

Hardware/Software for use with D-STAR

Hardware



DV Dongle (blue box)

The DV Dongle is a small plastic (blue) box containing electronic components that allow a user via an Internet connected Windows, Apple Mac or Linux based PC/Laptop/Netbooks to access the D-STAR Network (repeaters and reflectors). No D-STAR transceiver is required therefore this is the lowest cost entry point to D-STAR.

The DV Dongle connects to via a USB port and provides encoding and decoding of compressed audio using the DVSI (Digital Voice Systems, Inc) AMBE2000 full duplex vocoder DSP chip. AMBE technology is used in all D-STAR transceivers to provide efficient voice transmissions. (It is also used in some HF digital protocols by vendors like AOR.)

Once the DV Dongle is installed and connected to a PC it requires the DVTool application to access the D-STAR repeaters and reflectors. The DVTool may be installed and run on Microsoft Windows XP/Vista/Win7, Mac OS X Leopard, or many flavours of Linux. (Users need to install USB drivers prior to installing the DVTools application much like installing USB drivers for a printer for example). Users additionally also need a good quality microphone and speakers to produce good audio. Although laptop user's can use built-in microphone/speakers, experience has proved that a headset with a boom microphone produces the best results. Good audio in equal's good audio out.

D-STAR Registration (see later in this article) is required if users want to 'transmit' audio. Receive only audio doesn't require any registration so non-amateurs can also take part in D-STAR as well.

Links:

<http://dvdongle.com>

<http://www.opendstar.org/tools/>

DVAP or DV Access Point (red box)



The DVAP is a small plastic (red) box with a SMA stubby antenna, containing a very low power (10 mW) 144-148 MHz transceiver (frequency agile) that allows a user via an Internet connected Microsoft Windows XP/Vista/Win7, Mac OS X Leopard, or many flavours of Linux based PC/Laptop/Netbooks to access the D-STAR Network.

The DVAP connects to via a USB port and provides a low power two-metre simplex repeater (or access point) for use with a D-STAR enabled transceiver only. The DVAP has **no** AMBE chip like the DV Dongle. The DVAP passes the transmitted digital audio in both directions with the D-STAR enabled transceiver doing all the encoding and decoding.

The major difference between the DV Dongle software and the DVAP software is once installed and running no further user input from the PC is required. The D-STAR enabled

transceiver controls all linking and unlinking to repeaters and reflectors.

D-STAR Registration (see later in this article) is required if users want to 'transmit' audio.

Links:

<http://dvapdongle.com>

<http://www.opendstar.org/tools/>

Update: a UHF (421-450 MHz transmit/receive) DVAP was released on 1 October 2012.

Note that these two devices are totally different, and so require different software to operate.

Usage (DV Dongle & DVAP)

Both the DV Dongle and the DVAP offer users different methods of accessing D-STAR repeaters and reflectors. Some users may favour one over the other, and some users may not favour either of them, as they are not independent devices without the internet such as an RF transceiver.

One of the best features of the DV Dongle is the ability to listen to multiple channels on a Gateway at the same time, which D-STAR transceivers cannot do unless they continuously scan the same channels. This means that a DV Dongle user can monitor all four channels on a standard Gateway stack of repeaters, e.g. 1.2 GHz Voice, 1.2 GHz Data, 70Cm and 2M Voice. (In the Mt Climie situation this means both repeaters can be monitored at the same time.) D-STAR transceivers only have one DV board so can only decode one channel at a time, regardless of their ability to be a dual band, dual receive transceiver.

DVAP's have the advantage of being able to support more than just the one user. They operate as a hotspot and provide a way for many users to get on the air if they are within range. This provides coverage or access where a D-STAR repeater doesn't exist. The DVAP owner can lockout any user apart from himself as well, so there some built in security or peace of mind if you are using and paying for the internet connection especially via a cellular network.

Both the DV Dongle and the DVAP work readily via free WiFi hotspots such as those provided by restaurants, public libraries and airports to name a few. Like most VOIP type systems they are very economical with their bandwidth and do not consume huge amounts of data.

Two examples show the versatility of these devices, one a user on a ship at sea uses his DV Dongle and laptop, via WiFi on the ship, to the ships satellite connection to get to the internet and then to his preferred repeater to stay in touch. The second was where a another user, using a DVAP in his vehicle, (using his mobile D-STAR transceiver as well) to connect his netbook, which in turn connects to the internet via his iPhone, and then out to the local repeater some 160 km away. So you are really never out of a touch of a traditional repeater just because you are outside its coverage area. Although perhaps none of these examples are new (EchoLink offers a similar solution) the fact that for little cost it makes them a great addition for any amateur wishing to stay in touch while on the road or holiday world wide.

Software

Robin Cutshaw AA4RC is the developer for both the DV Dongle and DVAP hardware. As part of this development he provides the software or DV Tools that goes with his hardware.

Software for these two devices is continuously under development and new versions are regularly released from a number of developers independent of Robin.

Software sources and the reflectors they support:-

	D-Star Repeaters	Reflectors (REFxxx)	Xreflectors (XRFxxx)	DCS Reflectors (DCSxxx)
DVTools Robin Cutshaw (AA4RC)	x	x		
WinDV Fred N. Van Kempen (PA4YBR)	x	x	x	x
PCRepeater Controller Jonathan Naylor (G4KLX)			x	x

Both of the following software solutions require hardware of some description to work, whether that is a device from Robin Cutshaw or another like device.

WinDV - Fred N. Van Kempen (PA4YBR)

DV Node (also known as WinDV, as it currently exists for Windows only) is a **next-generation implementation of a "D-STAR Hotspot"** application.

It supports both the "**Node Adapter**" series of boards as well as the "**DVAP**" and "**DV Dongle**" series of USB devices. So you can use either of Robin's hardware solutions with Fred's software to gain access to other repeaters and reflectors outside the normal offerings.

It can connect to reflectors and gateways using **DPlus, DExtra or DCS**. It can do **D-STAR Callsign Routing** through the **ircDDB network**. Additionally reporting of GPS positions of stations are handled through the built-in APRS-IS interface. Various data-handling options are now available through the D-RATS interface module.

This software can be found at http://www.dutch-star.eu/dv_node/

You must log-in before you can download the WinDV software.

PCRepeaterController from Jonathan Naylor G4KLX

The D-Star repeater exists in four flavours:

1. Works with a sound card to modulate and demodulate the D-Star GMSK data,

2. Works with D-Star GMSK Modems using either Satoshi (JK1ZRW) or Dutch*Star firmware from Fred N. Van Kempen (PA4YBR).
3. Uses the DVAP.
4. Uses the DV-RPTR DSP modem.

A special repeater has been created to combine more than one D-Star transmitter and receiver together to allow for diversity operation and/or increase the coverage area.

This software can be found at groups.yahoo.com/group/pcrepeatercontroller

You must be a member of the Yahoo group before you can download the PC Repeater Controller software.

Gateway Registration (D-STAR)

To 'transmit' or to pass audio back to the originating system using most, if not all of the above hardware/software solutions require that the user be registered on the D-STAR network.

Registration is a somewhat confusing process but is well documented on Robin's web site for either the DV Dongle or the DVAP. Once registered (a two stage process for those registering), there is no need to do it again as you are registered worldwide within hours of the process being completed. Once this system has replicated your registration worldwide you can operate from any country without any issues. Perhaps the only reason to re-register would be if your callsign changed or you decided to permanently move to another country and wish to be registered there.

One important rule is to ensure you only register once, on one Gateway.

The whole registration process should take from a few hours to a few days depending on the System Operators processing your registration.

It is suggested that you register in advance of using any of the above solutions so you are not waiting to have the registration process completed.

Costs: Hardware

DV Dongle - USD\$199.95

DVAP - USD\$249.95 (VHF) & USD\$269.95 (UHF)

Costs: Software

WinDV - free download (requires registration via a log on process)

PC Repeater Controller - free download (requires registration via a log on process)

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DV Tool Evaluation September 2012

The following table has been produced to assist the users of the various software solutions, with comparisons across each software application or package. Each has its strengths and weaknesses, so we don't favour one over the other.

DV Tool Evaluation September 2012

Tool	Win OS	Additional Drivers	Linux	Mac	Info DPlus	Error Reporting	Simultaneous Module Mon	History	GPS Data	Audio Modulation	Favourites	Text Messaging
DVTool2 Beta 5	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
DVAP Tool 1.03	Yes	No	Yes	Yes	Yes	No	No	No	No	No	No	No
WinDV	Most	Yes	Yes	No	No	No	No	Yes	Yes	Yes	No	No
DCS Client	Yes	No	Yes	No	No	No	N/A	No	No	No	No	No
DExtra Client	Yes	No	Yes	No	No	No	N/A	No	No	No	No	No
DVAP Client	Yes	Yes	Yes	No	No	No	No	No	No	No	No	No

NOTE: for Windows 8 users (and other Windows users as well) if you don't have the latest iTunes from Apple then you either need to download it or if you prefer not to have iTunes then you need to download Bonjour from the Apple web site. This software installs a required DLL onto your system.