page as shown in Figure 20. The channels are displayed at the bottom of the page and the details are described in Table 5.
- ▼ To display the channels streaming on a particular tuner:
 1. Click on the required tuner name to open its menu.
 2. Click **Stream** to display the **Stream Tuner 0** or **Stream Tuner1** as shown in Figure 20. The channels are displayed at the bottom of the page and the details are described in Table 5.

Table 5. Table 4 Streaming channels information

Parameter	Description
Tuner	Listed only on the global Stream page. Displays the tuner associated with the streamed channel.
Name	This name will be displayed in the channel list on VBrick set top boxes and PC clients
Ch Num	The channel number used by VBrick set top boxes and PC clients
URI	This is the multicast address and port used by this channel
Data Services	Reports if data services are streamed for this channel as configured on the Channels page
Audio PID	The Transport Stream audio PID of this channel
Video PID	The Transport Stream video PID of this channel
Groups	The groups to which the channel belongs

Viewing Channels

If you are using Internet Explorer or VBrick StreamPlayer, and you have the VBrick IP TVGatewayPlayer installed, you can quickly check that the channels are playing satisfactorily.

Viewing Channels with Internet Explorer

▼ To view a channel with Internet Explorer:

1. Click on the TVGateway name to open its menu.
2. Click **Stream** to display the TVGateway **Stream** page.
3. Click the channel name in the **Currently streaming** list to display the channel in a new browser window.

Note: If you receive a popup error message, you will need to use VEMS or StreamPlayer to verify the stream.

Viewing Channels with StreamPlayer

You can also view channels using the VBrick StreamPlayer desktop application:

▼ To view channels with StreamPlayer:

1. From the Gateway Stream menu obtain the IP Address and Port number of any stream.
2. In StreamPlayer, type the values from the Stream menu in the **IP Address** and **Port** fields and press Enter, or click the play icon.
3. The stream will play on your default player.

Advanced Stream Configuration

Configuring Global Stream Settings

This section deals with stream settings which apply to all tuners on a TVGateway. These mainly relate to the way the stream is transmitted on the network, including IP configuration and traffic smoothing settings.

▼ To configure global stream settings:

1. Click on the TVGateway name to open its menu.
2. Click **Stream** to display the TVGateway **Stream** page as shown in Figure 20.
3. Set stream parameters as described in Table 6.
4. Click the **Apply** button.

Table 6 describes the stream parameters which can be configured on a global basis via the top-level **Stream** page.

Table 6. Global Stream Settings

Parameter	Description
Parameter	Description
Base address:	Base multicast address from which individual channel multicast addresses are determined. The first two digits form the start of an IPv4 multicast address, while the last two digits are zero. The default value is 239.192.0.0. When automatic multicast address assignment is in use, channels are assigned a multicast address based on this address. Using the default address as an example, a channel multicast addresses is 239.192.x.y, where y is the last digit(s) of the TVGateway IP address and x is a unique number assigned by the TVGateway.
Default Multicast Port:	All streams are transmitted with destination UDP port number as defined here. The default value is 5000. This global setting can be overridden if manual multicast address assignment is in use.
Multicast TTL:	All streams are transmitted with an IP TTL value as defined here. The default value is 7.
IP TOS/Diffserv:	All streams are transmitted with an IP TOS/Diffserv value as defined here. Note that the value specified here refers to the full 8 bit TOS/Diffserv field in the IP header. The default value is 0. The value can be set between 0 and 255, though you should take care to set a value appropriate to your network and if necessary refer to RFC 2474 when choosing the value to set.
EPG Server Address:	<i>VEMS 6.1 or higher.</i> If you have a VEMS server, specify its IP address here. The TVGateway sends EPG information for all streaming channels to this server. This can be enabled/disabled on a per-tuner basis (see below).
Announce using SAP:	By default, all channels are announced using SAP on UDP port 9875 to the address 239.255.255.255. It is possible to disable these announcements by deselecting this checkbox.

Parameter	Description
Enable Traffic Smoothing:	Traffic smoothing is used on the Ethernet Interface to ensure that each Transport Stream is transmitted at a regular rate, especially at low data rates. When transmitting a large number of video channels the gateway in effect becomes self regulating and the traffic smoothing can inhibit performance. The default setting is to have traffic smoothing enabled. When streaming is in excess of 20Mbps it is recommended this function is disabled by deselecting the checkbox.
Send IGMP Join Group:	The TVGateway by default uses IGMP to join the multicast group for all the channels it is streaming. This can be essential to prevent flooding on some network switches. If required, this function can be disabled by deselecting the checkbox.

Configuring Tuner Stream Settings

This section describes stream settings which apply to a particular tuner on a TVGateway.

Configuring Multicast Address Assignment Mode

You can choose to assign multicast addresses automatically or manually. If you choose automatic assignment, multicast addresses are assigned for each channel as described in Table 6. If you choose manual assignment, you must configure a multicast address for each channel before starting streaming.

▼ To configure multicast address assignment mode for a tuner:

1. Click on the required tuner name to open its menu.
2. Click **Stream** to display the **Stream Tuner 0** or **Stream Tuner 1** as shown in Table 6.
3. Select the **Automatic** or **Manual** radio button, as required.
4. Click the **Apply** button.

Configuring Stream Type

Multicast streams from a TVGateway are by default transmitted as MPEG transport streams over UDP (Transport/UDP). The Transport/RTP option (MPEG transport streams over RTP) is provided mainly as a network debugging tool, as the sequence number in the RTP header can help to identify packet loss. Transport/RTP may also be useful for interoperability with some third party products.

▼ To configure stream type for a tuner:

1. Click on the required tuner name to open its menu.
2. Click **Stream** to display the **Stream Tuner 0** or **Stream Tuner 1** page as shown in Figure 19.
3. Choose **Transport/UDP** or **Transport/RTP** from the **Stream type** dropdown list.
4. Click the **Apply** button.

Status Monitoring

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Viewing TVGateway Details

- ▼ To view details about the TVGateway:
 1. Click on the TVGateway name to open its menu.
 2. Click **General** to display the TVGateway General page, as shown in Figure 21.

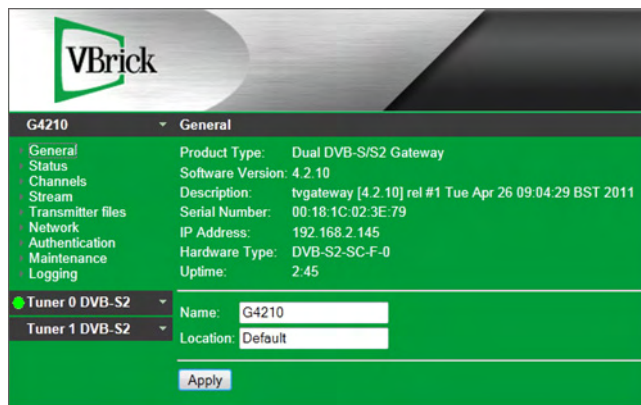


Figure 21. TVGateway General Page

The following information is displayed on the General page:

Product Type	The IP TVGateway model number.
Software Version	The version of software (often known as firmware) running on this device.
Description	A detailed version description identifying when the software was built.
Serial number	The MAC address of the unit.
IP Address	The IP address being used by the unit.
Hardware Type	This identifies the exact type of hardware in the device.
Uptime	The length of time this device has been running since the last restart.

Note This information is useful for identifying the software and hardware revisions in use in this device. If contacting technical support regarding a problem with the device, it can be useful to provide all this information.

Viewing Operating Status

The TVGateway reports on the status of the tuners on a per-tuner basis. The streaming status of the tuner is reported, as well as a number of statistics that represent the quality of the input RF signal. Note that Status information is refreshed automatically.

▼ To view details of the operating status of the TVGateway:

1. Click on the TVGateway name to open its menu.
2. Click Status to display the TVGateway Status page as shown in Figure 22.

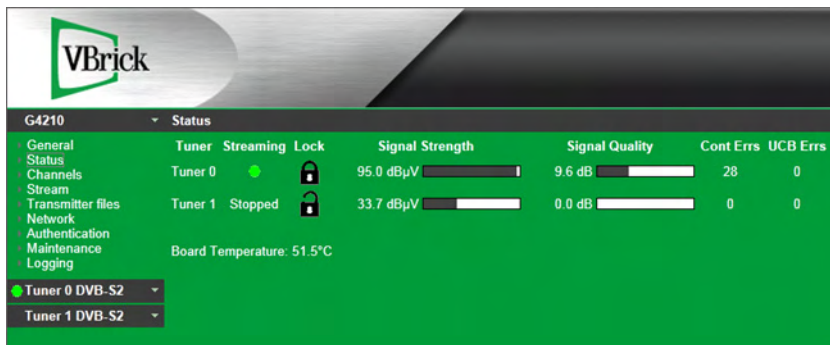


Figure 22. TVGateway Status Page

Operational status is shown by a simple traffic light icon, which can have three states:

Green	indicates that a tuner is tuned and streaming.
Red	indicates that the tuner is either not tuned, has not established signal lock, or the tuner is not streaming. Streaming without lock can mean that the signal is too weak, too noisy or simply that an error has been made in the configuration of the unit.
No Icon	there is usually no traffic light if the user has not yet scanned; this is the default state from the factory.

If the icon is Red, check the streaming page of the particular tuner for a detailed status. There will be a message providing a reason for the lack of stream. These messages are shown in Table 7.

Table 7. Operational Status

Status	Description
Stopped	User has deliberately stopped streaming or has not attempted to start streaming.
no tuner lock	Appears just after starting before tuner gets lock, or if tuner loses lock.
no multiplex selected	User should select multiplex on channels page.
no channels selected	User should select at least one channel on channels page.

Status	Description
too many channels	Maximum number of channels is set to 128 per multiplex; make sure you have no more than this selected.
bad multiplex file bad command bad binding file no binding file no socket created missing channels file tuning error	These messages show a number of internal failures for which there is no specific user action to resolve. If any of these internal errors occur start the process of configuring channels again, i.e. perform scan, channel and multiplex selection and then try streaming again. If the problem continues then reset the unit to factory defaults and try to re-configure the unit. If after this step the problem persists contact VBrick Support Services.

Signal Status

There are three parameters which report the status of the RF signal to the TVGateway. These parameters are only relevant if the TVGateway is streaming.

Signal Lock	shows locked if the tuner has successfully locked onto the signal at the required frequency, and unlocked if not.
Signal Quality	(Terrestrial tuners) gives a rough guide as to the quality of the input signal. Signal quality is expressed as a percentage.
Signal and Signal Quality	(Satellite tuners) give a rough guide as to the quality of the input signal. Signal quality is expressed in dB and signal power in dBuV.

Error Statistics

Uncorrectable Blocks

All RF signals from a DVB-S or DVB-T source will have errors. The tuners will frequently automatically correct these errors. Some of these errors will not be correctable and these will be reported as uncorrectable blocks under the heading **UCB Err**. This is the most important metric for determining the quality of RF signal to the TVGateway. If this value is steadily increasing the signal is almost certainly not of good enough quality and will probably result in poor TV picture. If the TVGateway is tuned to a good satellite or terrestrial source, the UCB error count will be close to zero.

Continuity Errors

DVB programs are transmitted as MPEG Transport Streams. Transport Stream packets contain a continuity counter which enables a check to be made of the integrity of the stream. Any missing packet is reported as a continuity error under the heading **Cont Err**. If the continuity error count is steadily increasing it will probably result in poor TV picture and usually indicates that the signal is not of good enough quality. If the continuity error count is increasing while the UCB error count is not increasing, this may indicate that the TVGateway is close to its performance limit. It may be possible to improve matters by disabling traffic smoothing, disabling advanced diagnostics, disabling Transport Stream/RTP and/or streaming fewer channels. If the TVGateway is tuned to a good satellite or terrestrial source and it is operating within its performance limits, the continuity error count will be close to zero.

Advanced Diagnostics

It is possible to obtain a graph over time of the signal and error statistics described above. This graphing is only available by enabling **Advanced Diagnostics** and displays graphs of signal quality, UCB errors and continuity errors over the previous 24 hours. It is recommended that for normal operation advanced diagnostics is disabled (the default setting), as it does consume resources to gather statistics on the gateway's performance.

▼ To view diagnostics graphs:

1. Click on the required tuner name to open its menu.
2. Click **Diagnostics** tab to display the **Diagnostics Tuner 0** or **Diagnostics Tuner 1** page as shown in Figure 23.



Figure 23. TVGateway Diagnostics Page

3. Ensure that the **Advanced Diagnostics** checkbox is selected. The graphs show diagnostic history specific for the tuner and are displayed once enough historical data has been collected.

Viewing Network Statistics

The network statistics reported for the TVGateway give an indication of the utilization of the network interface as well as reporting any errors.

▼ To view details of network port utilization:

1. Click on the TVGateway name to open its menu.
2. Click **Network** tab to display the **Network** page as shown in Figure 8. The Ethernet interface statistics are shown along the bottom of the page, as follows:

Transmit Utilisation	Shows you how much of the capacity of the Ethernet interface is being used for streaming TV channels. If this value is 80% or over there is a danger of dropping packets, which would adversely affect the quality of TV picture at the endpoints. In this case, it may be necessary to reduce the number of channels being streamed, or disable data PID streaming if this is enabled.
Transmit Errors (Errors, Dropped, Collisions, Discarded)	If being recorded in any volume may indicate that the interface capacity has been reached, or may indicate a mismatch in Ethernet settings between the TVGateway and the network switch (e.g. auto-negotiation settings mismatch). Any transmit errors may adversely affect the quality of TV picture at the endpoints.
Receive Utilisation	Shows you how much traffic the TVGateway is receiving from the network. In normal circumstances this should be 0%. If this is non-zero, this may indicate that the network is not correctly multicast enabled, resulting in the TVGateway receiving multicast traffic from other streaming devices.



Troubleshooting

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Troubleshooting Tips

Table 8. Troubleshooting Tips

Problem	Possible Cause	Solution
Failure to scan for channels	Poor or faulty terrestrial or satellite signal.	Check all connections.
		Get the aerial or satellite dish checked by a professional installer.
		On a satellite installation, check that you have an appropriate feed to each tuner. This would be a direct feed from an LNB, or a connection from a satellite multiswitch which in turn would be connected to a quattro LNB.

Problem	Possible Cause	Solution
Poor quality video at endpoints	Poor terrestrial or satellite signal. This would be indicated by UCB and/or continuity error counts increasing.	Check the tuner statistics, as described in Viewing Operating Status on page 40, and if necessary get the aerial or satellite dish checked by a professional installer. The recommended signal levels are detailed in Admin Interface Connection .
	Network is not multicast enabled	Check that IGMPv2 is enabled on all network switches and that one network device is acting as the IGMP querier.
	Traffic is bursty. This is a possibility if streaming less than 20Mbps total network traffic and would be indicated by the message <i>buffer overrun</i> in the log file of a STB.	Enable traffic smoothing (see page Table 6 on page 37).
	Traffic smoothing enabled unnecessarily. This is possible if streaming more than 20Mbps network traffic.	Disable traffic smoothing (see Table 6 on page 37).
	Network traffic limit reached. May be indicated by the discarded packet count increasing (see page Viewing Network Statistics on page 43).	Disable one or more channels.
		Disable data PIDs on channels if enabled.
	TVGateway performance limit reached. This may be indicated by the continuity error count increasing without a corresponding increase in the UCB error count (see page Uncorrectable Blocks on page 41).	Disable one or more channels or traffic smoothing (see Table 6 on page 37).
		Disable data PIDs on channels if enabled.
		Disable advanced diagnostics (see Advanced Diagnostics on page 42).
Network port misconfiguration	Use Transport Stream/UDP instead of Transport Stream/RTP (see Configuring Stream Type on page 38).	
	Ensure that the TVGateway and the corresponding network switch port are configured in the same way i.e. auto-negotiation enabled or disabled (see Configuring Network Settings on page 10).	
Duplicate multicast addresses	Ensure that each IPTV channel has a unique multicast address.	
	Ensure that there is no multicast address duplication with other multicast traffic.	

Problem	Possible Cause	Solution
After upgrade, the device is still running the old version of firmware.	The correct firmware files are not on the TFTP server.	Put the correct files on the TFTP server.
	The TFTP server address configured for the device is wrong	Check that the TFTP server address is the address of the machine the TFTP server is running on.
	The TFTP server is not running.	Start the TFTP server.
	The TFTP server is not configured to send files.	Fix the security settings on the TFTP server.
	The PC firewall is blocking the incoming TFTP requests.	Disable firewall or configure firewall to allow traffic to TFTP Server.

Admin Interface Connection

The serial admin interface provides the ability to manage a small subset of device functionality e.g. to configure an IP address.

Cabling

To connect to the serial interface use the female DB-9 to RJ45 adaptor supplied by VBrick (shown in Figure 24). Be sure to use the black DB-9 to RJ45 adaptor that was shipped with the product (do not use the adaptor that is shipped with VBrick encoding appliances).



Figure 24. DB-9 to RJ45 serial adaptor

The female DB-9 connector should be plugged into the serial port on a PC. A straight-through network cable should be used between the RJ45 socket on the adaptor and the admin port on the VBrick device. Note that although the cable fits, the admin port should not be connected to the Ethernet port on a PC.

Adaptor Wiring

If you do not have an adaptor you can make one using the details shown in Figure 25 and Table 9.



Figure 25. DB-9 and RJ45 connector

Table 9. Serial Pin Out

DB9 Connector Pin No	Description	RJ45 Pin No
2	TxD	8
3	RxD	2
5	GND	4

Opening a Session

Open a terminal program such as Hyperterminal (this can be found on a standard Windows XP PC). Set up the serial port with the following settings (see example in Figure 26):

Baud rate	115200
Data bits	8
Parity	none
Stop bits	1
Flow control	none

The program should now connect and present a login prompt if the return key is pressed.



Figure 26. Serial Port Settings

Recommended Signal Levels

The digital satellite and terrestrial IP TVGateways require good quality signals at their inputs. The recommended signal levels are specified below.

DVB-T/T2

The recommended terrestrial input signal is as follows:

Signal level	> 45 dB μ V and < 70 dB μ V
Signal to noise ratio (SNR)	> 26dB
Bit Error Rate (BER)	< 2E-04

DVB-S/S2

The recommended satellite input signal is as follows:

Signal to noise ratio (SNR)	> 7 - 9 dB
Bit error rate (BER)	< 2E-04

Scan Resources

This page lists useful sources of information which may help you work out how to scan for the required channels.

Terrestrial

DVB-T broadcasts are country-specific, and within a country there will be multiple transmitters, each broadcasting on a different set of frequencies. To find out the transmission frequencies for your location you may need to get this information from the relevant national broadcasting authority. For example, in the UK this information is available at the following site:

<http://www.digitaluk.co.uk>

Satellite

The websites listed below contain details of major satellites broadcasting DVB-S signals. Channels are listed on a per-frequency basis, and maps are available detailing satellite coverage.

<http://www.lyngsat.com>

<http://www.kingofsat.net>

Transmitter File Format

The format of transmitter files is as shown in the examples below.

DVB-T/T2

The fields in order are type (T = terrestrial), frequency (Hz), bandwidth, FEC Hi, FEC Lo, modulation, transmission mode, hierarchy. All but the first three fields can generally be set to AUTO.

```
# Description
T 506000000 8MHz AUTO AUTO AUTO AUTO AUTO AUTO
T 530000000 8MHz AUTO AUTO AUTO AUTO AUTO AUTO
T 538000000 8MHz AUTO AUTO AUTO AUTO AUTO AUTO
T 562000000 8MHz AUTO AUTO AUTO AUTO AUTO AUTO

T 226500000 7MHz 3/4 NONE QAM64 8k 1/16 NONE
```

```
T 177500000 7MHz 2/3 NONE QAM64 8k 1/16 NONE
T 191625000 7MHz 3/4 NONE QAM64 8k 1/16 NONE
T 219500000 7MHz 3/4 NONE QAM64 8k 1/16 NONE
```

DVB-S/S2

The fields in order are type (S=satellite), frequency (kHz), polarisation (V or H), symbol rate (symbols/sec), FEC.

```
# Description
S 10719000 V 27500000 3/4
S 10723000 H 29900000 3/4
S 10758000 V 27500000 3/4
S 10775000 H 28000000 3/4
```

Installation

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Overview

Chassis

There are three chassis in the IP TVGateway series. The 1-slot Chassis, 3-slot Chassis and 10-slot Chassis providing 1, 3 and 10 hot-swap slots respectively. For maximum redundancy each module slot has its own Ethernet Interface. This interface is gigabit ready for future VBrick modules. Provision should be made on the Ethernet back bone for each interface. The IP TVGateway 10-slot Chassis Monitor slot also has a 10/100 interface, this means that a maximum of eleven IGMP enabled switch ports are required for the chassis.



Figure 27. 10-slot Chassis



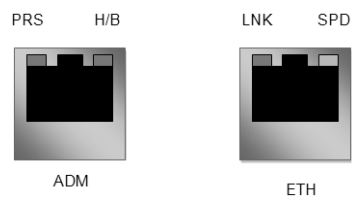
Figure 28. 3-slot Chassis



Figure 29. 1-slot Chassis

LEDs

Each module slot has two interface connections on the front face of the chassis. The first is a standard VBrick admin port which has two LEDs associated with the connector. These are marked “PRS” and “H/B”. The second port is a 10/100 Ethernet interface (possibly 1000 depending on module blade inserted) with LEDs marked “LNK” and “SPD”. These connectors and LEDs are shown below.



PRS	When lit shows that a blade is PRESENT in the module slot.
H/B	The blade’s HEART BEAT LED. The exact function of this is dependent on the module blade but basically a flashing LED shows that the blade in the slot is running.
LNK	Shows that the Ethernet LINK is up. The LNK LED will flash off briefly to show activity in that data is passing over the Ethernet link.
SPD	Displays the SPEED of the Ethernet link. In general this will be on for 100 Mbps Ethernet, but is dependent on the module blade inserted.

Module Blades

The chassis allows for various module blades to be inserted. Each blade is hot-swappable and fully independent of other modules, this means that if a blade fails it cannot affect the operation of another. Module blades include VBrick's TVGateway and encoder products.



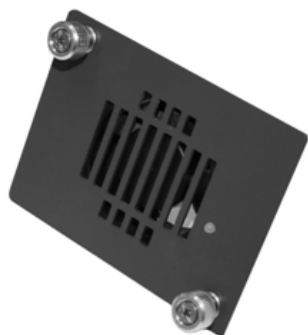
Power

The three chassis all have different power supply options. The IP TVGateway As shown from left to right, the 1-slot Chassis has an external brick supply capable of supplying 50W to the chassis. The IP TVGateway 3-slot Chassis has a fixed internal supply capable of supplying 150W to the chassis. The IP TVGateway 10-slot Chassis is powered by two or three 300W hot-swappable power supplies to provide an N+1 redundant solution. Each supply requires its own mains feed. The supplies are fully hot swappable meaning if a supply fails it can be replaced without powering down the chassis.



Fans

The IP TVGateway 1-slot Chassis and 3-slot Chassis chassis have fixed internal fans. The IP TVGateway 10-slot Chassis chassis has five individually hot-swappable fan modules. Each fan module can be individually monitored and replaced without affecting the rest of the chassis.



Monitor Blade

The IP TVGateway 10-slot Chassis has a slot for a monitor blade. The blade will monitor the entire chassis but is currently not available.

Initial Tasks

Follow the steps in the order given to complete the installation process in a minimum amount of time and to avoid personal injury. Please read this section in its entirety before you begin the installation procedure outlined in the sections that follow.

Unpacking the System

You should inspect the box the IP TVGateway chassis was shipped in and note if it was damaged in any way. The IP TVGateway chassis are shipped empty, with the module blades and the IP TVGateway 10-slot Chassis power supplies shipped in individual packaging. Do not add the modules or power supplies until the 3-slot Chassis or 10-slot Chassis chassis has been securely mounted in a rack.

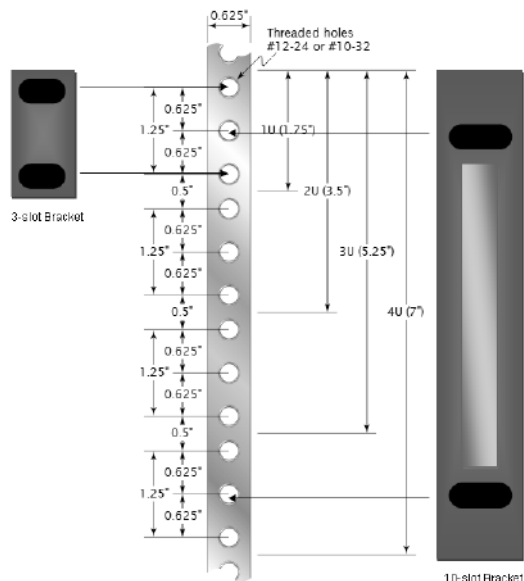
Before you start, make sure you received all the necessary parts. Decide on a suitable location for any rack unit that will hold a IP TVGateway 3-slot Chassis or 10-slot Chassis. Read the Rack Precautions in the next section. The IP TVGateway chassis should be situated in a clean, dust-free area that is well ventilated. Avoid areas where heat, electrical noise and electromagnetic fields are generated. You will also need it placed near a grounded power outlet.

Preparing for Setup (3-slot Chassis and 10-slot Chassis)

Fitting and installation of the IP TVGateway assemblies should be carried out by an experienced technician who is familiar with IT equipment installation. The Ethernet cable must be at least Category 5 (CAT-5) compatible. The Ethernet network must be compliant with I.E.E.E. 802.3.

The IP TVGateway 3-slot Chassis and 10-slot Chassis chassis are designed primarily as a 19" rack mounting unit and comes supplied with the appropriate brackets already attached. You should use only these brackets as the mounting method in a 19" Rack. On the IP TVGateway-C3 these brackets can be re-positioned so that the unit is recessed into the rack. On the IP TVGateway 10-slot Chassis these brackets can be re-positioned on either end of the unit, or so that the unit is recessed into the rack.

The 1U sized IP TVGateway 3-slot Chassis chassis is designed to fit in any standard 19" rack. The 4U sized IP TVGateway-10-slot Chassis chassis is designed to fit in a standard 19" rack. Some early 19" racks do not have the centre hole present (within each 1U spacing) and will not be suitable for mounting a IP TVGateway 10-slot Chassis.



The IP TVGateway is a relatively heavy product so take care to use appropriate manual handling procedures during installation, particularly when mounting in a 19" rack where it will be necessary to provide the unit with appropriate support while you screw the rack mount brackets to the 19" rack mount chassis.

Choosing a Setup Location (3-slot Chassis and 10-slot Chassis)

- Leave enough clearance in front of the rack to enable you to open the front door completely (~50cm).
- Leave enough clearance in the back of the rack to allow for sufficient airflow and ease in servicing (~50cm).
- This product is for installation only in a Restricted Access Location (dedicated equipment rooms, service closets and other suitable localities).

Preparing for Setup (IP TVGateway 1-slot Chassis)

Fitting and installation of the IP TVGateway assemblies should be carried out by an experienced technician who is familiar with IT equipment installation. The Ethernet cable must be at least Category 5 (CAT-5) compatible. The Ethernet network must be compliant with I.E.E.E. 802.3. The IP TVGateway 1-slot Chassis chassis is designed primarily as a desk top unit. Care should be taken to ensure the unit cannot be knocked or damaged by other equipment.

Choosing a Setup Location (IP TVGateway 1-slot Chassis)

- This product is for installation only in a Restricted Access Location (dedicated equipment rooms, service closets and other suitable localities).

Warnings and Precautions

Rack Precautions (3-slot Chassis and 10-slot Chassis)

- Ensure that the levelling jacks on the bottom of the rack are fully extended to the floor with the full weight of the rack resting on them.
- In single rack installation, stabilizers should be attached to the rack.
- In multiple rack installations, the racks should be coupled together.
- Always make sure the rack is stable before mounting the unit.

Unit Precautions (3-slot Chassis and 10-slot Chassis)

- Review the electrical and general [Safety Precautions](#) on page viii.
- Determine the placement of each component in the rack before you begin
- Note the IP TVGateway 10-slot Chassis is almost exactly 4U high. It may be a snug fit to other equipment due to the wide tolerances of the 19" racking standards.
- Install the heaviest components on the bottom of the rack first, and then work up.
- You may want to consider using a regulating uninterruptible power supply (UPS) to protect the server from power surges, voltage spikes and to keep your system operating in case of a power failure.
- Always keep the rack's front door and all panels closed when not servicing to maintain proper cooling.

Unit Precautions (1-slot Chassis)

- Review the electrical and general [Safety Precautions](#) on page viii.
- Determine the placement of the chassis before you begin
- You may want to consider using a regulating uninterruptible power supply (UPS) to protect the server from power surges, voltage spikes and to keep your system operating in case of a power failure.

Environmental Considerations

Ambient Operating Temperature

If installed in a closed or multi-unit rack assembly, the ambient operating temperature of the rack environment may be greater than the ambient temperature of the room. Therefore, consideration should be given to installing the equipment in an environment compatible with the maximum rated ambient temperature (40°C) and a minimum rated ambient temperature of (0°C).

- The IP TVGateway 10-slot Chassis chassis itself will consume 15W (51BTU) of power for the fans and monitoring functions.
- The IP TVGateway 3-slot Chassis chassis will consume 5W (17BTU) of power for the fans.
- The IP TVGateway 1-slot Chassis chassis will consume 1W (3.4BTU) of power for the fan.

Each slot can be provided with a maximum of 50W (171BTU) of power, however the typical load for VBrick module blades is 10W (34BTU) to 20W (68BTU). Please see individual module blade documentation for exact power consumption. The lifetime of all electronic devices is extended if they are operated at lower temperatures so while operating the product at 40°C is within its specification it is recommended that for maximum lifetime you operate the product at as low a temperature as possible (not lower than 0°C).

Reduced Airflow

3-slot Chassis and 10-slot Chassis equipment should be mounted into a rack so that the amount of airflow required for safe operation is not compromised. 1-slot Chassis equipment should be mounted so that the air vents are not blocked or obstructed.

Mechanical Loading

3-slot Chassis and 10-slot Chassis equipment should be mounted into a rack so that a hazardous condition does not arise due to uneven mechanical loading. 1-slot Chassis equipment should be mounted so that no additional load is placed upon the chassis.

Circuit Overloading

Consideration should be given to the connection of the equipment to the power supply circuitry and the effect that any possible overloading of circuits might have on over-current protection and power supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.

Reliable Ground

A reliable ground must be maintained at all times to the marked earth studs. The stud should be connected to ground using 0.75mm² 18AWG 6A wire or thicker. On the 10-slot Chassis, the chassis should be properly earthed using the provided M4 earth stud, nut and washer. The stud is located between the left and centre power supply apertures.



Figure 30. IP TVGateway 10-slot Chassis

On the 3-slot Chassis, the chassis should be properly earthed using the provided M4 earth screw. The screw is located above the mains inlet.



Figure 31. IP TVGateway 3-slot Chassis

On the 1-slot Chassis, the chassis should be properly earthed using the provided M4 earth screw. The screw is located to the left of the unit next to the fan air intake.



Figure 32. IP TVGateway 1-slot Chassis

Installing an IP TVGateway

This section provides information on installing a IP TVGateway chassis. The following components are user replaceable using VBrick original components;

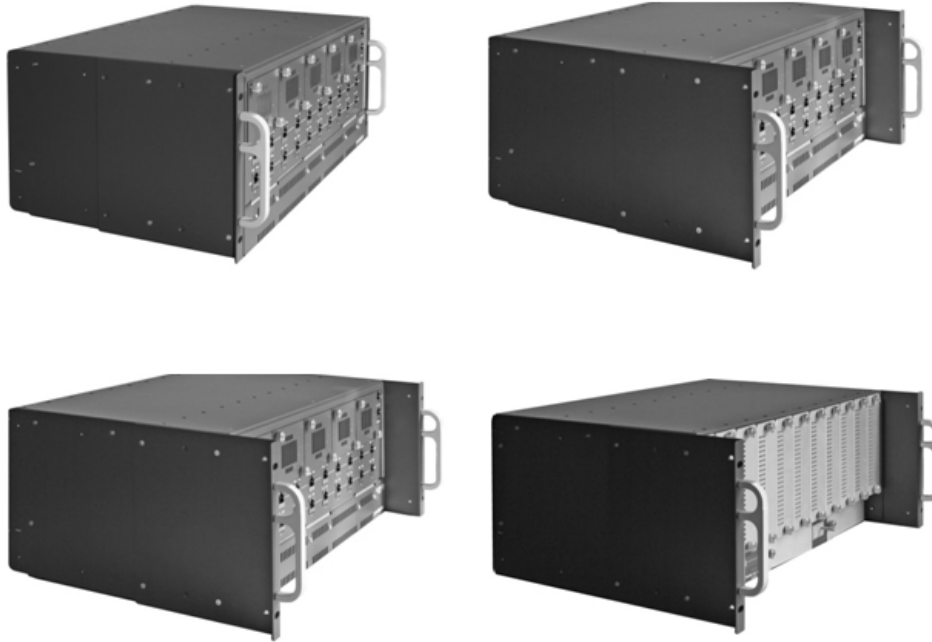
- 10-slot Chassis – Fans, PSU, Module blades
- 3-slot Chassis – Module blades
- 1-slot Chassis – PSU, Module blade

Any attempt to remove, replace, or repair components other than above will result in the warranty being invalidated and may represent a safety risk. In the event of a fault with any other components please contact your reseller.

Positioning the Mounting brackets (10-slot Chassis)

The mounting brackets provided can be attached to the 10-slot Chassis chassis in one of four positions. These positions allow either face of the unit to be presented at the front of the rack and for the unit to be recessed slightly back into the rack. Once the orientation has been

decided on remove the four screws attaching each rack mounting bracket to each side of the unit. Move the bracket to the required position and re-insert the original screws back into position. DO NOT use any other screws other than those provided. Failure to do so could damage the unit and will invalidate warranty.



Positioning the Mounting Brackets (3-slot Chassis)

The mounting brackets provided can be attached to the 3-slot Chassis in two positions. These positions allow for the unit to be flush or recessed slightly back into the rack. If recessed mounting is required, remove the four screws attaching each rack mounting bracket to each side of the unit. Move the bracket to the required position and re-insert the original screws back into position. DO NOT use any other screws other than those provided. Failure to do so could damage the unit and will invalidate warranty.



Installing Chassis into a Rack (3-slot Chassis or 10-slot Chassis)

There are a variety of rack units on the market, which may mean the assembly procedure will differ slightly. The following is a guideline for installing the system into a rack with the

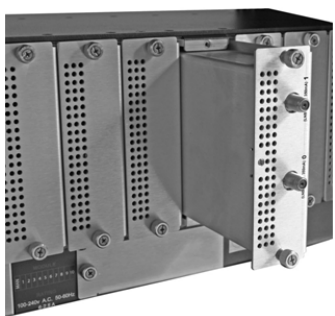
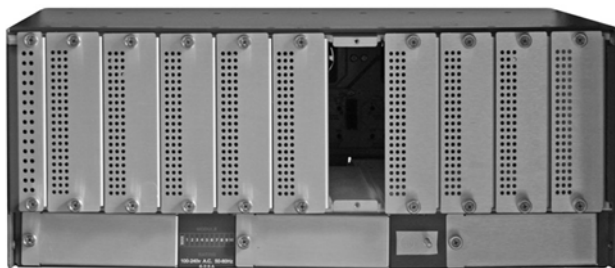
mounting brackets provided. You should also refer to the installation instructions that came with the rack unit you are using. Ensure the IP TVGateway chassis is empty. Do not insert module blades or 10-slot Chassis power supplies in the chassis before mounting it as this adds weight to the chassis and makes it more difficult to handle.

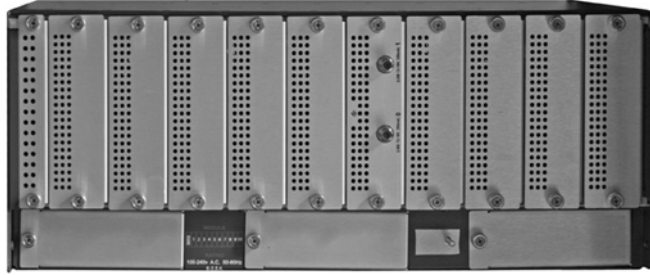


Screw the unit into the rack as shown. Once the chassis is secure attach the Earth lead and then the Ethernet cables between each slot and the Ethernet switch.

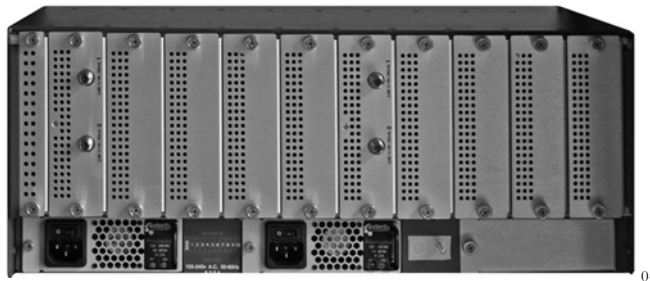
Installing the Module Blades (10-slot Chassis)

Once the chassis is securely mounted, remove the module blades from their packaging and insert one at a time into the IP TVGateway chassis.





For full redundancy, if it is intended that any two module blades are to be used to backup each other, it is not recommended to place them in adjacent slots. The fans on the chassis cool two slots each, if a fan were to fail this may mean that both the live blade and the redundant blade could be affected. It is recommended to place the live blades in slots 1-5 and the backup blades in slots 6-10 (clearly slot 5 and 6 should not act as a primary secondary pair). If redundant services are not being provided slots 1-10 can be used in any order.



Installing the Module Blades (3-slot Chassis)

Once the chassis is securely mounted, remove the module blades from their packaging and insert one at a time into the IP TVGateway chassis.





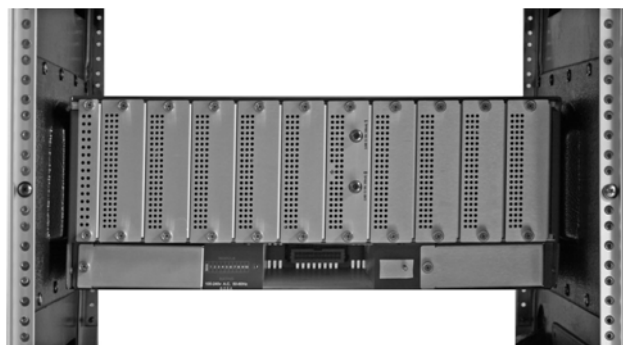
Installing the Module Blades (1-slot Chassis)

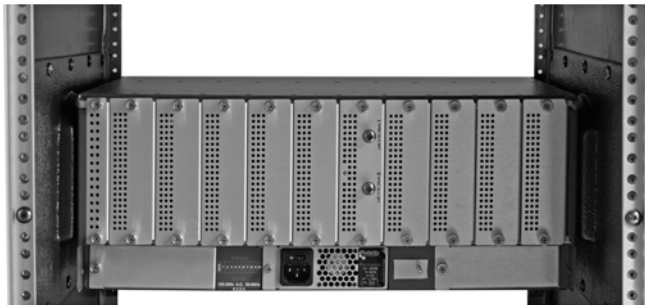
Once the chassis is positioned, remove the module blade from its packaging and insert into the IP TVGateway chassis.



Installing the Power Supplies (10-slot Chassis)

Once the chassis is securely mounted, remove the power supplies from their packaging and insert one at a time into the IP TVGateway chassis.





Replacing the Fans (10-slot Chassis)

If a fan module fails then it can be easily replaced by unscrewing and removing the faulty part and replacing it with a new fan as shown. The chassis does not need to be powered down for this operation.





Troubleshooting

Table 10. TVGateway Troubleshooting

Problem	Possible Cause	Solution
No Power (none of the fans spin and/or one or more LEDs are off on front of 10-slot Chassis supply)	Power switched off at wall	Check fuse and wall socket switch are ok.
	Power switched off at PSU	10-slot Chassis PSUs have an additional on off switch on front.
	Power supplies switched on before being inserted into chassis	10-slot Chassis PSUs contain a fail safe on DC output. They cannot be switched on before being inserted. Switch off supplies using switch on front then ensuring they are securely screwed into the chassis. Switch back on.
	Faulty PSU	Contact reseller for 1-slot Chassis or 10-slot Chassis power supply replacement or 3-slot Chassis chassis replacement
Fan does not spin	Loose fan module	Check 10-slot Chassis fan module is securely screwed into chassis
	Faulty fan	Contact reseller for 10-slot Chassis fan module replacement or 1-slot Chassis or 3-slot Chassis chassis replacement
Module blade does not power up	Module not present	Check that slot is not empty, and that module blade is firmly seated
	Faulty module blade	Contact reseller

Problem	Possible Cause	Solution
No Link light on slot	Module not present	Check that slot is not empty, and that module blade is powered up
	Wiring or switch port fault	Replace cable or try a different port on switch



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