



Pulsonix Vault Users Guide

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Pulsonix Vault

What is the Vault?

Pulsonix Vault is a data management system that can help you organise and manage your Pulsonix data in a safe and secure way.

In its simplest form it could be viewed as a 'managed library', holding Parts, Footprints and other data in the same way as your existing Pulsonix libraries. However, it is much more than that, as it can hold design files as well as library data, it controls how they are updated and who can update them, understands the relationships between items, and maintains a revision history of each item. Pulsonix Vault can help you organise, manage and track the creation and modification of your important Pulsonix data, at the same time making that data available where it is needed across your organisation.

Pulsonix Vault consists of two main elements, a server and a client (or indeed many clients). Additional elements are used to assist with tasks such as installation, configuration and backup.

Do I need to use the Vault?

You do not have to use the Vault. If for example you wish to use native Pulsonix libraries for your Part and other library data, and the normal Windows file store for your design files, then that is fine. There is even a single checkbox on the Options dialog that will hide away or turn off the Vault features and commands in the user interface.

You may also decide not to use the Vault because your company already has a data or document management system in place. There is probably no point confusing the issue by trying to use two different systems to manage your Pulsonix data. If you are unsure about this, we can advise you.

However, even for a single user who does not share their Pulsonix data with anyone else, the Vault offers data management facilities that should help you maintain your library and design data over time.

Licensing

The Pulsonix Vault is a licensed item, from Version 9.0 onwards, it will require this license feature to be available to run. If you are using a version of Pulsonix earlier than Version 8.x, you will require a new license, this would have been supplied to you under the terms of your maintenance contract.

If you are unsure whether you have it or not, either run the **License Manager** and check the list of contents where you'll see it listed as an option, or contact your local sales office.

System Requirements

The Vault uses an industry-standard Postgres database to store its information. This database will run on any Windows system that is supported for use with the main Pulsonix application, although you should consider the information under ‘Deployment Planning’ below before deciding where to install the server.

Connection to the database from the Pulsonix ‘client’ application is via an ODBC connection, using a driver that will be installed by the Pulsonix setup program if it is not already there on your system.

To store the actual data files in the Vault, access to a shared network folder is required. This needs to be a folder that is accessible with both read and write permission directly over your Windows network.

Installation

There are two main components to the installation. The first is the database server, which is installed using its own **Vault Server Setup** installer program.

This program contains several elements that are used to **install and launch the Postgres** database server, and to **prepare the Vault database** for first use.

The second component is the **ODBC driver** that is needed on each ‘client’ computer to allow the Pulsonix application to connect to the Postgres database.

Deployment planning

Before installing the Vault database server, there are several things you should consider to ensure you achieve an optimal experience when using the Vault.

The Postgres database used for the Vault server has a long history of reliable operation across a wide range of platforms, so the choice is more about the ability of the selected Windows platform to service the demands of the database server and the clients who wish to use it.

If you expect to have a small number of connected clients, making occasional demands on the Vault to provide data, then it is feasible to install the server on a ‘workstation’ edition of Windows, provided you can satisfy the requirements of folder sharing for the Data Files (see below).

If instead you are contemplating large numbers of connected clients making heavy use of the Vault data, or checking many files in and out, then it is wise to consider installing on a Server edition of Windows such as Server 2012.

Similarly, the underlying hardware choice largely depends on how heavy you expect your demand to be. A server that is configured without sufficient memory to cope with the load can cause the response of the Vault operation to be degraded.

Network speed should not be a significant factor, as it will not be any different from using a network server for file storage. Storing files – even large design files – via the Vault is no more time-consuming than saving them to a network folder via the normal File Save commands. However, if you have been used to storing all your files locally and are now moving to a server-based Vault configuration, it is quite possible that you may see some increase in file read and save times due to network latency or bandwidth issues.

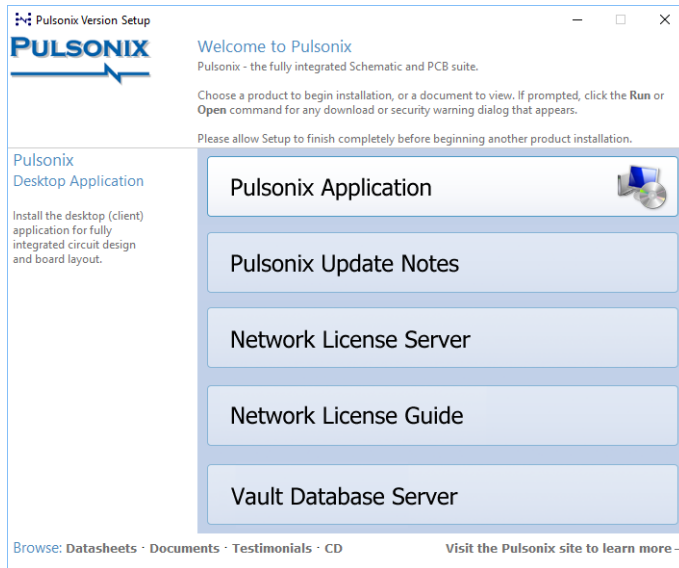
Installing the database server

Installing the server tools

The first stage is to run the installer that loads your computer with the tools needed to install the Vault database and prepare the system for use, as well as admin tools for managing your Vault. This installer will load onto your computer everything required to create your Vault.

CD Install

If installing from the **Pulsonix CD**, select **Vault Database Server** from the start screen that should automatically appear when you insert the CD. If this start screen does not appear, you can instead browse to the **VaultAdmin** folder on the CD and click on the **Setup.exe** file to start the installation.



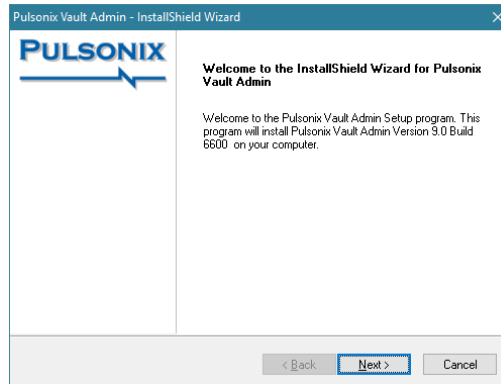
Download/Web Install

If receiving Pulsonix via the internet, the Vault Admin installation is a separate download. Again, this is a self-contained file containing everything required to create your Vault.

Running the install

The **VaultAdminSetup** program displays a simple installation wizard that lets you load all the Vault tools onto your computer. You should run this installer on the server on which you are going to install and run the database. You may also wish to install it on a different computer if you are going to carry out management activities such as backups from another machine, although due to the amount of data that needs to be copied out of the Vault data area for a backup, it is recommended that this activity is actually run directly on the server itself.

Launch the setup program and follow the steps to install the tools onto your computer.

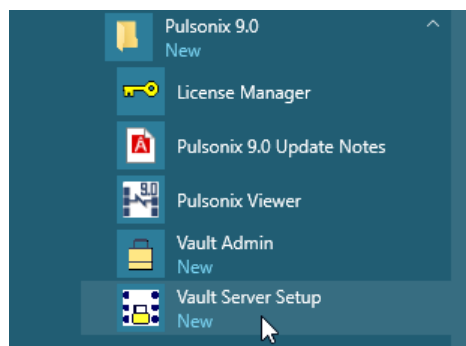


Vault Server Setup application

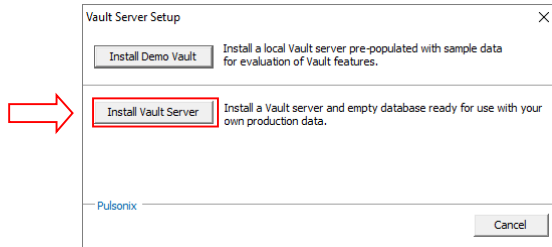
Having installed the setup and admin tools, the next stage of actually preparing your system to run the Vault is to install and prepare the database server. This is a three part process:

1. **Install the PostgreSQL Server** – this is the installation of the database that contains the Vault.
2. **Create Vault Database** – you must create a vault database to use with Pulsonix.
3. **Choose Data Folder** – you must choose where Pulsonix will store Vault data.

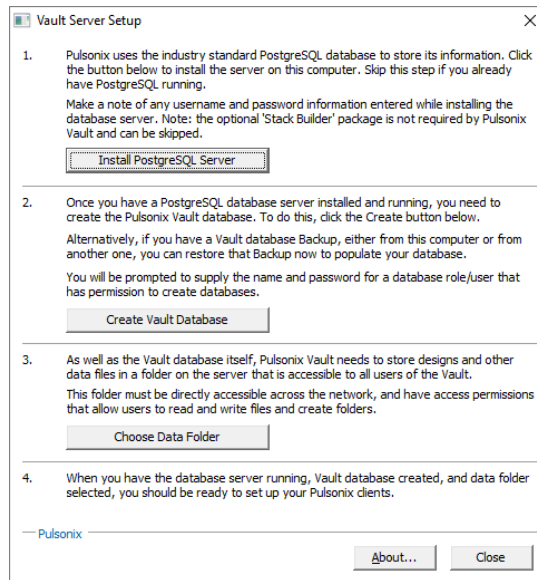
To begin this process, find and run the **VaultServerSetup** program. This can be found on your Start menu under “Pulsonix 9” as an entry called “Vault Server Setup”.



The first dialog you will be presented with is the choice between setting up a Demo Vault, full or pre-populated data for use in evaluating the software, or the **Install Vault Server** option, this is the option you need to select as this will install an empty database to use with Pulsonix.



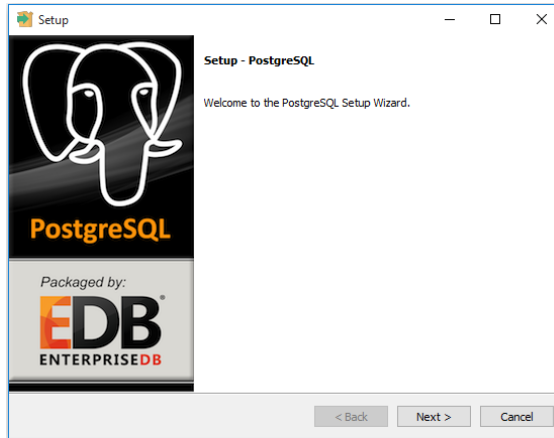
This displays a simple dialog to help you through the three stages of setting up your Vault server. This dialog should be self-explanatory to guide you through the installation steps.



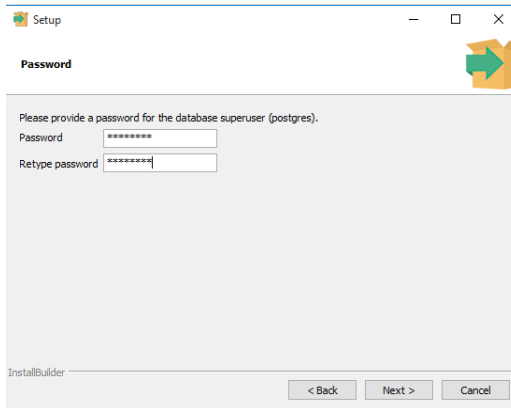
Install PostgreSQL Server

The first step for most installations will be to install the database server itself. Clicking this button will invoke the Setup program for Postgres, which has a number of steps that you need to follow.

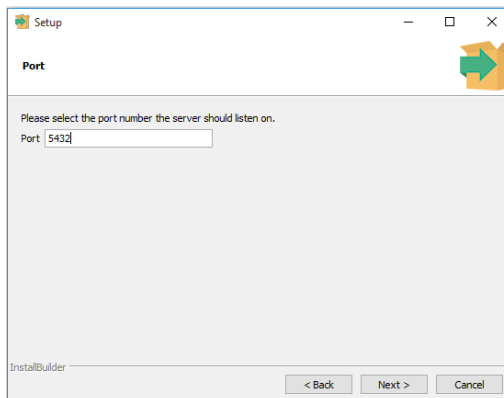
The first is just a simple welcome screen:



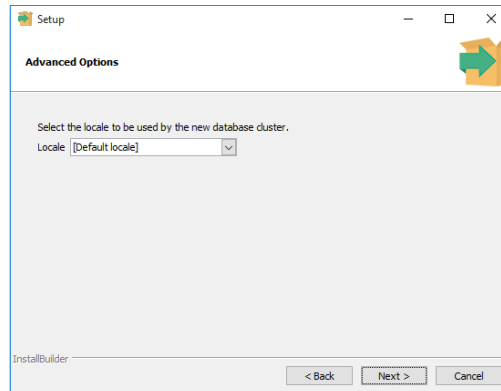
Next, you need to enter the password to use for the main Postgres administrator role. You should note this password down as you will need it later on:



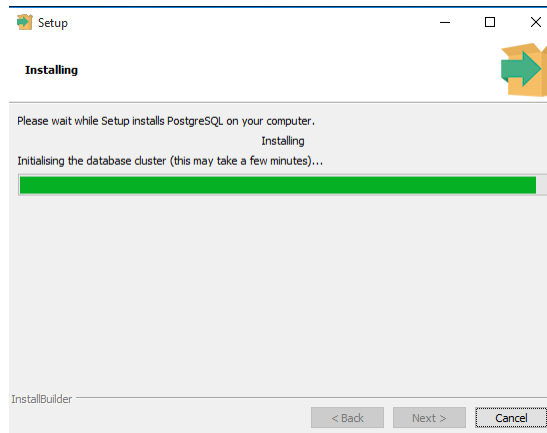
Next, the port number for the client-server communication. The default for this is 5432, which you should not need to change unless it clashes with some other software you have running on your network:



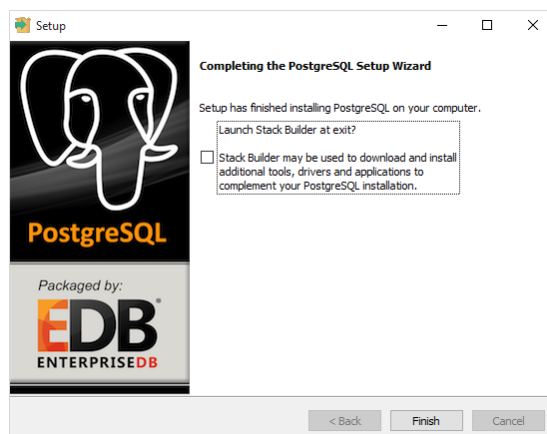
Language Locale can be left as the default setting:



The database server will now be installed:



After this you will be offered the chance to install a package called "Stack Builder". This is not required by Pulsonix Vault so it does not need to be installed.



Using an existing Postgres server

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As the Vault Setup dialog indicates, if you already have Postgres installed and running, then you may be able to use that to hold your Pulsonix Vault. All you should need is the relevant sign-in information to gain admin access to the server to create the database.

However, if you are using a version of Postgres that is significantly older than the one provided with the Vault Setup, you may encounter issues during installation of the database which could mean you need to consider upgrading your Postgres to the version bundled with our installer.

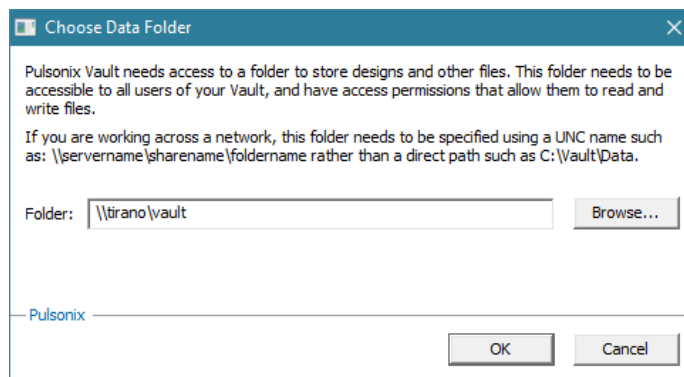
Access through Firewalls

To connect Pulsonix clients to the Vault, network access to the Postgres server is required using the Database Port number you specify for your new Postgres server installation. The default port number for Postgres is 5432, although you may have chosen a different port when installing Postgres as described above. Exactly how you open that port in your firewall on both server and clients will depend on your version of Windows and which security software you are running.

Data Folder requirements

The data files in the Vault are not contained within the Postgres database itself, but are instead saved in a controlled folder structure that is then accessed directly through the Vault modules in the Pulsonix client applications.

In order to do this, the folder you choose must be directly accessible from all the client systems on which you wish to use Pulsonix with the Vault. This will generally mean that you have to make this folder accessible as a shared network folder with read/write access permission granted to all your users who are going to use the Vault.



In normal operation this folder structure is not directly accessed via the Pulsonix user interface. Indeed, no attempt should be made to use or alter files within this folder structure as doing so would risk seriously damaging the integrity of your Vault.

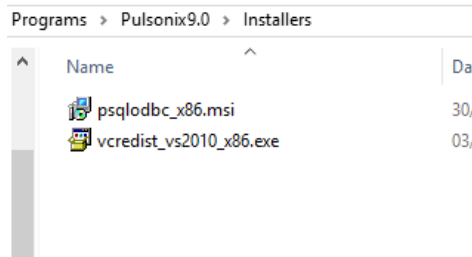
ODBC driver installation

Each client computer using Pulsonix requires a Postgres ODBC driver to enable the application to connect to the Postgres database. The setup process for this driver is run automatically as part of a normal Pulsonix installation, so you should not need to do anything extra from the client side to enable connection to the Vault.

Adding a missing ODBC driver

If for any reason your system does not have the ODBC driver even after the full Pulsonix setup has been run, then you can install the driver separately. If you look in the folder where you have already installed Pulsonix, you should find a sub-folder called “Installers”. In there will be a **psqlodbc** installation package (.MSI). Simply launch that installation package and it will update your system to include the ODBC driver.

You will also find a copy of the same driver MSI file in the folder into which you installed the Vault Setup tools as part of the server setup.



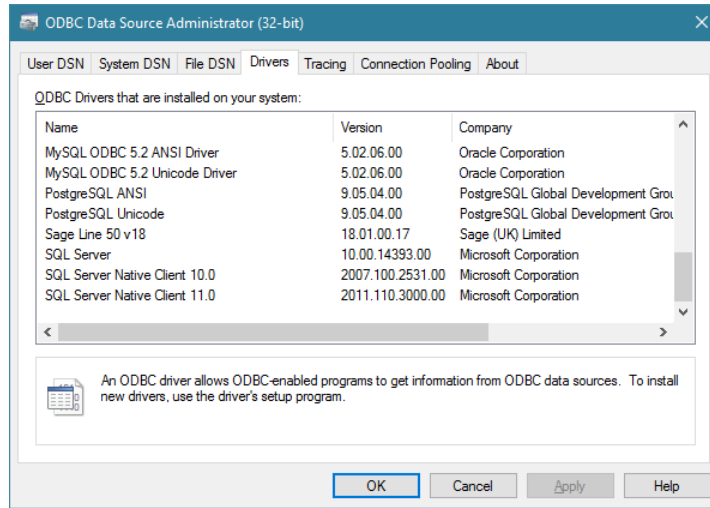
Checking ODBC drivers and versions

If you want to check which ODBC drivers are present on your computer, you need to use the Windows Control Panel to do this. Exactly how to do this will depend on your version of Windows, as there have been some interface changes for ODBC drivers between different Windows versions.

The easiest way is to launch Control Panel, then search for ODBC. On Windows 10 you should see two entries for 32- and 64-bit ODBC Data Sources, so you need to select the 32-bit entry. On earlier versions of Windows you may find this is not so clear, on some it will only display one entry that takes you to the 64-bit version although it doesn't actually tell you that. The easiest way to be sure in this situation is to close any ODBC manager dialogs that are already open (as they often don't tell you whether they are dealing with 32-bit or 64-bit drivers), press the Windows 'flag' key and R to open the Run dialog, and enter:

```
%WINDIR%\syswow64\odbcad32.exe
```

Once you have the Data Source admin dialog running, go to the Drivers tab and you should be able to scroll down to the entries for Postgres:



You may see a slightly different wording from that shown in the above picture, depending on the exact version of the Postgres driver that is installed.

Note: if you see a different Postgres driver name, perhaps for an earlier version of Postgres, then this may still work with the Vault but you may have additional settings to enter when you come to connect your Pulsonix clients to the Vault (see “Alternate ODBC Drivers” below).

Key Concepts of the Vault

What can be stored in the Vault?

The Vault can hold the following types of ‘library’ data: Parts, Footprints, Schematic Symbols, and Schematic and PCB Doc Symbols.

It can also hold the following types of file-based data: Schematic and PCB Designs, Schematic and PCB Technology Files, Schematic and PCB Profiles, Schematic Block Files and PCB Panels.

The Vault is designed to provide you with a secure environment for managing your ‘published’ data. You may still use locally-stored design files and native libraries for developing data, and release your completed items to the Vault when you are ready to do so.

What is an ‘item’?

Each item that is placed into the Vault is given a unique item identifier, or “IID”. Each time that item is saved to the Vault, a new version of the item is created, with this latest version having a new version timestamp or “Version”. This is distinct from the “Revision”, which is the name given to this version as defined in your Revision Naming Scheme. In this way, the Vault contains a full history of all revisions of an item.

The IID combined with the Version uniquely identifies a specific version of an item. In this way a Part for example can know which exact version of a Footprint it is to use. Not just any version of the Footprint, only the specific version that is indicated by the IID and Version listed in the information held along with the Footprint name inside the Part.

Other Vault item properties

In addition to each item having its own Item ID, every Vault installation has its own Vault ID. This allows the application to clearly identify an item as belonging to the current Vault. This means you cannot share items across separate Vaults, because there is no safe way of ensuring the uniqueness of the item ID of items created in different Vaults. You can still take an item from one Vault and check it into your own Vault as a new item, at which point it will be assigned a new item ID.

Cross References

Depending on the settings you use when publishing your data to the Vault, the application will maintain cross-references between related items, allowing rapid access to information such as 'Where Used' without having to resort to time-consuming compilation of reports.

Managing and updating Vault items

There are four basic actions which you can use to manage your Vault items. Your Permissions will control which of these actions are available to you for the various types of item in the Vault.

Check Out

Check Out will "book out" an item from the Vault for you to make changes. This action will be recorded in the Audit Trail, and the item will be marked as checked-out by you to prevent other users from making changes to it at the same time. They will still be able to access the item, for example for a Part they will still be able to use that Part in one of their designs, but they will not be able to check it out to alter it until you have finished with it.

Check In

After modifying an item, Check In will "book it in" to the Vault to commit your changes. Another record is placed in the Audit Trail, the item you are checking in is given a new revision, the 'lock' on it is released, and the newly modified item is available for others to use.

You can also Check In an item that is not yet in the Vault, including newly-created items such as Parts and Footprints.

Uncheck

If you have used Check Out to book out an item to change it and then change your mind, you can use Uncheck to release your hold on that item.

Copy Out

If you need to use an item for something without actually changing it, then Copy Out can be used to pull a copy of the item to be stored locally. You might want to use this for example to open a PCB design to generate manufacturing data or run reports, actions that don't actually change the design in a way that you want to record.

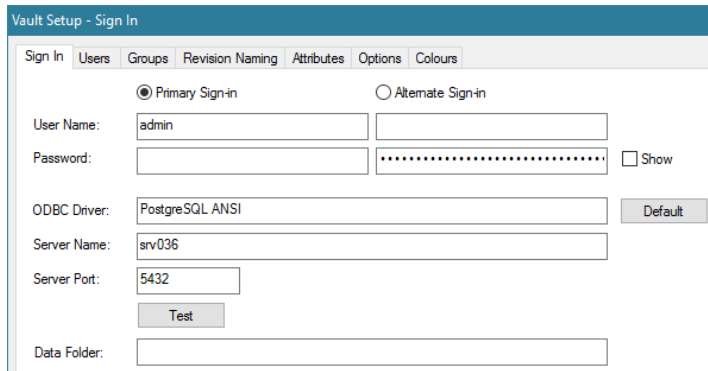
Preparing your Vault for first use

Before using the Vault, there are some steps you should go through to make sure everything is set up how you need it to work. This includes creation of login details if you are sharing the Vault with other Pulsonix users, initial settings that control how items need to refer to each other, and so on.

Testing Connection to Vault

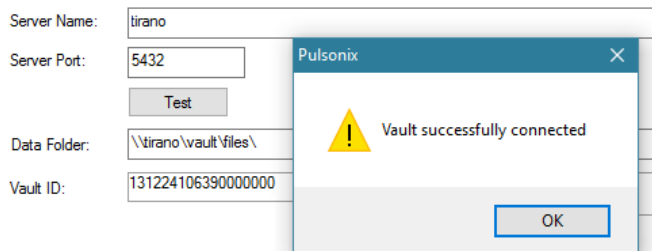
Launch the Pulsonix application, and from the **Setup** menu, choose **Vault**. On the Sign In page, enter the built-in user name “admin” and the password “password”. This is a predefined user that is created when the Vault database is installed.

You will also need to enter the name of the server on which the Postgres database server is running, and alter the port number if you are not using the default setting.



The screenshot shows the 'Vault Setup - Sign In' dialog box. It has several tabs: 'Sign In', 'Users', 'Groups', 'Revision Naming', 'Attributes', 'Options', and 'Colours'. The 'Sign In' tab is active. There are two radio buttons: 'Primary Sign-in' (selected) and 'Alternate Sign-in'. Below these are fields for 'User Name' (containing 'admin') and 'Password' (masked with dots). A 'Show' checkbox is next to the password field. There is an 'ODBC Driver' dropdown menu set to 'PostgreSQL ANSI' with a 'Default' button to its right. Below that are fields for 'Server Name' (containing 'srv036') and 'Server Port' (containing '5432'). A 'Test' button is located below the 'Server Port' field. At the bottom is a 'Data Folder' field.

Now click the **Test** button to verify your connection to the Vault. This will connect via ODBC to the database server, and check that the Vault database exists and contains valid data. If successful, the Data Folder field on the dialog will be updated to show the full path to where the Vault data files are stored, as confirmation that all is well.



The screenshot shows the 'Pulsonix' application window. In the background, the 'Vault Setup - Sign In' dialog box is visible with the following values: 'Server Name: tirano', 'Server Port: 5432', 'Data Folder: \\tirano\vault\files\'', and 'Vault ID: 131224106390000000'. A 'Test' button is highlighted. In the foreground, a smaller dialog box titled 'Pulsonix' displays a yellow warning icon and the text 'Vault successfully connected'. An 'OK' button is at the bottom of this dialog.

Once you have successfully connected, you should change the default password to something more secure. See “Users and Groups” below for more information about managing Users and Groups.

Alternate ODBC Drivers

If you click Test and get error messages about being unable to connect to the database, or a popup dialog about selecting a Data Source, then it is possible that either you don't have a Postgres ODBC

driver installed, or that the version of that driver requires a different connection setup to the ones that the Pulsonix application knows about.

The drivers Pulsonix knows about are:

- PostgreSQL ANSI
- PostgreSQL ODBC Driver(ANSI)

If you are using a driver that has a slightly different name, you will need to use that name in the ODBC Driver field of the Vault Setup dialog.

Users and Groups

Each Vault user will need their own Vault sign-in account set up. These are completely separate from both Windows user accounts and Postgres users or roles, and are only used to manage access to the facilities of the Vault.

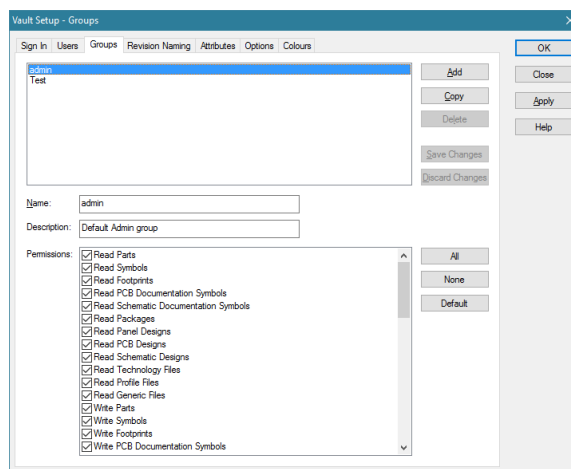
Although in theory you can share one Vault sign-in across multiple Pulsonix users, this is not recommended as it is the Vault user information that is used to record actions such as checking items out and back in. If you have multiple Pulsonix users sharing one Vault sign-in, you won't be able to tell which user has actually carried out those actions.

Care should be taken when deciding who is able to carry out some of the administrative operations, so that the security and integrity of your system is assured. For example, any User belonging to a Group with permission to 'Alter users and groups' can replace the password of any User in the system, so this level of permission should clearly not be available to everyone.

Groups and Permissions

Creating new Groups and editing existing ones

Groups are managed using the Groups page on the Vault Setup dialog. Here you can see the Groups already defined, see the permissions for each of those Groups, and make changes. Note that you cannot delete a Group once it is referenced by a User.



Default 'Admin' Group

There is a default Group already defined called “Admin”, which you cannot delete or rename. This is a safety measure to ensure that you will always have at least one Group defined that has administrator rights to carry out Vault actions. You can use this Group for your ‘power’ users, or create your own.

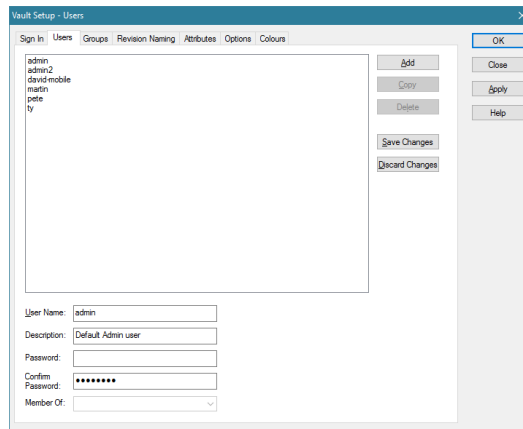
Setting permissions

Setting permissions for a Group simply involves checking or unchecking the relevant check-boxes in the list. Depending on who in your organization needs to access the Vault data, you may need to distinguish between those with permission to manipulate all of the data and those who are only allowed to view or read it, or perhaps only access certain types of item.

Users

Creating new Users and editing existing ones

Each Vault User belongs to a Group. Once you have your Groups set up, you can create your Users. Note that you cannot delete a User once that user has been referenced by a Vault action such as checking out an item.



Default 'admin' user

As with Groups, there is a default user called “Admin” which you cannot delete or rename. This is another safety measure to ensure that you always have at least one user with permission to manage Users and Groups.

The default password for this user is “password”, but it is recommended that you change this to something more secure, otherwise you are leaving your Vault database open to change by anyone who knows the default password.

Changing existing Users

The settings for an existing User can be changed by any User that has the permission “Alter Users and Groups”. You can change any of the User’s settings at any time, including their password and the Group to which they belong.

Those changes will apply almost immediately, as the application will only stay connected to the Vault for as long as is needed to carry out each action. For example, if you alter the Group to which a User belongs, the Permissions for that Group will be applied the very next time the application connects to the Vault.

Primary and Alternate Sign-in

There are two sets of sign-in controls on the Sign In page, labelled as “Primary” and “Alternate”. You may not need to use the Alternate Sign-in, but some users may find it useful if they need to work under two different roles. In that situation you can set up a different User under the Alternate sign-in, then all you need do is visit this dialog to quickly switch from one to the other.

Recovering lost passwords

The actual passwords are not stored in the Vault database, only a one-way encrypted copy of the password. This is compared with the password you supply when signing in, using the same one-way encryption.

This means that if a User forgets their password then you cannot find out what that password is, instead you need to reset their password to a known value. Any User belonging to a Group with permission to ‘Alter users and groups’ can overwrite the password of any User.

Revision Naming

Choosing a Revision Naming Scheme

Before you start publishing data to your Vault, you should set up a Revision Naming Scheme. A default scheme is supplied with the initial database, but you can replace this with your own scheme if the built-in one does not suit your requirements.

Adding or changing Revision Naming Schemes

Naming Schemes are managed using the Revision Naming page of the Vault Setup dialog. Access to this page is only available to a User with the permission to view or alter revision formats. The options available for defining a naming scheme include numeric and alphabetic values, defined start points and step, and ‘width’ of field, offering a great deal of flexibility in specifying how revision names are to be created.

Up to three levels of numbering can be defined for a naming scheme, and if required you can apply a different scheme to the two types of Vault content (designs and library data).

Vault Setup - Revision Naming

Sign In | Users | Groups | Revision Naming | Attributes | Options | Colours

Naming Schemes

Default Revision Scheme

Add

Copy

Delete

Name: Default Revision Scheme

Description:

Level 2 Level 3

Prefix: .

Value: Numeric

Width:

Start & Step: 1

Examples: 1.0, 1.1, 2.0

Save Changes

Discard Changes

Default Schemes

Use these settings to define how revision names are applied to each type of item

Designs: Library Content: Default: Default Revision Scheme

Attributes

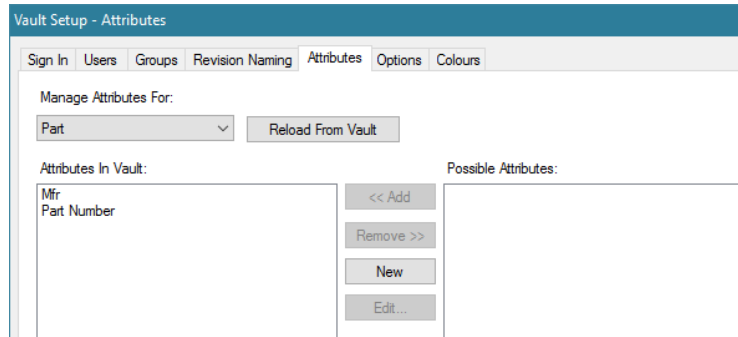
Within the database, different types of items are stored in their own tables, with fields in those tables that are appropriate for the type of item. All of them will have a Name field for example, but some fields are only present for some types of item. A Part for example has fields for Description and Part Family.

The fields defined for a type of item will control what is available to you when using the Search dialog and in other places where field names have to be chosen.

You can further customise the table definitions by adding Attribute fields. These will be populated with values from the defined attributes as items are published to the Vault. You could for example add a field “Mfr” to the Part table, which will then be populated with Mfr attribute values as parts are checked into the Vault.

How to set them up

Custom attributes are set up using the Attributes page of the Vault Setup dialog. As with other setup features, access is controlled by permissions.



Options

Database Settings

These settings are in the database, and you can only alter them if your sign-in user has permission to do so. As the title implies, they affect all database users, not just the user currently signed in.

Database Settings

Referenced Items when Check-in Library Items

Must be from the Vault
 If not from the Vault will be automatically linked using Name:
 Need not be from the Vault

Referenced Items when Check-in Design Items

Must be from the Vault
 If not from the Vault will be automatically linked using Name (Library items versions must also match)
 Need not be from the Vault

Vault Date Format: (used inside database, so it applies to all Vault users)

Referenced Items

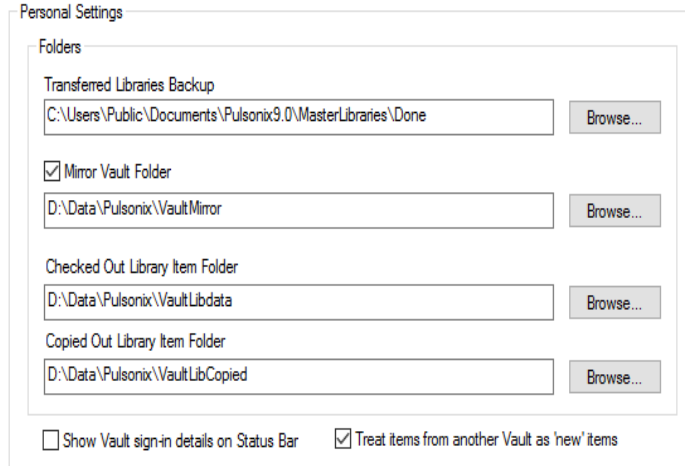
The two sets of radio buttons for determining how item cross-referencing works are explained below in the section covering migrating data into the Vault.

Date Format

The Vault Date Format is also a database setting, because this setting is used inside the database itself to carry out sorting and conversion of time- and date-related values.

Personal Settings

Again as the title implies, these are settings that only affect your own system.



Personal Settings

Folders

Transferred Libraries Backup
C:\Users\Public\Documents\Pulsonix9.0\MasterLibraries\Done Browse...

Mirror Vault Folder
D:\Data\Pulsonix\VaultMirror Browse...

Checked Out Library Item Folder
D:\Data\Pulsonix\VaultLibdata Browse...

Copied Out Library Item Folder
D:\Data\Pulsonix\VaultLibCopied Browse...

Show Vault sign-in details on Status Bar Treat items from another Vault as 'new' items

Folder Settings

Setting up these folders to appropriate values will help you to keep your data organised when interacting with the Vault.

The folder for 'Transferred Libraries Backup' is used when migrating library data into the Vault. To assist you in separating data already migrated from that which has yet to be migrated, completed library files are moved aside to the folder designated here so that those libraries are no longer looked at by the application when doing things like filling in lists of library items.

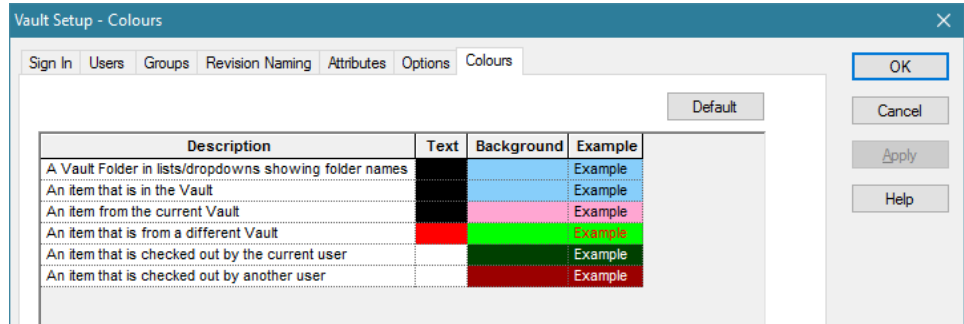
To help keep your 'local' working copies of Vault data organised, it is recommended that you check the 'Mirror Vault Folder' box and enter a suitable folder name. This folder name will be used to construct a suitable location for file-based items retrieved from the Vault.

For example, if you have a PCB design in your Vault in a folder called “\Vault\Designs\Project6”, and your Mirror folder is “C:\Work\VaultMirror”, when you Check Out that design it will be copied into the local folder “C:\Work\VaultMirror\Designs\Project6” for you to work on it.

Similarly for working with library data, there are folders for checked-out and copied-out items. These folders are not optional, you need to set them up before the application will allow you to check or copy out library items, because it has to make sure that the folders you choose here is included in the search order for libraries so that the local items are 'visible' to all the normal application commands.

Colours

These are personal settings that you can alter to suit your preference for how Vault-related items are displayed or highlighted in the user interface.



Folders

In common with the normal Windows file system, the Vault also uses a system of ‘virtual folders’ to help you organise your data and present it in an easily understandable way.

Each item in the Vault can be assigned to a folder. There are no restrictions on what types of item can be assigned to a particular folder, although it may help you to choose sensible folder names to contain certain types of item.

In any place in the user interface where you are presented with a particular type of item, you will see all items of that type regardless of the folder in which you have placed them. For example in the drop-down list of Parts in the Insert Component dialog, you will see all Part items in the Vault, not just those under a folder you may have called “Parts”.

Folders are presented in the user interface in two different ways. On the Vault Manager Browser they are displayed in the familiar ‘tree’ view you are used to seeing in Windows Explorer. In places such as Library Manager they will appear like library names.

Wherever the Vault Folder tree view is displayed, depending on your Permissions you may find some options on your right-click context menu, allowing you to manage the folders.

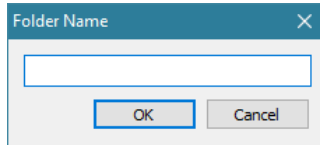
Folder Names

Folders can be given any name you wish, the only exception being that you cannot use characters that would not be allowed in a normal file or folder name. This is to allow ‘matching’ folders to be created in your file system when you check or copy items out of the Vault.

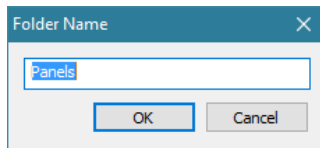
The five special characters not allowed in Folder names are : / \ ? *

Creating and renaming folders

Create a new folder using the New Folder command on the menu. Enter the name of the new folder and click OK. The folder will be created and added to your folder tree.

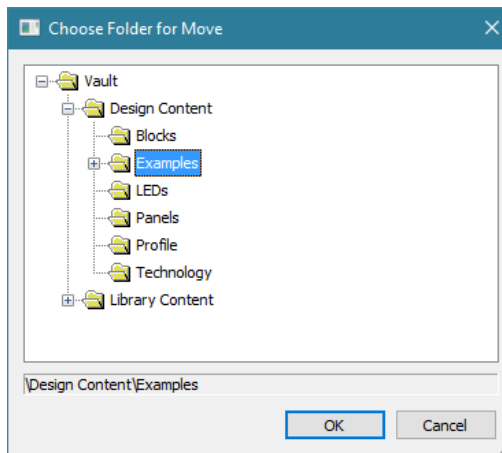


Similarly, to change the name of an existing folder, use the Rename command. Edit the name as required and click OK.



Moving folders

This option allows you to move a complete folder (and all its sub-folders) to a new location in the virtual folder tree.



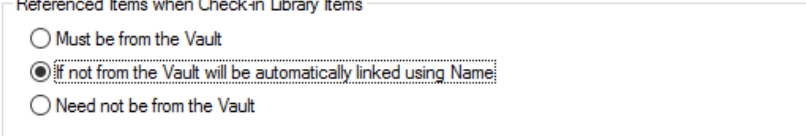
Choose the folder into which you want to move the selected folder, or use the context menu option to create a new folder if the one you need is not already there.

Migrating Library Data into the Vault

Libraries-To-Vault is a page on the Vault Manager dialog, which is accessed from the File menu or from the Vault toolbar.

Before you start

Before starting to migrate your library data into the Vault, there are some choices you need to make. These have been mentioned earlier in the section covering the Options page of the Setup dialog, but are explained here in more detail.



Referenced Items when Check-in Library Items

Must be from the Vault

If not from the Vault will be automatically linked using Name

Need not be from the Vault

Some library items are ‘self-contained’, as they don’t reference or ‘point to’ other items. This includes Footprints, Schematic Symbols, and in fact all types except Parts.

For Parts, they can contain references to Footprints, Schematic Symbols, and/or other Parts (as Associated Parts). In native libraries, these references work purely by name, so a Footprint in a Part is just a name, and that name is used to scan the available Footprint libraries to locate an item with that name. In order to get the most benefit from using the Vault for your library data, the references need to do more than that.

Referenced Items ‘Must be from the Vault’

This is the ‘strongest’ rule. Choosing this option means that in order to check in a Part to the Vault, all items referenced by that Part must be from the Vault. That is, your Part must have been created or updated to point directly to Vault-based items for all its Footprints, Symbols and Associated Parts.

Use this option if you want to impose the strongest possible control on integrity of library data. Doing this will ensure that you know beforehand precisely which item and version is being used for everything that each Part needs.

Referenced Items ‘Linked using Name’

This is the ‘middle ground’, allowing you a little more flexibility in how your Part data is configured before it can be successfully checked in.

With this option selected, any item referenced by a Part still needs to be in the Vault, but you do not have to ‘preload’ those items into the Part yourself using the Part Editor. Instead, as the Part is validated during the check-in process, any referenced item that does not have complete Vault information is looked up by name in the Vault.

As the items are matched up in this way, the relevant item and version identifiers are added to the references in the Part, so that once the check-in process is complete the Part is fully ‘wired up’ with proper references to explicit Vault-based items.

This allows you to take an existing native library Part and check it into the Vault without having to go through any editing process beforehand, as long as the items named do actually exist in the Vault.

This of course means that you do need to check in your Footprints and Schematic Symbols before checking in any Parts that use them, something that the Library-To-Vault dialog will help you with.

Referenced Items 'Need not be from Vault'

This is the most 'relaxed' setting, allowing you to check in Parts without ensuring that referenced items exist in the Vault already. No checking or cross-referencing is done, the Parts are simply saved to the Vault as they are.

Selecting this option means you are using the Vault simply as a kind of 'file store', without the added benefits that the other options give you. You get no 'Where Used' or 'Refers To' capability, and no ability to check whether an item is used before allowing you to delete it from the Vault.

Item Names

To be compatible with how all the commands and dialogs in the application work, and to avoid ambiguity, the Vault will not allow you to store duplicate named items of any given type.

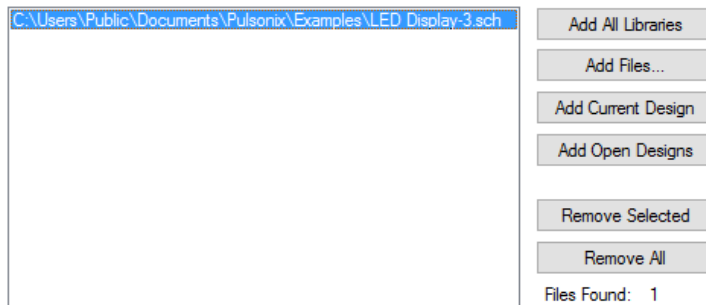
Using the 'Libraries to Vault' dialog

Libraries-To-Vault is a page on the Vault Manager dialog, which is accessed from the File menu or from the Vault toolbar.

Adding libraries

The first stage (after selecting the appropriate 'Referenced Items' option) is to choose the libraries that you want to migrate into the Vault. You can add all the libraries that exist in your library search order or add individual library files from elsewhere by browsing to them.

You can also choose design files as a source of library data. This may be useful in situations where you are trying to take library items such as Footprints from an old design file for which you no longer have the libraries, or perhaps from a design imported from another system.



Below this are some settings which you should review, to ensure that the data is arranged as you require when posted into the Vault.

To avoid confusion over which libraries have been processed and which haven't, it is generally advisable to keep the checkbox 'Move Completed Libraries to Backup' checked. Libraries are posted to the Vault in their entirety, and only moved to backup once the whole library has been successfully checked in. Once check in is completed for a library, your Vault will become the source for that

library data and having the original library file still in place in its original folder may only lead to confusion.

You can also choose how the Vault virtual folder name is composed, and enter a suitable comment to annotate the audit trail items that record the addition of each item to the Vault.

The screenshot shows a settings dialog box with three sections:

- Settings:** Contains two checked checkboxes: "Move Completed Libs to Backup" and "Only Report Errors".
- Destination in Vault:** Contains a "Vault Folder:" label, a text input field with "Library Content", and a "Browse..." button. Below it is an "Additional Folder Names:" label, a dropdown menu with "Library Type then Name", and a "Default" button.
- Check In Note:** Contains a large text area with the text "Adding Existing Libraries to the Vault".

Once you have made your choices, you are ready to begin processing the data. The Check button will run through all the library data and check that it is 'suitable' for checking in. Depending on which 'Referenced Items' radio button is currently selected, checking will look for things like the referenced items being present, correct library versions, etc. Any issues are listed in the box below the Check button, and also in the report that will open when checking is complete.

You can also choose which types of library data to process, either an individual type or the special entry 'All Library Types' which will instruct the application to process them in sequence, finishing with Parts as those are the only types of library item that reference other types.

The screenshot shows a "Transfer To Vault" dialog box with the following elements:

- A label "Library Data to Transfer:" followed by a dropdown menu set to "All Library Types" and a "Files Chosen: 1" indicator.
- Two buttons: "Check..." and "To Vault".

Using both Libraries and Vault

Although the Vault is used to manage library items, you would still use 'native' Pulsonix libraries to store local or development data, and only migrate that data to the Vault when it is ready to be published.

For items that reference other items (such as Parts or Designs), depending on the settings in the Options dialog, checking in those items may insist that any referenced items have come from the Vault rather than from 'local' libraries.

Shared master libraries

If you are working in an organisation that has shared master libraries, then those libraries only need to be migrated into the Vault once. Having successfully completed that migration process, each Pulsonix user should then remove the master library folder(s) from their library folder search order, so that they can switch across to access the master data from the Vault instead of the shared native libraries.

Migrating Design Data into the Vault

Designs-To-Vault is a page on the Vault Manager dialog, which is accessed from the File menu or from the Vault toolbar.

Before you start

Design items includes actual PCB and Schematic design files, as well as file-based items such as PCB and Schematic Technology Files and Profiles, and PCB Panels.

As with library data, there are choices available for how rigorous the references between items are enforced when checking them in.

Referenced Items when Check-in Design Items

- Must be from the Vault
- If not from the Vault will be automatically linked using Name (Library items versions must also match)
- Need not be from the Vault

Referenced Items ‘Must be from the Vault’

This is the ‘strongest’ rule. Choosing this option means that in order to check in a file to the Vault, all items referenced by that file must be from the Vault. This means all referenced items, including Technology file, Profile, Parts, Footprints, etc.

Use this option if you want to impose the strongest possible control on integrity of design data. Doing this will ensure that you know beforehand precisely which item and version is being used for everything that each file needs.

Referenced Items ‘Linked using Name’

This is the ‘middle ground’, allowing you a little more flexibility in how your design data is configured before it can be successfully checked in.

With this option selected, any item referenced by a file still needs to be in the Vault, but you do not have to ‘preload’ those items into the file yourself using the Part Editor. Instead, as the design file is validated during the check-in process, any referenced item that does not have complete Vault information is looked up by name in the Vault.

To avoid accidental link-up to the wrong item simply because the names match, the application does insist that library item versions match as well. Each library item (Footprint, Symbol, etc.) in a design has a timestamp inside it, the timestamp that is updated as a library item is saved to the library file.

When the design is checked into the Vault, it compares both name and library version to ensure that the right library item has been found.

As the items are matched up in this way, the relevant item and version identifiers are added to the references in the design, so that once the check-in process for the design is complete it is fully 'wired up' with proper references to explicit Vault-based items.

This allows you to take an existing design and check it into the Vault without having to go through any editing process beforehand, as long as the items named do actually exist in the Vault, and they are the correct version.

Referenced Items 'Need not be from Vault'

This is the most 'relaxed' setting, allowing you to check in design files without ensuring that referenced items exist in the Vault already. No checking or cross-referencing is done, the files are simply saved to the Vault as they are.

Selecting this option means you are using the Vault simply as a kind of 'file store', without the added benefits that the other options give you. You get no 'Where Used' or 'Refers To' capability, and no ability to check whether an item is used before allowing you to delete it from the Vault.

Understanding and managing your Vault contents

The Vault Manager dialog

This dialog is accessed from the **File** menu or the Vault toolbar. It is the main interface between Pulsonix and the connected Vault. From here you can browse the Vault contents, examine the revision history of items, search for items, and carry out other management tasks.

Browser Page

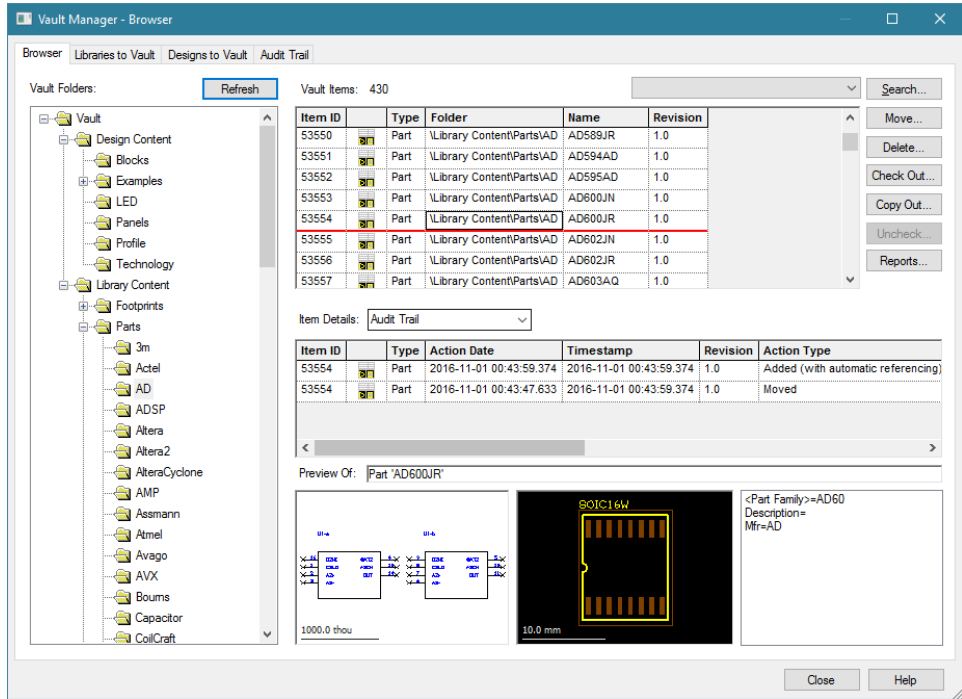
The Browser page is where you can carry out many of the management tasks relating to your Vault. At the left-hand side is the folder tree, showing the Vault virtual folders that have been defined.

To the right are two grids and a preview area. The upper grid will display the items found in the selected folder, those resulting from using a search, or those found by choosing one of the actions available on items in the lower grid.

The lower grid shows information depending on which of the three modes you select.

For Audit Trail, you will see all the Audit Trail records relating to the item selected in the upper grid. Thus in the picture below you can see that a part is selected in the upper grid, and its Audit Trail records displayed below.

You can also select the mode 'Where Used', which will list all the places where the item selected in the upper grid is used. This allows you for example to quickly locate all the Parts and Designs that use a particular Footprint. Alternatively, the 'Refers To' mode shows all the items referenced by the selected item, for example you can list all the Parts, Footprints and other items used by a Design.

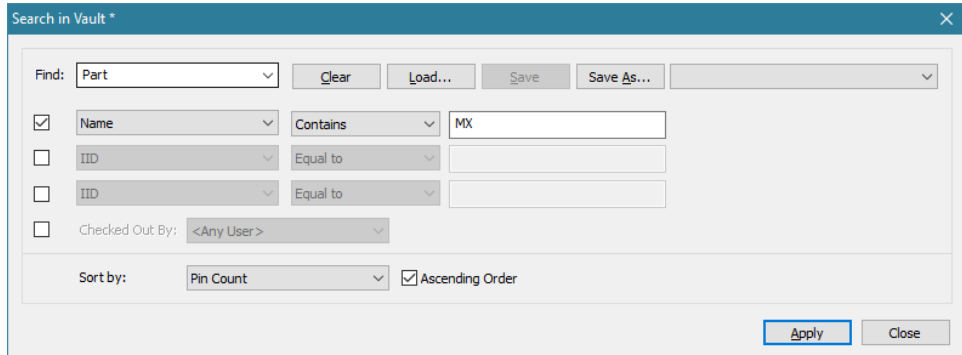


Search

At the top right of the Browser dialog is a Search button, which opens the Search dialog. Here you can find a set of controls that provide you with the tools to search across the whole Vault for the information you require.

For each type of Vault item you can match up to three fields, and for each type of item or all types you can search on the checked-out status.

There are also controls along the top of the dialog that allow you to load and save searches to file so that they are easily accessible.



Alongside the Search button on the main Browser page is a drop-down list. That list will show the names of all the Vault search files currently found in the folder you last used to save a Search file.

This allows you to quickly access your favourite searches without having to return to the Search dialog each time.

Audit Trail

The final page on the Manager dialog is the Audit Trail, where (if your permissions allow) you can examine the audit trail which records all activity in the Vault.

Here you will see the Audit Trail records listed, and controls to allow you to filter the display by various parameters including User name and action type.

Note that the Audit Trail can grow quite large so it is not advisable to uncheck the Filter button and try to display the entire Audit Trail in one go.

Reports

Reports can be generated containing Vault information using the Report Maker. Some items (components, symbols, etc.) can report their Vault properties such as item ID or revision name, and it is also possible to iterate through a list of Vault items and report things such as their checked-out state and related Audit Trail records.

Deleting items from the Vault

Items can be deleted from the Vault, but on certain conditions.

The Delete command will only be available to Users belonging to a Group with Delete permissions for the type(s) of item selected.

In addition, if an item is cross-referenced from another item then it cannot be deleted. For example a Footprint that is used by a Part or a Design cannot be removed.

It is also possible to delete a specific version of an item, by right-clicking on the relevant row showing that version in the Audit Trail view of the details grid in the Browser.

Using Vault-based data in your application

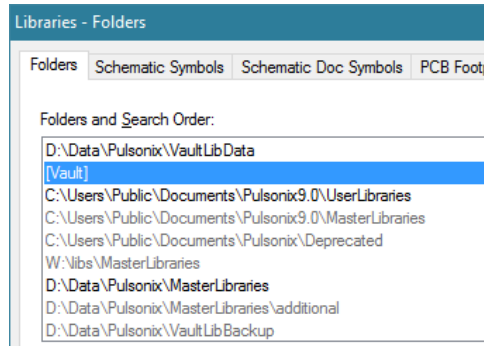
Once data (library data and file-based data) is in the Vault, it is accessible within Pulsonix in much the same way as native data. In the Insert Component dialog for example, Vault-based Parts are listed for you to use in the same way as those from your native libraries. Some colour-coding and other alterations in the way they are presented will help you to distinguish between Vault and native items where you need to, without getting in the way of normal usage.

Library Search Order

In the Folders page of Library Manager, or the Libraries page of the Folders dialog, you will see that there is a special entry in the folder list called “[Vault]”. This is the placeholder for all Vault-based library data, and is automatically included in your folder list to allow you to set the order of precedence for how library data is ‘discovered’ for things like filling in the list of Parts in Insert Component.

The library item folder you chose on the Options page of the Vault Setup dialog should be placed above the Vault pseudo-folder entry, so that when you check out an item from the Vault the application commands will 'see' that local copy first in preference to the one in the Vault.

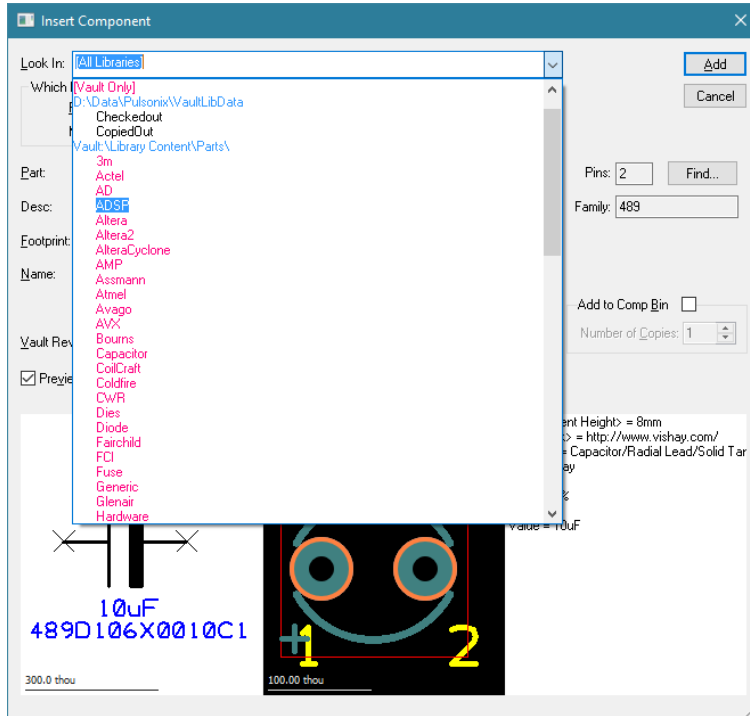
All your other libraries should probably be positioned below the Vault, so that you know you are using published Vault data wherever possible, and only referring to locally-stored items for things you have checked out or those you are still developing and have yet to be published to the Vault.



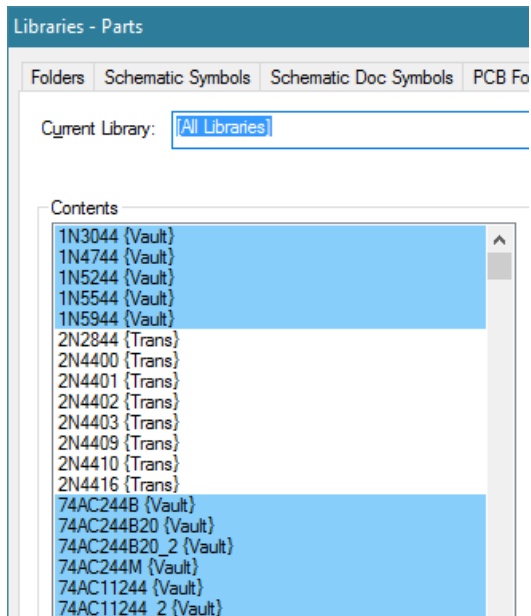
Parts, Footprints and other library items

Wherever you would normally expect to access library items, your Vault-based library items will also be included. Each Vault virtual folder which contains the required type of library item will be displayed as if it was a library, allowing you to easily browse through the available data quickly and easily.

For example, here in Insert Component you can see each Vault folder that contains Parts is drawn in the colour we happen to have chosen for Vault folders. This helps you to distinguish Vault-based items from those you may have in native library files:



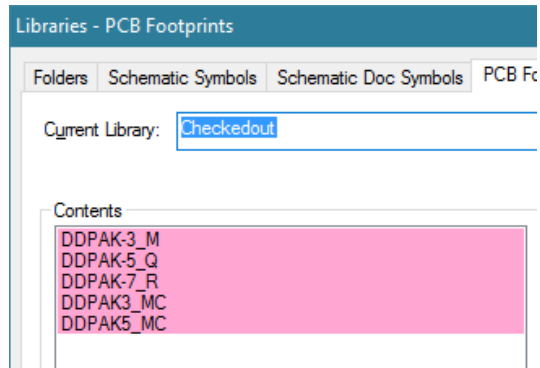
Similarly, here in Library Manager you can easily see the Vault-based parts:



If instead you select a library into which you have checked-out the items you need to edit, these will be displayed clearly in their own colour. In this example, you can see the bright pink items that

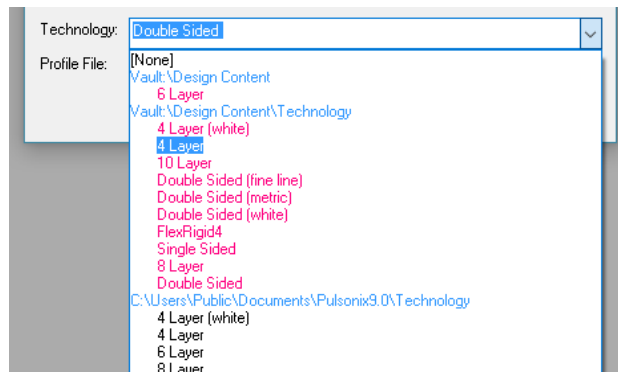
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indicate that these are from the Vault but not currently *in* the Vault. This is an important distinction to make:



Technology and Profile files

Technology and Profile files will be presented in the same kind of way, such as here on the File New dialog:



Schematic Blocks

Schematic Blocks from the Vault will appear in drop-down lists in dialogs such as Insert Block Instance.

PCB items for Panels

When using PCB design items in a Panel, the situation is not quite as straightforward. Once you insert other types of item such as Blocks and Parts into a design they are copied into the design, making the design completely self-contained. The items still retain their item ID and vault version so they know precisely which Vault items they are, but the design does not need to refer back to the Vault to get information about those items.

However, panels only contain *references* to the PCB items that have been inserted, rather than complete copies of those designs. This means that whenever a command is invoked that needs to access the PCB design data, those actual PCB designs need to be opened in the application for the data to be available.

When a PCB item is added from the Vault to a panel, its item ID and version are retained as for other types of item. When the application needs to access the PCB design, it uses that Vault information to locate the PCB design file and open it. While all your PCB designs are in the Vault, the source location for that PCB is clear and unambiguous, it is the Vault. However, if you check or copy out a PCB design to your own file system, the application may access that design instead.

To do this, it will look for a matching design that is in the same relative place within the folder defined as your 'Mirror Vault Folder' location, using the Vault virtual folder as the place to look. For example, if you have a PCB design in your Vault in a folder called \Vault\Designs\Project6, and your Mirror folder is C:\Work\VaultMirror, the application will look for the design in the local folder C:\Work\VaultMirror\Designs\Project6. This allows you to check out a PCB from the Vault, modify its contents, and then update your Panel with that copy of the PCB instead of the 'master' one from the Vault.

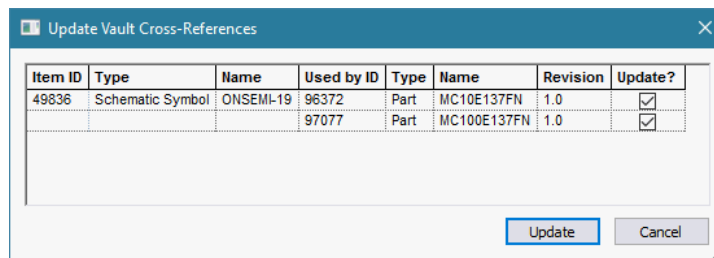
Reloading data and updating references

Part references to footprints, symbols and associated parts

Parts may include references to footprints, schematic symbols and/or associated parts. For a fully cross-referenced Part in the Vault, links between each version of the Part and the specific versions of those referenced items are maintained automatically.

When you have been editing a checked-out Footprint and decide to check it back into the Vault, to save you having to track down all the Parts that use that Footprint and refresh them to point to the new version of the Footprint, the application can do that for you.

Whenever you check in one or more library items, if those items are referenced by Parts, the Update Cross References dialog is displayed. This shows a list of the items that will be updated, allowing you to preview the effect of the checked-in items across the Parts in your Vault.

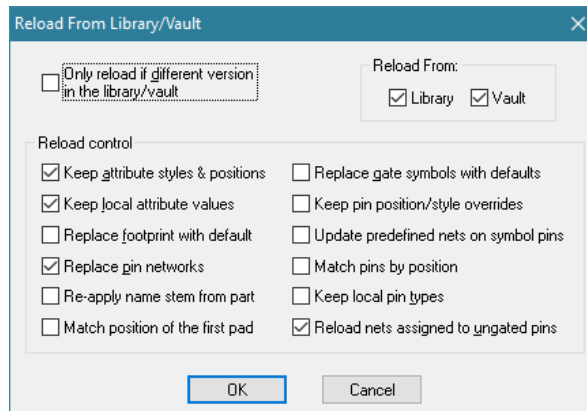
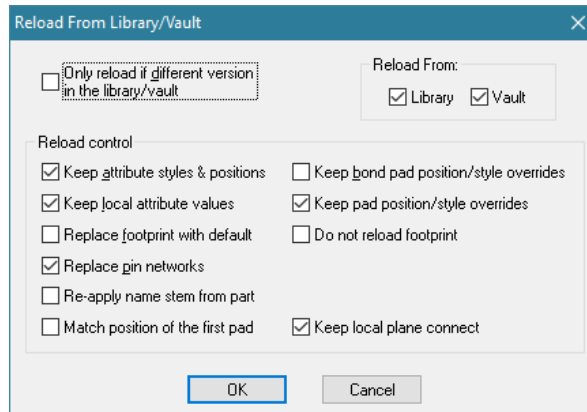


Allowing the dialog to update the cross-references for you is the exact equivalent of what would happen anyway with native library data. If you saved an edited footprint back to a native library, all Parts that reference that Footprint by name would automatically use that newly-saved Footprint. All that this dialog is doing is helping you to achieve the same thing with your Vault-based library data.

Design references to library items

To update a Design to use Vault library items, you need to use the 'Reload From Library' command exactly as you would do when updating your Design from native libraries. This allows you to manage the reload process in the same way, using the same range of options and switches, regardless of where the library data is being drawn from.

The **Reload From Library** dialog has been slightly extended to allow you to select your library data source, either Vault or Library, or both.



Vault Admin Tools

Admin tools

Admin tools to manage your Vault data are available as a separate installation package, as they would not be required by most users. Your data is still secure no matter who is running the Admin tools though, as the password for the Postgres administrator role is required in order to carry out any of its operations.

The Vault Admin tools are available as a dialog-based application, and a command-line program. The latter is useful if you want to run it as a scheduled task to take regular backups.

While the backup and restore processes are running, the Vault database is locked down so that it cannot be modified in the middle of backup or restore. This means that for the duration of the backup or restore process, Pulsonix applications will not be able to access the Vault data.

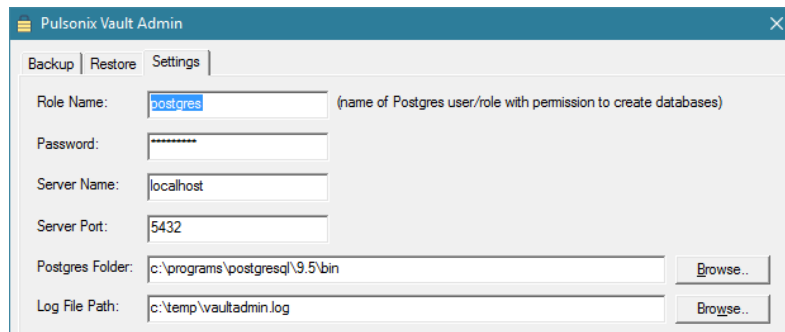
Installation

The admin tools are installed by the same installer you ran to prepare your database server. Simply use the installed program shortcut, or navigate to the folder where you installed the admin tools and run the VaultAdmin application.

Vault Admin application

Settings

The settings page contains the details of your Postgres database, and the location of the log file to which information about each backup and restore action are added. These settings are stored in the system Registry ready for next time.

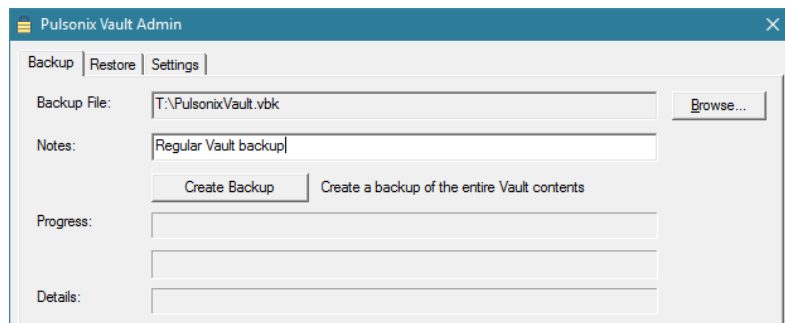


The screenshot shows the 'Pulsonix Vault Admin' window with the 'Settings' tab selected. The fields are as follows:

- Role Name: postgres (name of Postgres user/role with permission to create databases)
- Password: [masked with asterisks]
- Server Name: localhost
- Server Port: 5432
- Postgres Folder: c:\programs\postgresql\9.5\bin (with a 'Browse...' button)
- Log File Path: c:\temp\vaultadmin.log (with a 'Browse...' button)

Backup

On the Backup page, choose a location and name for your Backup file. The Notes field is optional, and is included in the header of the backup file to be displayed at the beginning of the Restore process. Click the Create Backup button to begin the process. Messages are displayed on the dialog showing you the stages of the backup process, and how far it has got.



The screenshot shows the 'Pulsonix Vault Admin' window with the 'Backup' tab selected. The fields and buttons are as follows:

- Backup File: T:\PulsonixVault.vbk (with a 'Browse...' button)
- Notes: Regular Vault backup
- Create Backup button: Create a backup of the entire Vault contents
- Progress: [empty progress bar]
- Details: [empty details box]

Once the first few data files have been collected, the application will calculate an estimate of the remaining time and display this on the dialog too.

Restore

Restoring a backup is as simple as browsing to the backup file and selecting it, then clicking one of the two Restore buttons.

The screenshot shows the 'Restore' tab of the Pulsonix Vault application. The 'Backup File' field contains 'C:\Users\Max\Desktop\vault.vbk' with a 'Browse...' button to its right. Below this is a 'Backup Details' section with several fields: 'Vault ID' (131208237909420000), 'From Server' (localhost), 'Backup Date' (empty), 'By User' (Max), 'File Size' (54.29 MB), and 'On Computer' (TUVALU). A 'Notes' field contains 'Backing Up!'. Below the details is the 'Data File Folder' field with 'D:\Data\Vault' and another 'Browse...' button. At the bottom, there are two buttons: 'Restore existing' (with the description 'Restore backup file to re-create an existing Vault') and 'Restore new Vault' (with the description 'Restore backup file to create a new Vault'). Below these buttons are three empty text boxes labeled 'Progress:' and 'Details:'.

Restore existing – this will replace your current Vault contents with those contained in the backup. You do not have to have a Vault database prepared, one will be created from scratch as part of the Restore process, but you do need to have the Postgres database server installed and running. Use this option for normal restore of your existing working Vault.

Restore new Vault – this works in exactly the same way as Restore existing, creating a database if one is not already there and filling it with the contents of the backup. The difference is that the resulting database will be marked with a brand new Vault ID so that items retrieved from this Vault will not be interchangeable with those from the original Vault. You would use this option if you wanted to create a Vault for someone else and populate it with your contents so they have some data to start from.

Important: do not use 'Restore existing' to create a clone of your current Vault on a separate server and then work with both Vaults. They will both have the same Vault ID so items from each Vault will look like they come from the same Vault, but each Vault will know nothing about the other one so there will be no coordination of item IDs, revision numbers, etc. It is important to treat a Vault as a unique entity and only run one copy of a particular Vault.

VAdmin command-line program

As well as the dialog-based admin tool, you can also use a command-line version. This can perform the same tasks as the dialog version, but it is driven from the command line and so is more use for things like scheduled backups using scripts or batch files.

Commands and options for this program are shown below. This information can also be retrieved by running “vadmin -help”.

Usage:

```
vaultadmin <Action> [<File>] [<Credentials>] [-m <MessageTo>] [-l <LogPath>] [-p
<PortNumber>] [-s <Server>] [-x <ExePath>] [-n <Notes>]
```

Where:

```
<Action>      = b[ackup] | r[estore] | c[clone] | i[nstall] | v[iew] | h[elp]

backup        = Back up database and attached files to the specified output path.
restore       = Restore a database backup from the specified path to recreate an existing vault.
clone         = Restore a database backup from the specified path to make a new separate Vault.
install       = Install settings in system Registry for future use.
view          = Show installed settings from system Registry (except password).
help          = This help message.

<MessageTo>   = Where to output messages (C=console, L=log file, N=none)
<LogPath>     = Fully qualified path to log file where messages are to be appended.

<File>        = -f <Path>
<Path>        = Fully qualified path to backup file
<Credentials> = -u <UserName> -w <Password>
<UserName>    = PostgreSQL role/user with permission to administer the database.
<Password>    = The password for this role/user.
<Server>      = Computer name of database server (default localhost).
<PortNumber>  = Numeric port number for accessing database server (default 5432).
<ExePath>     = fully qualified path to PostgreSQL executable programs.
<Notes>       = optional notes or comments to be saved with the backup.
```

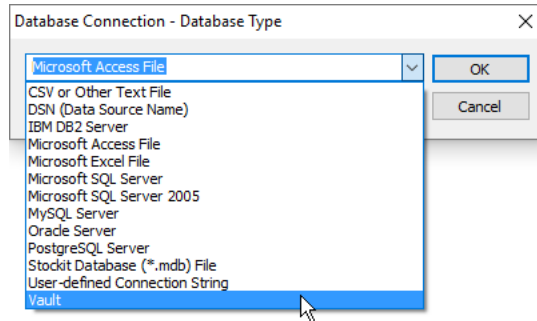
The following settings can be supplied on the command line, or will be taken from the values that have already been prepared on this system using the 'install' command:

```
<UserName>
<Password>
<Server>
<PortNumber>
<ExePath>
```

Vault and Database Connection (PDC) option

Pulsonix 9.0 includes integration between the Pulsonix Database Connection (PDC) and the Vault.

An additional PDC connection type of **Vault** is now available on the **Database Connection Setup** page and **Database Type**:



When this is selected no other PDC connection details need be provided as those from the **Vault Setup** are automatically used.

For a Vault PDC, much of the field mapping functionality in the PDC Setup is no longer editable as the field names shown represent information already built-in to a library part and not additional attributes that can be added to it like with a conventional PDC setup.

A Vault PDC allows full parametric search capabilities to be applied directly to all parts stored in a Pulsonix Vault.

The **Insert Component** option will add to a design, a component using the chosen **Vault Part** irrespective of other Pulsonix libraries and the library search path.

The use of PDC from within **Change Part** is also supported for the **Vault PDC**.