



Information on Perseus Software



The **PERSEUS** Software can be used under Windows 2000, XP and Vista/32-bit. Mac-PCs with Intel Processors can use this software with Windows XP or Vista in Boot Camp.

Software HFSpan

A bandwidth of 40 MHz, the whole shortwave, can be displayed as a spectrum in real-time. So it is possible to get an idea how reception conditions change over the day, leading to different signal levels. Of course also smaller bandwidths can be analyzed.

Software Winrad

This is a self-contained Software that can tune PERSEUS directly. The recording/recording option offers some special tools for display of very weak signals. The audio signal is available to third party software too.

Test option

This software may be tested on PCs without any prior Perseus installation for 30 days. During this time span remote operation of other units via internet as well as playback of recorded files are available.

HFSpan v2.0

The software now accepts dpi settings of more than 100% (> 96 dpi). HFSpan does not offer audio. It is intended solely for displaying the total spectrum in one window. Preselector settings cannot be changed. HFSpan and perseus.exe cannot be operated simultaneously.

Installation hints

The Perseus software v4.0c needs the same USB driver as all versions from v2.1i. If this driver is installed already, only the software has to be downloaded, decompressed (i.e. with Winzip) and copied to your programme files directory. NO installation is necessary!



Important notice for users of the External Down-Converter Software Plugin: If you bought the External Down-Converter License for Perseus, please copy the "perseuslf.dat" file from the previous software version folder to the 4.0c install folder. You must overwrite the "perseuslf.dat" file supplied in the 4.0c package with the copy you received via e-mail after the purchase. Don't forget to update shortcuts you may have created for previous Perseus software versions. If you have been using an older Perseus software version (2.1f or before), the USB driver must be updated.

Client-Server Perseus Software Reference

This part explains how to use a Perseus as Client (remote listening) and as Server (others can tune your Perseus). Hint: For Client operation perseus.exe has to be started, for Server operation perseussvr.exe. Both functions require a correct configuration of the Windows Firewall, and, if a router is used, a correct Port-Forwarding (aka NAT). The Default Ports are: 8014 TCP for the Server and 8014 UDP for the Client. To enable client and server operation simultaneously, the ports 8014 and 8015 must be forwarded both for TCP and UDP as well. Every Port-Number is permitted if the user wants to offer more than one server with different IP numbers, or more than client at a time. When the server is active, the hardware is in use by the according software, so the owner can open a client only for replay of recordings - as if no Perseus was connected. The server operator does not see informationen in the main spectrum window, S-Meter or in the frequency display - this information is only available at the client side.

Requirements for CLIENT operation

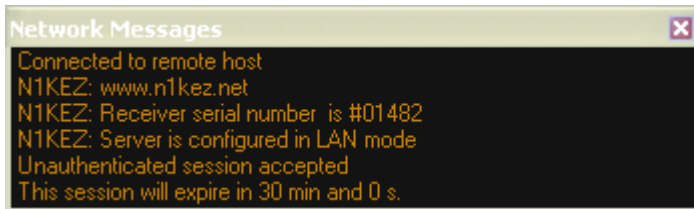
- A working network connection (80 kbps downstream minimum)
- Forwarding port 8014 (UDP Protocol) to your computer (only if behind a router)
- "Unblocking" the Perseus software in Windows Firewall (automatically requested by the OS at the first run)

Requirements for SERVER operation

- A working network connection (80 kbps upstream minimum)
- A Perseus receiver
- Forwarding port 8014 (TCP Protocol) to the computer where the server runs (only if behind a router)

Hint: If you can't figure out what is not working in your client/server setup, as a general troubleshooting guide, it is highly suggested to try "local" operation first, i.e. running both the server and the client on the same computer, and connecting to the loopback IP address, that is 127.0.0.1. A further step could be trying to connect to the same server from another computer in the same LAN (Ethernet/WiFi). If both tests are passed, the problem is in the router, which is not correctly forwarding the ports to your (local) IP address.

Client Software Setup and Operation



The main graphical difference between the Client-Server enabled Perseus software and the previous versions is in the *Input Select* section. The *Net* button allows remote connectivity; once clicked a new window called *Network Messages* will appear. This is a notification window, i.e. no user interaction is required, it simply shows informations about connections and server messages. It can be safely closed and reopened clicking on the *Net* button in the input selection pane. Clicking on the *Addr* button a new window will show up (only the very first time) to configure the client:

- Client Nickname: custom string that identifies the client (i.e. amateur radio call sign, first name).
- City/Country: optional field to specify the user hometown and country, or custom data, like the connected antenna.
- Client UDP Port: This is the port number you must configure for forwarding on your router to use your computer as a client. If the connection to the server is made, but no audio or waterfall is available, this port is not correctly forwarded to your computer.
- Longitude und Latitude: coordinates of the client user, these are not shown on the map and can be seen only by the server host. If the coordinates should be unknown they may be easily accessed here: <http://f6fvy.free.fr/qthLocator/fullScreen.php> - zoom to the street level and click at your own location with the right mouse button.

These settings are only required once, as they will be saved in the windows registry for future use. The user can change his settings clicking on the Microtelecom logo and pushing the button labeled *Network Settings*. Changing the *Network Settings* is not allowed while connected to a server for remote operation.

Network Settings

Client Nickname

City/Country

Client UDP Port

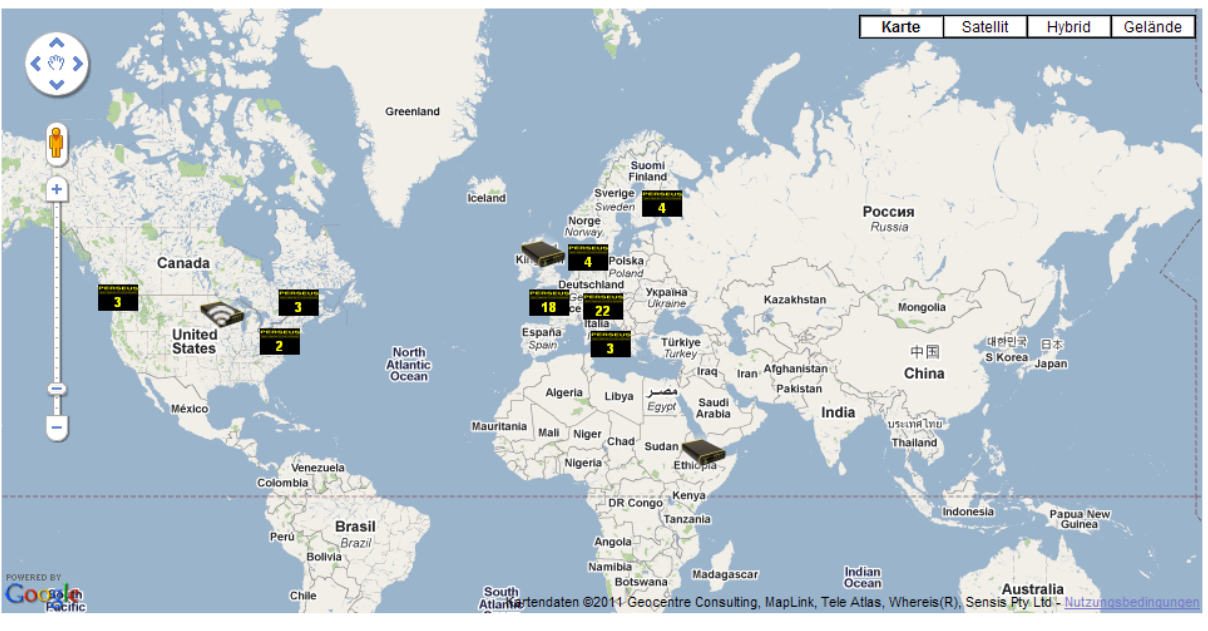
Longitude (+/- xxx.ddddddd)

Latitude (+/- xx.ddddddd)

Connecting to a Server

After setup, clicking on the *Addr* button, another window will appear (since v4.0c the map opens in a browser window):

Connect to Perseus server



Domain Name or IP Address:

Port:

Password (optional):

If the computer is connected to the Internet, a map will appear, showing online servers. The map is also available using a web browser, at the address <http://microtelecom.it/?p=101>. Both the client-embedded map and the browseable one self-update automatically every 30

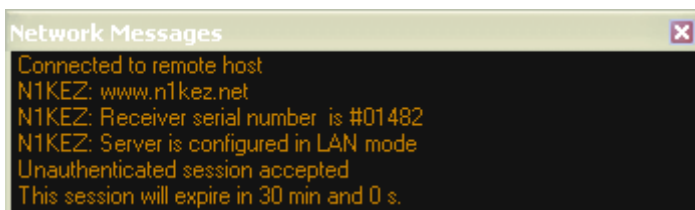


seconds, without changing location or zoom level, so there is no need for the user to press F5 to update the view (and, in any case, it would not show newer data). Moving the mouse over the icons, the user can obtain further info about the server. Clicking on the icon, the connection domain and port will be automatically filled in. The *Password* field needs to be manually written. The last line in the popup refers to the server status, which is basically a combination of 2 variables:

- **Available/Busy:** A server is listed as *Available* if no client is connected; similarly, if a remote user is connected, it will show up on the map as *Busy*.
- **Free access/Password Required:** the server is shown as *Free access* if the remote user is not required to enter a password to connect to the server.

Please note that the map is not updated in realtime. It could take a maximum of one minute to show new or updated server statuses.

If many users are available in a small area, a different icon will show up, collecting all servers under a single icon. The number on the icon indicates the number of servers grouped by that icon. The map is browseable like any Google map, using the mouse wheel to control the zoom level (or the slider and the +/- buttons) and drag&drop operation to move the map around. After clicking on an icon (or manually filling in connection IP and port) and optionally writing the connection password, click on the *Ok* button to initiate the connection and the audio/video streaming. Information about the connection status are available in the *Network Messages* window. If a server allows unauthorized access, the number of allowed minutes will show up.



If the *Network Messages* window shows a completed connection, but no data is audible, the selected UDP port is not properly forwarded to your computer and you need to check your router configuration. Connection to a server equipped with a down-converter is allowed only if a Down-converter License Option was bought on the computer running the client. If you bought a license, after copying the Perseus software to a folder on your hard drive, you need to overwrite the provided "perseuslf.dat" with the file you received via e-mail after license purchase. This converter license can be obtained only from Microtelecom. See: http://microtelecom.it/paypal/add_lic.php



Server Software Setup and Operation

Perseus Server Settings

Server Mode

- ☐ LAN - Upload network bandwidth is more than 2 Mbit/s
- ☒ ADSL - Upload network bandwidth is at least 250 kbit/s
- ☐ GPRS - Keep network bandwidth at minimum

External Down Converter

LO Freq (MHz): ☐ RF < LO

Gain (dB):

Server Configuration

Nickname:

TCP/IP Server Port:

☐ Bind to specific IP Addr:

Welcome message:

Password:

☒ Allow unauthenticated sessions

Disconnect unauthenticated sessions after minutes

After a session expires accept it again after minutes

☒ List this server on the Perseus Directory

Identification on the Perseus Servers Directory

Server Name or IP Addr:

City/Country:

Longitude: (+/- xxx.dxxxxx)

Latitude: (+/- xx.dxxxxx)

Cancel OK

Server Mode: Preset for the connection bandwidth.

- The LAN mode should be enabled only in local networks or if your WAN connection allows a sustained upstream rate of 2 Mbit per second. This mode sends a 16 bit PCM audio stream to clients to provide maximum audio quality. Only in LAN mode, USR and DRM demodulation buttons are enabled, and allow forwarding zero-IF data to third party demodulation clients. Sample rate is normalized to 31.25 kSps or 15.625 kSps (depending on client filter settings).
- In ADSL mode the sample rate is fixed to 15.625 kSps, while the audio stream is compressed with an ADPCM codec (based on ITU-T G.727). This allows around 8 kHz of audio bandwidth with good quality. The minimum sustained upload rate to allow remote operation in ADSL mode is around 200 kbps; DRM and USR demodulation buttons are disabled.
- GPRS mode was developed to allow remote operation in any case where the ADSL mode requirements are not met or the uplink is not reliable. Using this setting, the required bandwidth is about 70-80 kbps. Audio data in this mode is sent at a rate of 7.812 kSps, allowing about 3.9 kHz of audio bandwidth.



All three modes send spectrum data using a proprietary wavelet codec. The respective upload rate depends on many factors and can be further reduced by using "Waterfall" mode for the main spectrum window, with reduced scroll speed.

- **Nickname:** string that identifies the server and will be shown on both the client and the map.
- **Bind to specific IP Addr:** this field should be enabled only in particular setups, where a computer connected to more than one network should listen for incoming connection only on a specific IP address/network card. Most users will not need to set this option.
- **Welcome Message:** this is a string that will appear on the clients *Network messages* window after the connection.
- **Password:** this password restricts server access. An authenticated user can remotely calibrate the receiver and stay connected for an unlimited time.
- **Allow unauthenticated sessions:** if this option is checked, any user can connect to the server (even if they don't know the password). If the client connected without a password, the maximum allowed connection time can be set with the next value.
- **Disconnect unauthenticated sessions after:** this field sets the maximum time (in minutes) allowed to unauthenticated clients before they are automatically disconnected from the server.
- **After a session expires...:** this settings represents the number of minutes the server will deny the connection to an unauthorized client after he stayed connected for the maximum allowed time (set in the previous field).
- **List this server on the Perseus Directory:** if this field is checked, the server will show up in the Perseus Servers webpage (<http://microtelecom.it/?p=101>) and in the client connection window.
- **External Down Converter:** If the server is equipped with a down-converter, this pane allows to specify both LO frequency and gain, so that clients will show the right amplitudes and frequencies. The clients will require a purchased down-converter license to connect to this server. If the license was bought for a previous Perseus version, you need to copy the "perseuslf.dat" from the previous version folder to the directory where you copied the new version. This way all down-converter options will be enabled in the new release.
- **RF LO** should be set if the local oscillator frequency is higher than the listened frequency (e.g. listening at 144 MHz with a 160 MHz LO down-converter).

Identification on the Perseus Servers Directory: This pane is enabled only if the corresponding flag in the Server Configuration pane is set. The following values can be set:

- **Server Name or IP Addr:** set your server name (e.g. myServer.dyndns.org) or IP address (e.g. in a local network, this could be 192.168.1.1). To check your own IP



address online, go to whatismyipaddress.com/ **Beware:** DSL connections usually have dynamic IP numbers which change with every reconnect to the internet. To stay available independently from the Perseus Online Server Map, it is possible to connect these dynamic IP number with a permanent hostname. Available free of charge from services no-ip.com: (i) create an account at www.no-ip.com, (ii) confirm the incoming mails, (iii) download and install the client software *Dynamic DNS Update Client*. So you get displayed your own IP number, and will see how often your DSL connection is interrupted, leading to a new IP after a reconnect. Now a hostname has to be defined (Muster: WA4XYZ.no-ip.com oder jim-brown.no-ip.com), and entered *Server Settings* into *Server Name or IP Addr*.

- **City/Country:** text field where you can specify your hometown and country or a custom string (i.e. antenna) that will appear on the popup on the map;
- **Longitude und Latitude:** if you want your server icon to appear in the correct place, you need to fill in the server coordinates, expressed in degrees (e.g. fill in 45.5575 if a coordinate is 45° 33' 27"). Negative values have to be entered for locations south of the equator and west of Greenwich. If the coordinates should be unknown they may be easily accessed here: <http://f6fvy.free.fr/qthLocator/fullScreen.php> - zoom to the street level and click at your own location with the right mouse button.

All accepted connections are logged to a text file, which can be safely deleted if not needed. The file will be created in the same folder where the server runs, and its name is "perseussvrlog.txt". After setting up all information, click on the *Ok* button to apply the settings. When you press this button, any connected remote users will be disconnected and the server will restart with the new settings. During the first run, a Windows Firewall windows could show up and ask you if you want to unblock the software. To allow external connections and automatically open the firewall port on your computer, you must click on "Unblock". If the server settings are formally correct, the server will start listening to incoming connections and notify the user showing the *Server started* string. If a user connects to the server, further lines will appear in the server log. During remote connections, the current upload bandwidth is shown in the bottom right corner of the window.



```
PERSEUS Server
2011/08/05 20:34:13 Connection to [84.62.145.238:3839] dropped
2011/08/05 20:46:48 Connection from [109.131.161.102:50081] accepted
2011/08/05 20:46:48 Client 109.131.161.102 can use all of the server timeout
2011/08/05 20:46:48 Connection will be dropped within 120 minutes
2011/08/05 20:46:48 Unauthenticated session accepted
2011/08/05 20:46:48 Client GS-DX 39 is located in Antwerp, Belgium [Lon=4.428945 Lat=51.252456]
2011/08/05 20:46:48 Starting UDP data stream to client port 8014
2011/08/05 20:47:58 Connection to [109.131.161.102:50081] dropped
2011/08/05 20:49:08 Connections from 109.131.161.102 enabled
2011/08/05 20:52:24 Connection from [116.65.187.101:58332] accepted
2011/08/05 20:52:24 Client 116.65.187.101 can use all of the server timeout
2011/08/05 20:52:24 Connection will be dropped within 120 minutes
2011/08/05 20:52:24 Unauthenticated session accepted
2011/08/05 20:52:24 Client Tanashi / Tokyo is located in Tokyo/Japan [Lon=139.313500 Lat=35.435500]
2011/08/05 20:52:24 Starting UDP data stream to client port 8014
2011/08/05 20:52:33 Connection to [116.65.187.101:58332] dropped
2011/08/05 20:52:38 Connections from 116.65.187.101 enabled
2011/08/05 21:16:18 Connections from 84.62.145.238 enabled
2011/08/05 21:30:06 Connection from [87.4.232.45:1153] accepted
2011/08/05 21:30:06 Client 87.4.232.45 can use all of the server timeout
2011/08/05 21:30:06 Connection will be dropped within 120 minutes
2011/08/05 21:30:06 Unauthenticated session accepted
2011/08/05 21:30:06 Client IV3NWV@home is located in Udine / Italy [Lon=13.253899 Lat=46.061392]
2011/08/05 21:30:06 Starting UDP data stream to client port 8014
2011/08/05 21:30:29 Connection to [87.4.232.45:1153] dropped
2011/08/05 21:30:58 Connections from 87.4.232.45 enabled
2011/08/05 21:32:31 Connection from [173.68.156.178:50276] accepted
2011/08/05 21:32:31 Client 173.68.156.178 can use all of the server timeout
2011/08/05 21:32:31 Connection will be dropped within 120 minutes
2011/08/05 21:32:31 Unauthenticated session accepted
2011/08/05 21:32:31 Client RSLauer is located in Brooklyn, NY [Lon=1.000000 Lat=2.000000]
2011/08/05 21:32:31 Starting UDP data stream to client port 8014
2011/08/05 21:34:37 Connection to [173.68.156.178:50276] dropped
2011/08/05 21:36:28 Connections from 173.68.156.178 enabled

Freq: 14.250000 MHz   Mode: USB   DDC Sampling Rate: 1 MS/s
Date: Fri 05-Aug-2011   Time: 21:40:25   Upload Network Bandwidth: 0 kbps
```

Operation of several Perseus

Version 4.0 supports operation of several units at a time! The following combinations are possible with two units: Perseus 1 is used locally, Perseus 2 is used as a client. to compare signal levels with another location. Perseus 1 is offered to others, Perseus 2 can work as local receiver, or be used for remote listening or replay of recordings. It is easy to check propagation conditions, licensed radio amateurs may check reception of their own signal in other continents. **Important:** The client software instance that was activated in the first place can use the COM port, which allow databases or external control units to communicate with Perseus. This instance can also be used for synchronisation with a transceiver. The COM Port works with a local Perseus as well as with a remote one.

Have fun with your Perseus!