

Live Video From Anywhere, Anytime

Broadband Global Area Network & Cellular Video

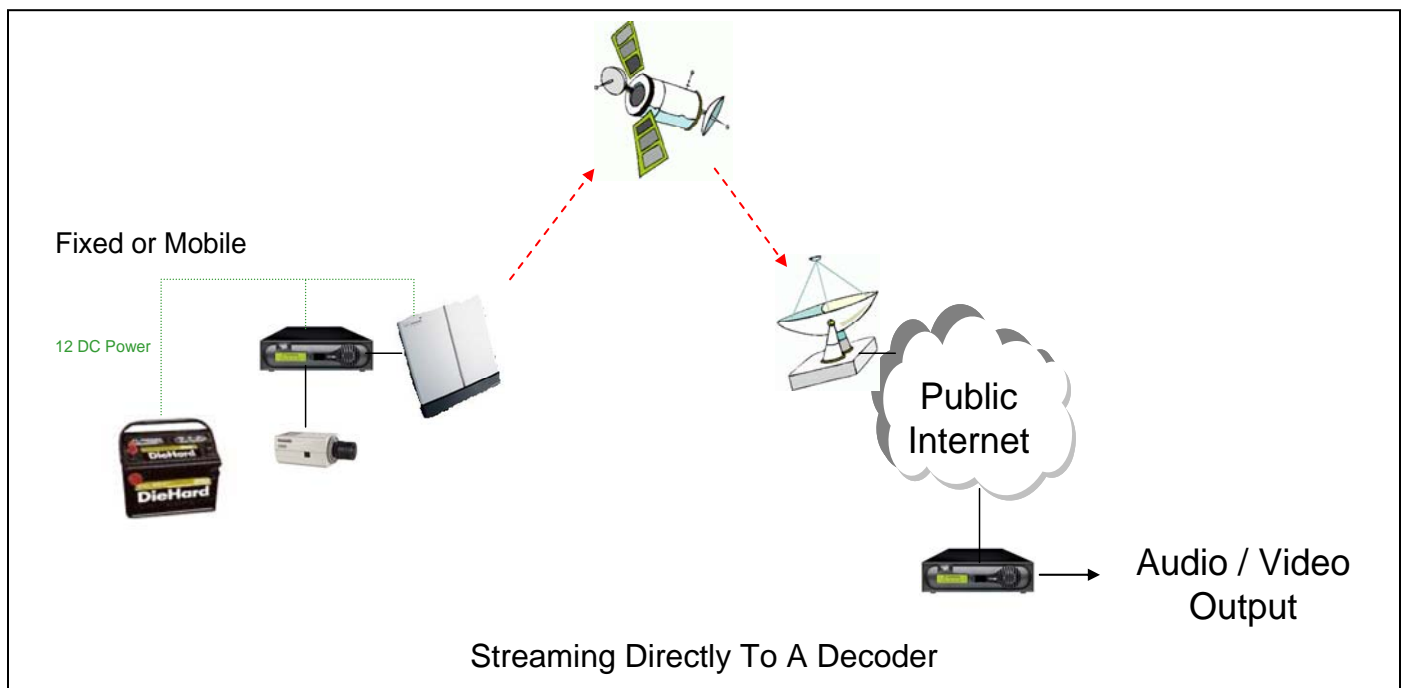
The world just got smaller. Wherever you are in the world, you can now transmit live, high quality audio/video. For television stations, a lone reporter can file a live report from anywhere. For Government, Emergency Responders can transmit live situational awareness video to subject matter experts. Educators can bring the world to their classrooms. Security personnel can monitor remote areas. True, worldwide portable live video has finally arrived.

VBrick Systems appliances are portable video terminals that instantly and reliably streams live video over any IP network. For transmitting live video from remote locations, there are three basic connectivity choices:

- **Wired** – plug a VBrick into any public Internet connection and send video at whatever rate you Internet access connection can provide (up to 4 Mbps).
- **Cellular** – plug a VBrick into a GPRS or EVDO cellular data modem and send video at a rate up to 100 Kbps (40 Kbps typical).
- **BGAN** – plug a VBrick into a BGAN satellite modem and send video at up to 250 Kbps (depending on service plan).

BGAN

The Broadband Global Area Network is a broadband IP network that is accessed by a small, portable satellite terminal. The BGAN technology allows you to casually aim the satellite modem and achieve connectivity in just a few minutes. But, you may ask, connect to what? In the following illustration, there is a VBrick MPEG-4 appliance at the portable location and a VBrick MPEG-4 appliance at the receiving location. The sending VBrick simply sends its video payload to the receiving VBrick which delivers live analog video to a TV monitor or studio equipment. The BGAN system can be configured to support a private network. In this case, the public Internet component can be easily eliminated and a private high speed connection between the satellite downlink

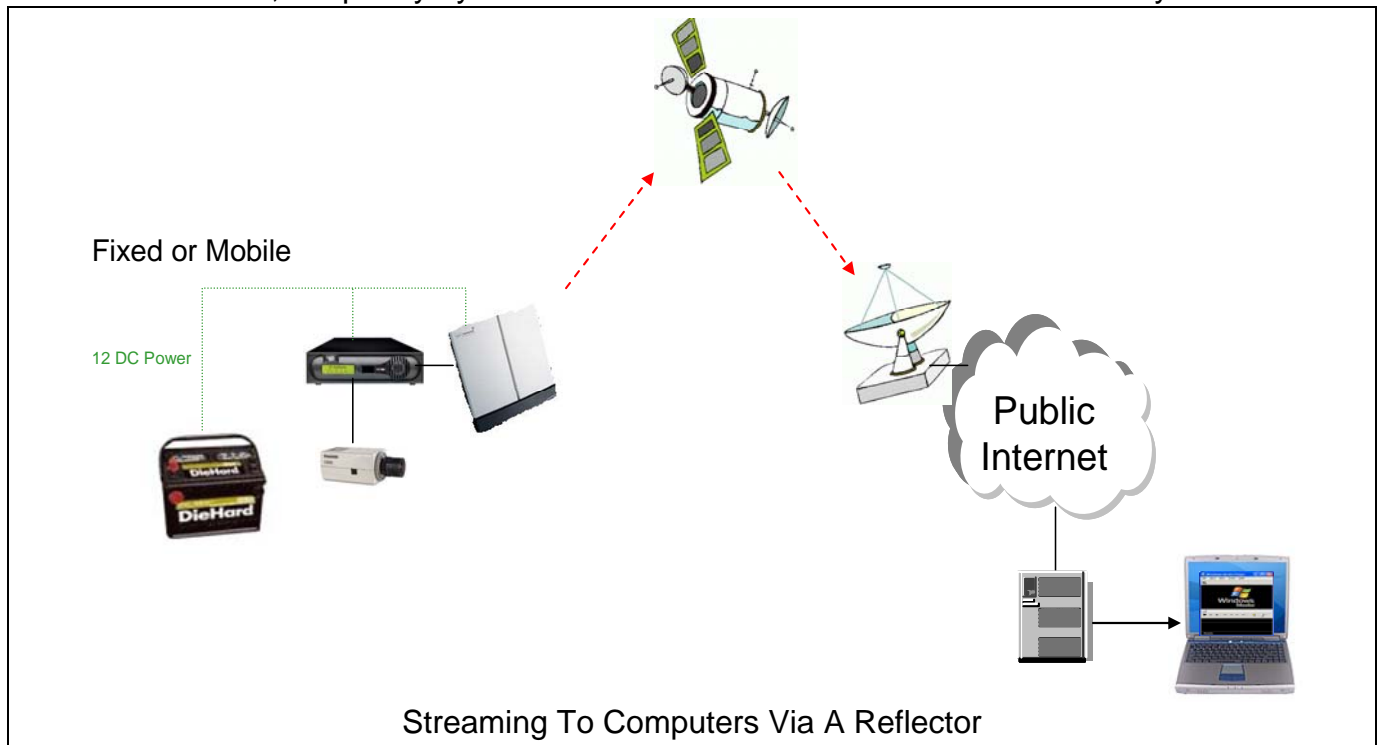


location and your location can be provisioned to ensure the connection has the full time bandwidth professional video requires.

Direct Internet Streaming is supported by the VBrick technology. Using either Windows Media or MPEG-4, the remote VBrick will send the live video to a reflecting server that is connected to the public Internet. The number of live viewers is not bound by the satellite bandwidth, but purely by the

up to about 250 Kbps^{*}, the cost is in the US\$8 per minute range. From a professional broadcaster's perspective, this is remarkably inexpensive when you compare it with DVB, C or Ku band satellite broadcast costs! Moreover, the small, portable package allows broadcasting from locations where it may be simply impossible to use other technologies.

The BGAN service allows you to provision a fixed IP address. This is very useful because



bandwidth available to the reflecting server. In this way, a remote broadcast can support virtually any number of live viewers. Moreover, this approach can be used by television stations as well, where the live video is displayed on a computer screen which may then be scan converted and inserted into any broadcast.

Using BGAN For Video

The VBrick and other equipment are inexpensive, but the BGAN service is expensive by Internet standards. The lowest cost solution, where you may broadcast video for one hour per month without any performance guarantees costs about US\$400. For dedicated satellite bandwidth

it allows an operator to log in to the remote VBrick and directly manage it, if desired. This capability virtually eliminates the need for remote personnel to have any technical training or knowledge, and allows a studio to change bit rates or other settings and to initiate recordings, on the fly.

Cellular Data

For some applications, the cellular data network provides the perfect means to transmit live video. By simply connecting the VBrick to a cellular data modem (for example,

^{*} The BGAN service sells what they call 128K and 256K packages. This is not necessarily the true IP bandwidth, and VBrick provides very granular bandwidth controls so you can optimize the service to squeeze every bit of audio/video quality of the service.

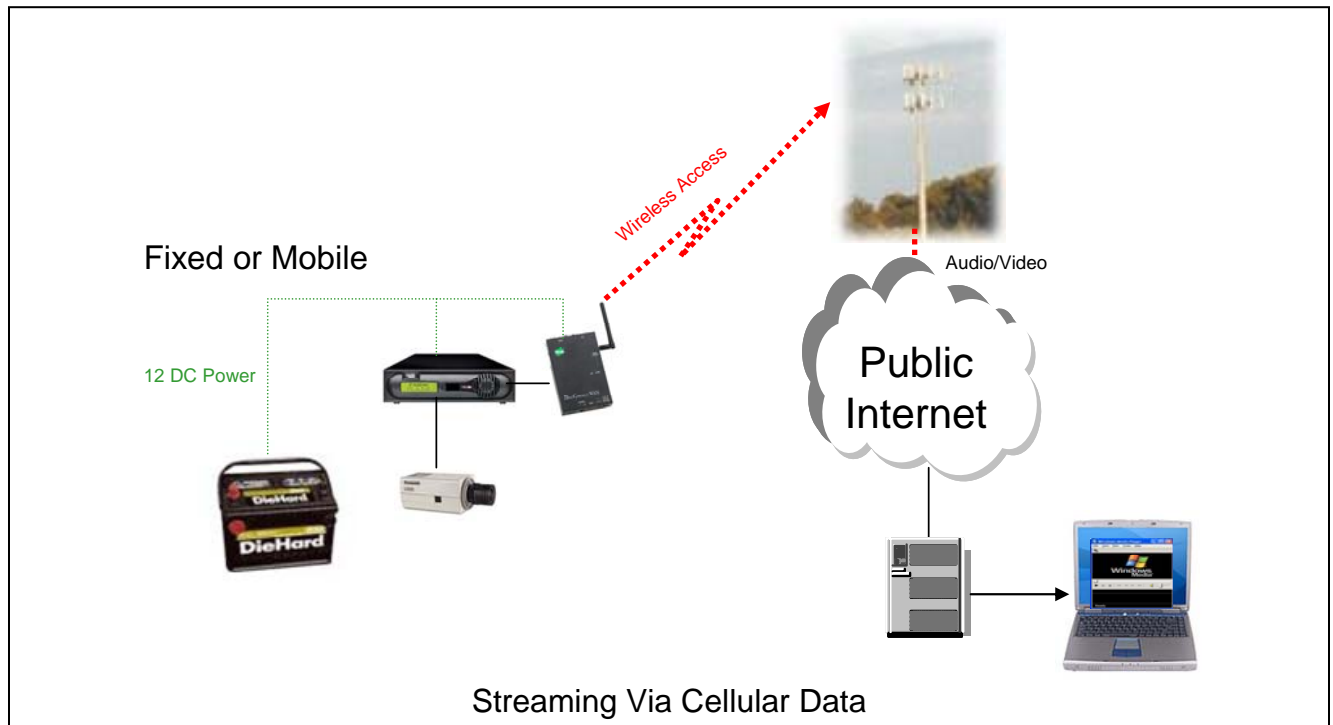
a Digi International “DigiWAN”), the VBrick will stream live video to a decoder or to a reflector server.

In the United States, GPRS (e.g. Cingular) or EVDO (e.g. Verizon) data service can be used, and GPRS is generally available throughout the world. Unfortunately, the maximum data rate provided by this service is in the 40 Kbps range (despite any sales claims to the contrary). As wireless carriers

Automatic Archive & Forwarding

While live video is delivered at whatever data rate is available, the VBrick appliance can also record and subsequently deliver a very high quality video.

For example, a remote reporter may stream live video at 200 Kbps via BGAN using the VBrick WM appliance. During the live video broadcast, the VBrick will record the video at



roll out High Speed Uplink Packet Access (HSUPA) in 2006 and beyond, the uplink speed will increase to the megabit range!

For today, 40 Kbps video is still very useful for a variety of applications, thanks to the flexibility of the VBrick appliance solution set. VBrick supports a wide range of frame rates and video resolutions. A remote VBrick can transit live video at 40 Kbps and achieve good quality (good for 40 Kbps) at about 7 frames per second, or one might elect to deliver higher resolution at 1 fps along with high quality audio. At these very low rates, the VBrick can also send live high quality audio along with periodic high-quality single frame JPEG image captures. The key in low bandwidth applications is flexibility.

a different encoding rate (say, 2 Mbps). Immediately after the live broadcast, the VBrick will automatically transfer the recorded file to virtually any remote server. Thus, a broadcaster has the advantage of a live broadcast and avoids having only the bandwidth-limited version of the archived broadcast.

Flexible, Reliable, Automatic

There are thousands of VBricks in service around the world today, and the product is acknowledged by the industry as the most flexible, reliable, rugged, and simple to use video appliance available. Now with true world-wide wireless service, it is truly the most portable too.