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1 What's New

New features in ODBC Driver for SQLite 4.4

- Now the Direct mode is based on the version 3.42.0 of the SQLite engine

New features in ODBC Driver for SQLite 4.3

- Added support for SQL_ATTR_MAX_ROWS attribute
- Improved compatibility with Visual Basic in Visual Studio
- Added support for macOS 13 Ventura
- Now the Direct mode is based on version 3.39.2 of the SQLite engine
- Improved compatibility with Tableau Prep Builder
- Improved compatibility with Crystal Reports
- Improved compatibility with 4D in macOS

New features in ODBC Driver for SQLite 4.2

- Added support for Windows 11
- Improved compatibility with FICO Mosel
- Improved compatibility with FileMaker
- Improved compatibility with JMP on macOS
- Improved support for an ODBC installer on Windows 2000
- Now the Direct mode is based on the version 3.31 of the SQLite engine

New features in ODBC Driver for SQLite 4.1

- MSI installer for deploying through GPO is added

New features in ODBC Driver for SQLite 4.0

- Apple Silicon M1 is supported
- Compatibility with macOS Big Sur is improved
- The JournalMode = jmDefault option is added

New features in ODBC Driver for SQLite 3.2

- The Connect Mode connection option is added
- The Journal Mode connection option is added
- The Locking Mode connection option is added
- The Synchronous connection option is added

New features in ODBC Driver for SQLite 3.1

- Now ODBC driver is thread-safe
- Now the Direct mode is based on the version 3.27.2 of the SQLite engine
- Now ODBC driver activation does not require administrator privileges
- Improved compatibility with sandboxed applications for macOS
- Support for connection pooling is improved
- The EnableSharedCache connection parameter is added
- The QueryTimeout connection parameter is added

New features in ODBC Driver for SQLite 3.0

- Now the Direct mode is based on the SQLite engine version 3.26.0
- Now ODBC driver for macOS is distributed as a PKG package
- Now ODBC driver for Linux is distributed as DEB and RPM packages
- Possibility to force the ODBC 2.x behavior is added

New features in ODBC Driver for SQLite 2.4

- Possibility to return String Types as Ansi or Unicode is added
- Compatibility with MS Access is improved
- Compatibility with Tableau is improved
- Compatibility with Omnis Studio is improved
- Compatibility with Power Pivot is improved
- Compatibility with DBeaver is improved

New features in ODBC Driver for SQLite 2.3

- Performance of batch operations is significantly improved
- The UnknownAsString connection option for returning fields of unknown type as a string is added

New features in ODBC Driver for SQLite 2.2

- The Direct Mode for Linux is supported
- Database encryption for Linux is supported
- The Direct Mode for macOS is supported
- Database encryption for macOS is supported
- Compatibility with SAS JMP is improved
- Compatibility with MS Power Query is improved
- OUTER JOIN macros in SQL queries are supported
- DateTime macros in SQL queries are supported
- Scalar function macros in SQL queries are supported

New features in ODBC Driver for SQLite 2.1

- Compatibility with MS Visual Studio
- Compatibility with MS FoxPro is improved
- Compatibility with MapInfo is improved
- Compatibility with Libre Office is improved
- Compatibility with Qlik is improved
- Compatibility with Delphi & C++Builder is improved
- MS Access linked tables support is improved

New features in ODBC Driver for SQLite 2.0

- Linux is supported
- macOS is supported

- Backward compatibility of SQLExecDirect with ODBC 2.x is improved
- Compatibility with MS Excel is improved
- Compatibility with ODBC 2.x is improved
- Bug with Trial expiration in Microsoft SQL Server Management Studio is fixed
- Bug with incorrect data displaying in MS Access is fixed

New features in ODBC Driver for SQLite 1.2

- Compatibility with Microsoft Visual Studio is improved
- Compatibility with Microsoft Office is improved
- Compatibility with Microsoft SQL Server Management Studio is improved
- Compatibility with Crystal Reports is improved
- Compatibility with ClikView is improved

New features in ODBC Driver for SQLite 1.1

- Performance is improved

New features in ODBC Driver for SQLite 1.0

- First release of ODBC Driver for SQLite
- Windows 32-bit is supported
- Windows 64-bit is supported

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2 General Information

1. [Overview](#)
2. [Features](#)
3. [Compatibility](#)
4. [Requirements](#)
5. [Licensing](#)

6. [Getting Support](#)

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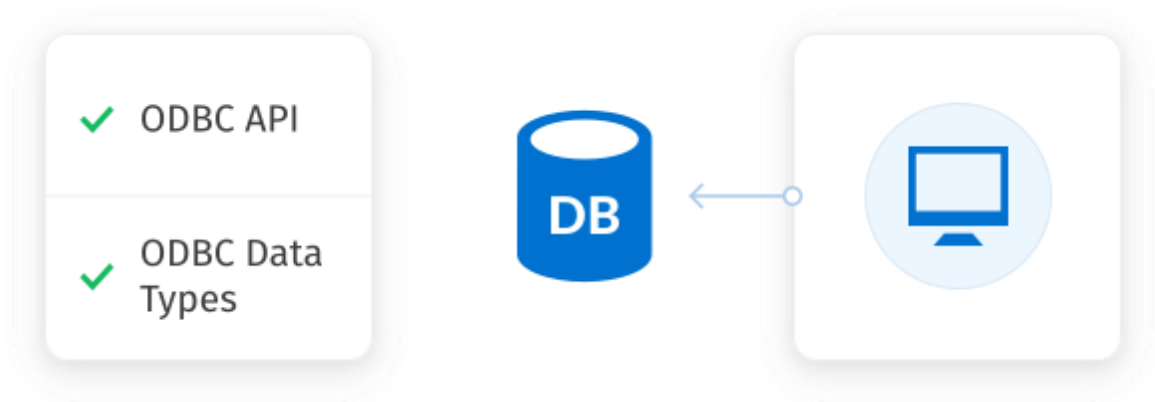
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2.1 Overview

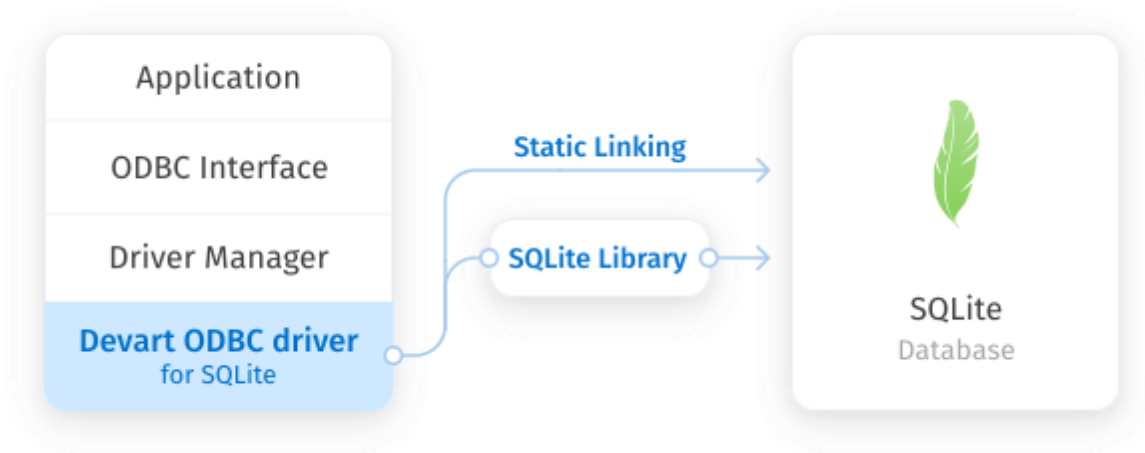
Overview

[ODBC Driver for SQLite](#) is a high-performance connectivity solution with enterprise-level [features](#) for accessing SQLite databases from ODBC-compliant reporting, analytics, BI, and ETL tools on both 32-bit and 64-bit Windows, macOS, and Linux. Our ODBC driver fully supports standard ODBC API functions and data types and enables easy and secure access to live SQLite data from anywhere.



Direct Connection

With our data connector, various ODBC-aware applications are able to establish a [connection](#) to an SQLite database not only by means of the native SQLite client library, but also in the Direct mode, without involving any external libraries. This improves performance of your applications and streamlines the deployment process, since there is no need to distribute any additional client software with the driver.



Compatibility

ODBC Driver for SQLite supports SQLite version 3.x.

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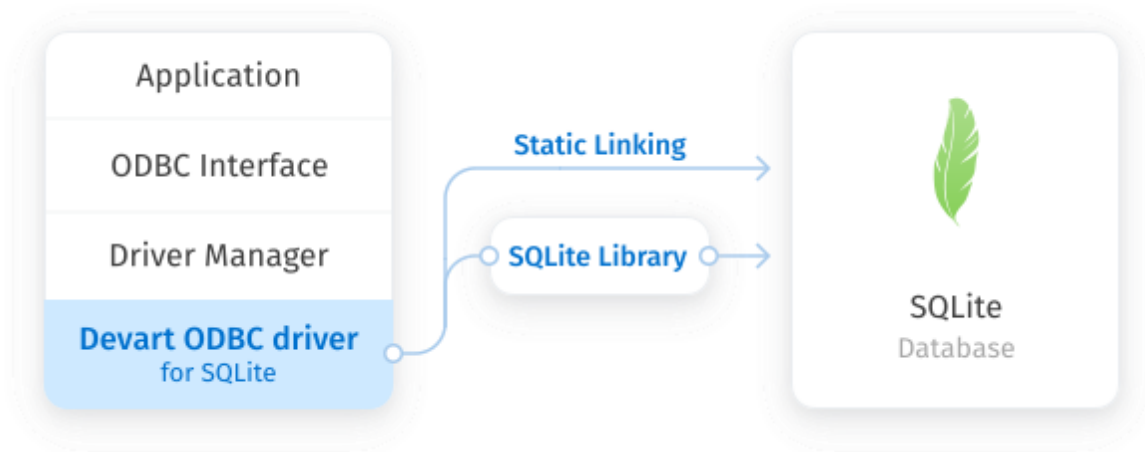
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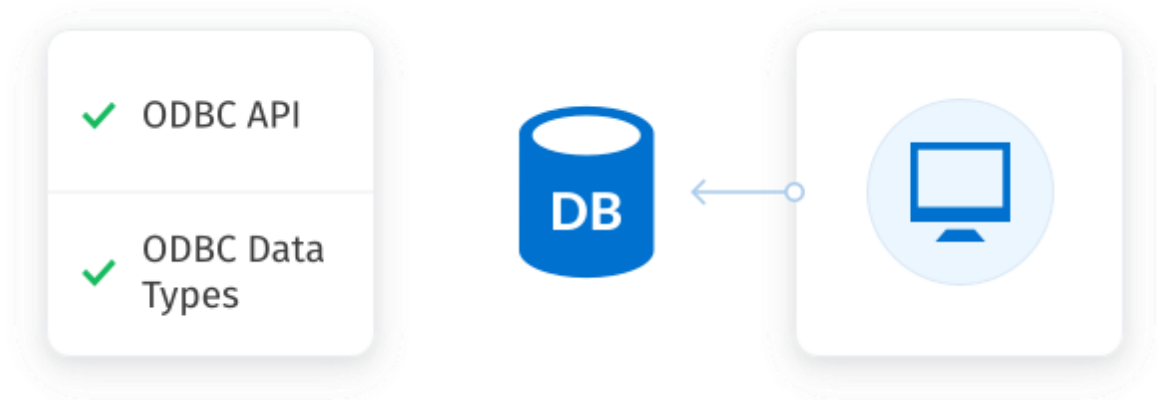
2.2 Features



Direct Connection

Database applications based on our solution get an opportunity to establish a connection to SQLite by means of native SQLite client software and directly. Direct Connection gives your applications an unrivaled advantage - connection to SQLite databases directly via TCP/IP

avoiding SQLite Client Library. That improves performance of your applications, their quality, reliability and especially the deployment process, since there is no need to supply additional client software together with your application.

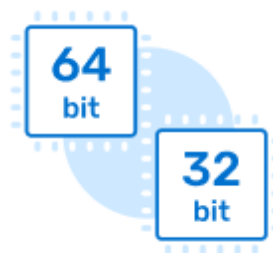


ODBC Conformance

Our ODBC driver provides full support for common ODBC interface:

- ODBC Data Types support
- ODBC API Functions support

In addition, we provide support for Advanced Connection String parameters. Thus allowing any desktop and web applications to connect to SQLite from various environments and platforms, that support ODBC.



Development Platforms Variety

ODBC Driver for SQLite doesn't limit your choice of the development platform and environment. The driver installations are available for various operational systems and

platforms. The current version supports Windows, macOS, Linux, both 32-bit and 64-bit. So you can develop both 32-bit and 64-bit cross-platform applications.



Database Compatibility

ODBC Driver for SQLite supports SQLite versions since 3.0 and higher.



High Performance

All our products are designed to help you write high-performance, lightweight data access layers, therefore they use advanced data access algorithms and techniques of optimization.



Support

Visit our [Support](#) page to get instant help from knowledgeable and experienced professionals, a quick resolution of your problems, and nightly builds with hotfixes.

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2.3 Compatibility

SQLite Compatibility

ODBC Driver for SQLite supports SQLite version 3.x.

Supported Platforms

- Windows x86 and x64 (including Windows Terminal Server)
- macOS x64 and ARM (Apple Silicon M1)
- Linux x86 and x64

Compatibility with Third-Party Tools

Application Development Tools

Adobe ColdFusion	✓
Embarcadero Delphi & C++Builder UniDAC, FireDAC, dbGo (ADO), BDE and dbExpress	✓
FileMaker	✓
Lazarus	✓
Microsoft Visual FoxPro	✓
Microsoft Visual Studio Server Explorer and ADO.NET ODBC Provider	✓
Omnis Studio	✓
PHP	✓
PowerBASIC	✓

Python	✓
--------	---

Database Management

Aqua Data Studio	✓
dbForge Studio	✓
dBeaver	✓
EMS SQL Management Studio	✓
Informatica Cloud	✓
RazorSQL	✓
SQL Server Data Tools	✓
SQL Server Management Studio	✓
SQL Server Reporting Services	✓

BI & Analytics Software

Alteryx	✓
DBExtra	✓
Dundas BI	✓
IBM SPSS Statistics	✓
MicroStrategy	✓
Power BI	✓
Qlik Sense	✓
QlikView	✓
RStudio	✓

SAP Crystal Reports	✓
SAS JMP	✓
Tableau	✓
TARGIT	✓
TIBCO Spotfire	✓

Office Software Suites

LibreOffice	✓
Microsoft Access	✓
Microsoft Excel	✓
OpenOffice	✓
StarOffice	✓

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2.4 Requirements

The following requirements must be met for ODBC Driver for SQLite:

- If you use the driver in the `client` mode, the SQLite client library must be available on your system.
- You can have only one version of ODBC Driver for SQLite installed on your system.

No additional client software is required in the `Direct` mode.

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2.6 Getting Support

This document lists several ways you can find help with using ODBC Driver for SQLite describes the Priority Support program.

Support Options

There are a number of resources for finding help on installing and using ODBC Driver for SQLite:

- You can find out more about ODBC Driver for SQLite installation or licensing by consulting [Installation](#) and [License](#) articles of this manual respectively.
- You can get community assistance and technical support on the [Community Forum](#).
- You can get advanced technical assistance by ODBC Driver for SQLite developers through the ODBC Driver for SQLite Priority Support program.

Subscriptions

The [ODBC Driver for SQLite](#) Subscription program is an annual maintenance and support service for ODBC Driver for SQLite users.

Users with a valid ODBC Driver for SQLite Subscription get the following benefits:

- Product support through the ODBC Driver for SQLite Priority Support program
- Access to new versions of ODBC Driver for SQLite when they are released
- Access to all ODBC Driver for SQLite updates and bug fixes

- Notifications about new product versions

Priority Support

ODBC Driver for SQLite Priority Support is an advanced product support service for getting expedited individual assistance with ODBC Driver for SQLite-related questions from the ODBC Driver for SQLite developers themselves. Priority Support is carried out over email and has a two business day response policy. Priority Support is available for users with an active ODBC Driver for SQLite Subscription.

To get help through the ODBC Driver for SQLite Priority Support program, please send an email to odbc@devart.com describing the problem you are having. Make sure to include the following information in your message:

Your ODBC Driver for SQLite Registration number.

- Full ODBC Driver for SQLite edition name and version number. You can find the version number in DLL version information.
- Versions of the SQLite server and client you are using.
- A detailed problem description.
- If possible, ODBC Administrator Log, scripts for creating and filling in database objects, and the application using ODBC Driver for SQLite.

If you have any questions regarding licensing or subscriptions, please see the FAQ or contact sales@devart.com

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3 Using ODBC Driver

1. [Installation](#)
2. [Product Activation](#)
3. [Connecting to SQLite](#)
4. [Connection String Options](#)
5. [Database Encryption](#)

6. [Sandboxed Apps on macOS](#)
7. [Using with iODBC](#)
8. [Enabling ODBC Tracing](#)
9. [Supported Data Types](#)
10. [Supported ODBC API Functions](#)

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3.1 Installation

ODBC Driver for SQLite currently supports the following platforms: Windows, macOS, and Linux, both 32-bit and 64-bit.

See how to install Devart ODBC Driver for SQLite :

- [Windows](#)
- [Windows Silent](#)
- [macOS](#)
- [Linux DEB](#)
- [Linux RPM](#)

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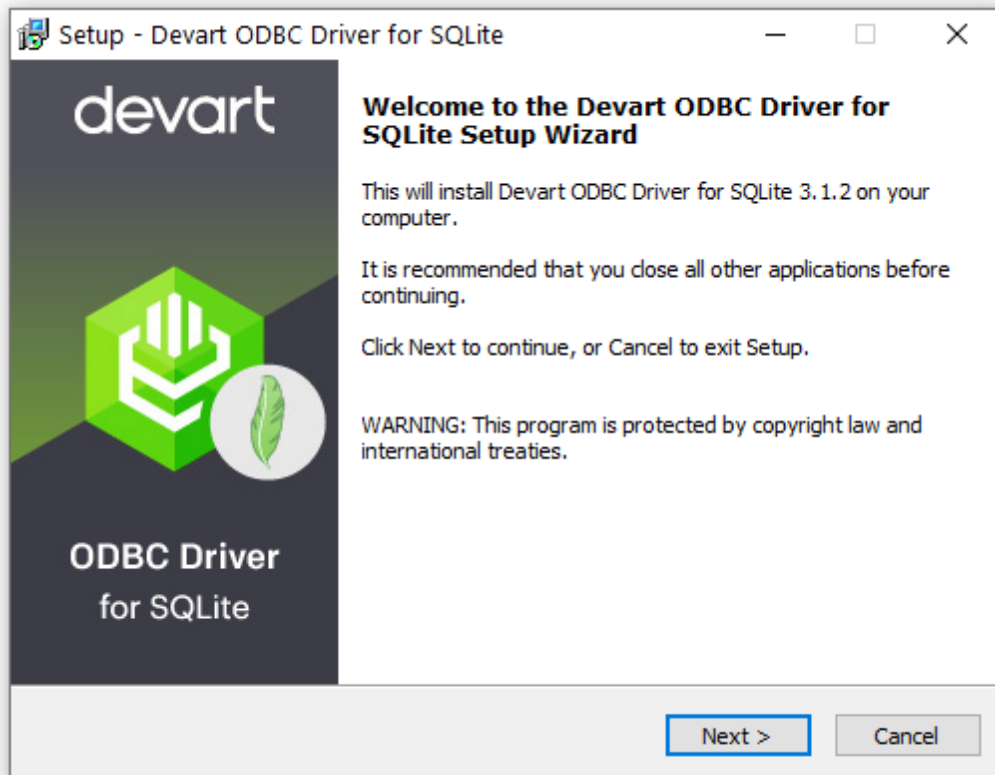
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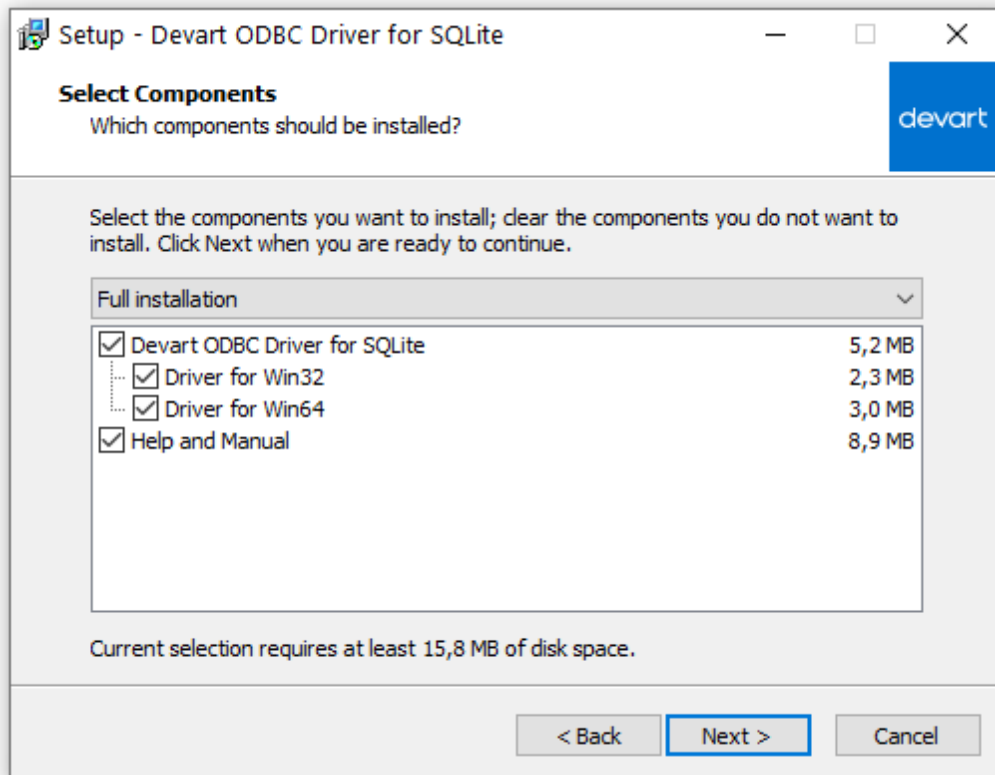
3.1.1 Windows

Installation

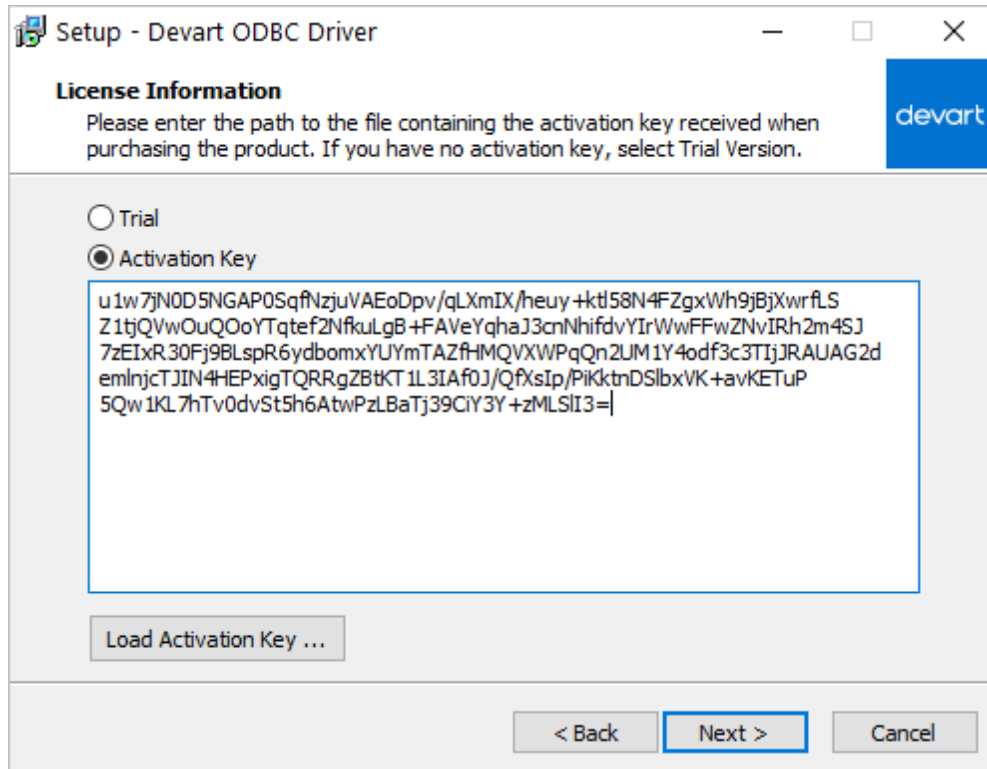
1. [Download](#) and run the installer.
2. Follow the instructions in the wizard.



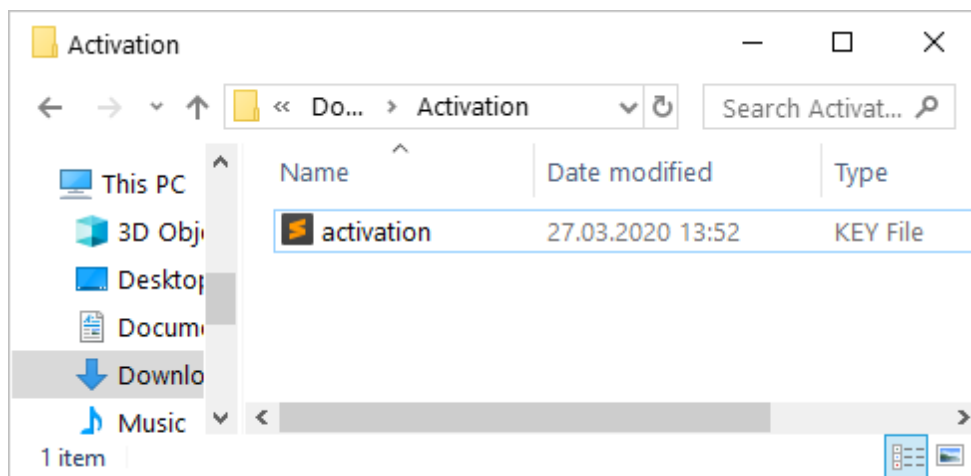
3. In case if you already have the specified installation folder on the PC or another Driver version is installed, you will get a warning. Click **Yes** to overwrite the old files with the current installation, but it is recommended to completely uninstall the previous driver version first, and then install the new one.
4. On the Select Components page you can select whether to install the **64-bit** version of the driver or not. Clear the check box if you need no 64-bit installation. There is also a check box on this page, that allows you to select whether to install Help and Manual.



5. In the License Information dialog box, you should select the license type and activate the product. If you have no activation key, you can select Trial and use the driver for evaluation purposes.
6. If you have an activation key, select the Activation Key option. Copy the activation key from the registration email or your Customer Portal account and paste it into the Activation Key edit box.



7. If you have the activation key file, click the Load Activation Key button and browse to it.



8. Click Next.

9. Click Install, then Finish.

10. After the installation is completed, you need to [configure the driver](#).

See also:

- [Installation on macOS](#)
- [Install Linux DEB package](#)
- [Install Linux RPM package](#)

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3.1.2 Windows Silent

Silent Installation with OEM license on Windows

1. Run the Command Prompt as an administrator.
2. Use the following command-lines to perform the driver silent/very silent installation:

```
DevartODBCSQLite.exe /SILENT /ActivationKey=y1c7nmgdu2341aszxcvONGurjfhxm90L
```

```
DevartODBCSQLite.exe /VERYSILENT /ActivationKey=ekhdh765mh09ukr237gfHRtri1wq
```

Note: The installation is performed by entering a license key.

```
DevartODBCSQLite.exe /SILENT /ActivationFile=d:\lic.key
```

```
DevartODBCSQLite.exe /VERYSILENT /ActivationFile=d:\lic.key
```

Note: The installation is performed by specifying the path to a license key file with any name.

When /SILENT is used, the installation progress is displayed, but no user interaction is required during installation.

When /VERYSILENT is used, the installation wizard dialog is hidden and the installation process is performed without user interference.

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3.1.3 macOS

Prerequisites

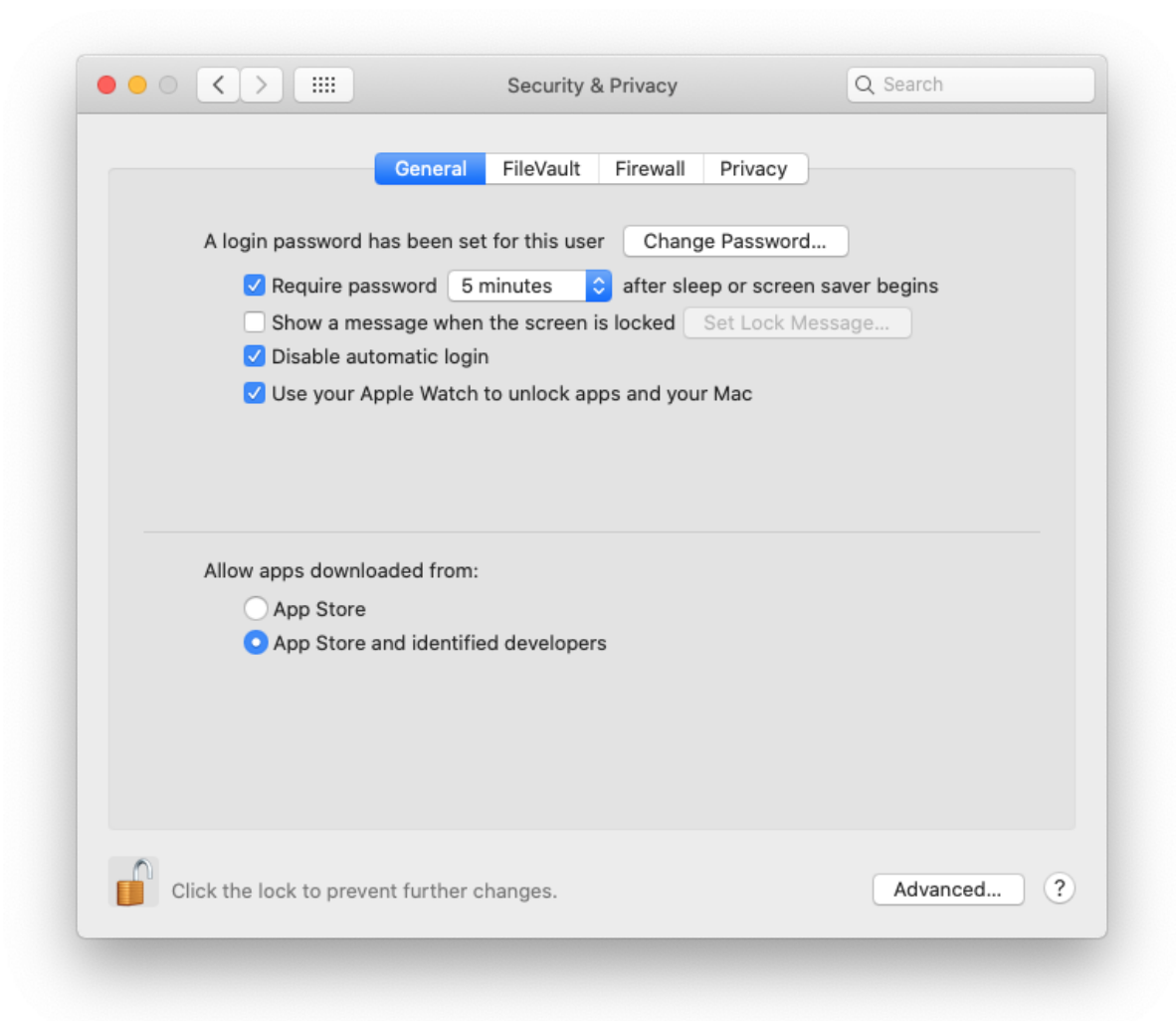
ODBC Driver for SQLite works under control of an ODBC driver manager. ODBC driver manager is not distributed along with our driver and must be installed separately.

[ODBC Driver for SQLite](#) is compatible with [iODBC](#) driver manager.

In case when using other ODBC driver managers, ODBC Driver for SQLite will be installed, but it will require manual modification of configuration files of these managers.

Installing ODBC Driver for SQLite

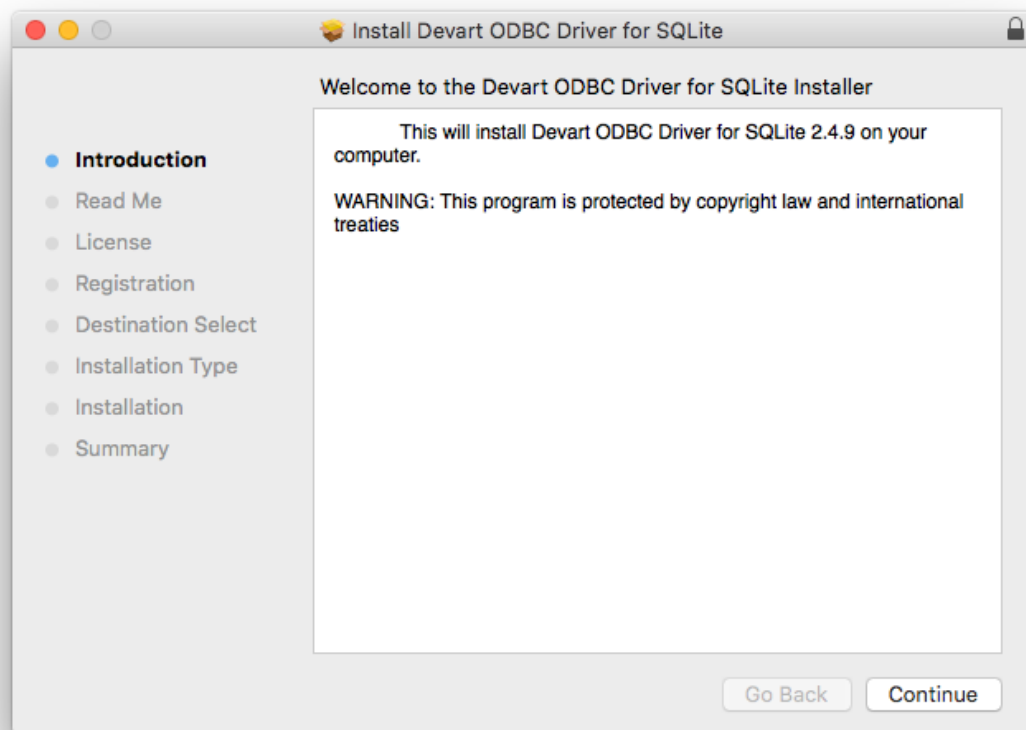
1. Go to Security & Privacy settings in the System Preferences.
2. Enable the *App Store and identified developers* option in the **Allows apps downloaded from** section.



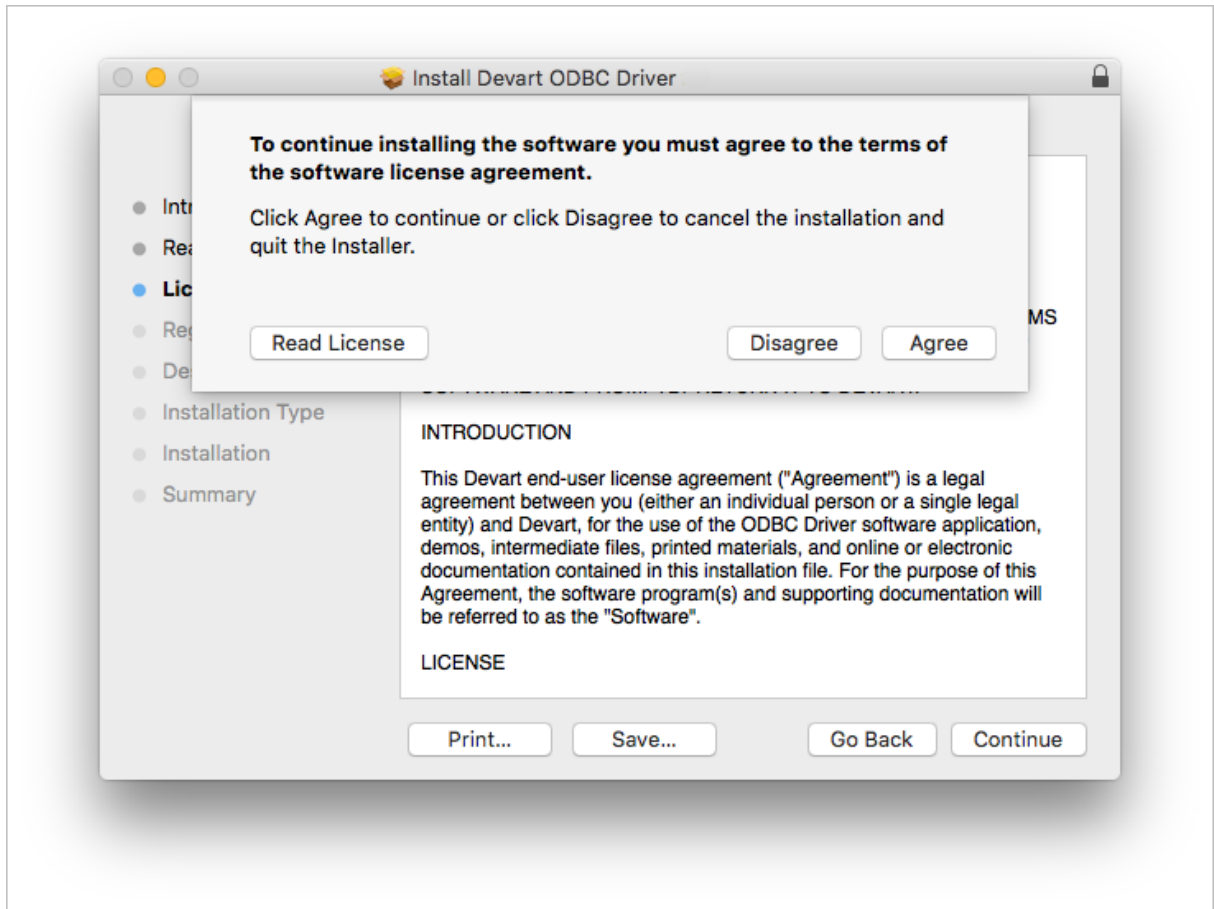
*Note: If the options in **Allow apps downloaded from** section are grayed out, click on the lock icon and enter your administrator password to proceed with the installation.*

3. [Download](#) the PKG file from the Devart website.

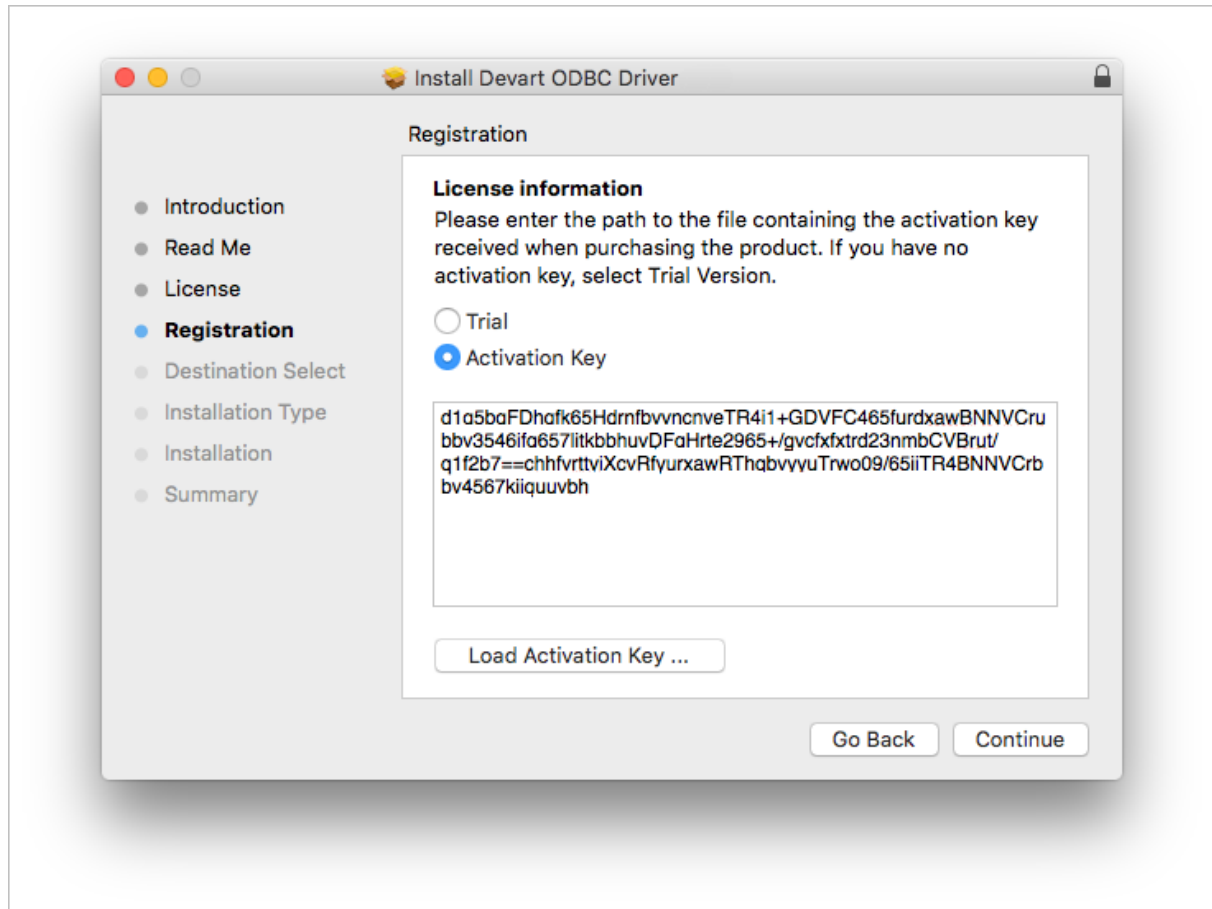
4. Run the downloaded file, press the Allow button to proceed with the installation.



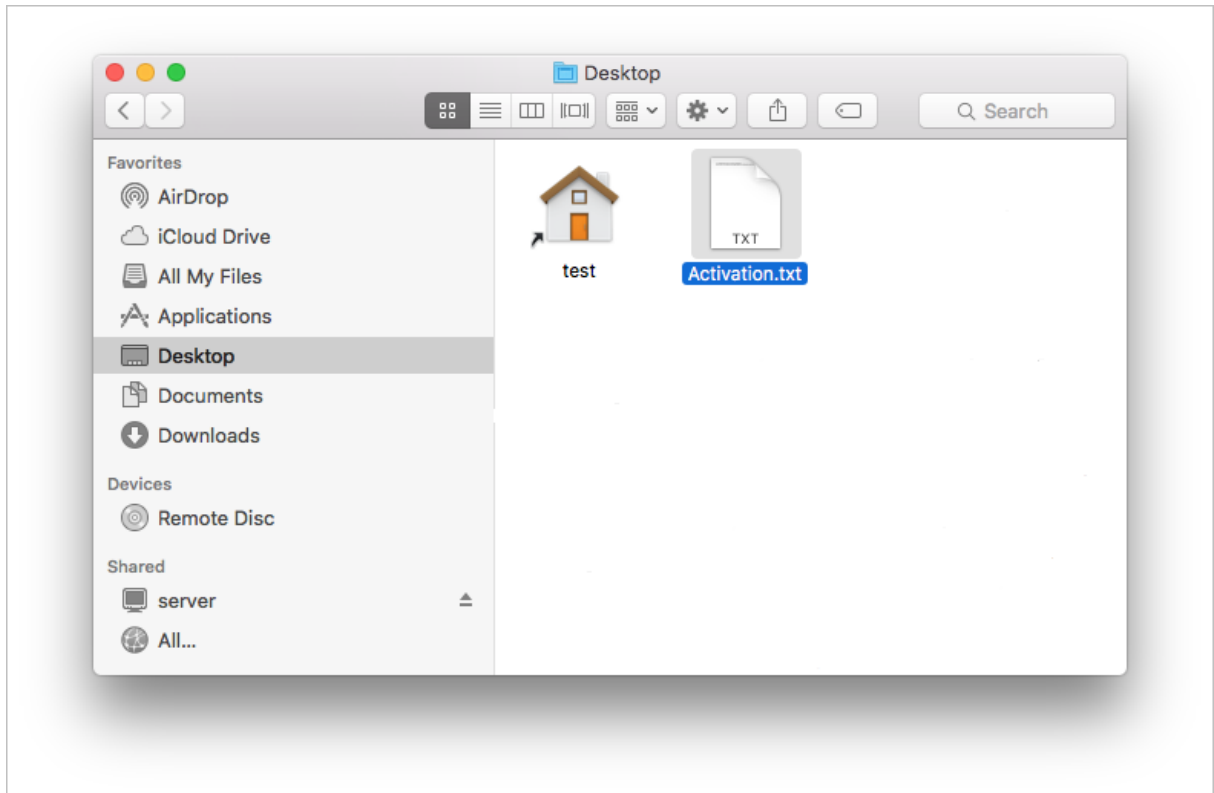
5. After reading the license agreement, click Agree.



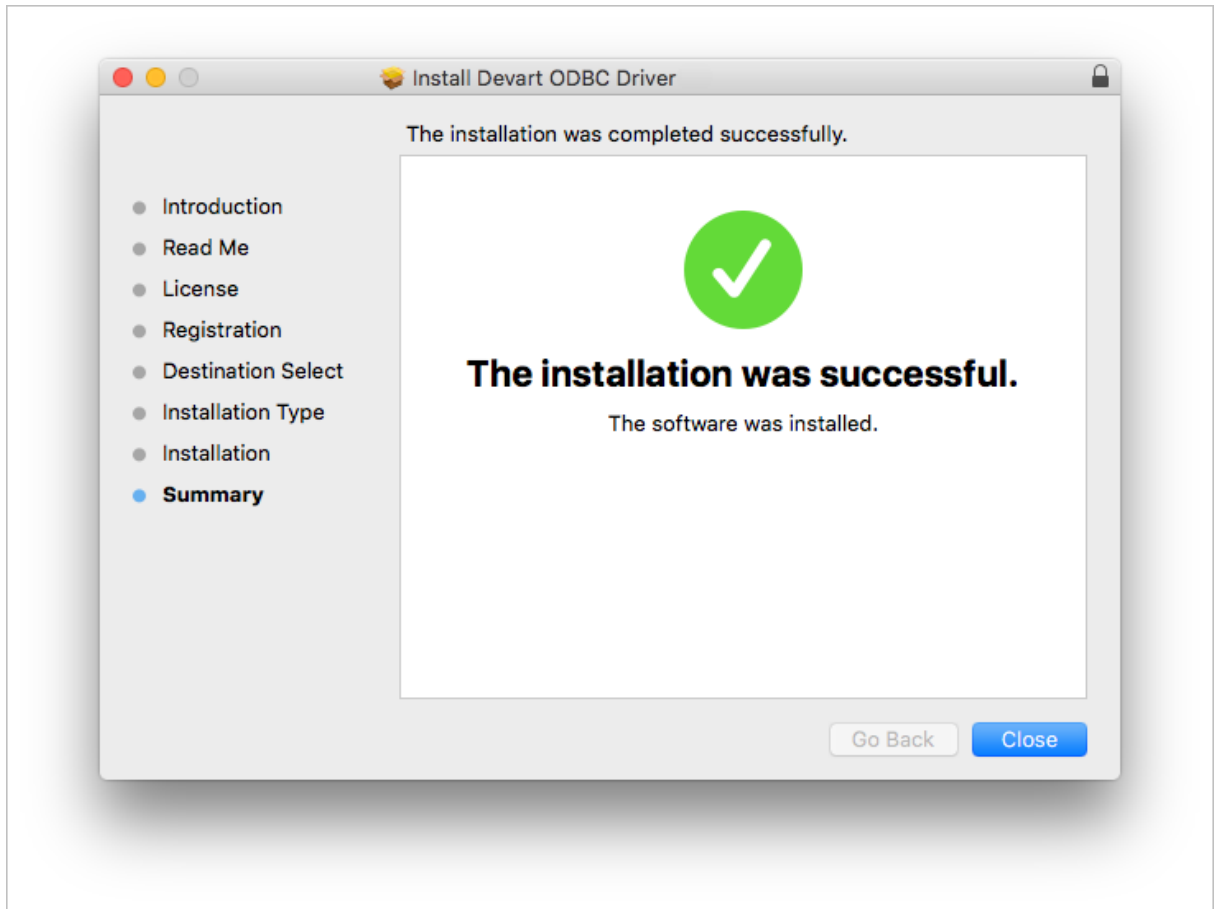
6. In the License Information dialog box, you should select the license type and activate the product. If you have no activation key, you can select Trial and use the driver for evaluation purposes.
7. If you have an activation key, select the Activation Key option. Copy the activation key from the registration email or your Customer Portal account and paste it into the Activation Key edit box.



8. If you have the activation key file, click the Load Activation Key button and browse to it.



9. To complete the installation click Continue, then Install buttons.



To activate the driver, perform the steps described in the [Product Activation](#) article.

See also:

- [Installation on Windows](#)
- [Install Linux DEB package](#)
- [Install Linux RPM package](#)

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3.1.4 Linux DEB

Prerequisites

ODBC Driver for SQLite works under control of an ODBC driver manager. ODBC driver manager is not distributed along with our driver and must be installed separately.

[ODBC Driver for SQLite](#) is compatible with [UnixODBC](#) driver manager. You can install the unixODBC driver manager using the command below:

```
sudo apt-get install odbcinst1debian2 libodbc1 odbcinst unixodbc
```

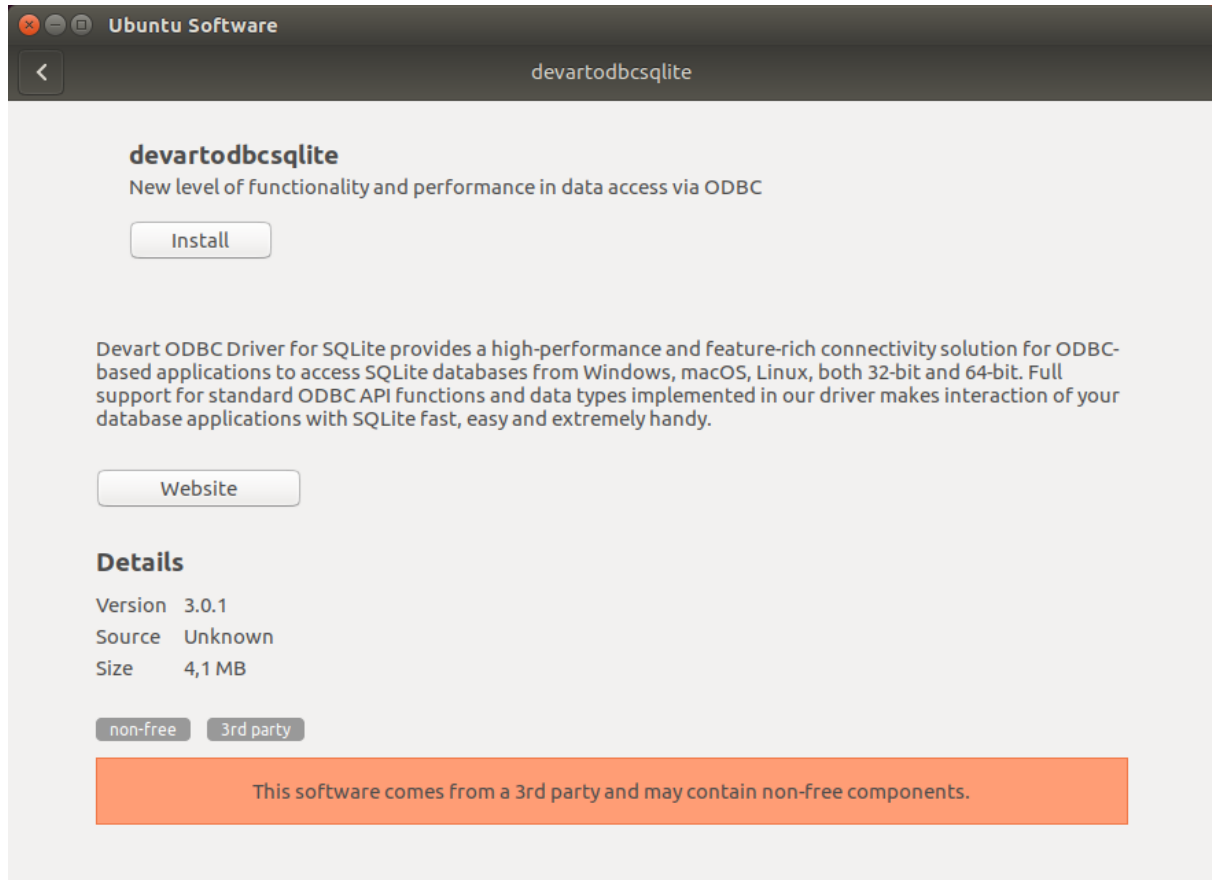
In case when using other ODBC driver managers, ODBC Driver for SQLite will be installed, but it will require manual modification of configuration files of these managers.

Installation

Let's consider how to install the Devart ODBC driver on Linux from a DEB package, for example, on Ubuntu. There are two ways to install the driver either manually or via the command line.

GUI installation

1. [Download](#) the DEB package of the required bitness from the Devart website.
2. Navigate to the folder with the downloaded package ("Downloads" by default) and double-click it.
3. In the opened dialog, click the **Install** button.



4. If the installation is successfully completed, the Install button changes into the Remove one.

Command-line installation

1. [Download](#) the DEB package from the Devart website.

By default the required package will be downloaded into the ~/Downloads folder (or the selected one);

2. Run the 'Terminal' program;
3. Navigate to the folder with the downloaded package `cd ~/Downloads` (if you downloaded the package into another folder, you need to specify the path to this folder as the `cd` command parameter):


```
cd ~/Downloads/
```

```
test@ubuntu:~$ cd ~/Downloads/  
test@ubuntu:~/Downloads$
```

4. To install the devartodbcsqlite_i386.deb on a 32-bit system, use the following command:

```
sudo dpkg -i devartodbcsqlite_i386.deb
```

```
test@ubuntu:~$ cd ~/Downloads/  
test@ubuntu:~/Downloads$ sudo dpkg -i devartodbcsqlite_i386.deb
```

5. To install the devartodbcsqlite_amd64.deb on a 64-bit system, use the following command:

```
sudo dpkg -i devartodbcsqlite_amd64.deb
```

```
test@ubuntu:~$ cd ~/Downloads/  
test@ubuntu:~/Downloads$ sudo dpkg -i devartodbcsqlite_amd64.deb
```

6. Driver is installed successfully.

```
test@ubuntu:~/Downloads$ sudo dpkg -i devartodbcsqlserver_i386.deb  
Selecting previously unselected package devartodbcsqlserver.  
(Reading database ... 238074 files and directories currently installed.)  
Preparing to unpack devartodbcsqlserver_i386.deb ...  
Unpacking devartodbcsqlserver (3.0.1) ...  
Setting up devartodbcsqlserver (3.0.1) ...  
test@ubuntu:~/Downloads$
```

To activate the driver, perform the steps described in the [Product Activation](#) article.

See also:

- [Install Linux RPM package](#)
- [Installation on Windows](#)
- [Installation on macOS](#)

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3.1.5 Linux RPM

Prerequisites

[ODBC Driver for SQLite](#) works under control of an ODBC driver manager. ODBC driver manager is not distributed along with our driver and must be installed separately.

ODBC Driver for SQLite is compatible with [UnixODBC](#) driver manager.

In case when using other ODBC driver managers, ODBC Driver for SQLite will be installed, but it will require manual modification of configuration files of these managers.

Installation

Let's consider how to install the Devart ODBC driver on Linux from an RPM package, for example, on CentOS. To install the driver, you should download the .rpm package and install it via the command line. See the detailed description of these steps below:

1. [Download](#) the RPM package from the Devart website.

By default the required package will be downloaded into the ~/Downloads folder (or the selected one);

2. Run the 'Konsole' program;

3. Navigate to the folder with the downloaded package `cd ~/Downloads` (if you downloaded the package into another folder, you need to specify the path to this folder as the `cd` command parameter):

```
cd ~/Downloads/
```

```
[test@centos7x64 ~]$ cd ~/Downloads/  
[test@centos7x64 Downloads]$ █
```

4. To install the `devart-odbc-sqlite.i386.rpm` on a 32-bit system, use the following command::

```
sudo rpm -ivh devart-odbc-sqlite.i386.rpm
```

```
[test@localhost ~]$ sudo rpm -ivh devart-odbc-sqlite.i386.rpm
```

To install the devart-odbc-sqlite.x86_64.rpm on a 64-bit system, use the following command::

```
sudo rpm -ivh devart-odbc-sqlite.x86_64.rpm
```

```
[test@centos7x64 ~]$ cd ~/Downloads/  
[test@centos7x64 Downloads]$ sudo rpm -ivh devart-odbc-sqlite.x86_64.rpm █
```

5. Driver is installed successfully.

```
[test@centos7x64 ~]$ cd ~/Downloads/  
[test@centos7x64 Downloads]$ sudo rpm -ivh devart-odbc-sqlite.x86_64.rpm  
[sudo] password for test:  
Preparing... ##### [100%]  
Updating / installing...  
  1:devart-odbc-sqlite-3.0.1-1 ##### [100%]  
[test@centos7x64 Downloads]$ █
```

To activate the driver, perform the steps described in the [Product Activation](#) article.

See also:

- [Install Linux DEB package](#)
- [Installation on Windows](#)
- [Installation on macOS](#)

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3.2 Product Activation

See how to activate Devart ODBC Driver for SQLite :

- [Obtaining Activation Key](#)

- [Activation on Windows](#)
- [Activation on macOS](#)
- [Activation on Linux](#)
- [Where to see the license information](#)

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3.2.1 Obtaining Activation Key

To obtain a product activation key, follow these instructions:

1. After purchasing the license, you receive a registration email to the email address, specified when ordering the product.
2. This email contains a Driver Activation Key and Login Credentials for the [Customer Portal](#). Keep this information secret.
3. You can copy the Activation Key either from the registration email or at the Customer Portal account.
4. To login to the Customer Portal, use your Username and Password from the registration email.
5. To obtain your Activation Key, click the View link on the right. You will get the following dialog box:



6. Copy the Activation Key with the Copy to Clipboard button.

See also:

- [Activation on Windows](#)
- [Activation on macOS](#)
- [Activation on Linux](#)

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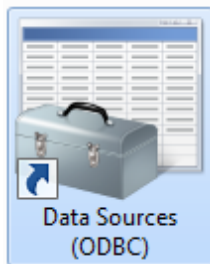
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3.2.2 Activation on Windows

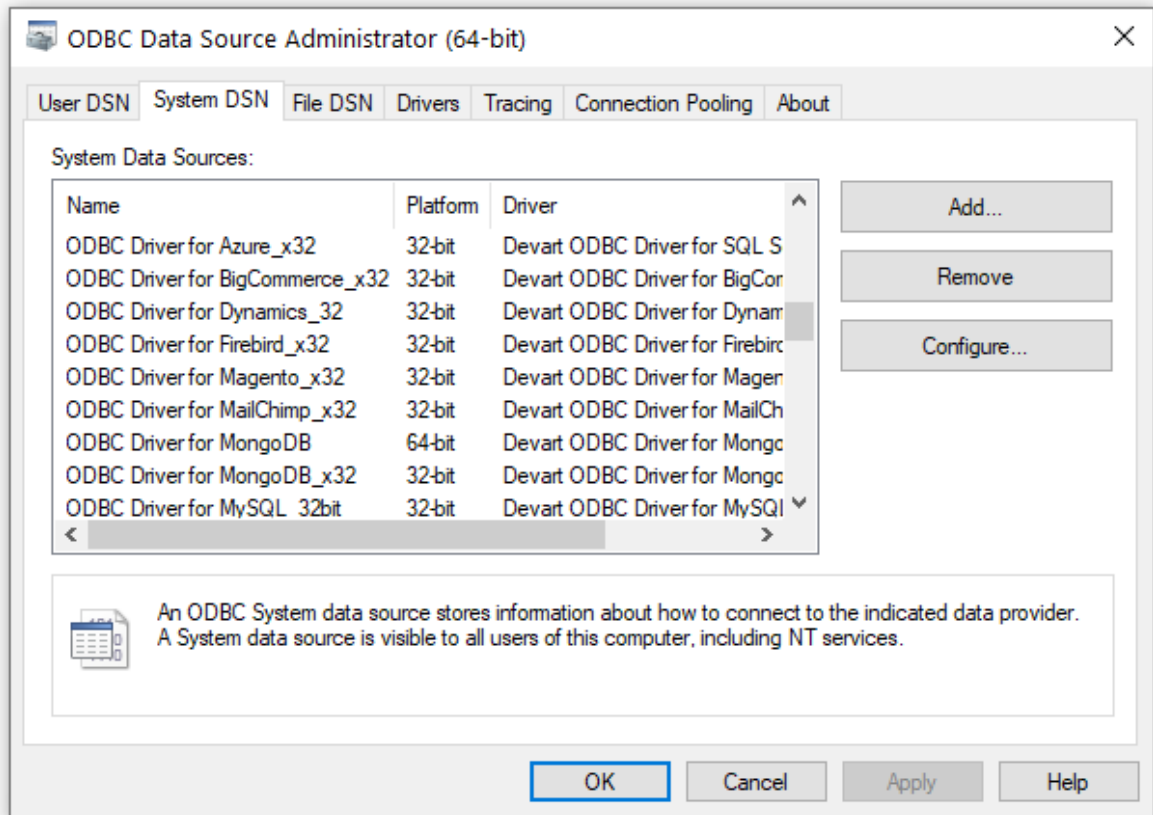
Driver Activation After Installation

To activate your installed driver using ODBC Administrator, perform the following steps:

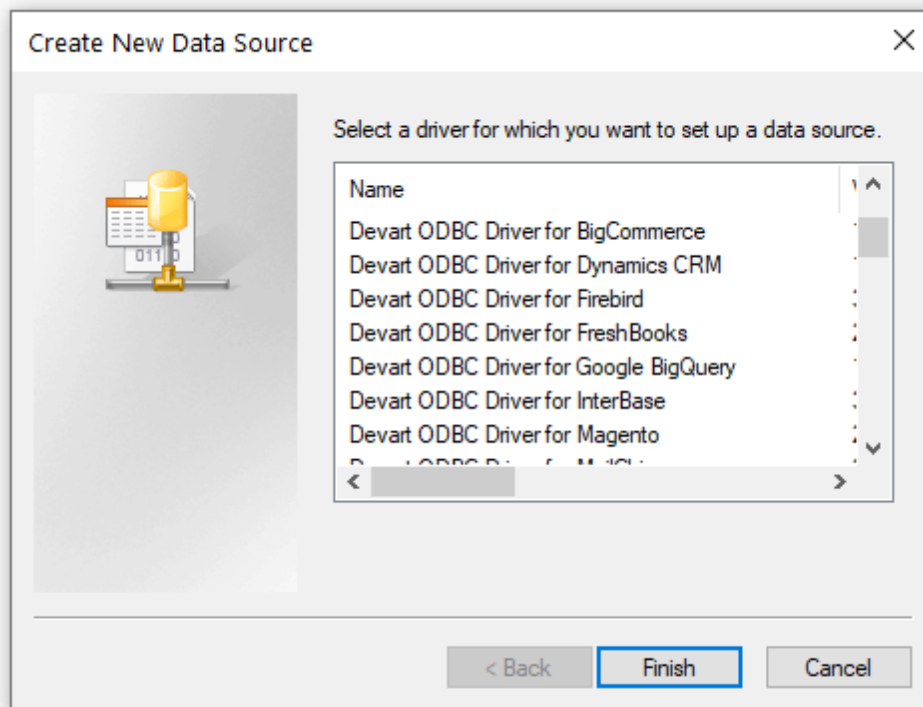
1. Run ODBC Administrator.



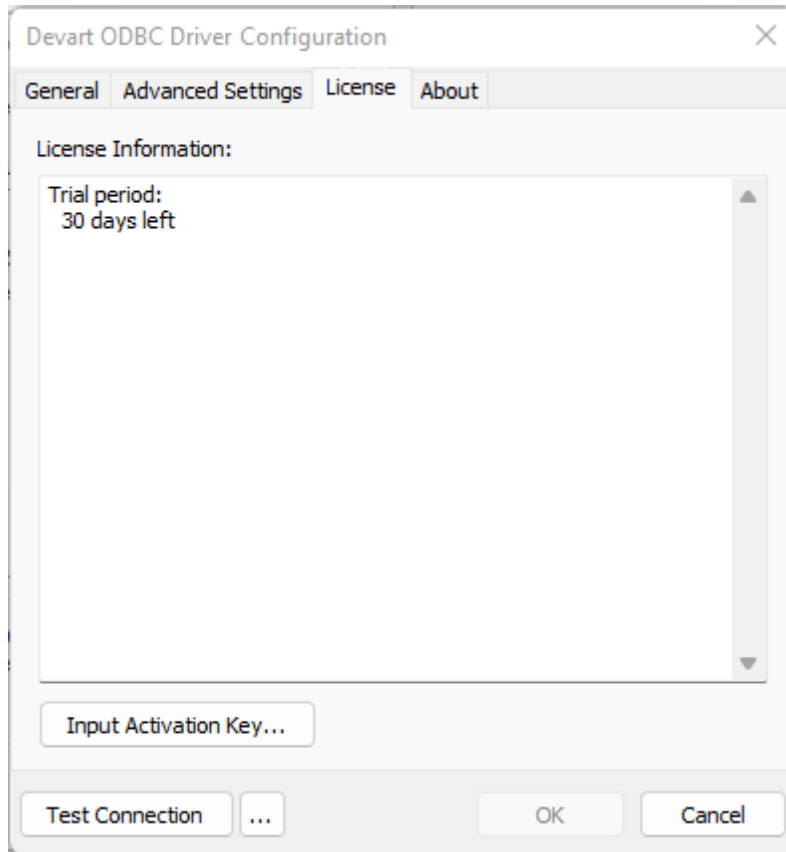
2. In the System DSN tab click the Add button.



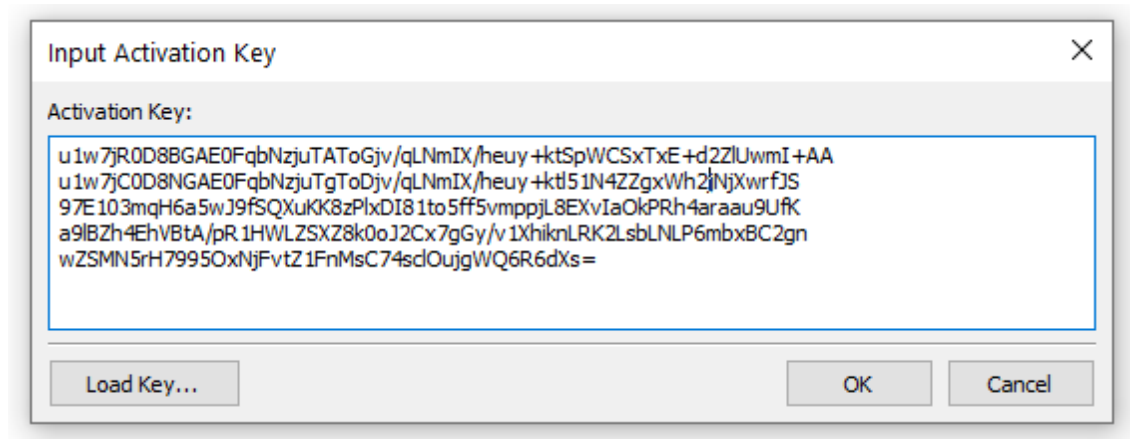
3. In the appeared dialog box, select the installed driver, click Finish.



4. In the Driver Configuration dialog box, on the License tab, click the Input Activation Key button.



5. Copy the activation key from the registration email carefully and paste it into the Input Activation Key edit box.



6. If you have the activation key file, click the Load Key button and browse to it.

7. Click OK.

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3.2.3 Activation on macOS

Driver Activation After Installation

If you don't activate your driver during installation, you can activate it later by following the steps:

1. Create a file with the "activation.key" name.
2. Copy the activation key from the registration email or your Customer Portal account and paste it into the created file.
3. Place the "activation.key" file into the folder where the driver was installed (for Devart ODBC Driver for SQLite it is /Library/ODBC/Devart/SQLite by default).

See also:

- [Activation on Windows](#)
- [Activation on Linux](#)

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3.2.4 Activation on Linux

Driver Activation After Installation

If you did not activate the driver during installation, you can activate it later:

1. Create a file with the "activation.key" name.
2. Copy the activation key from the registration email or your Customer Portal account and paste it into the created file.
3. Place the "activation.key" file into the folder where the driver was installed:

- for the DEB package of Devart ODBC Driver for SQLite, it is `/usr/share/devart/odbcsqlite` by default;

- for the RPM package of Devart ODBC Driver for SQLite, it is `/usr/local/devart/odbcsqlite` by default.

See also:

- [Activation on Windows](#)
- [Activation on macOS](#)

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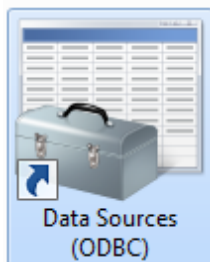
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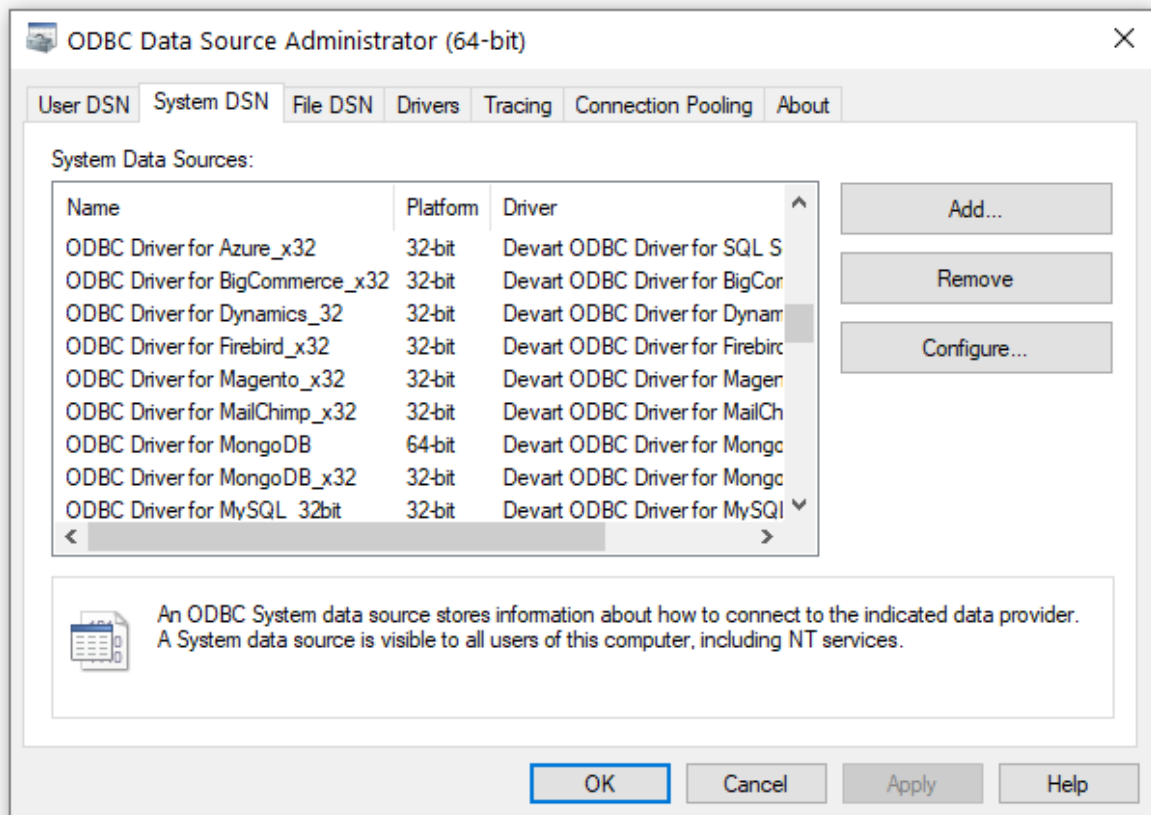
3.2.5 Where to See the License Information?

To see the license information of your installed driver, do the following:

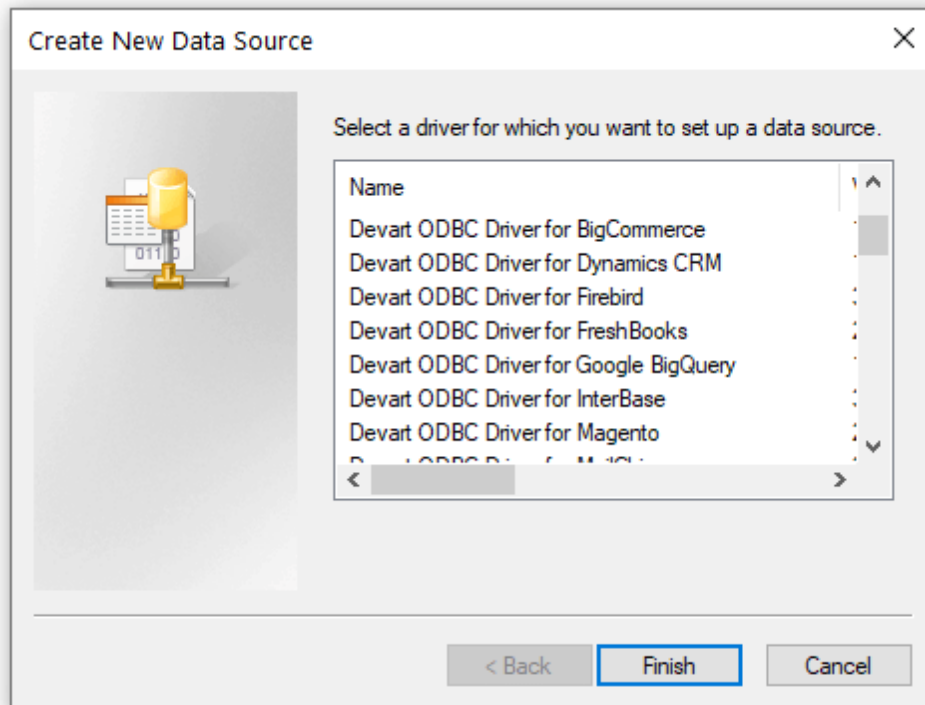
1. In the Control Panel run ODBC Administrator



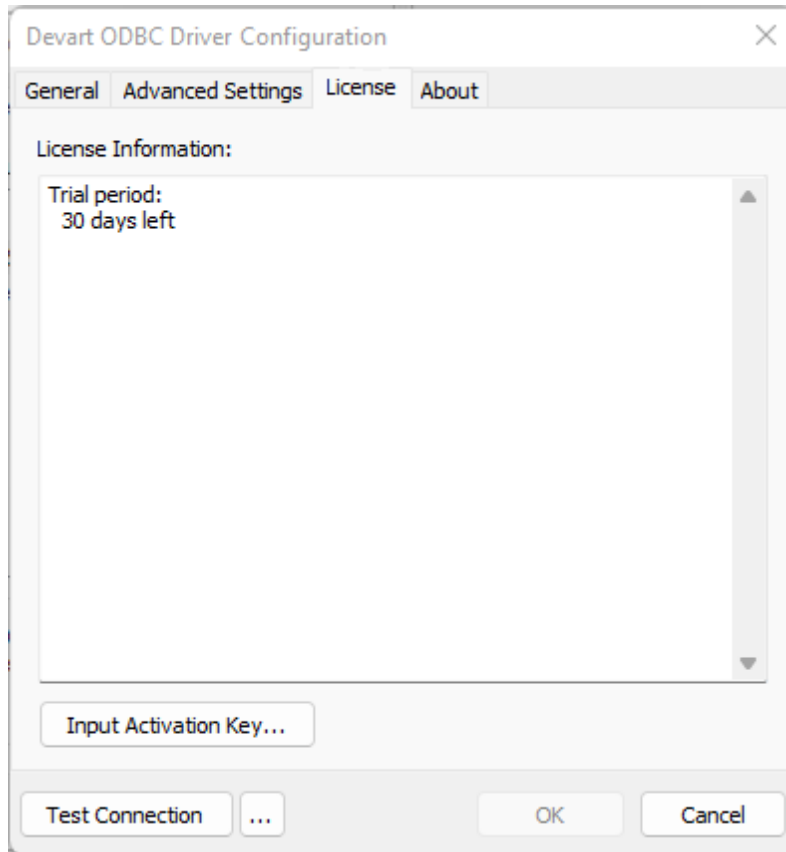
2. Open the System DSN tab and click the Add button



3. Select the driver and click Finish



4. In the appeared dialogue, select the License tab



See also

- [Product Activation](#)

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3.3 Connecting to SQLite

See how to connect the Devart ODBC Driver for ODBC Driver for SQLite:

- [Windows DSN Configuration](#)
- [macOS DSN Configuration](#)
- [Linux DSN Configuration](#)

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3.3.1 Windows

Windows DSN Configuration

After installing the driver, create a DSN for SQLite in the ODBC Data Source Administrator.

1. Open the ODBC Data Source Administrator.

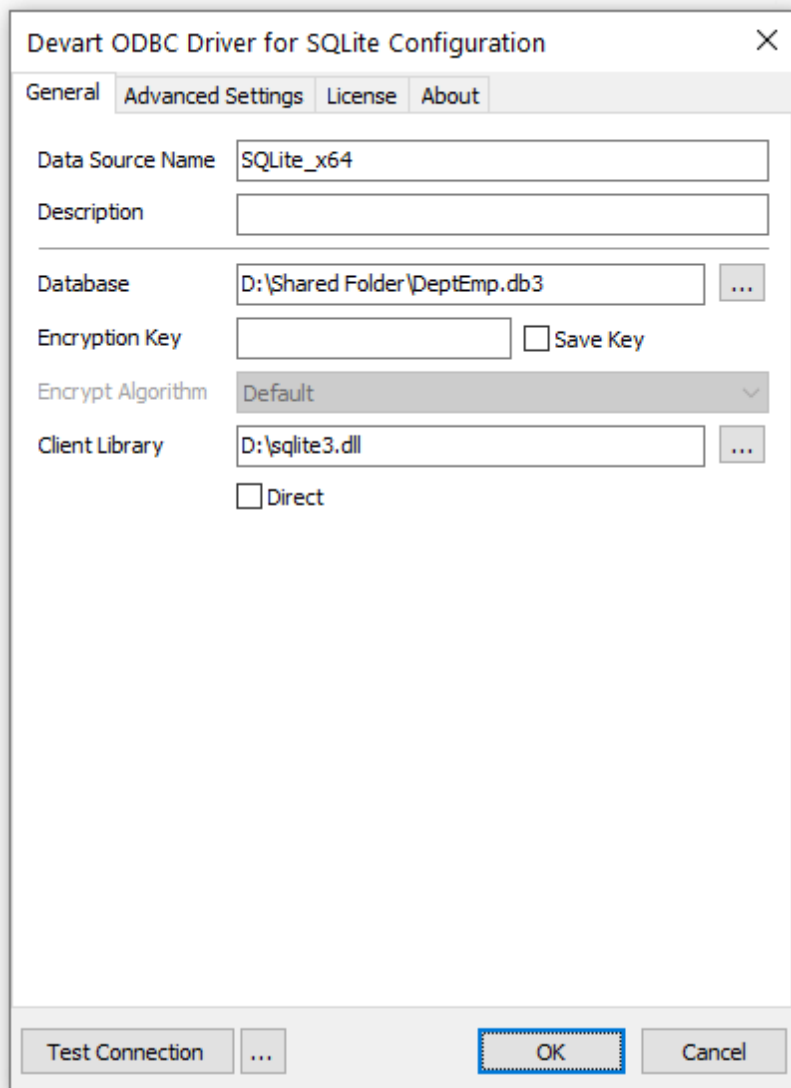
- Type `ODBC Data Sources` in the Windows search box and choose the application that matches the bitness of the third-party application (32-bit or 64-bit). You can also open **ODBC Data Sources** from **Control Panel > Administrative Tools**. Note that before Windows 8, the icon was named **Data Sources (ODBC)**.
- Alternatively, you can run `C:\Windows\SysWOW64\odbcad32.exe` to create a 32-bit DSN or `C:\Windows\System32\odbcad32.exe` to create a 64-bit DSN.

2. Select the **User DSN** or **System DSN** tab. Most applications work with both types, yet some applications require a specific type of DSN.

3. Click **Add**. The **Create New Data Source** dialog will appear.

4. Select **Devart ODBC Driver for ODBC Driver for SQLite** and click **Finish**. The driver setup dialog will open.

5. Enter the connection information in the appropriate fields.



6. You may test the connectivity by clicking **Test Connection**.

7. Click **OK** to save the DSN.

See Also

[Connection Options](#)

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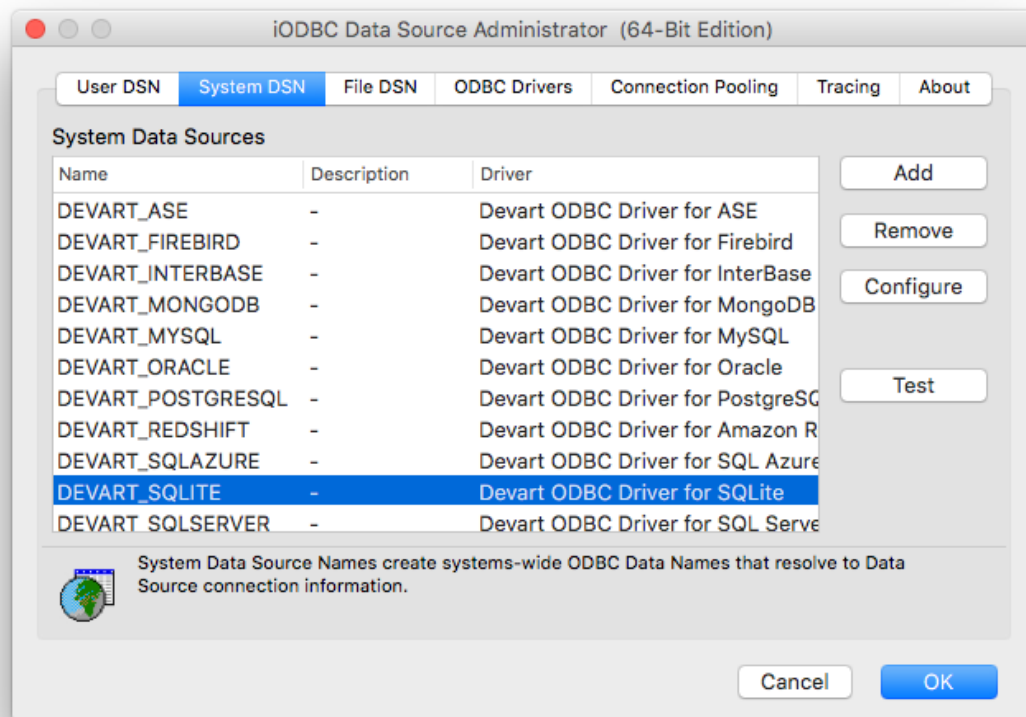
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3.3.2 Mac

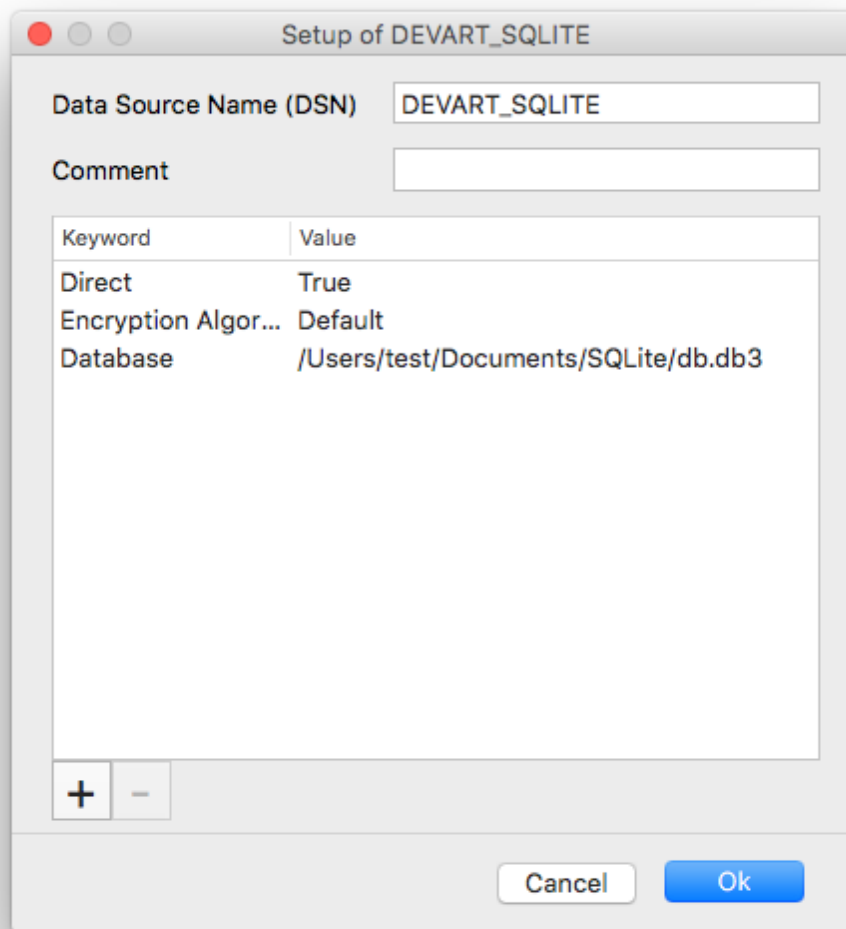
macOS DSN Configuration

After the driver is [installed](#), DSN with the name DEVART_SQLITE is created. You can use it to test a [connection with SQLite](#) database. For this, perform the following steps:

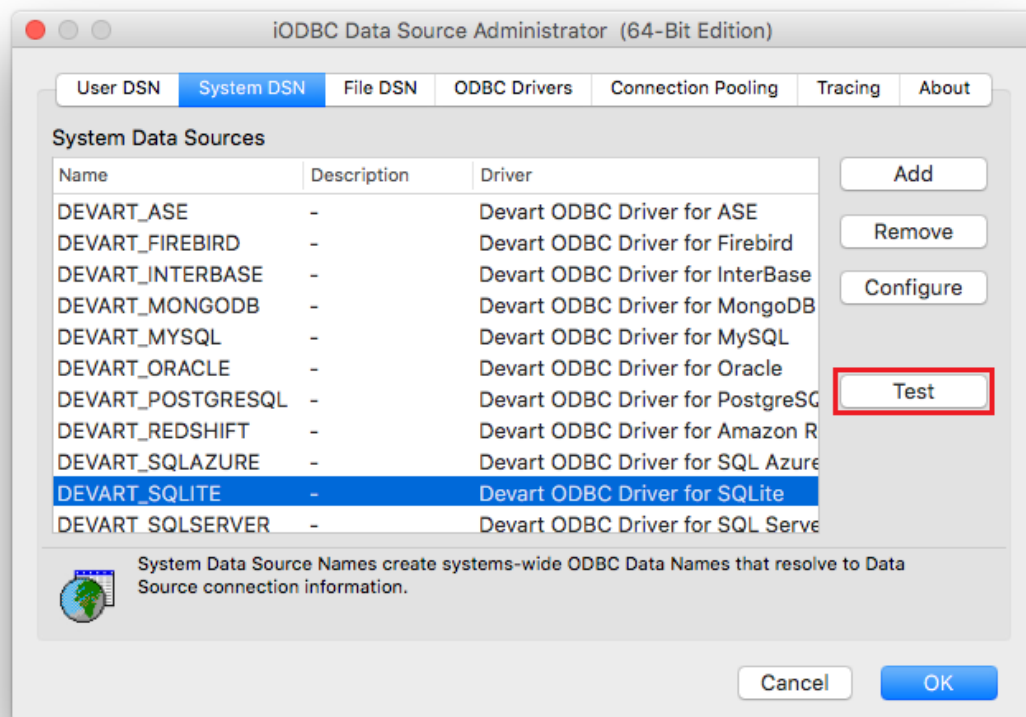
1. Run the iODBC utility of the required bitness. Find the DEVART_SQLITE section and click the Configure button:



2. In the appeared dialog, specify the required connection settings and click OK.



3. Now click the Test button to establish a test connection to your data source.



Using Client Library with SIP enabled

When SIP is enabled on your machine, put the client library file in either of these directories and specify the path to the client library in the **Client Library** connection parameter.

- /Applications
- /Library
- /usr/local

If you place the client library in either of the following directories when SIP is enabled, the driver will not be able to access the library due to protection for these parts of the system by SIP.

- /System
- /usr

- /bin
- /sbin
- /var
- Apps that are pre-installed with OS X

If you would like to disable SIP on your system, follow the instructions. Read more about System Integrity Protection in macOS [documentation](#).

See Also

[Connection Options](#)

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3.3.3 Linux

Linux DSN Configuration

After the linux ([DEB](#) or [RPM](#)) driver is installed, a DSN with the name DEVART_SQLITE is created. You can use it to test the [connection with the SQLITE](#) database. For this, perform the following steps:

1. Open the odbc.ini file located in the /etc folder. Find the DEVART_SQLITE section and specify the required connection settings:

```
Database=<your SQLite database name>
```

2. Run the UnixODBC Test Command utility and test a connection using the following command:

```
isql -v DEVART_SQLITE
```

```
test@ubuntu:~$ isql -v DEVART_SQLITE
+-----+
| Connected!
|
| sql-statement
| help [tablename]
| quit
|
+-----+
SQL>
```

See Also

[Connection Options](#)

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3.4 Connection String Options

SQLite ODBC Connection String Options

The following table lists the connection string options for SQLite.

Option	Description
ClientLibrary	The path to the SQLite3 client library.
Database	The path to the SQLite database file.
Direct	Enables direct connections to the database, which doesn't require the SQLite client library.
EncryptionA	The encryption algorithm to be used when connecting to an encrypted

Algorithm	<p>database. The value can be one of the following:</p> <ul style="list-style-type: none"> • Triple DES • Blowfish • AES128 • AES192 • AES256 • Cast128 • RC4
EncryptionKey	The encryption key to be used when connecting to an encrypted database.

Advanced Settings

Option	Description
Allow NULL strings	To retrieve metadata, not all parameters according to MSDN can accept a null value. If NULL, the driver should return an error. But some 3rd-party tools pass NULL to the parameters. These options should be enabled for compatibility with such tools.
Empty strings as NULL	
Busy Timeout	Sets the busy timeout duration in milliseconds, or disables busy handlers. A busy handler will sleep for a specified amount of time when a table is locked. After the specified time has elapsed, an exception is raised. Setting the timeout to 0 will disable all busy handlers. The default value is 15.
Cipher License	The SQLCipher license key for the SQLCipher Commercial Edition library for encrypting the SQLite database files. Note that this option is not available in the Direct mode.
ConnectMode	<p>The connection mode. Default</p> <p>The default value. Opens the database in the default mode.</p>

	<p>ReadWrite Opens the database for reading and writing.</p> <p>ReadOnly Opens the database in read-only mode.</p>
Enable Shared Cache	Enables multiple connections to the same database to share a single data and schema cache. The shared-cache mode is intended for use in embedded servers. The default value is True.
Integer As BigInt	If True, INTEGER fields are mapped to SQL_BIGINT. The default value is False.
ForceCreate Database	If the database does not exist, a new database will be created before opening a connection.
Journal Mode	<p>The journal mode.</p> <p>Delete The rollback journal is deleted at the conclusion of each transaction.</p> <p>Truncate The rollback journal is stored in volatile RAM. It reduces disk I/O, but decreases database safety and integrity. If the application using SQLite crashes in the middle of a transaction, the database file may become corrupt.</p> <p>Persist The rollback journal file is not deleted when the transaction is committed. The header of the journal is filled with zeroes to prevent other connections rolling back from the journal. This mode optimizes performance on platforms where deleting or truncating a file is much more expensive than overwriting the first block of a file with zeros.</p> <p>Memory The rollback journal is stored in volatile RAM. This reduces the disk I/O, but decreases database safety and integrity. If the application using SQLite crashes in the middle of a transaction in this mode, the database file is likely to become corrupt.</p>

	<p>WAL</p> <p>A write-ahead log is used instead of a rollback journal to implement transactions. When data database is updated, the original content is preserved in the database file and the changes are appended in a separate WAL file. All the transactions that are appended in the WAL file are eventually transferred back into the original database.</p> <p>Off</p> <p>The rollback journal is completely disabled. No rollback journal is created, thus there is no rollback journal to delete. The ROLLBACK command does not work — it behaves in an undefined way. Avoid using the ROLLBACK command when the journal mode is disabled.</p> <p>Default</p> <p>The default value. If the database was previously opened in the WAL mode, then Default will open the database in the WAL mode; otherwise, the database will be opened in the Delete mode.</p>
Locking Mode	<p>The database locking mode.</p> <p>Exclusive</p> <p>The default value. The database connection never releases file locks. The first time the database is read or written in this mode, a shared lock is obtained and held. Use this mode if you want to prevent other processes from accessing the database file, reduce the number of filesystem operations, or access WAL databases without using the shared memory.</p> <p>Normal</p> <p>The database connection unlocks the database file at the conclusion of each read or write transaction.</p>
ODBC Behavior	<p>Used to set the behavior corresponding to the ODBC specification version that a third-party tool expects. The behavior of ODBC driver can be changed by setting a value for the SQL_ATTR_ODBC_VERSION attribute by calling the SQLSetEnvAttr function. But some third-party tools expect the driver to exhibit ODBC 2.x behavior, but forget to call</p>

	<p>SQLSetEnvAttr with the specified version or pass an incorrect value there. In this case, the required behavior can be explicitly specified in the Connection String by setting the ODBC Behavior parameter. The possible values are:</p> <ul style="list-style-type: none"> • Default - default ODBC behavior determined by a third-party tool. • Ver 2.x - ODBC 2.x behavior is explicitly set. • Ver 3.x - ODBC 3.x behavior is explicitly set.
RegionalDateTimeSettings	Enables the use of local regional settings when converting dates and times to strings.
RegionalNumberSettings	Enables the use of local regional settings when converting numbers to strings.
String Types	<p>Sets the string value types returned by the driver as Default, Ansi or Unicode.</p> <ul style="list-style-type: none"> • Default - the driver defines the string types. • Ansi - all string types will be returned as SQL_CHAR, SQL_VARCHAR and SQL_LONGVARCHAR. • Unicode - all string types will be returned as SQL_WCHAR, SQL_WVARCHAR and SQL_WLONGVARCHAR. <p>The option value should be changed if any third-party tool supports only Ansi string types or Unicode ones.</p>
Synchronous	<p>The database synchronization mode when writing to disk. Off</p> <p>The default mode. The database engine continues without syncing after handing data off to the operating system. If the application running SQLite crashes, the data will safe, unless the operating system crashes or the computer loses power before data has been written to disk, in which case the database might become corrupted. This is the fastest mode.</p>

	<p>Normal</p> <p>The database engine still syncs at the most critical moments, but less often than in the FULL mode. The Normal mode is faster than the Full mode. When using the WAL mode (and probably the DELETE mode) with synchronous=NORMAL, data is safe from corruption. The synchronous=NORMAL setting is a reasonable choice for most applications running in the WAL mode.</p> <p>Full</p> <p>The database engine ensures that all content is safely written to disk before continuing. This preserves database integrity even in case of an operating system failure or power outage. It is a safe, but slower mode, and is most commonly used when not in the WAL mode.</p> <p>Extra</p> <p>This mode is similar to the FULL mode, but in the DELETE mode, the directory containing the rollback journal is synced after that journal is unlinked to commit a transaction. This provides additional durability if a power outage occurs right after the commit.</p>
UnknownAsString	<p>If False, fields of unknown data types (for example, the ifnull function result) are mapped to SQL_LONGVARCHAR. SQL_LONGVARCHAR is used because maximum length of values from such fields is unknown. If True, fields of unknown data types are mapped to SQL_VARCHAR. Size of fields is set to 8192. Values larger than this size are truncated. The default value is False.</p>

Sample SQLite ODBC Connection String in Direct Mode

```
DRIVER={Devart ODBC Driver for SQLite};Database=D:\test.db3
```

Sample SQLite ODBC Connection String Using Client Library

```
DRIVER={Devart ODBC Driver for SQLite}; Direct=False; Database=D:
```

```
\test.db3; Client Library=D:\SQLite3.dll
```

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3.5 Database Encryption

How SQLite Database Encryption Works

The SQLite database engine provides the ability to work with encrypted databases. The SQLite client library performs low-level encryption and decryption on the fly: database files are encrypted or decrypted during read/write operations. These operations are completely transparent to the applications accessing the database. However, the official SQLite client library doesn't support encrypting database files by default. Instead, you need to use a custom version of SQLite with encryption extensions.

Database Encryption with ODBC Driver for SQLite

Devart ODBC Driver for SQLite provides built-in encryption capabilities in the `Direct` mode, which allows you to:

- [encrypt a database](#);
- [connect to an encrypted database](#);
- [change the encryption key of a database](#);
- [decrypt a database](#).



Note: There're no standard requirements defined for implementing database encryption for SQLite. Thus, the implementation of database encryption in Devart ODBC Driver for SQLite is only compatible with other Devart products, such as [LiteDAC](#) and [UniDAC](#). Devart ODBC Driver for SQLite can only work with databases that were encrypted by the driver itself, [LiteDAC](#), or [UniDAC](#).

Encrypting a Database

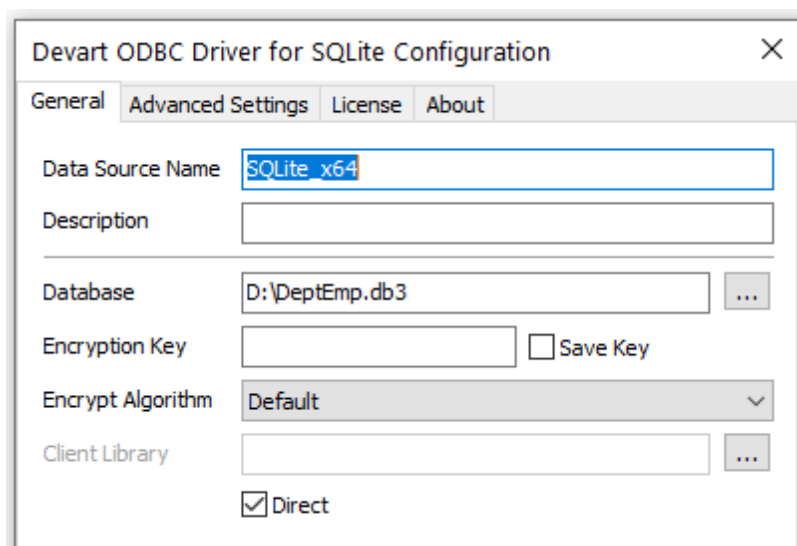
The `PRAGMA ENCRYPTION` statement specifies the encryption algorithm that will be used to encrypt an unencrypted database. It can't be used on a database encrypted with a different

encryption algorithm. The statement can be run with one of the following values: TripleDES, Blowfish, AES128, AES192, AES256, Cast128, or RC4.

The `PRAGMA REKEY` statement is used to encrypt an unencrypted database, change the encryption key of an encrypted database, or decrypt a database.

The `PRAGMA` statements can be executed using any database tool with Devart ODBC Driver for SQLite after connecting to the database in the `Direct` mode. To enable this mode, select the corresponding checkbox in the DSN settings, or set the `Direct` parameter to `True` in the connection string:

```
DRIVER=Devart ODBC Driver for SQLite;Direct=True;Database=D:\DeptEmp.db3
```



Execute the statements to encrypt the database, for example:

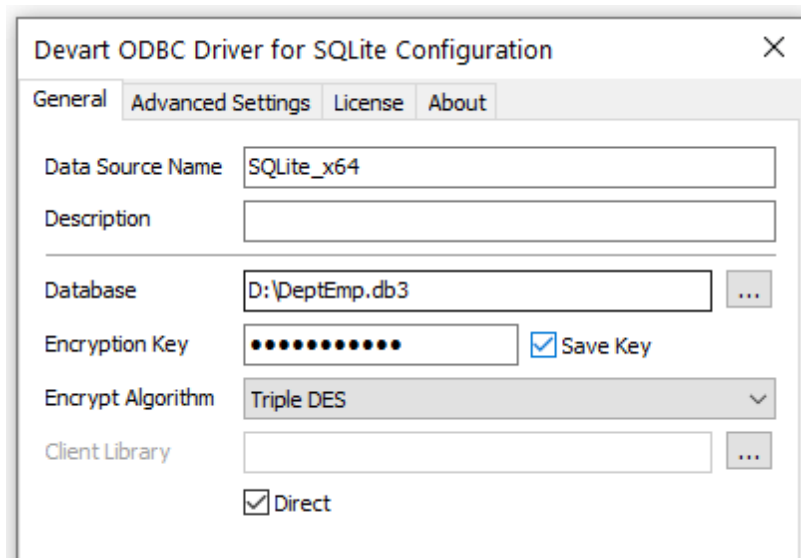
```
PRAGMA ENCRYPTION=TripleDES;
```

```
PRAGMA REKEY='mynewkey';
```

Connecting to an Encrypted Database

To connect to an encrypted database, enable the `Direct` mode and specify the `Encryption Algorithm` and `Encryption Key` in the DSN settings or in the connection string, for example:

```
DRIVER=Devart ODBC Driver for SQLite;Direct=True;Database=D:\DeptEmp.db3;Enc
```



Changing the Encryption Key of a Database

To change the encryption key of a database, connect to the database and execute the `PRAGMA REKEY` statement with a new encryption key:

```
PRAGMA REKEY='mynewkey';
```

Decrypting a Database

To decrypt a database, connect to the database and execute the `PRAGMA REKEY` statement with an empty value:

```
PRAGMA REKEY='';
```

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3.6 Sandboxed Apps on macOS

Sandboxed Apps on macOS

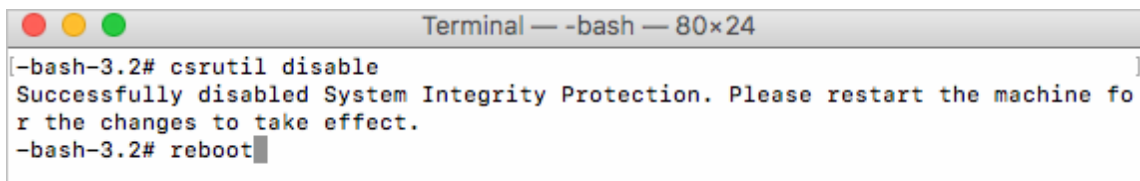
Sandboxed applications don't have permission to access iODBC Driver Manager on macOS. This is caused by the System Integrity Protection (SIP) technology on macOS which protects your files and folders from potentially malicious software by locking the application. When accessing a data source from an application like Excel through the [ODBC driver for SQLite](#), you may get an error message saying that the driver is unable to create a file.

Note that all third-party applications distributed through the Mac App Store are sandboxed. If you access SQLite from Excel, place the database files in the `/Users/<username>/Library/Containers/com.microsoft.Excel/Data/Documents/` directory.

Disabling System Integration Protection (SIP) on macOS

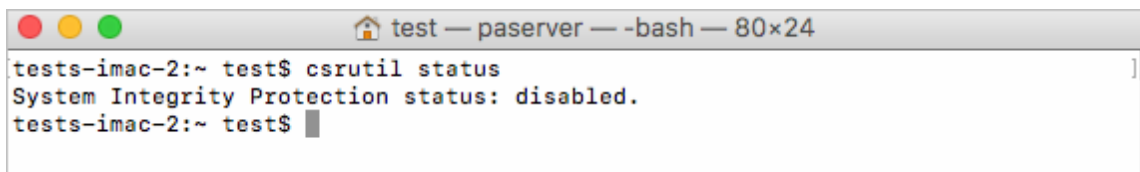
To resolve the issue, you should turn off SIP on your computer:

1. Restart your computer in **Recovery mode** (hold down **Command + R** until you see the Apple logo).
2. Select **Utilities > Terminal**.
3. In the Terminal window, enter `csrutil disable`.



```
Terminal — -bash — 80x24
[-bash-3.2# csrutil disable
Successfully disabled System Integrity Protection. Please restart the machine fo
r the changes to take effect.
-bash-3.2# reboot]
```

4. Restart your computer.
5. Enter `csrutil status` to check the status of SIP.



```
test — paserver — -bash — 80x24
tests-imac-2:~ test$ csrutil status
System Integrity Protection status: disabled.
tests-imac-2:~ test$
```

Enable SIP after you finish working with an ODBC data source. To turn on SIP, enter `csrutil enable` and restart your computer.

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3.7 Using with iODBC

Using the Driver with iODBC

Among known issues with iODBC driver manager is incorrect handling of the following ODBC

data types:

- SQL_WCHAR
- SQL_WVARCHAR
- SQL_WLONGVARCHAR

For this reason, we recommend using the following data types instead:

- SQL_CHAR
- SQL_VARCHAR
- SQL_LONGVARCHAR

If you have to work with the SQL_WCHAR, SQL_WVARCHAR, and SQL_WLONGVARCHAR data types, we recommend that you use the unixODBC driver manager rather than iODBC.

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3.8 Enabling ODBC Tracing

Creating an ODBC Trace Log on Windows

When you start or stop tracing in the 64-bit ODBC Administrator, the tracing is also enabled or disabled in the 32-bit ODBC Administrator, and vice versa.

If the ODBC client application you need to trace runs under Local System account or any other user login than your own, select `Machine-Wide tracing for all user identities`. For example, this option may be necessary for SSMS.

To generate a trace file using ODBC Source Administrator on Windows, follow the steps below.

1. Type `ODBC Data Sources` in the Windows 10 search box (in earlier versions of Windows, open `Control Panel > Administrative Tools`) and choose the application of the needed bitness.
2. Select the `Tracing` tab.
3. If necessary, change the default `Log File Path`. Make sure that the path is writable by the

application, then click `Apply`.

4. Click `Start Tracing Now`.
5. Restart all application processes.
6. Click `Test Connection` in the DSN settings to make sure the driver is able to connect.
7. Reproduce the issue.
8. Click `Stop Tracing Now` on the `Tracing` tab.
9. Send us the obtained log file (for example, `devart.log`).

Creating an ODBC Trace Log on macOS

To enable the trace option on macOS, use the `Tracing` tab within ODBC Administrator.

1. Open the ODBC Administrator.
2. Select the `Tracing` tab.
3. If necessary, change the default `Log file path`.
4. Select `All the time` in the `When to trace` option.

Creating an ODBC Trace Log on Linux

To trace the ODBC calls on Linux, set the `Trace` and `TraceFile` keyword/value pairs in the `[ODBC]` section of the `/etc/odbcinst.ini` file, for example:

```
[ODBC]
Trace=Yes
TraceFile=/home/test/devart.log
```

Make sure to disable logging after obtaining a log file since it affects the read/write speed.

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3.9 Supported Data Types

Data Type Mapping

The Devart ODBC Driver for SQLite supports all SQLite data types.

The following table describes how the SQLite data types are mapped to the ODBC data types.

SQLite Data Types	ODBC Data Types
INT2, SMALLINT	SQL_SMALLINT
TINYINT	SQL_TINYINT
BIGINT	SQL_BIGINT
UNSIGNED BIGINT	SQL_BIGINT
INT8	
INT64	
MEDIUMINT	SQL_INTEGER
VARCHAR	SQL_WVARCHAR
CHAR	SQL_WCHAR
CLOB	SQL_WLONGVARCHAR
FLOAT	SQL_FLOAT
DOUBLE	SQL_DOUBLE
NUMERIC	SQL_NUMERIC
DECIMAL	SQL_DECIMAL
MONEY	SQL_REAL
NUMBER	SQL_NUMERIC
BOOL	SQL_TINYINT
BINARY	SQL_BINARY
VARBINARY	SQL_VARBINARY
DATE	SQL_TYPE_DATE
TIME	SQL_TYPE_TIME
TIMESTAMP	SQL_TYPE_TIMESTAMP

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3.10 Supported ODBC API Functions

Supported ODBC Functions

The SQLGetInfo function returns information about the driver and data source. To find out whether a specific function is supported in the driver, call SQLGetFunctions.

For more information about the ODBC interface, see the [ODBC Programmer's Reference](#).

ODBC Driver for SQLite supports all deprecated functions for backward compatibility.

The following table lists the currently supported ODBC functions.

Function Name	Support	Standard	Purpose
SQLAllocHandle	✓	ISO 92	Obtains an environment, connection, statement, or descriptor handle.
SQLConnect	✓	ISO 92	Connects to a specific driver by data source name, user ID, and password.
SQLDriverConnect	✓	ODBC	Connects to a specific driver by connection string or requests that the Driver Manager and driver display connection dialog boxes for the user.
SQLAllocEnv	✓	Deprecated	Obtains an

			environment handle allocated from driver.
SQLAllocConnect	✓	Deprecated	Obtains a connection handle

ODBC API Calls for Obtaining Information about a Driver and Data Source

Function Name	Support	Standard	Purpose
SQLDataSources	✓	ISO 92	Returns the list of available data sources, handled by the Driver Manager
SQLDrivers	✓	ODBC	Returns the list of installed drivers and their attributes, handles by Driver Manager
SQLGetInfo	✓	ISO 92	Returns information about a specific driver and data source.
SQLGetFunctions	✓	ISO 92	Returns the functions supported by the driver.
SQLGetTypeInfo	✓	ISO 92	Returns information about supported data types.

ODBC API Calls for Setting and Retrieving Driver

Attributes

Function Name	Support	Standard	Purpose
SQLSetConnectAttr	✓	ISO 92	Sets a connection attribute.
SQLGetConnectAttr	✓	ISO 92	Returns the value of a connection attribute.
SQLSetConnectOption	✓	Deprecated	Sets a connection option
SQLGetConnectOption	✓	Deprecated	Returns the value of a connection option
SQLSetEnvAttr	✓	ISO 92	Sets an environment attribute.
SQLGetEnvAttr	✓	ISO 92	Returns the value of an environment attribute.
SQLSetStmtAttr	✓	ISO 92	Sets a statement attribute.
SQLGetStmtAttr	✓	ISO 92	Returns the value of a statement attribute.
SQLSetStmtOption	✓	Deprecated	Sets a statement option
SQLGetStmtOption	✓	Deprecated	Returns the value of a statement option

ODBC API Calls for Preparing SQL Requests

Function Name	Support	Standard	Purpose
SQLAllocStmt	✓	Deprecated	Allocates a

			statement handle
SQLPrepare	✓	ISO 92	Prepares an SQL statement for later execution.
SQLBindParameter	✓	ODBC	Assigns storage for a parameter in an SQL statement.
SQLGetCursorName	✓	ISO 92	Returns the cursor name associated with a statement handle.
SQLSetCursorName	✓	ISO 92	Specifies a cursor name.
SQLSetScrollOptions	✓	ODBC	Sets options that control cursor behavior.

ODBC API Calls for Submitting Requests

Function Name	Support	Standard	Purpose
SQLExecute	✓	ISO 92	Executes a prepared statement.
SQLExecDirect	✓	ISO 92	Executes a statement
SQLNativeSql	✓	ODBC	Returns the text of an SQL statement as translated by the driver.
SQLDescribeParam	✓	ODBC	Returns the description for a

			specific parameter in a statement.
SQLNumParams	✓	ISO 92	Returns the number of parameters in a statement.
SQLParamData	✓	ISO 92	Used in conjunction with SQLPutData to supply parameter data at execution time. (Useful for long data values.)
SQLPutData	✓	ISO 92	Sends part or all of a data value for a parameter. (Useful for long data values.)

ODBC API Calls for Retrieving Results and Information about Results

Function Name	Support	Standard	Purpose
SQLRowCount	✓	ISO 92	Returns the number of rows affected by an insert, update, or delete request.
SQLNumResultCols	✓	ISO 92	Returns the number of columns in the result set.
SQLDescribeCol	✓	ISO 92	Describes a column in the result set.
SQLColAttribute	✓	ISO 92	Describes attributes

			of a column in the result set.
SQLColAttributes	✓	Deprecated	Describes attributes of a column in the result set.
SQLFetch	✓	ISO 92	Returns multiple result rows.
SQLFetchScroll	✓	ISO 92	Returns scrollable result rows.
SQLExtendedFetch	✓	Deprecated	Returns scrollable result rows.
SQLSetPos	✓	ODBC	Positions a cursor within a fetched block of data and enables an application to refresh data in the rowset or to update or delete data in the result set.
SQLBulkOperations	✓	ODBC	Performs bulk insertions and bulk bookmark operations, including update, delete, and fetch by bookmark.

ODBC API Calls for Retrieving Error or Diagnostic Information

Function Name	Support	Standard	Purpose
---------------	---------	----------	---------

SQLError	✓	Deprecated	Returns additional error or status information
SQLGetDiagField	✓	ISO 92	Returns additional diagnostic information (a single field of the diagnostic data structure).
SQLGetDiagRec	✓	ISO 92	Returns additional diagnostic information (multiple fields of the diagnostic data structure).

ODBC API Calls for Obtaining Information About Database Objects (Catalog Functions)

Function Name	Support	Standard	Purpose
SQLColumnPrivileges	✓	ODBC	Returns a list of columns and associated privileges for one or more tables.
SQLColumns	✓	X/Open	Returns the list of column names in specified tables.
SQLForeignKeys	✓	ODBC	Returns a list of column names that

			make up foreign keys, if they exist for a specified table.
SQLPrimaryKeys	✓	ODBC	Returns the list of column names that make up the primary key for a table.
SQLProcedureColumns	✓	ODBC	Returns the list of input and output parameters, as well as the columns that constitute the result set for the specified procedures.
SQLProcedures	✓	ODBC	Returns the list of procedure names stored in a specific data source.
SQLSpecialColumns	✓	X/Open	Returns information about the optimal set of columns that uniquely identifies a row in a specified table, or the columns that are automatically updated when any value in the row is updated by a

			transaction.
SQLStatistics	✓	ISO 92	Returns statistics about a single table and the list of indexes associated with the table.
SQLTablePrivileges	✓	ODBC	Returns a list of tables and the privileges associated with each table.
SQLTables	✓	X/Open	Returns the list of table names stored in a specific data source.

ODBC API Calls for Performing Transactions

Function Name	Support	Standard	Purpose
SQLTransact	✓	Deprecated	Commits or rolls back a transaction
SQLEndTran	✓	ISO 92	Commits or rolls back a transaction.

ODBC API Calls for Terminating a Statement

Function Name	Support	Standard	Purpose
SQLFreeStmt	✓	ISO 92	Ends statement processing, discards pending results, and, optionally, frees all

			resources associated with the statement handle.
SQLCloseCursor	✓	ISO 92	Closes a cursor that has been opened on a statement handle.
SQLCancel	✓	ISO 92	Cancels an SQL statement.

ODBC API Calls for Terminating a Connection

Function Name	Support	Standard	Purpose
SQLDisconnect	✓	ISO 92	Closes the connection.
SQLFreeHandle	✓	ISO 92	Releases an environment, connection, statement, or descriptor handle.
SQLFreeConnect	✓	Deprecated	Releases connection handle.
SQLFreeEnv	✓	Deprecated	Releases an environment handle.

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4 Using in Third-Party Tools

This section discusses how to use ODBC Driver for SQLite with ODBC-compliant tools.

- [DBeaiver](#)

- [Oracle Database Link](#)
- [Microsoft Access](#)
- [Microsoft Excel](#)
- [OpenOffice and LibreOffice](#)
- [PHP](#)
- [Power BI](#)
- [Python](#)
- [QlikView](#)
- [SQL Server Management Studio](#)
- [SSIS](#)
- [Tableau](#)

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4.1 Using in DBeaver

DBeaver Overview

DBeaver is a free, open source multiplatform database management tool and SQL client for developers and database administrators. DBeaver can be used to access any database or cloud application that has an ODBC or JDBC driver, such as Oracle, SQL Server, MySQL, Salesforce, or Mailchimp. Devart DBeaver provides you with the most important features you'd need when working with a database in a GUI tool, such as:

- SQL queries execution
- Metadata browsing and editing
- SQL scripts management
- Data export/import
- Data backup
- DDL generation

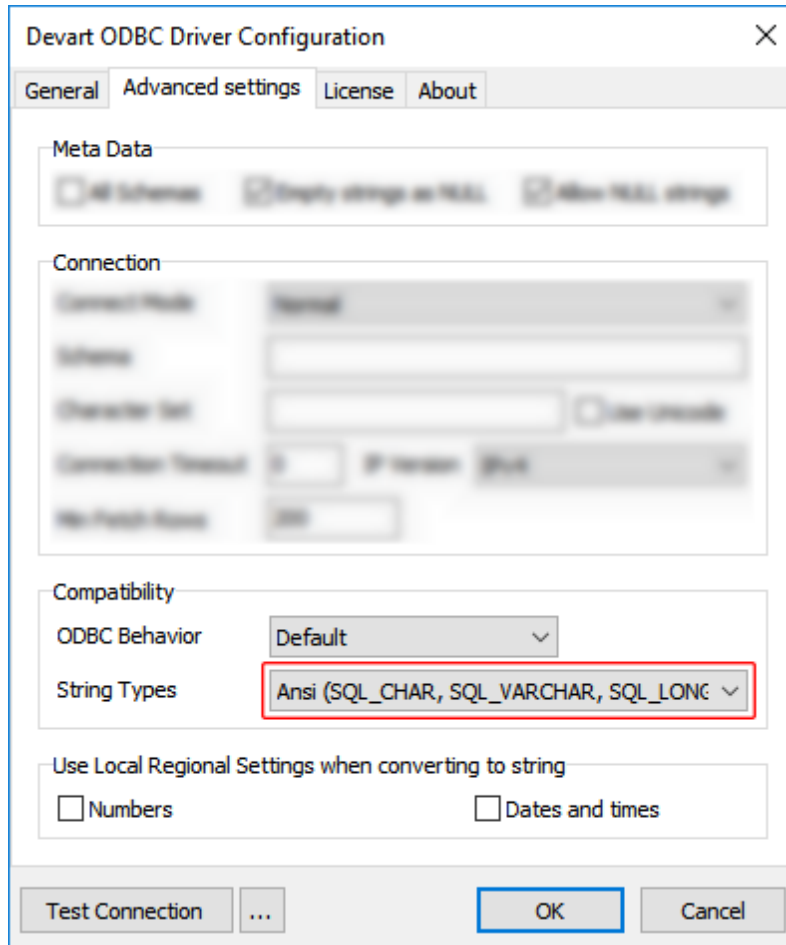
- ER diagrams rendering
- Test data generation
- BLOB/CLOB support
- Database objects browsing
- Scrollable resultsets

The tool comes in two editions — Community and Enterprise. Enterprise Edition supports NoSQL databases, such as MongoDB or Cassandra, persistent query manager database, SSH tunneling, vector graphics (SVG) and a few other enterprise-level features. Note though that you can access a MongoDB database from DBeaver Community Edition using the respective Devart ODBC driver. For the purposes of this guide, we'll use the Community Edition of DBeaver to retrieve data from SQLite via the Open Database Connectivity driver.

Creating an ODBC Data Source to Use SQLite Data in DBeaver

1. Click the **Start** menu and select **Control Panel**.
2. Select **Administrative Tools**, then click **ODBC Data Sources**.
3. Click on the **System DSN** tab if you want to set up a DSN name for all users of the system or select **User DSN** to configure DSN only for your account.
4. Click the **Add** button and double-click Devart ODBC Driver for SQLite in the list.
5. Give a name to your data source and set up the connection parameters.
6. Click the **Test Connection** button to verify that you have properly configured the DSN.

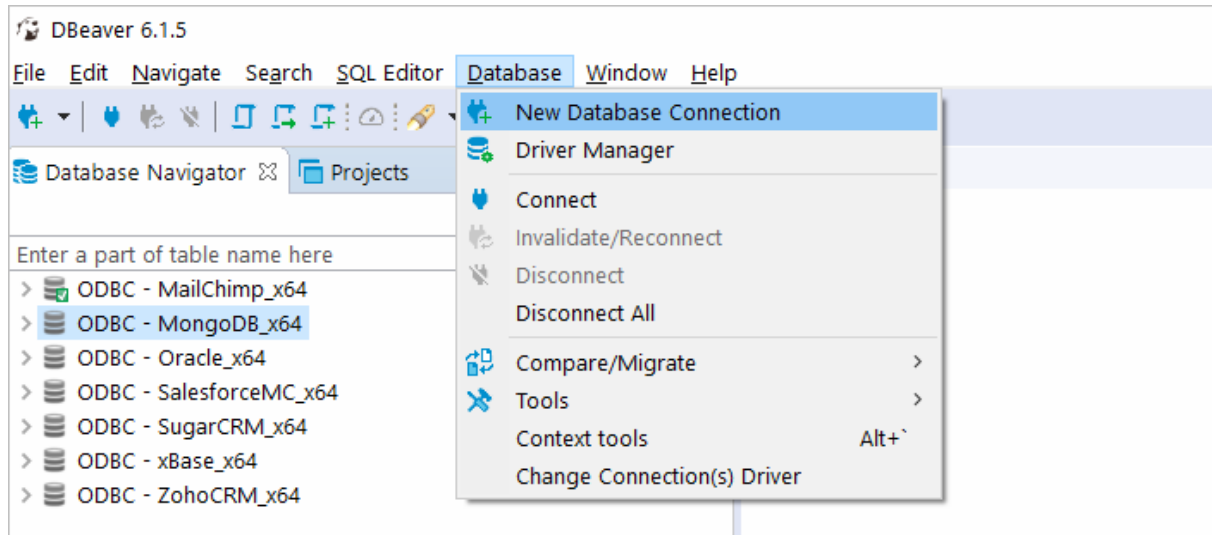
When using ODBC driver for SQLite with DBeaver, SQL_WVARCHAR data types may be displayed incorrectly in DBeaver. To prevent this, you need to set the string data types to Ansi either in the **Advanced Settings** tab of the driver configuration dialog or directly in the connection string (String Types=Ansi) — all string types will be returned as SQL_CHAR, SQL_VARCHAR and SQL_LONGVARCHAR. Below you will see guidelines on [how to connect SQLite database in DBeaver](#).



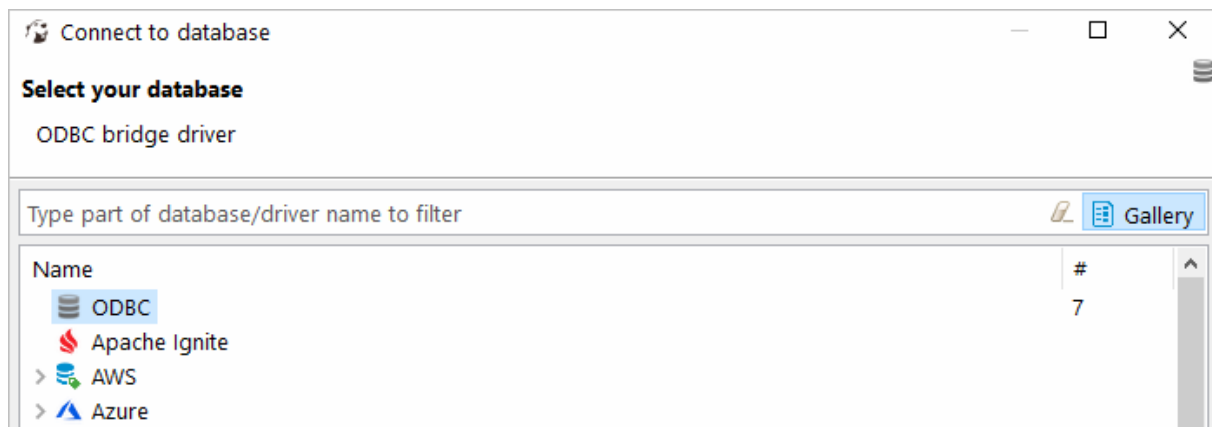
Connecting to SQLite Data from DBeaver via ODBC Driver for SQLite

Follow the steps below to establish a connection to SQLite in DBeaver.

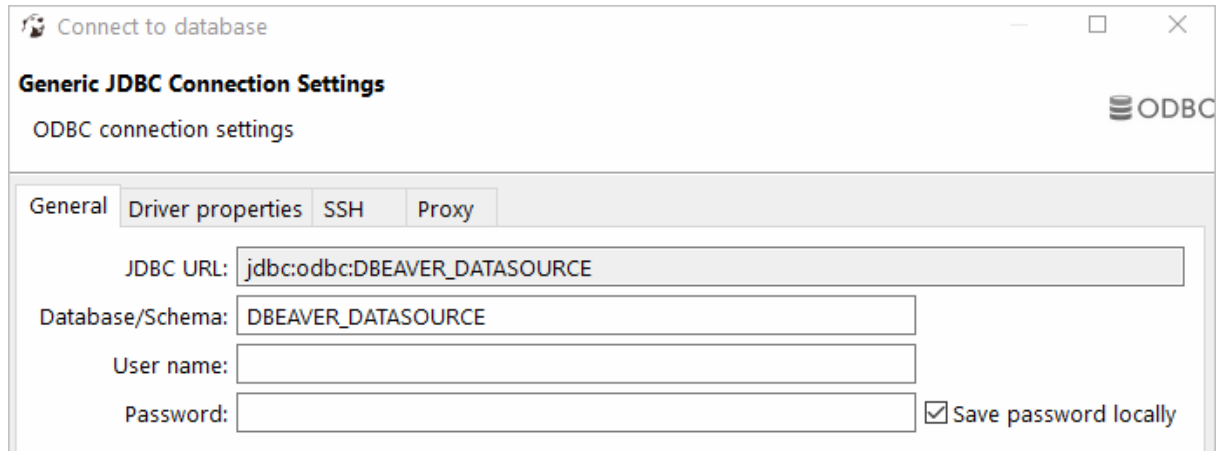
1. In the **Database** menu, select **New Database Connection**.



2. In the **Connect to database** wizard, select **ODBC** and click **Next**.



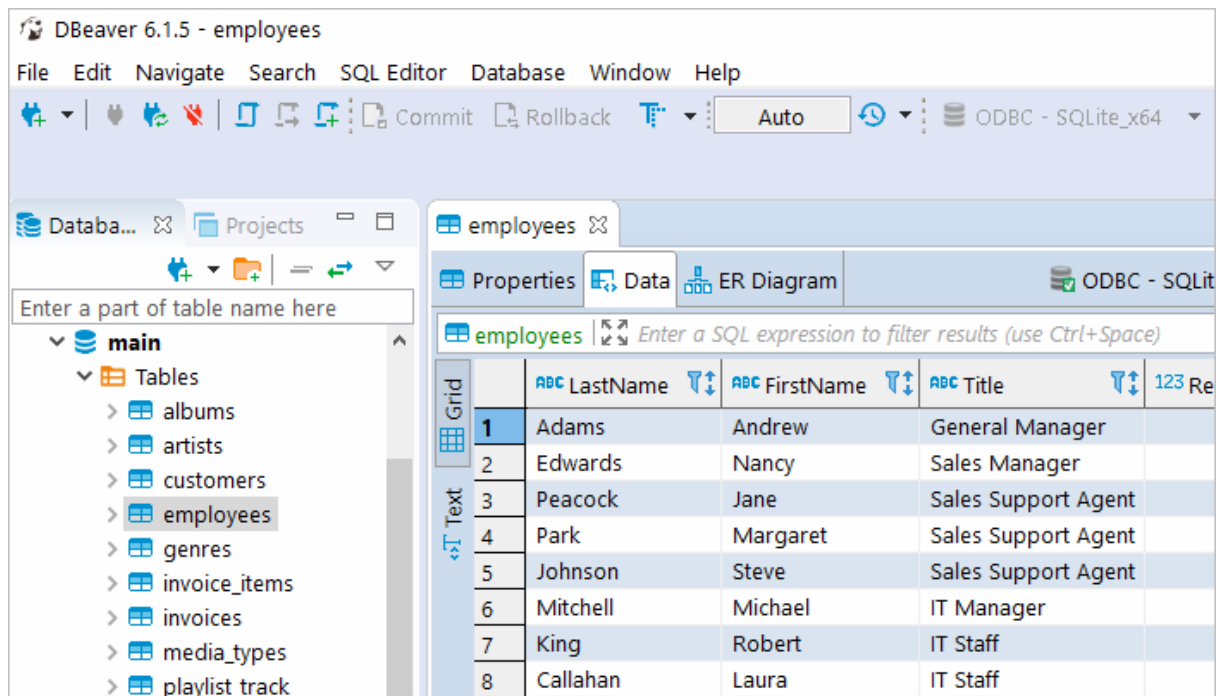
3. Enter the previously configured DSN in the **Database/Schema** field.



4. Click **Test Connection**. If everything goes well, you'll see the **Success** message.

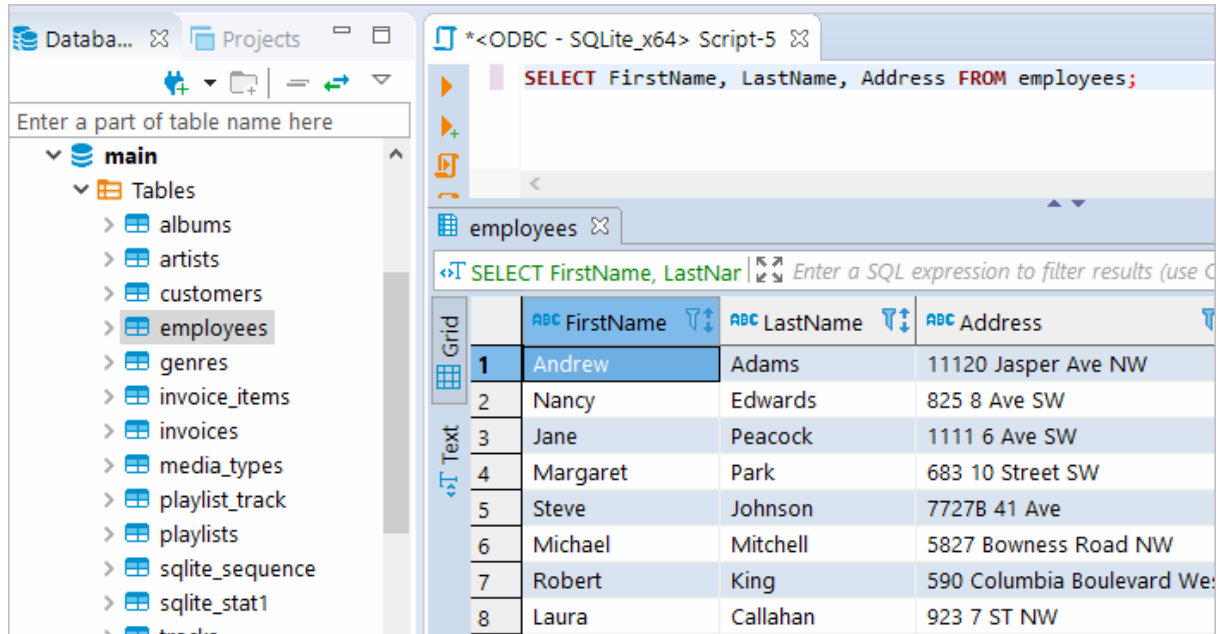
Viewing SQLite Database Objects and Querying Data

You can expand out the database structure in DBeaver's **Database Navigator** to visualize all the tables in SQLite database. To view and edit the data in a table, you need to right-click on the target table name and select **View data**. The content of the table will be displayed in the main workspace.



If you want to write a custom SQL query that will include only the necessary columns from the

table, you can select **New SQL Editor** in the **SQL Editor** main menu. Create your query and run it by clicking **Execute SQL Statement** to view the results in the same window.



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4.2 Using in Oracle DBLink

Configuring Oracle Database Gateway for ODBC

This article explains how to configure Oracle Database Gateway for ODBC. If your data is stored in a non-Oracle database system or cloud application, and you need to access it from an Oracle Database server, you can create a database link to an Oracle Database Gateway for ODBC. The gateway works with an ODBC driver to access non-Oracle systems or other, remote Oracle servers. Any ODBC-compatible data source can be accessed using the gateway and the appropriate ODBC driver. The driver must be installed on the same machine as the gateway. The non-Oracle system can run on the same machine as the Oracle server or on a different machine. The gateway can be installed on the machine running the non-Oracle system, the machine running the Oracle database or on a third machine as a standalone.

Configure the Initialization File

After installing the gateway and the [ODBC driver for SQLite](#), create an initialization file for your Oracle Database Gateway for ODBC. The sample file `initdg4odbc.ora` is stored in the `ORACLE_HOME\hs\admin` directory. To create an initialization file for the gateway, copy the sample initialization file and rename it. The name must be prefixed with `init` — for example, `initSQLite.ora`. You need a separate initialization file for each ODBC data source. After creating the file, set the `HS_FDS_CONNECT_INFO` parameter to the system DSN that you created earlier, for example:

```
HS_FDS_CONNECT_INFO=SQLite
```

Configure Oracle Net Listener

After configuring the gateway, you need to configure Oracle Net Listener to communicate with the Oracle database. Information about the gateway must be added to the `listener.ora` configuration file which is located in the `ORACLE_HOME\NETWORK\ADMIN\` directory. The following example is the address on which the Oracle Net Listener listens (`HOST` is the address of the machine on which the gateway is installed):

```
LISTENER =  
  (DESCRIPTION_LIST =  
    (DESCRIPTION =  
      (ADDRESS = (PROTOCOL = TCP)(HOST = localhost)(PORT = 1521))  
    )  
  )
```

Add an entry to the `listener.ora` file to start the gateway in response to connection requests. The SID of the gateway (`SID_NAME`) must be the same in `listener.ora` and `tnsnames.ora`. `ORACLE_HOME` is the Oracle home directory where the gateway resides. To apply the new settings, stop and restart the Oracle Net Listener service.

```
SID_LIST_LISTENER=  
  (SID_LIST=  
    (SID_DESC=  
      (SID_NAME=SQLite)  
      (ORACLE_HOME=D:\ORACLE_HOME)  
      (PROGRAM=dg4odbc)  
    )  
  )
```

Configure Oracle for Gateway Access

Add a connect descriptor for the gateway to the `tnsnames.ora` file, which is located in `ORACLE_HOME\NETWORK\ADMIN` directory. The `SID` must match the value specified in the `listener.ora` file.

```
SQLite =
```

```
(DESCRIPTION =  
  (ADDRESS = (PROTOCOL = tcp)(HOST = localhost)(PORT = 1521))  
  (CONNECT_DATA =  
    (SID = SQLite)  
  )  
  (HS = OK)  
)
```

Create Database Links

To access an ODBC data source, you must create a database link using a database tool like SQL Plus or dbForge Studio for Oracle: connect to your database server and execute the

`CREATE DATABASE LINK` statement, as follows:

```
CREATE DATABASE LINK dblink CONNECT TO " " IDENTIFIED BY " " USING 'tns_na
```

`dblink` is the complete database link name. `tns_name_entry` is the Oracle Net connect descriptor specified in the `tnsnames.ora` file.

When you create the database link in [dbForge Studio for Oracle](#), you can see your newly created link in Database Links on the left panel. After creating the database link, you can run a query against the ODBC data source using the following syntax:

```
SELECT * FROM table_name@"dblink_name"
```

See also

[Configuring Oracle Database Gateway for ODBC](#)

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4.3 Using in Microsoft Access

Connecting Microsoft Access to SQLite Using an ODBC Driver

This article explains how to connect Microsoft Access to SQLite through the standard ODBC interface. Microsoft Access is a database management system that combines the relational database engine with a graphical user interface. Access can be used as a substitution for spreadsheet applications like Excel to organize, store, and retrieve large amounts of related data that can be difficult to manage in spreadsheets.

In Microsoft Access, you can connect to your SQLite data either by importing it or creating a table that links to the data. Devart ODBC drivers support all modern versions of Access. It is

assumed that you have already installed and configured a DSN for ODBC driver for SQLite. For the purpose of this article, we tested an [ODBC connection to SQLite](#) through our ODBC drivers in Microsoft Access 2003, Microsoft Access 2007, Microsoft Access 2010, Microsoft Access 2013, Microsoft Access 2016, Microsoft Access 2019. The following steps describe how to use Microsoft Access 2019 to import or link to your data in SQLite.

Importing SQLite Data Into Microsoft Access Through an ODBC Connection

1. Open your Microsoft Access database.
2. Select the **External Data** tab in the ribbon.
3. Expand the **New Data Source** drop-down and select **From Other Sources**, then select **ODBC Database**.
4. In the **Get External Data - ODBC Database** dialog box, select **Import the source data into a new table in the current database**, and click **OK**.
5. In the **Select Data Source** dialog box, select the **Machine Data Source** tab.
6. Select the DSN that you have configured for SQLite and click **OK**.
7. In the **Import Objects** dialog box, select the tables that you want to import, and click **OK**.
8. If the database objects have been successfully imported, you should see the corresponding message in the dialog box. If you want to save the import steps to quickly repeat the process without using the wizard at a later time, select the **Save import steps** checkbox. Click **Close**.
9. The imported tables should appear in the **Tables** navigation pane on the left.
10. Double-click on the needed table to display its contents.

Linking to SQLite Data in Microsoft Access Through an ODBC Connection

1. Open your Microsoft Access database.
2. Select the **External Data** tab in the ribbon.
3. Expand the **New Data Source** drop-down and select **From Other Sources**, then select **ODBC Database**.
4. In the **Get External Data - ODBC Database** dialog box, select **Link to the data source**

by creating a linked table.

5. In the **Select Data Source** dialog box, select the **Machine Data Source** tab.
6. Select the DSN that you have configured for SQLite and click **OK**.
7. In the **Link Tables** dialog box, select the table or tables that you want to link to, and click **OK**.
8. The **Select Unique Record Identifier** dialog box will prompt you to choose a field or fields that uniquely identify each record in the table. To avoid inconsistencies, it is recommended to select the primary key in the SQLite table as the unique record identifier. You are linking multiple tables, you will be prompted to select unique record identifiers for each of the selected tables.
9. The linked tables should appear in the **Tables** navigation pane on the left.
10. Double-click on the needed table to display its contents.

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4.4 Using in Microsoft Excel

Connecting to SQLite from Microsoft Excel using ODBC Driver for SQLite

You can use Microsoft Excel to access data from a SQLite database using ODBC connector. With ODBC Driver, you can import the data directly into an Excel Spreadsheet and present it as a table. Make sure that you use matching Excel and ODBC Driver, e.g. if you have installed a 64-bit ODBC Drive, you will need to use the 64-bit version of Excel.

When working with Microsoft Excel, there are different ways of retrieving data from various data sources using our ODBC drivers. Please see the list of sections that will help you to [connect Excel to SQLite](#) database:

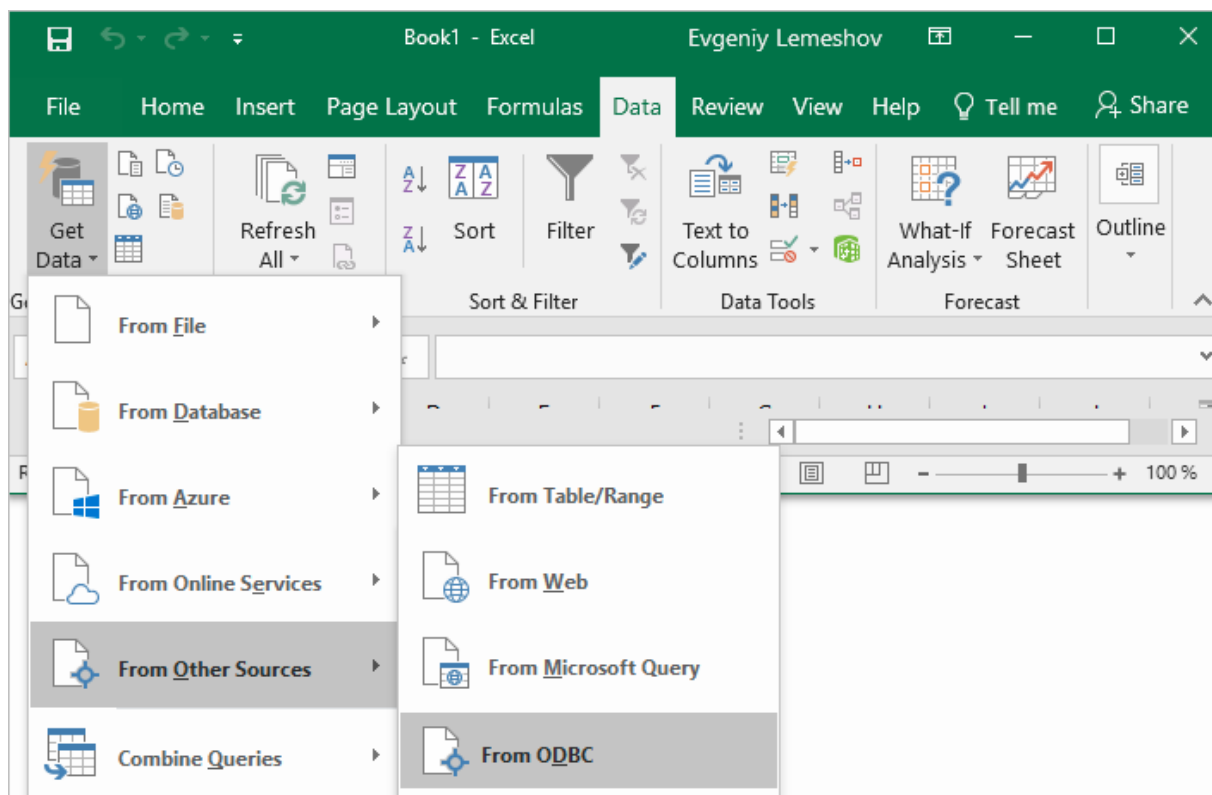
- [Connecting Excel to SQLite with Get & Transform \(Power Query\)](#)
- [Connecting Excel to SQLite with Data Connection Wizard \(Legacy Wizard\)](#)
- [Connecting Excel to SQLite with the Query Wizard](#)
- [Connecting Excel to SQLite with Microsoft Query](#)

- [Connecting Excel to SQLite with PowerPivot](#)

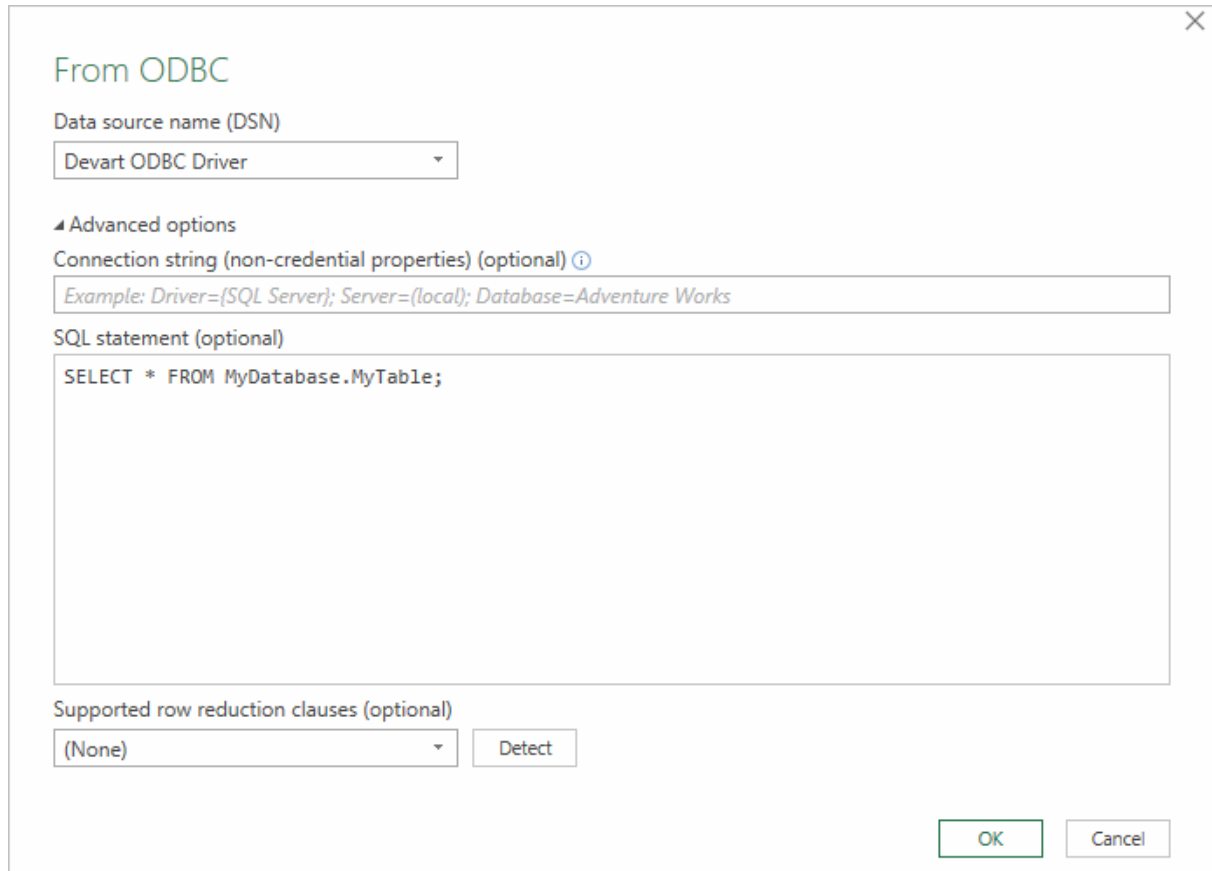
Connecting Excel to SQLite with Get & Transform (Power Query)

You can use Get & Transform (Power Query) to connect to SQLite from Excel with ODBC. This method assumes that you've installed an ODBC driver for SQLite.

1. Click the **Data** in Excel, then expand the **Get Data** drop-down list. Click **From Other Sources > From ODBC**.



2. In the **From ODBC** dialog, choose your data source name (DSN). If you haven't configured your ODBC driver yet, you can expand the **Advanced Options** dialog box and enter the connection string for your data source (without credentials, which are defined in the credentials dialog box in the next step). Additionally, you can enter an SQL statement that will be executed right after establishing a connection to the data source. Click **OK**.



From ODBC

Data source name (DSN)
Devart ODBC Driver

Advanced options

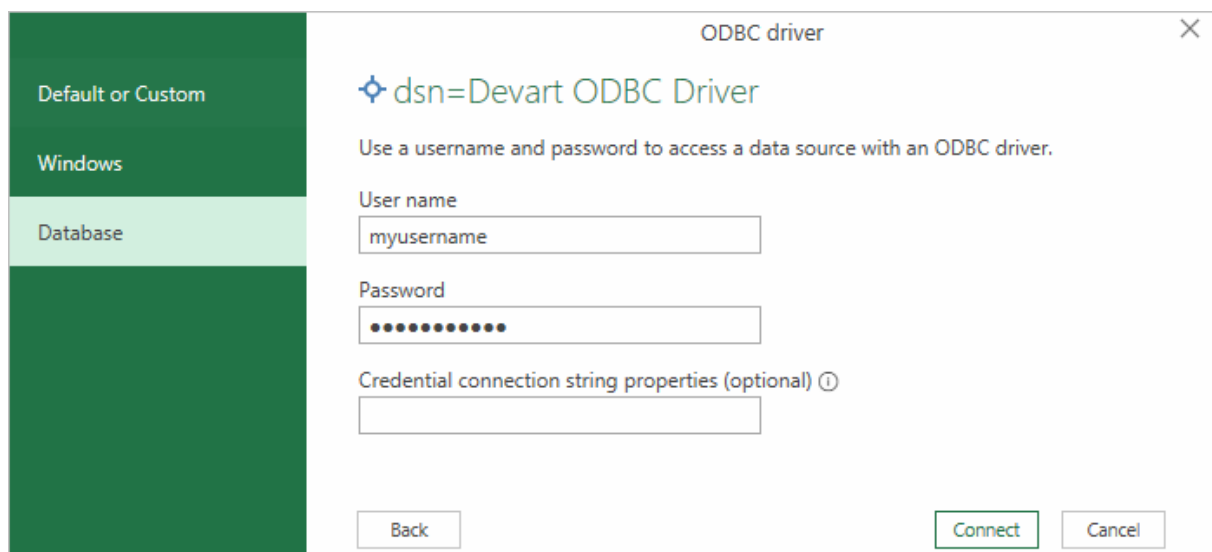
Connection string (non-credential properties) (optional) ⓘ
Example: Driver={SQL Server}; Server={local}; Database=Adventure Works

SQL statement (optional)
SELECT * FROM MyDatabase.MyTable;

Supported row reduction clauses (optional)
(None) Detect

OK Cancel

3. If you're using a database username or password, select **Database** and enter your credentials in the dialog box, then click **Connect**.



ODBC driver

Default or Custom

Windows

Database

dsn=Devart ODBC Driver

Use a username and password to access a data source with an ODBC driver.

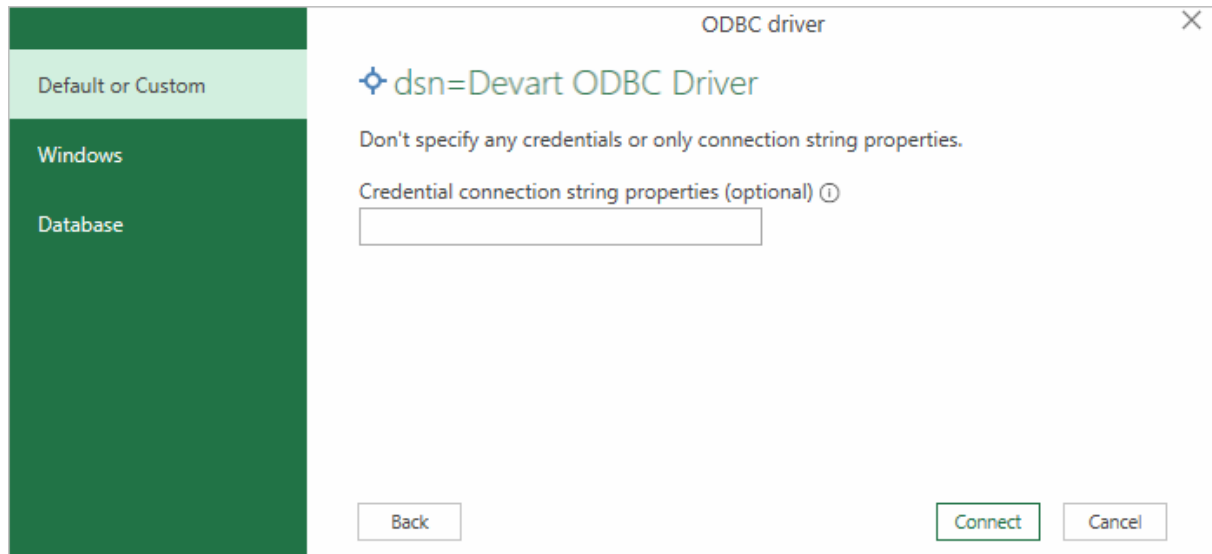
User name
myusername

Password
.....

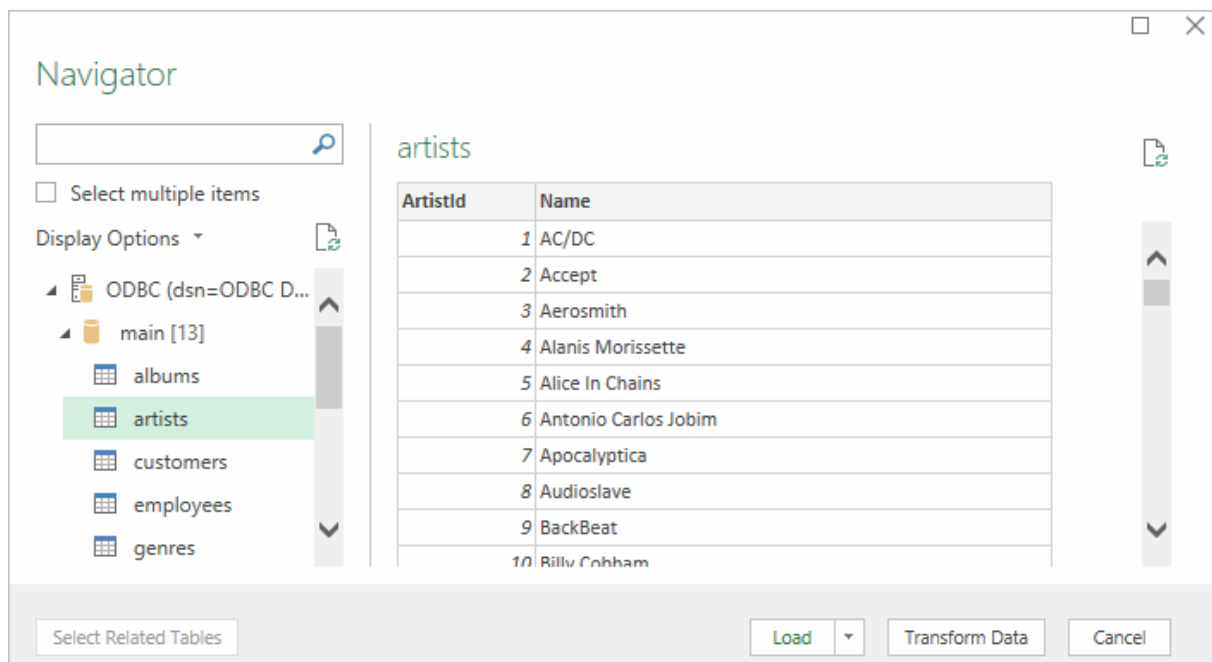
Credential connection string properties (optional) ⓘ

Back Connect Cancel

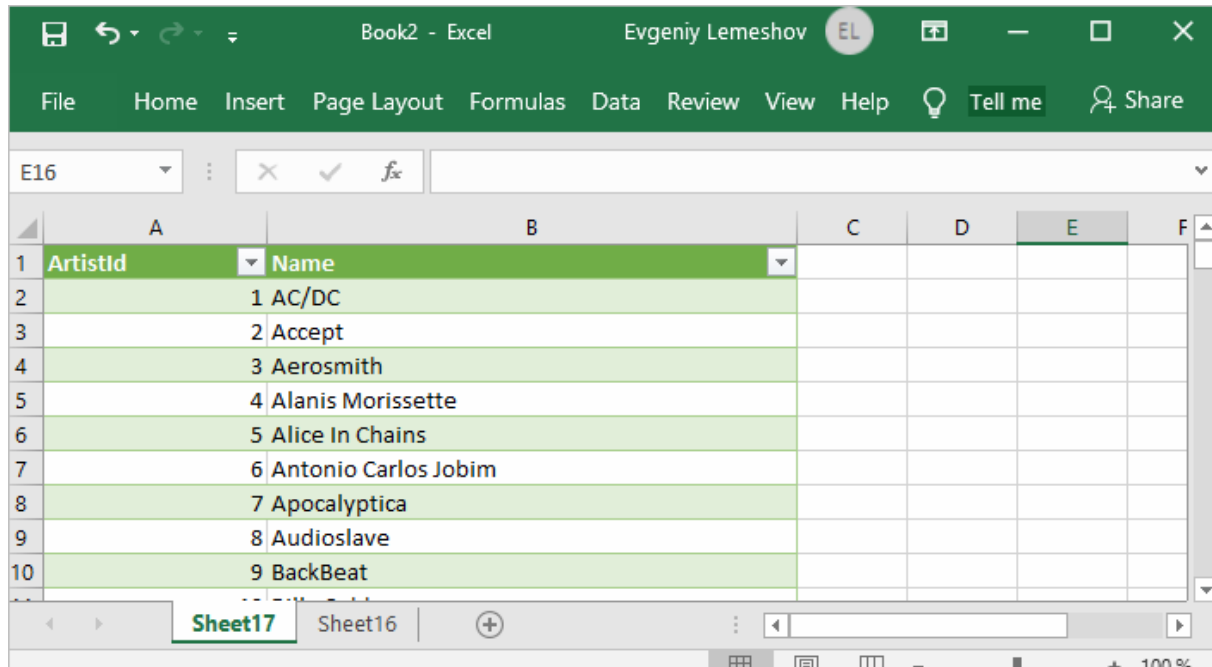
If your database is not password-protected or you've already specified your credentials in the ODBC data source settings, select **Default or Custom** and press **Connect**



4. In the window that appears, select the table you want to retrieve data from, and click **Load**.



The data from the table will be displayed in an Excel spreadsheet where you can further work with it.



Connecting Excel to SQLite with Data Connection Wizard (Legacy Wizard)

You can use this option to connect to OLE DB or ODBC external data source that has already been defined.

1. In Excel, go to the **Data** tab. Click **From Other Sources**, and then click **From Data Connection Wizard**.
2. In the opened dialog, select **ODBC DSN** and click **Next** to continue.
3. Now select a data source you want to connect to, and click **Next**.
4. To connect to the table containing the required data, select its name and click **Next** to enter and save information about your new file or click **Finish**.
5. In the **Import data** dialog, you can select the way your data will be viewed in Excel and the place where to put it in the worksheet, and click **OK**.
6. The required data is now displayed in the existing Excel worksheet.

Connecting Excel to SQLite with the Query Wizard

You can use this option to create a simple query for retrieving data from SQLite to Excel via

ODBC driver.

1. Open Excel, in the main menu, click the **Data** tab.
2. Click the **From Other Sources** dropdown menu, and then click **From Microsoft Query**.
3. In the appeared dialog, you can choose the data source you want to connect to.
4. After a successful connection, you can select the data you want to be displayed in Excel and click **Next**.
5. The next two steps allow filtering and sorting the data. Click **Next** to skip these procedures.
6. If you plan to further use the query, you can save it by clicking the **Save** button on the right.
7. Select **Return Data To Microsoft Excel** and click **Finish**.
8. In the **Import data** dialog, you can select the way your data will be viewed in Excel and the place where to put it in the worksheet, and click **OK**.
9. The required data is successfully imported to Excel.

Connecting Excel to SQLite with Microsoft Query

You can use this option to create a more complex query for retrieving SQLite data to Excel via ODBC driver.

1. Start Excel, click the **Data** tab.
2. In the appeared ribbon, click **From Other Sources**, and then click **From Microsoft Query**.
3. In the next dialog, choose the data source you want to connect to (e.g., using data source name - Devart ODBC SQLite). Uncheck **Use the Query Wizard to Create/Edit Queries** and click **OK**.
4. Now you can select the tables you want to add to your query. When you finish, just click the **Add** button.
5. In the graphical editor, you can filter rows or columns of data, sort data, join multiple tables, create a parameter query, etc.

Connecting Excel to SQLite with PowerPivot

You can use PowerPivot - an Excel add-in to perform data analysis and create complex data models. To load the required data, do the following:

1. In Excel, click the **PowerPivot** tab, then click **Manage** to go to the PowerPivot window.

2. In the opened window, click **From Other Sources**.
3. When the **Table Import Wizard** opens, select **Others (OLEDB/ODBC)** and click **Next**.
4. In the **Specify a Connection String** window, click the **Build** button.
5. In the **Data Link Properties** dialog, specify the data source you want to connect (e.g., using data source name - Devart ODBC SQLite), and then click **Next**.
6. Now you should choose how to import the data (either select a table from the list or write a query to specify the data to be imported).
7. When the Import operation succeeded, click the **Close** button. The retrieved data is inserted in the active worksheet.

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4.5 Using in SQL Server Management Studio

This section describes how to establish and troubleshoot a connection to SQLite from SQL Server Management Studio using ODBC Driver for SQLite.

- [Creating a Linked Server](#)
- [Troubleshooting in SSMS](#)

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4.5.1 Creating a Linked Server

Requirements

In order to avoid incorrect integration with MS SSMS, the working environment must meet the following conditions:

- The data source must be a configured system DSN. Refer to the [Driver Configuration](#) article to learn how to configure a System DSN
- The driver, studio, and SQL Server must be of the same bitness. For example, if you are using 64-bit SQL Server Management Studio on 64-bit Windows platform, then configure the 64-bit version of the driver using ODBC Administrator launched from %windir%

\\system32\odbcad32.exe. Otherwise, configure the driver using the 32-bit version of ODBC Administrator - launch it from %windir%\SysWOW64\odbcad32.exe.

- ODBC Driver for SQLite and SQL Server must be installed on the same computer.
- .NET Framework 4.5 must be installed on the computer.

Connecting to SQLite from SQL Server Management Studio using ODBC Driver for SQLite

You can use the Microsoft SQL Server Management Studio to connect your SQLite data to an SQL Server instance. Linked Server is a tool of MS SQL Server that allows to execute distributed queries to refer tables stored on non-SQL Server database in a single query. With linked servers, you can execute commands against different data sources such as SQLite and merge them with your SQL Server database. You can create a linked server with one of these methods: by using the options in the Object Explorer or by executing stored procedures.

Below are major advantages of using SQL Server Linked Servers to connect to SQLite:

1. The ability to connect other database instances on the same or remote server.
2. The ability to run distributed queries on heterogeneous data sources across the organization.
3. The ability to work with diverse data sources in the same way.

How to configure a SQL Server Linked Server to connect to SQLite

You can follow the steps to create a linked server for SQLite in SQL Server Management Studio by using Object Explorer:

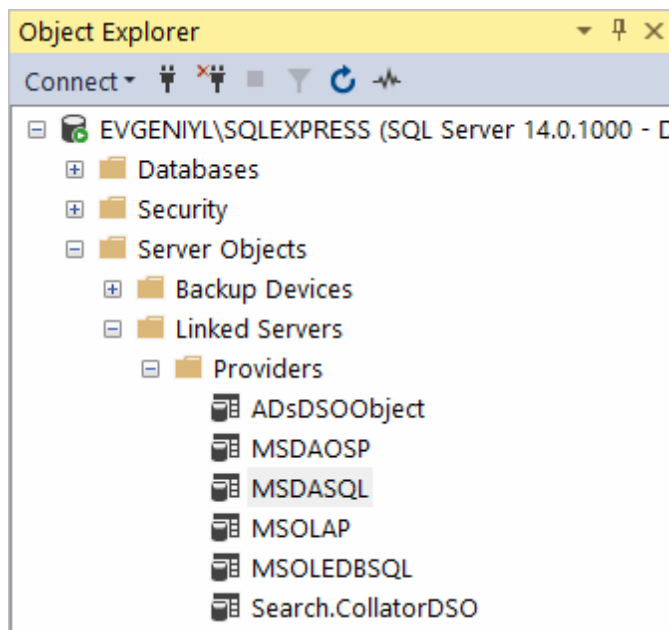
1. Start your Management Studio and choose your SQL Server instance.
2. In the **Object Explorer pane**, expand the **Server Objects**, right-click on **Linked Servers** and then click on **New Linked Server**.
3. Configure your linked server in the dialog box:
 - Give a name for your server in the **Linked server** field.
 - Under **Server type**, select **Other data source**.

- Choose **Microsoft OLE DB Provider for ODBC Drivers** in the **Provider** drop-down list.
- In the **Data source** field, enter the name of your DSN, e.g. Devart ODBC Driver for SQLite . Alternatively, you can input the ODBC Driver connection string in the **Provider** field.

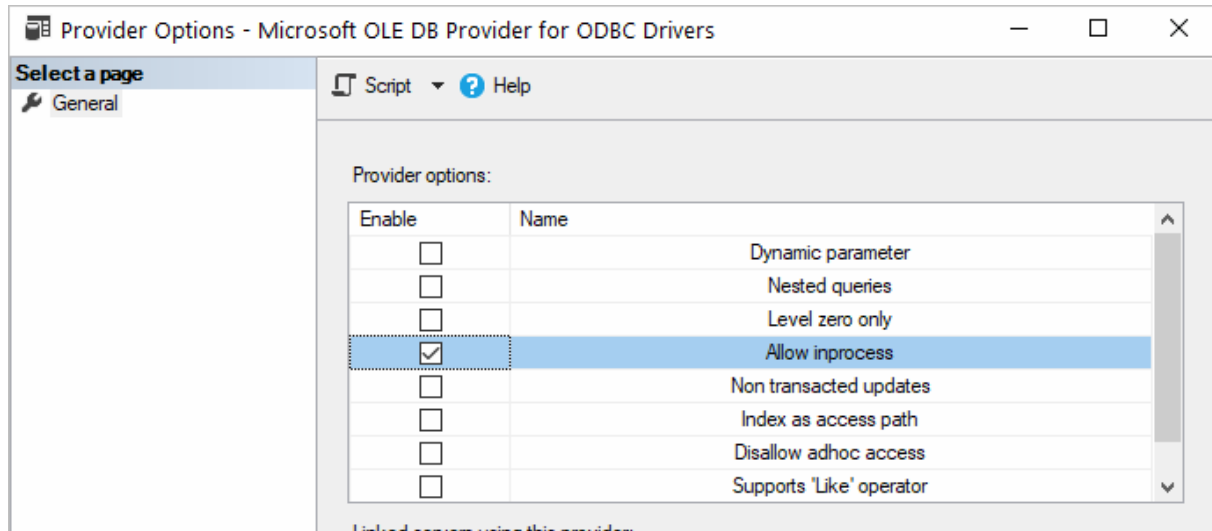
The linked server will appear under the Linked Servers in the Object Explorer Pane. You can now issue distributed queries and access SQLite databases through SQL Server.

Retrieving Data From SQLite

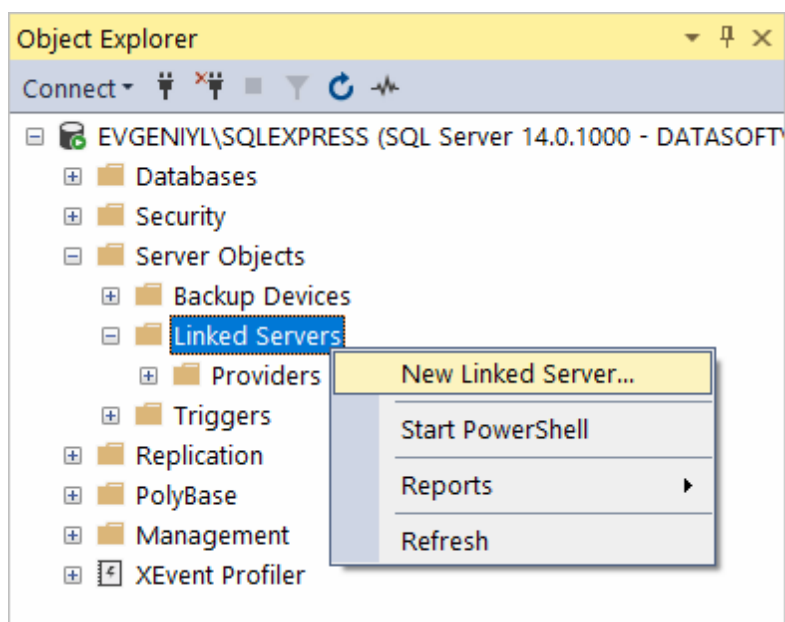
Ensure the **Allow inprocess** option of MSDASQL OLE DB Provider for ODBC Drivers is enabled. For this, find the **MSDASQL** provider in the list of Linked Servers and double-click on it



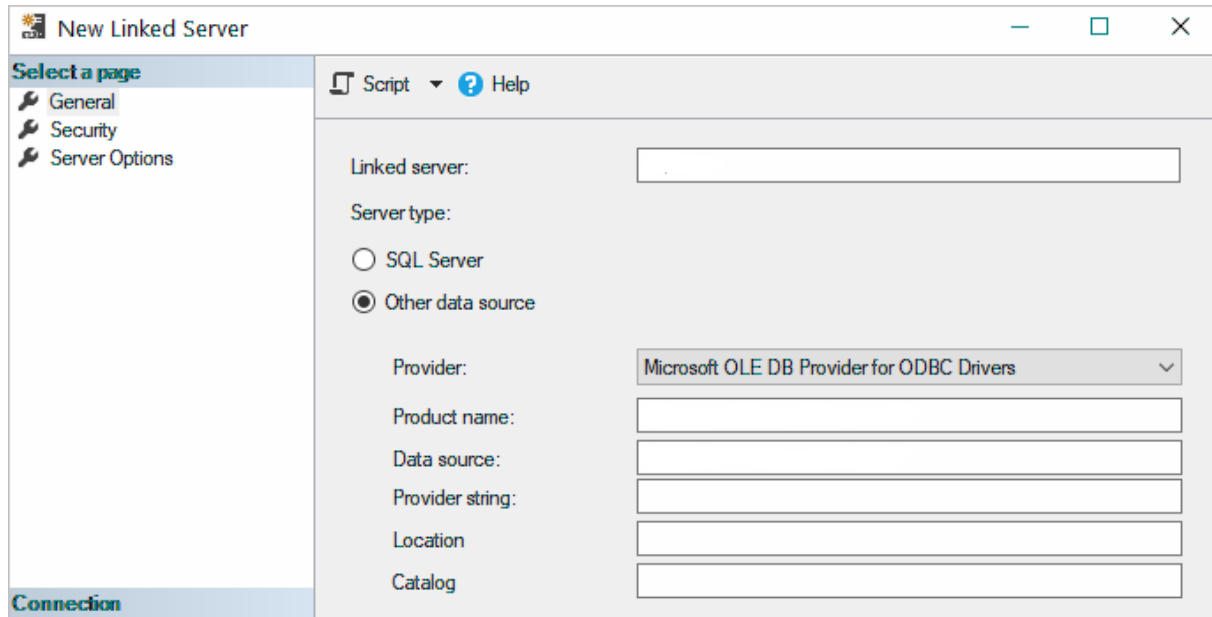
In the appeared **Provider Options** window, enable the **Allow inprocess** checkbox:



Create a new **Linked Server**

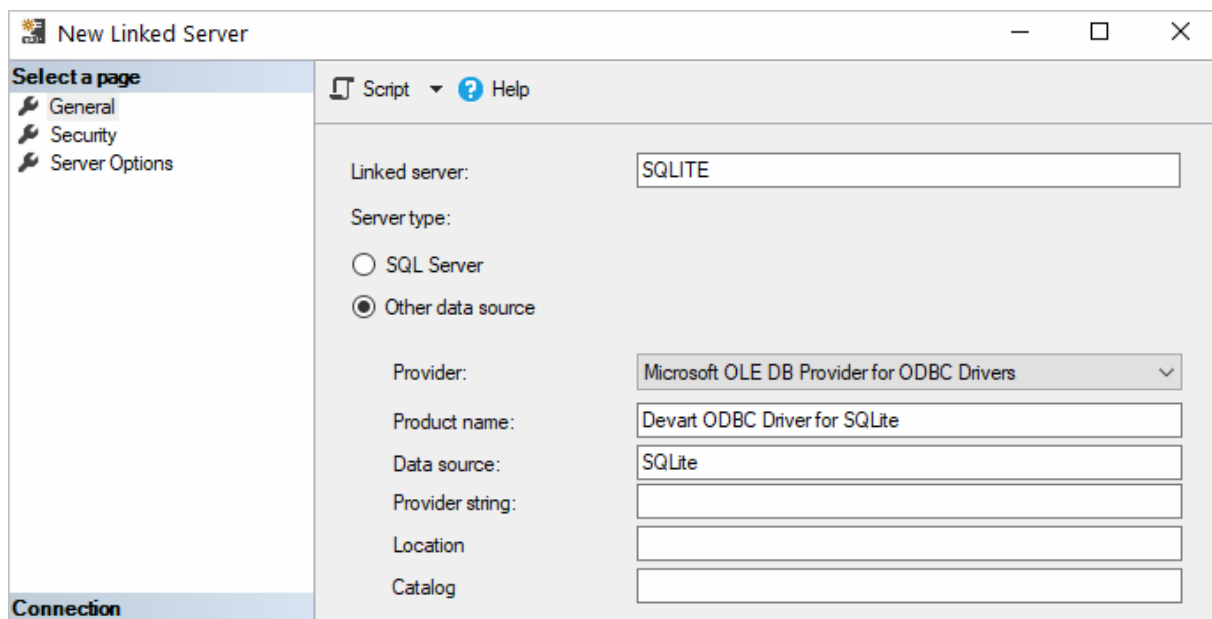


Make sure to select **Microsoft OLE DB Provider for ODBC Drivers**:



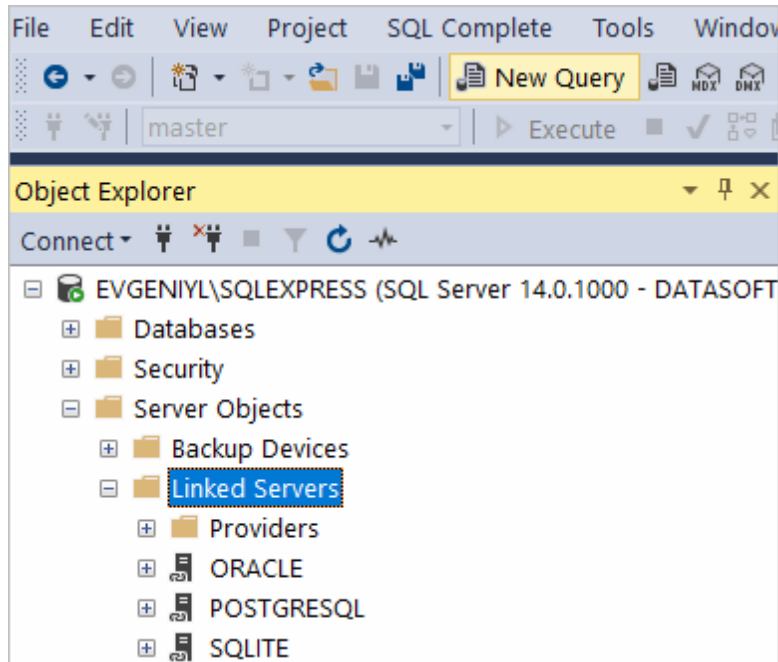
The screenshot shows the 'New Linked Server' dialog box. On the left, there is a 'Select a page' sidebar with 'General', 'Security', and 'Server Options'. The 'General' page is active. The main area has a 'Script' button and a 'Help' icon. Below these, the 'Linked server' field is empty. The 'Server type' section has two radio buttons: 'SQL Server' (unselected) and 'Other data source' (selected). The 'Provider' dropdown is set to 'Microsoft OLE DB Provider for ODBC Drivers'. Below this, there are five empty text boxes for 'Product name', 'Data source', 'Provider string', 'Location', and 'Catalog'.

Now you need to input the Linked Server name, e.g. SQLITE. In the Product Name and Data Source fields you need to indicate the System DSN that you've previously created - more info on System DSN setup can be found [here](#).

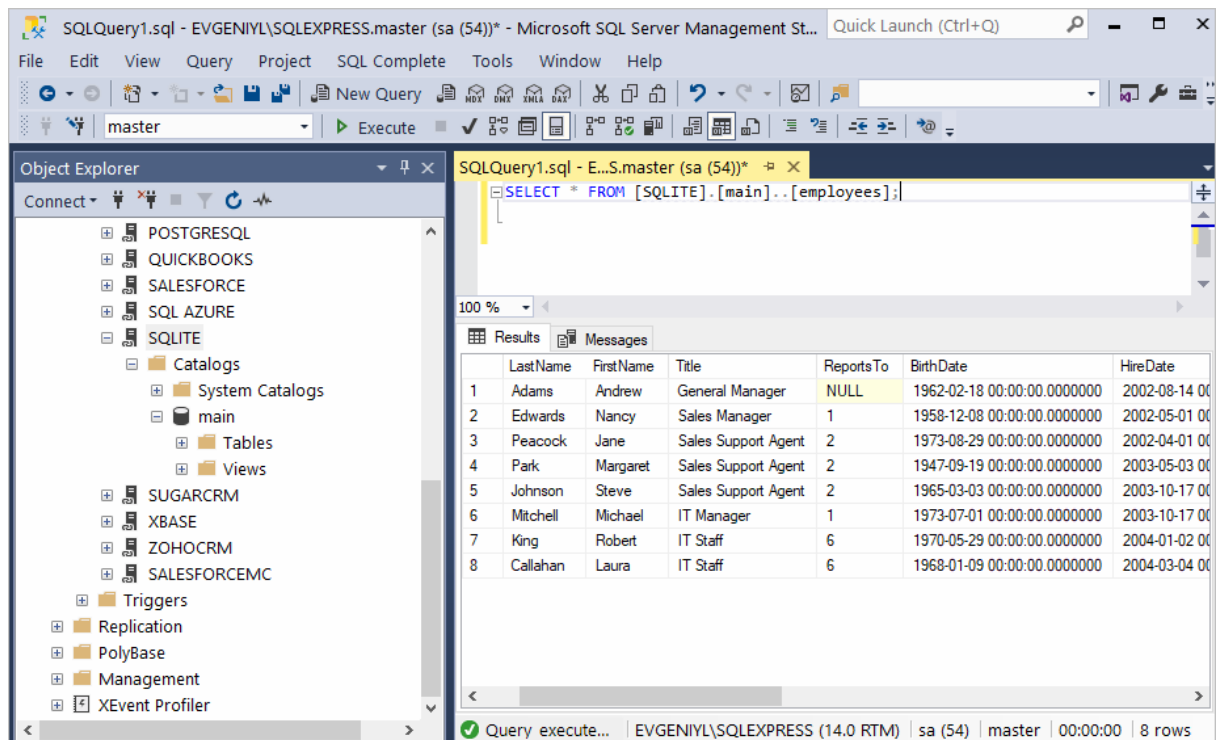


This screenshot shows the same 'New Linked Server' dialog box, but with the following fields filled in: 'Linked server' is 'SQLITE', 'Product name' is 'Devart ODBC Driver for SQLite', and 'Data source' is 'SQLite'. The 'Server type' remains 'Other data source' and the 'Provider' remains 'Microsoft OLE DB Provider for ODBC Drivers'. The 'Provider string', 'Location', and 'Catalog' fields are still empty.

The SQLite tables are already available to be fetched. To query the linked server, click **New Query** in the toolbar:



Enter your SQL query in the editor window and click **Execute** to run the query:



As a result, you can see the contents of the selected table retrieved directly from the SQLite account you are connected to.

See also

- [Troubleshooting SSMS](#)

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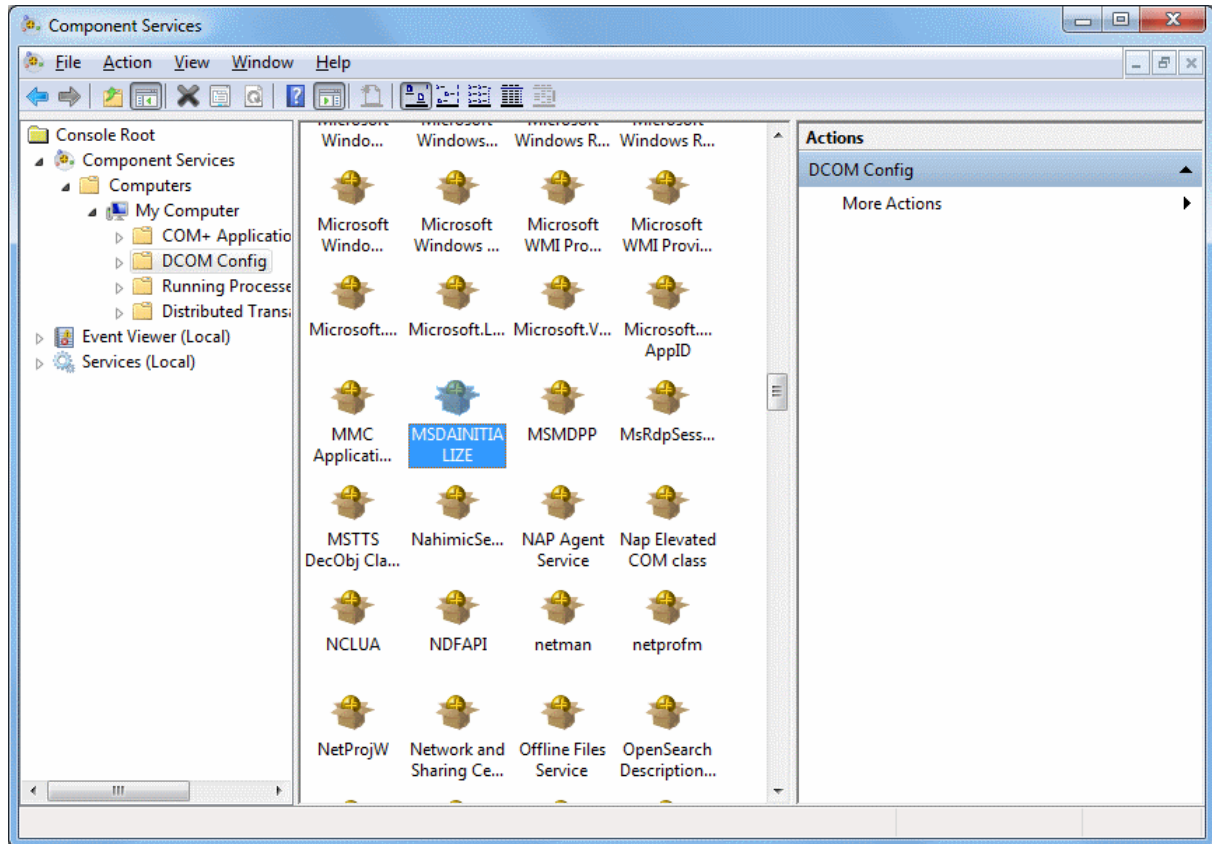
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4.5.2 Troubleshooting in SSMS

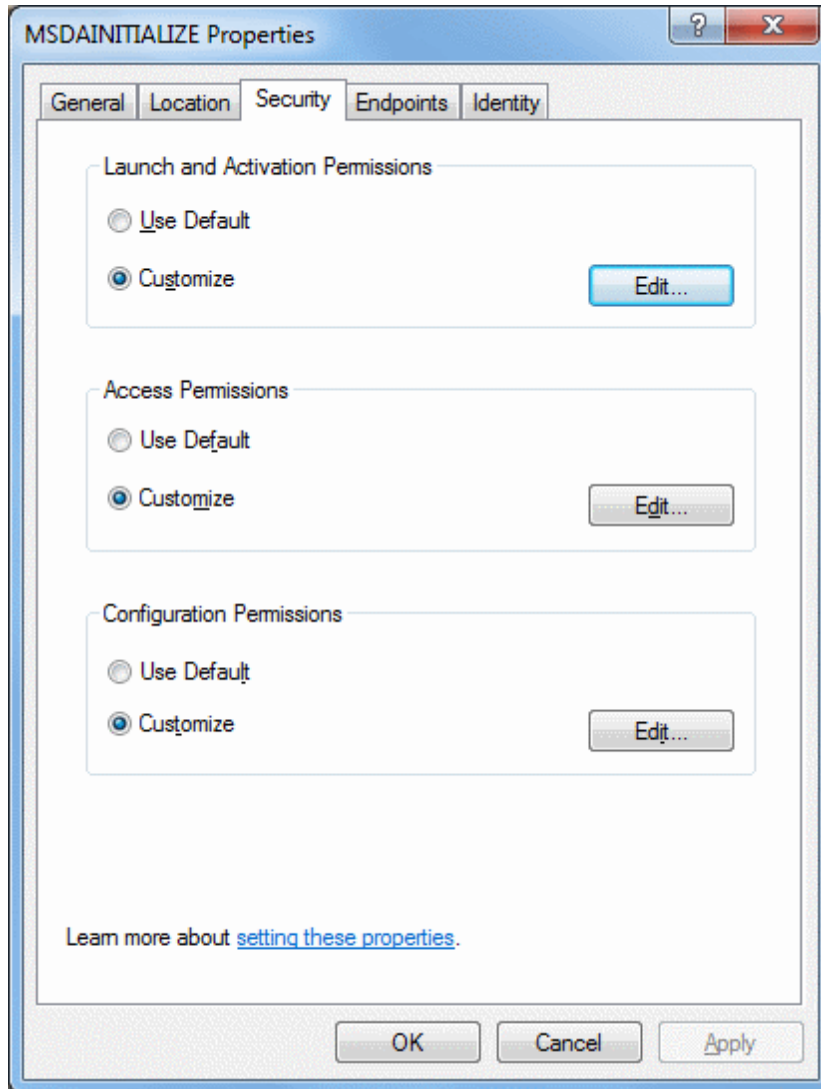
When creating a linked server in SSMS, most errors happen due to security issues with DCOM class MSDAINITIALIZE. We need to alter the DCOM Class MSDAINITIALIZE security settings to make it work.

Following are the steps:

1. Open Component Services (Start>Run>DCOMCNFG)
2. Expand Component Services>Computers>My Computer>DCOM Config
3. From the list of DCOM components on the right side, select **MSDAINITIALIZE** and go to its properties:



4. Go to the Security Tab, Choose 'Customize' and click on the 'Edit' Button:

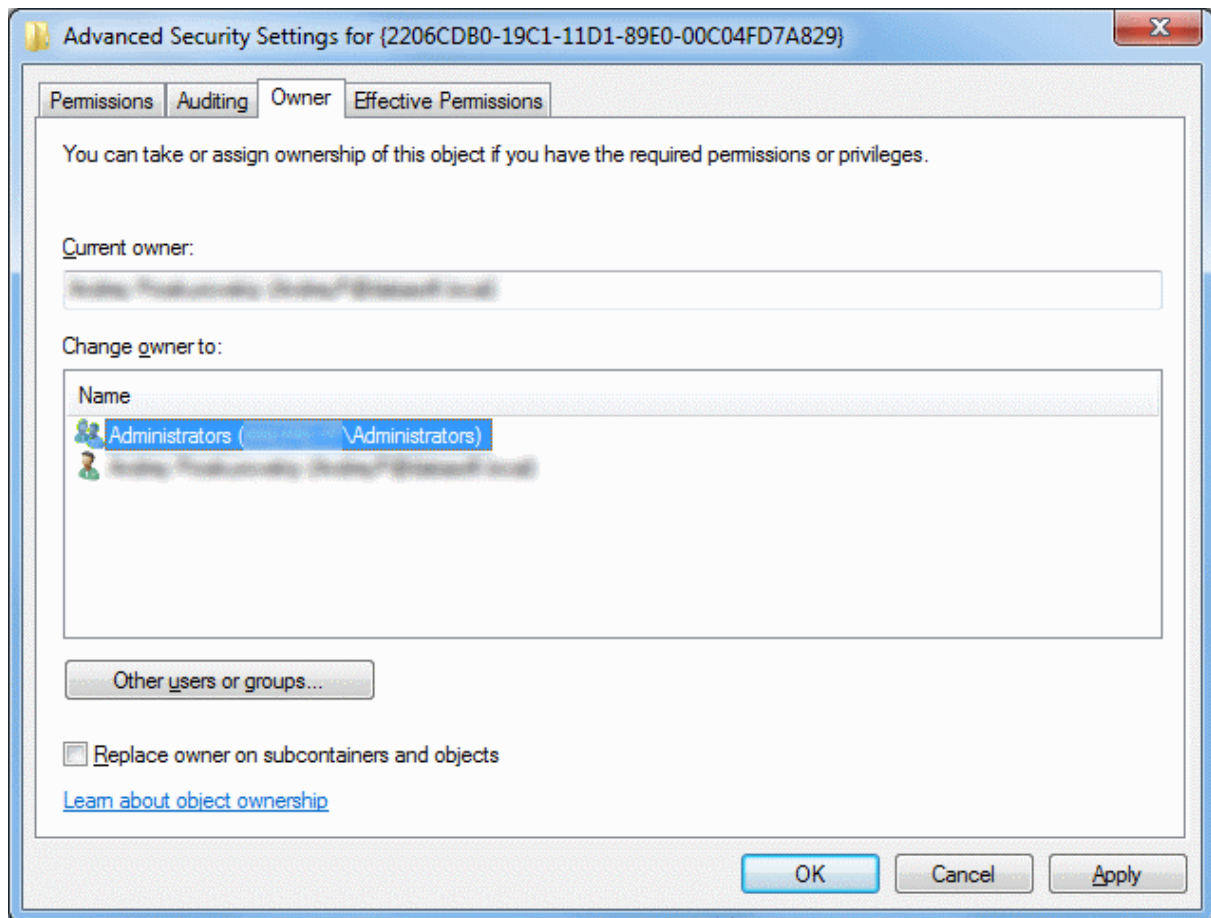


5. Add the Domain User who is accessing the linked server and 'Allow' all the permissions available (Local Launch, Remote Launch, Local Activation, Remote Activation). If you are connecting to SQL server using SQL account, you need to provide this permission to the account under which the SQL service is running.
6. Do this for all the 3 sections in the above screenshot.

To edit the Security settings, we followed the below steps:

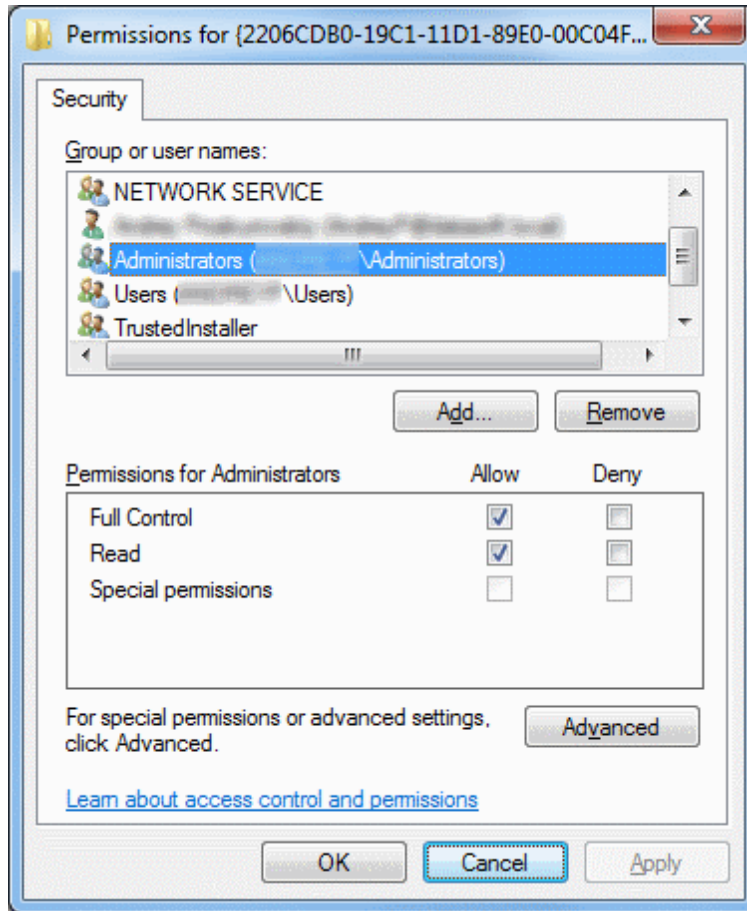
1. Start > Run > Regedit
2. Find the Key: HKEY_LOCAL_MACHINE\SOFTWARE\Classes\AppID\{2206CDB0-19C1-11D1-89E0-00C04FD7A829}

3. Right Click>Permissions>Advanced>Owner Tab:



4. Change the owner to Administrators.

5. Now, grant 'Full Control' to Administrators:



After this you should be able to edit MSDAINITIALIZE security settings .

See also

- [Error message when you try to create an instance of an OLE DB provider in SQL Server: "Cannot create an instance of OLE DB provider"](#)

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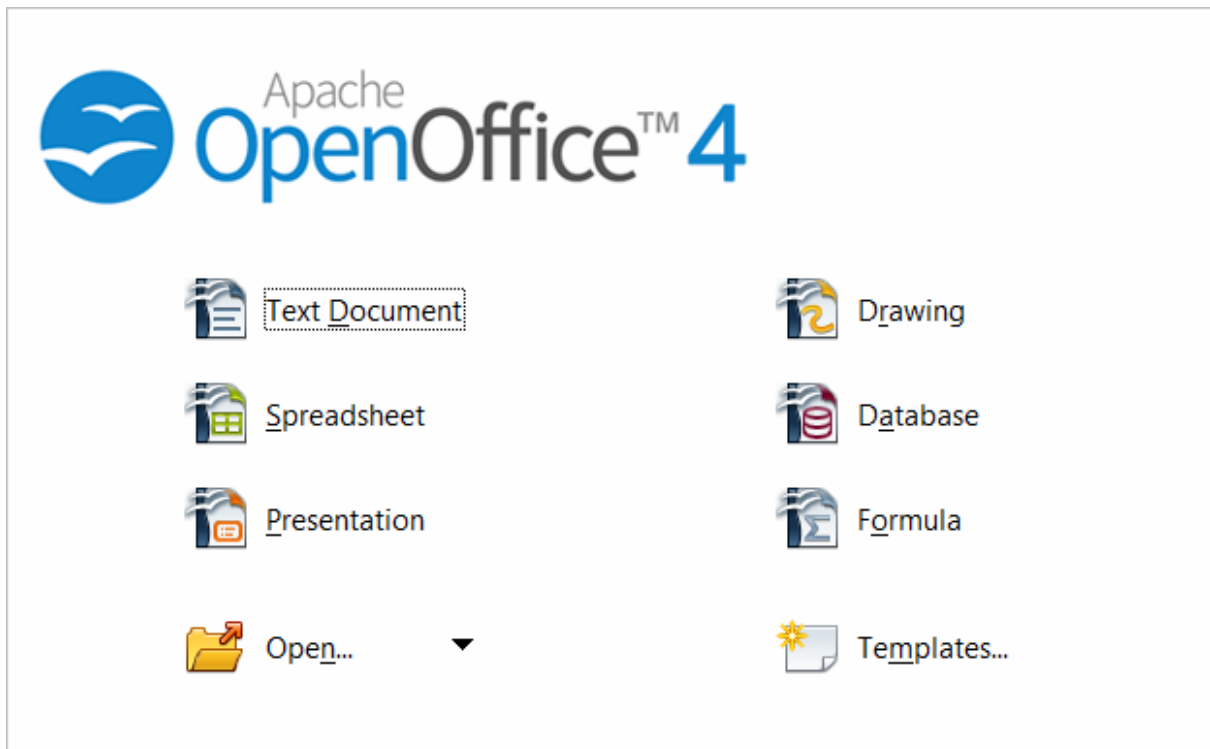
4.6 Using in OpenOffice and LibreOffice

Connecting to SQLite from OpenOffice and LibreOffice using ODBC Driver for SQLite

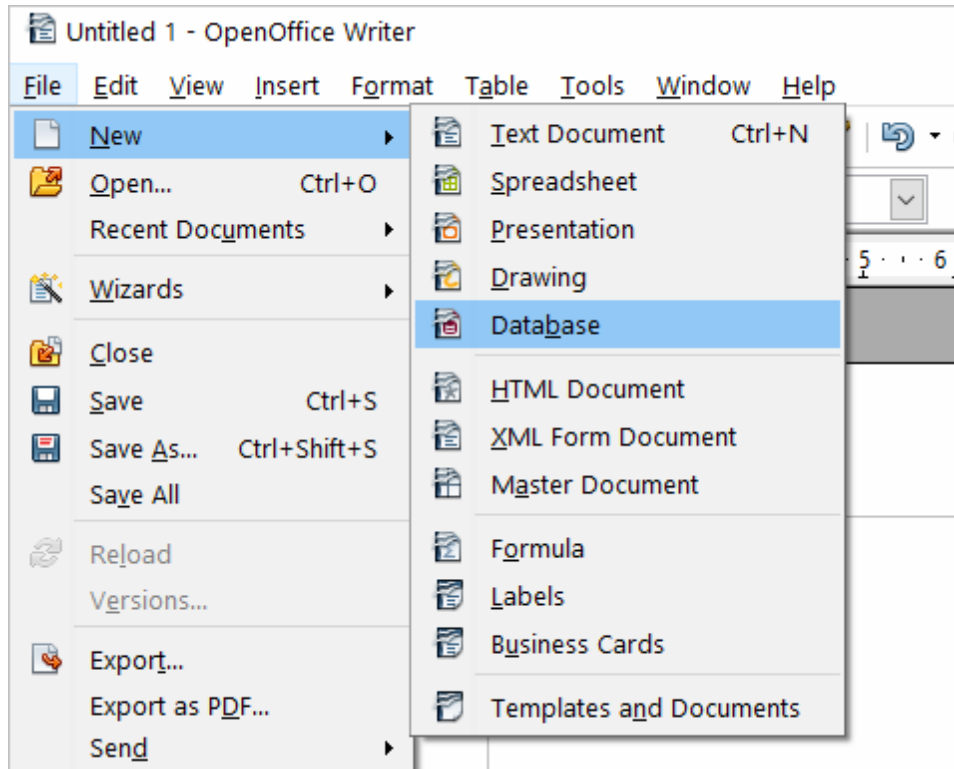
The article describes how to use Apache OpenOffice and LibreOffice to access ODBC data sources using the respective driver. You can access SQLite data from Open Office Base or LibreOffice Base — desktop database management systems. Note that the Windows version of OpenOffice is 32-bit, and you may get the error “The specified DSN contains an architecture mismatch between the Driver and Application” when trying to access a data source through a 64-bit ODBC driver. To get rid of the error message, set up the 32-bit version of the driver.

To connect to an ODBC data source from OpenOffice or LibreOffice using our [driver for SQLite](#), perform the steps below:

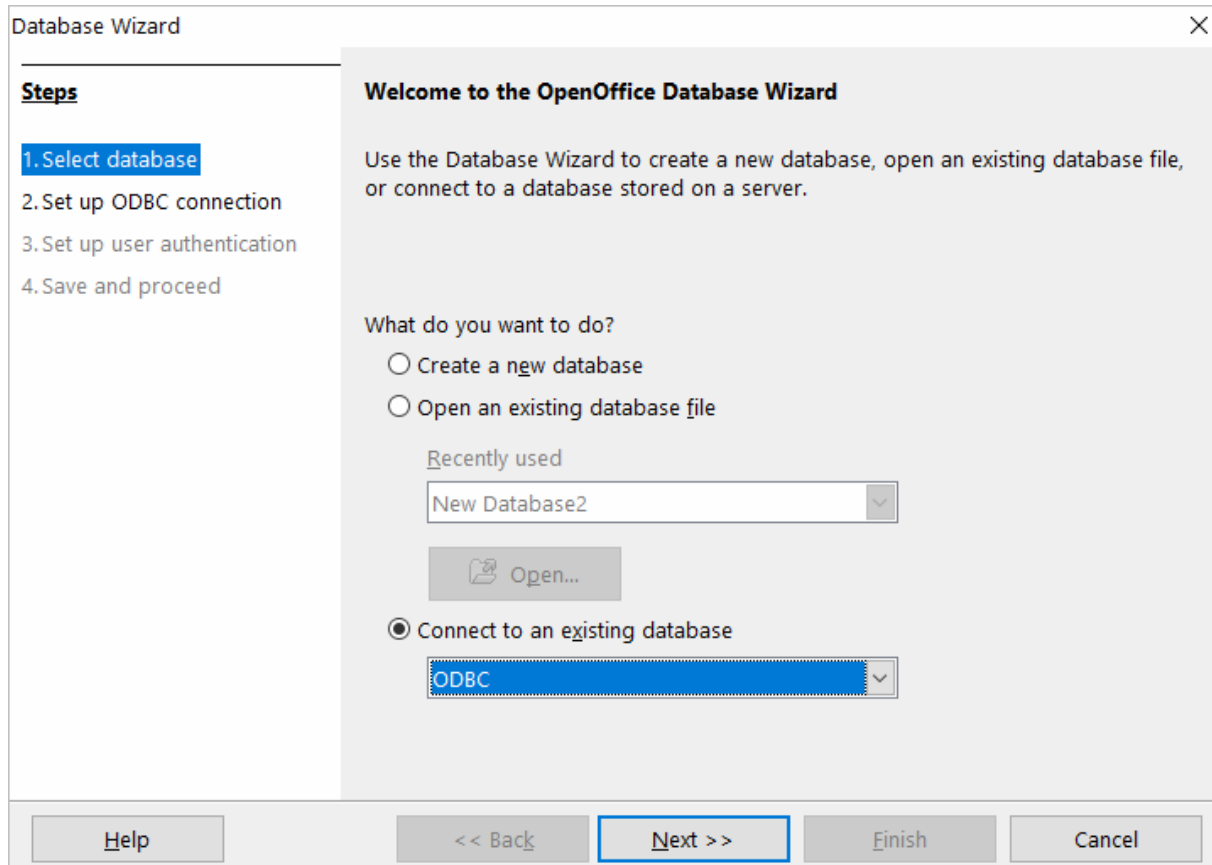
1. Start OpenOffice or LibreOffice, click **Database** to open the **Database Wizard**.



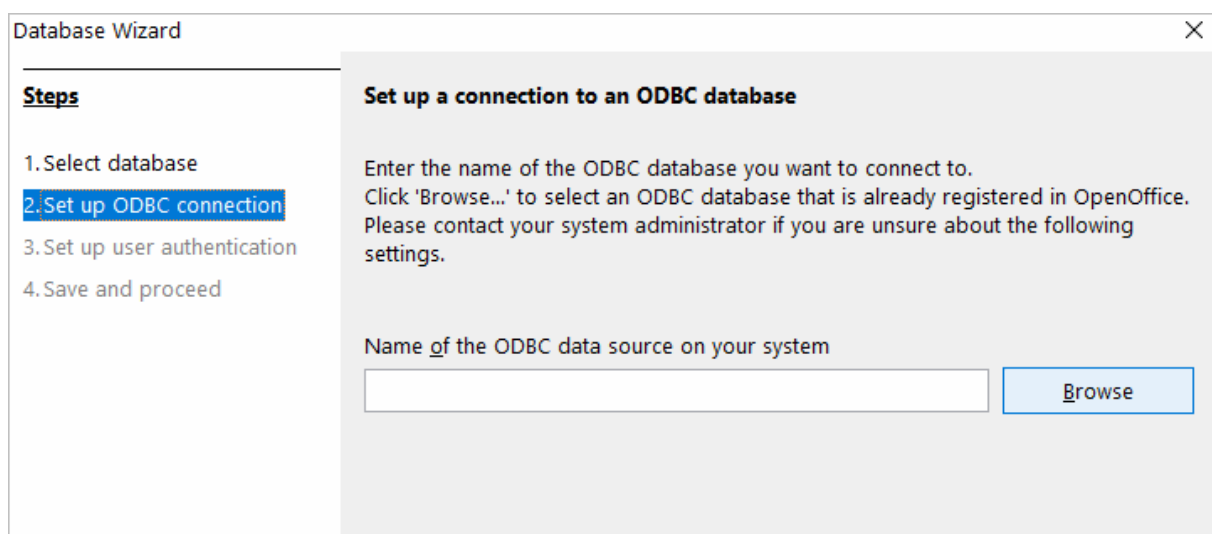
Alternatively, you can launch the **Database Wizard** from OpenOffice or LibreOffice Calc, Writer or any other tool by choosing **File > New > Database**.

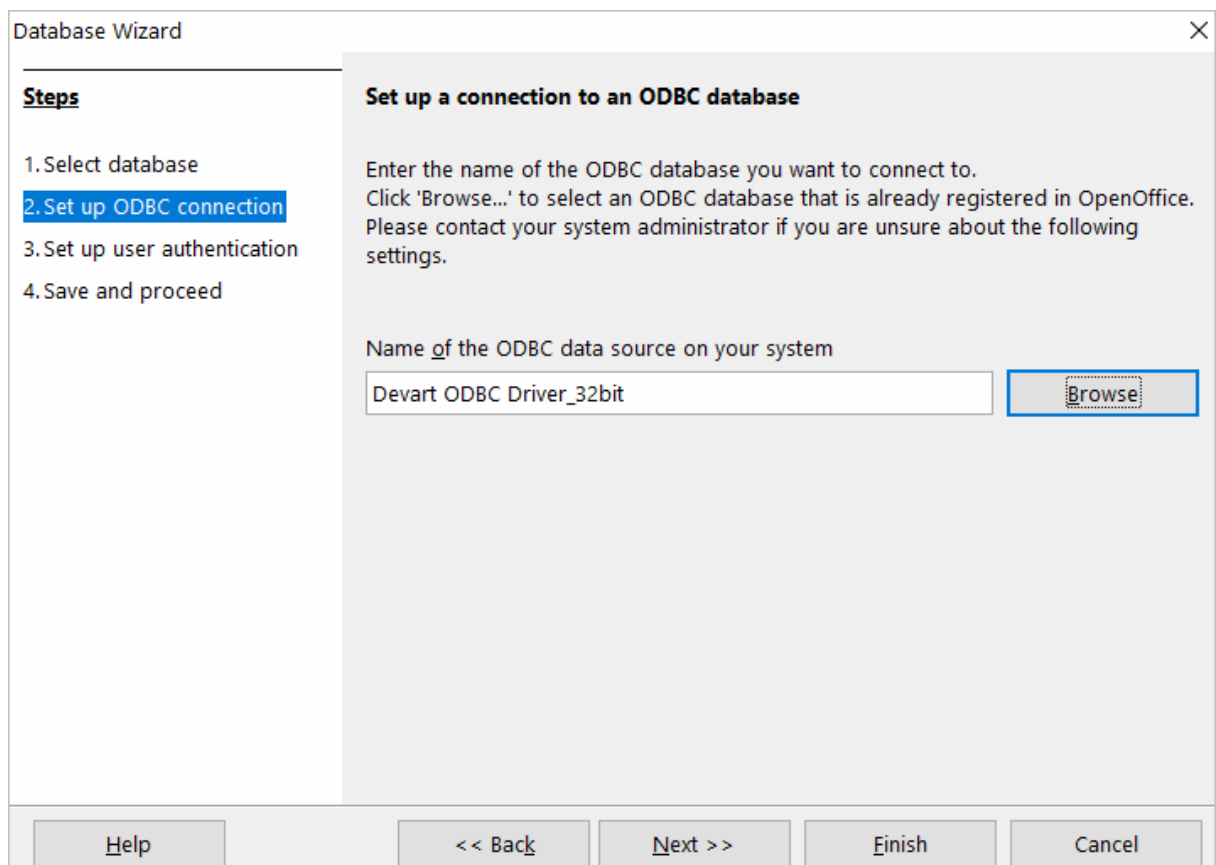
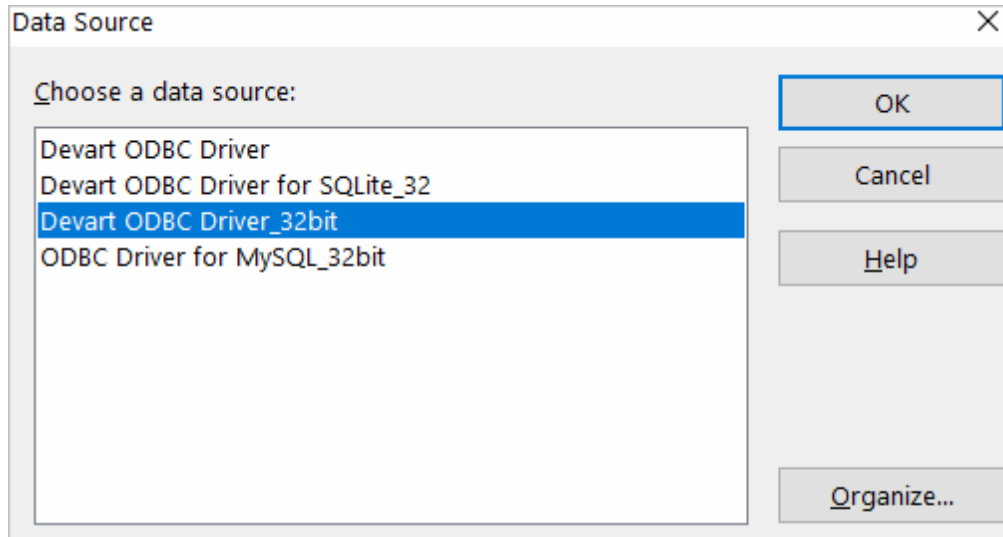


2. In the **Database Wizard dialog box**, click **Connect to an existing database**, select **ODBC** from the drop-down list, and click **Next**.



3. Specify the name of the data source you want to connect to. You can either type the name of your data source into the field, e.g. **ODBC Driver for SQLite**, or you can click **Browse**, double-click the data source you need, and then click **Next**.



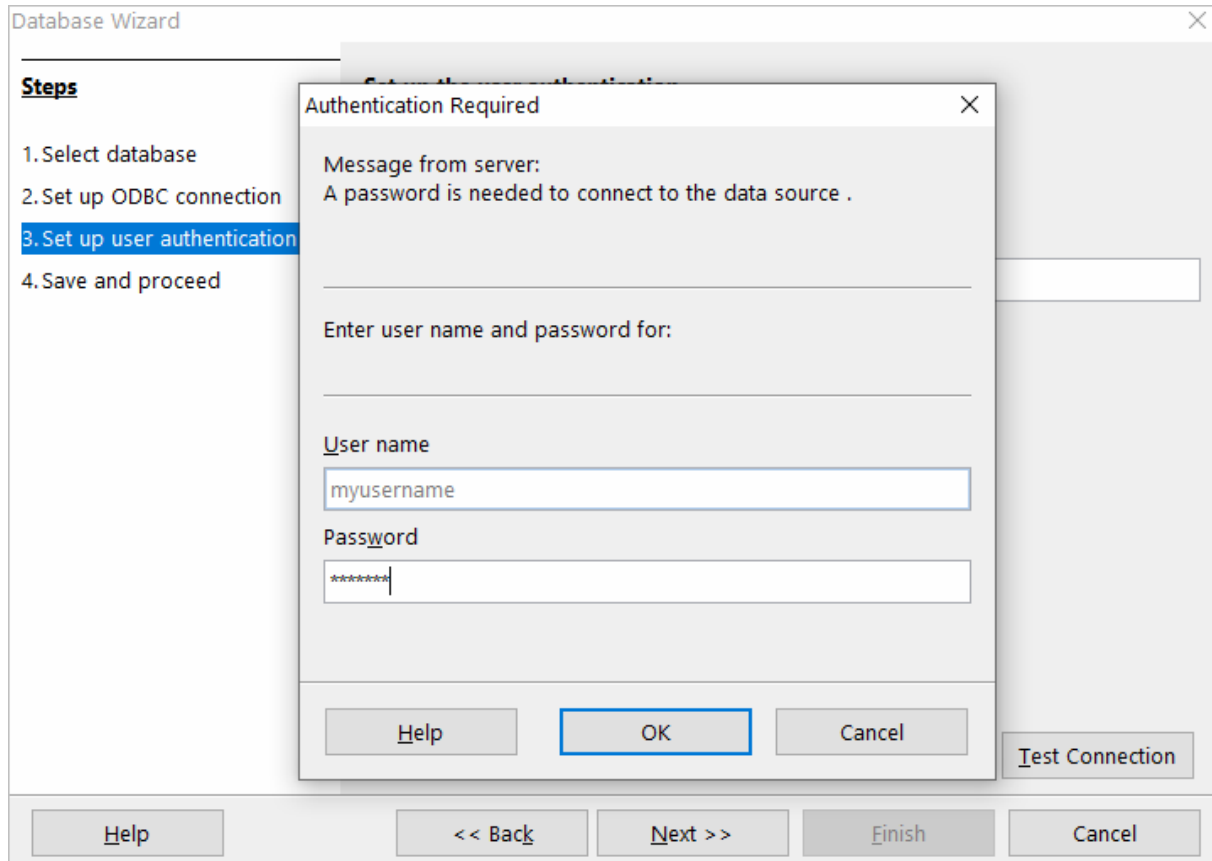


4. If your database requires a user name, type it into the **User name** field. If you are connecting to a password protected database, check the **Password required** field. Alternatively, you can specify these parameters in the data source settings of your ODBC

Driver for SQLite and leave these fields empty in **Database Wizard**.

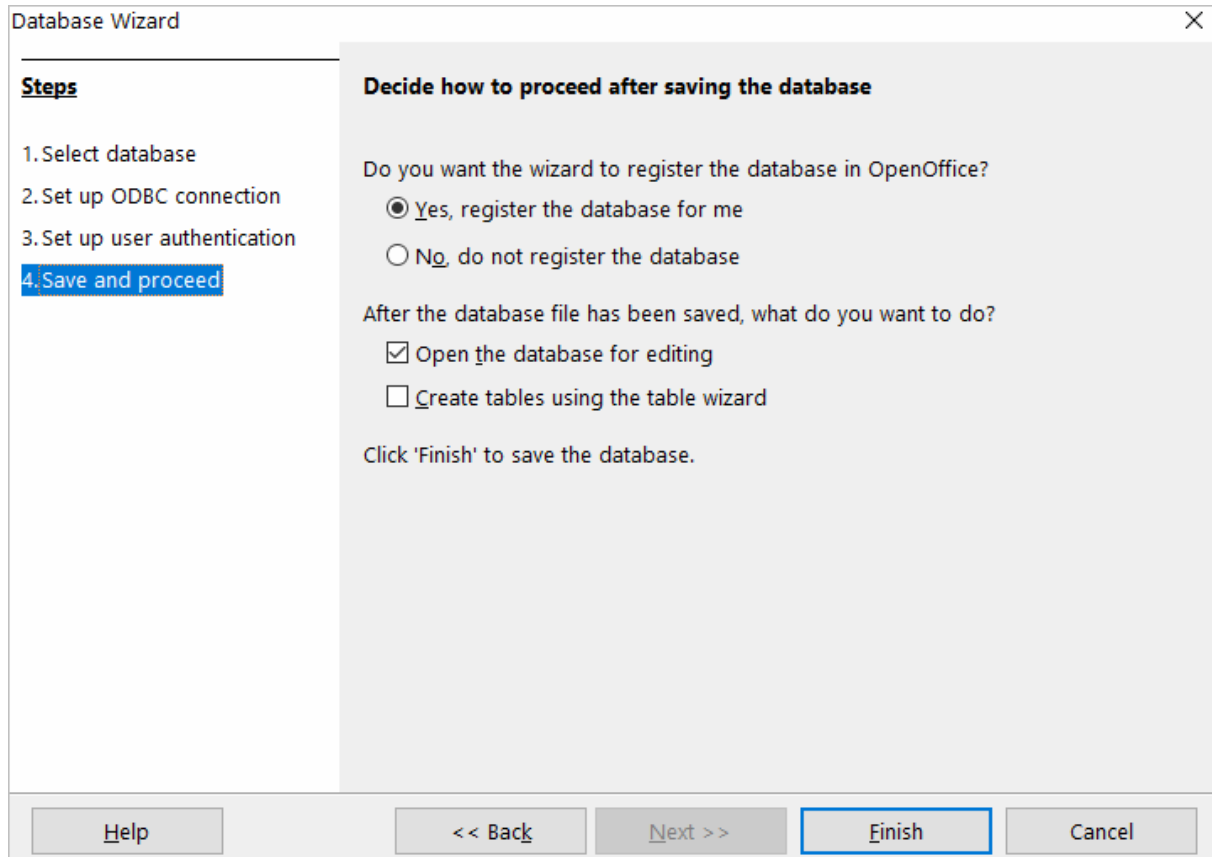
The screenshot shows the 'Database Wizard' dialog box with the title bar 'Database Wizard' and a close button (X). On the left, a 'Steps' list contains four items: '1. Select database', '2. Set up ODBC connection', '3. Set up user authentication' (highlighted with a blue background), and '4. Save and proceed'. The main area is titled 'Set up the user authentication' and contains the text 'Some databases require you to enter a user name.' Below this, there is a 'User name' label and a text input field containing 'myusername'. A checkbox labeled 'Password required' is checked. At the bottom right of the main area is a 'Test Connection' button. The bottom of the dialog features a row of five buttons: 'Help', '<< Back', 'Next >>' (highlighted with a blue border), 'Finish', and 'Cancel'.

To test the connection to your data source, click **Test Connection**, input your credentials and click **OK**.

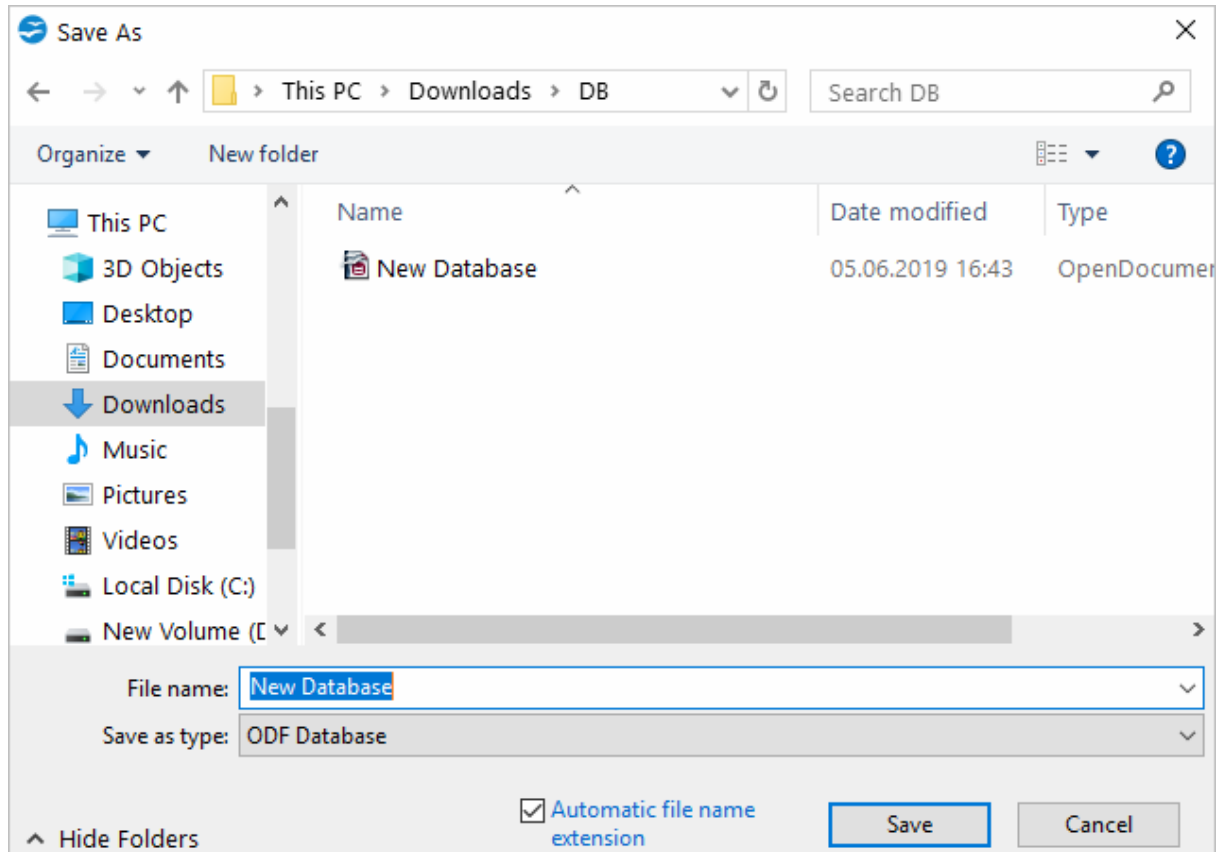


If you have entered valid credentials, you will see a success message. Click **Next** to proceed to the final step.

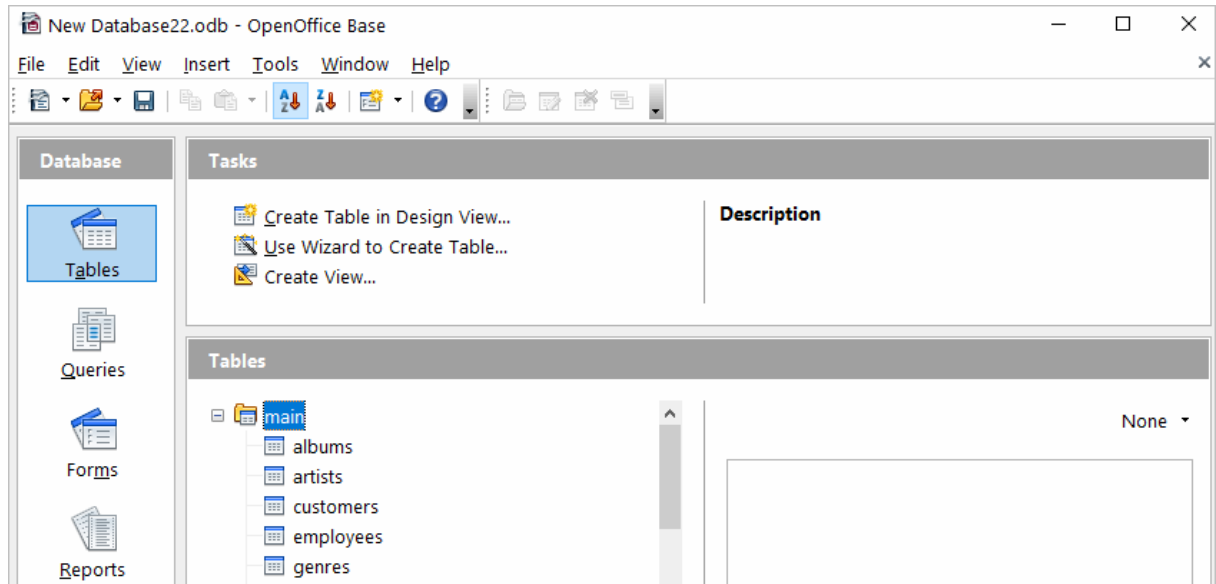
5. You can keep the default selection in this dialog box and click **Finish**.



You will be prompted to give a name to your new database and select the directory where you want to store it.



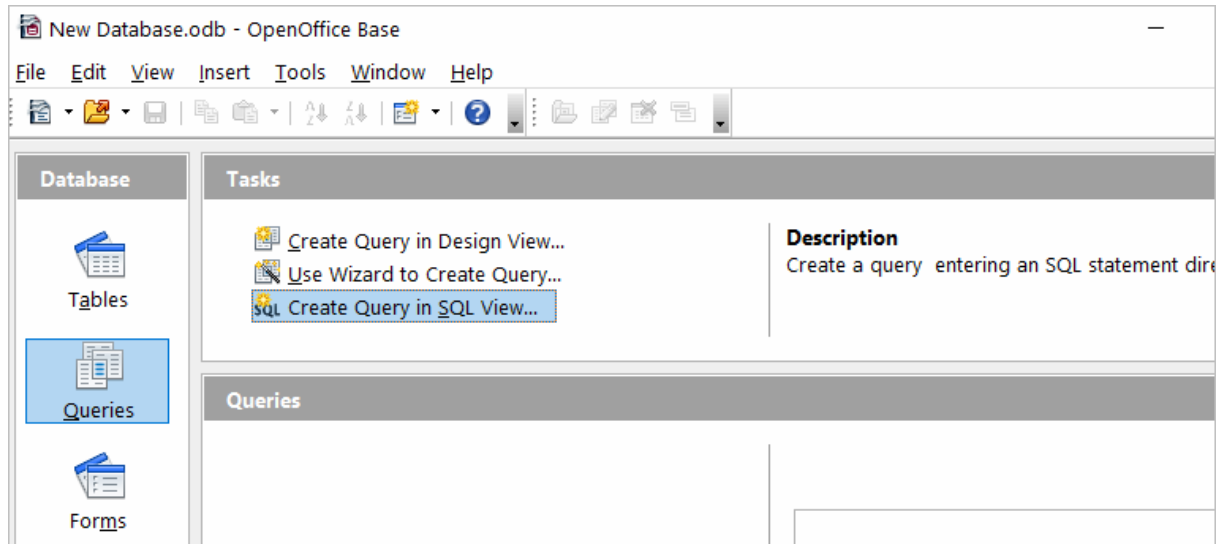
6. When the database opens, you will see the list of tables from your data source displayed in OpenOffice or LibreOffice Base workspace. To view the data from a specific table, double-click the table name.



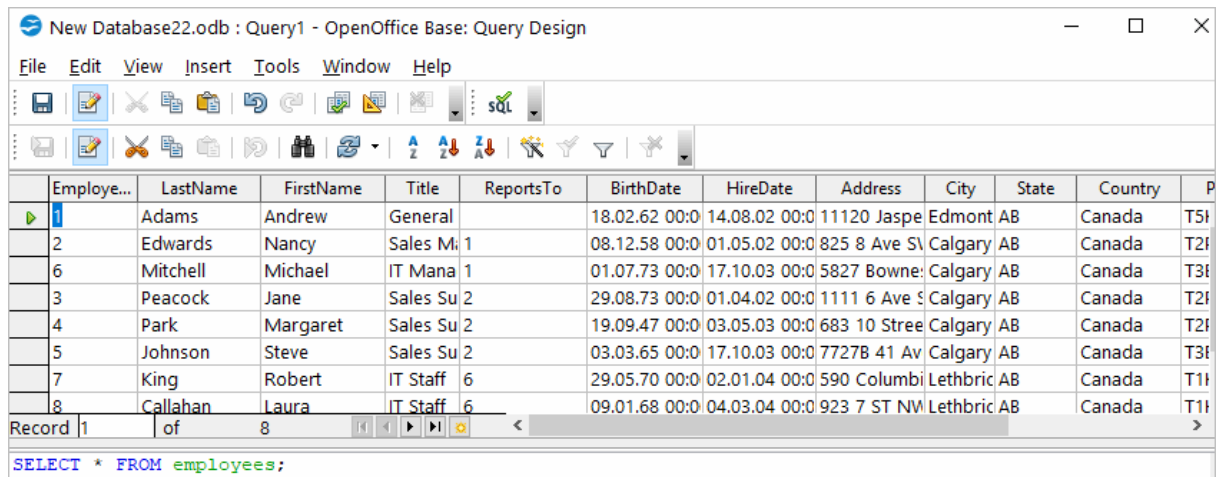
main.employees - New Database222 - OpenOffice Base: Table Data View

Employee...	LastName	FirstName	Title	ReportsTo	BirthDate	HireDate	Address	City	State	Country
1	Adams	Andrew	General Manager		18.02.62 00:0	14.08.02 00:0	11120 Jasper	Edmont	AB	Canada
2	Edwards	Nancy	Sales Manager	1	08.12.58 00:0	01.05.02 00:0	825 8 Ave S	Calgary	AB	Canada
6	Mitchell	Michael	IT Manager	1	01.07.73 00:0	17.10.03 00:0	5827 Bowne	Calgary	AB	Canada
3	Peacock	Jane	Sales Support Agent	2	29.08.73 00:0	01.04.02 00:0	1111 6 Ave S	Calgary	AB	Canada
4	Park	Margaret	Sales Support Agent	2	19.09.47 00:0	03.05.03 00:0	683 10 Stree	Calgary	AB	Canada
5	Johnson	Steve	Sales Support Agent	2	03.03.65 00:0	17.10.03 00:0	7727B 41 Av	Calgary	AB	Canada
7	King	Robert	IT Staff	6	29.05.70 00:0	02.01.04 00:0	590 Columbi	Lethbric	AB	Canada
8	Callahan	Laura	IT Staff	6	09.01.68 00:0	04.03.04 00:0	923 7 ST NW	Lethbric	AB	Canada

7. To create an SQL query, click **Queries** in the **Database** pane, then click **Create Query in SQL View...**



Enter your query in the query text box and click **Run Query (F5)**. The date will be fetched from the database and displayed in Open Office or LibreOffice, respectively.



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4.7 Using in PHP

Connecting to SQLite from PHP using ODBC Driver for SQLite

PHP is one of the most popular programming languages for website development. ODBC drivers are connectors that make PHP development database agnostic — your software written in PHP will function with any vendor's database management system. You can use functions like `odbc_exec()` to prepare and execute SQL statements against any databases like MySQL, SQLite, PostgreSQL, etc.

PHP-based projects usually require a data storage, whether a traditional database or a cloud-based database. You can establish a connection to them using ODBC interface. With our ODBC drivers, you can access various data sources and retrieve tables and fields from a database.

Below is a sample PHP script for accessing SQLite via ODBC. The script [connects to SQLite database](#) and fetches all records from a table:

Step 1: Connect to ODBC data source

The `odbc_connect()` function is used to connect to an ODBC data source. Note that the function takes three mandatory parameters: the data source name, username and password. If your database is not password-protected or doesn't require a username, leave these parameters empty. In the following example, a connection is established using the `odbc_connect()` function in PHP.

```
<?php
$user = "myusername";
$password = "mypassword";
$ODBCConnection = odbc_connect("DRIVER={Devart ODBC Driver for SQLite};D
```

Step 2: Execute an SQL statement

If connection is successful, the `odbc_exec()` function is used to execute a SELECT statement against the `dept` table in the `autotest` database.

```
$SQLQuery = "SELECT * FROM autotest.dept";
$RecordSet = odbc_exec($ODBCConnection, $SQLQuery);
```

Step 3: Print the result set

The `odbc_fetch_row()` function is used to return records from the result set. While `odbc_fetch_row()` returns rows, the `odbc_result_set()` function prints a set of result in HTML table. After all rows from the result set have been printed, the `odbc_close()` function closes the connection.

```
while (odbc_fetch_row($RecordSet)) {
    $result = odbc_result_all($RecordSet, "border=1");
```

```
}  
odbc_close($ODBCConnection);  
?>
```

You can modify this script by specifying general settings for each Devart ODBC driver to use any of them with your PHP projects.

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4.8 Using in Power BI

Importing SQLite Data into Power BI Through an ODBC Connection

Power BI is a popular business intelligence solution that is comprised of services, apps, and connectors that allow you to pull raw data from various sources and create meaningful reports. To connect Power BI to a data source such as SQLite, you can use a corresponding ODBC driver.

This tutorial explores how to connect to SQLite and [import data](#) into Power BI Desktop using an ODBC driver. It is assumed that you have already installed and configured a DSN for ODBC driver for SQLite.

1. Run Power BI Desktop and click **Get Data**.
2. Select the **Other** category in the **Get Data** dialog box, then select **ODBC**. Click **Connect** to confirm the choice.
3. In the **From ODBC** dialog box, expand the **Data Source Name (DSN)** drop-down list and select the previously configured DSN for SQLite
4. If you would like to enter a SQL statement to narrow down the returned results, click the **Advanced options** arrow, which expands the dialog box, and type or paste your SQL statement.
5. Click **OK**. If your data source is password-protected, Power BI will prompt you for user credentials. Type your **Username** and **Password** in the respective fields and click.
6. Now you should see the data structures in your data source. You can preview the contents of the database objects by clicking on them.
7. To load the SQLite data into Power BI for analysis, select the needed table and click **Load**.

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4.9 Using in Python

Installing the ODBC Driver for SQLite

One of the most convenient methods to connect to an external database or access cloud data from Python is via ODBC. Devart has developed a range of ODBC Drivers for Python to work with databases and cloud services.

If you don't have Python installed on your machine, go to the Python official website, download the appropriate installer and run it. You will also need to install the **pyodbc** module — the easiest way to do that is by using the `pip install pyodbc` command in the Python interactive mode. Next, you need to [download the ODBC Driver](#) for SQLite. To use the ODBC driver as a translation layer between the application and the database, you need to configure it by following the installation [instructions](#).

Connecting to SQLite from Python using ODBC Driver for SQLite

Here's an example to show you how to [connect to SQLite](#) via Devart ODBC Driver in Python. First we import the pyodbc module, then create a connection to the database, insert a new row and read the contents of the EMP table while printing each row to the Python interactive console. To execute the script, you can type the code directly in the interactive console or add the code to a file with the .py extension and run the file from the command prompt.

Step 1: Connect

```
import pyodbc
cnxn = pyodbc.connect('DRIVER={Devart ODBC Driver for SQLite};Direct=True;Da
```

Step 2: Insert a row

Here's a simple example of how to execute an *insert* statement to test the connection to the database. The script inserts a new record to the EMP table.

```
cursor = cnxn.cursor()
cursor.execute("INSERT INTO EMP (EMPNO, ENAME, JOB, MGR) VALUES (535, 'Scott
```

Step 3: Execute query

The `cursor.execute()` function retrieves rows from the *select* query on a dataset. The `cursor.fetchone()` function iterates over the result set returned by `cursor.execute()` while the `print()` function prints out all records from the table to the console.

```
cursor = cnxn.cursor()
cursor.execute("SELECT * FROM EMP")
row = cursor.fetchone()
while row:
    print (row)
    row = cursor.fetchone()
```

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4.10 Using in QlikView

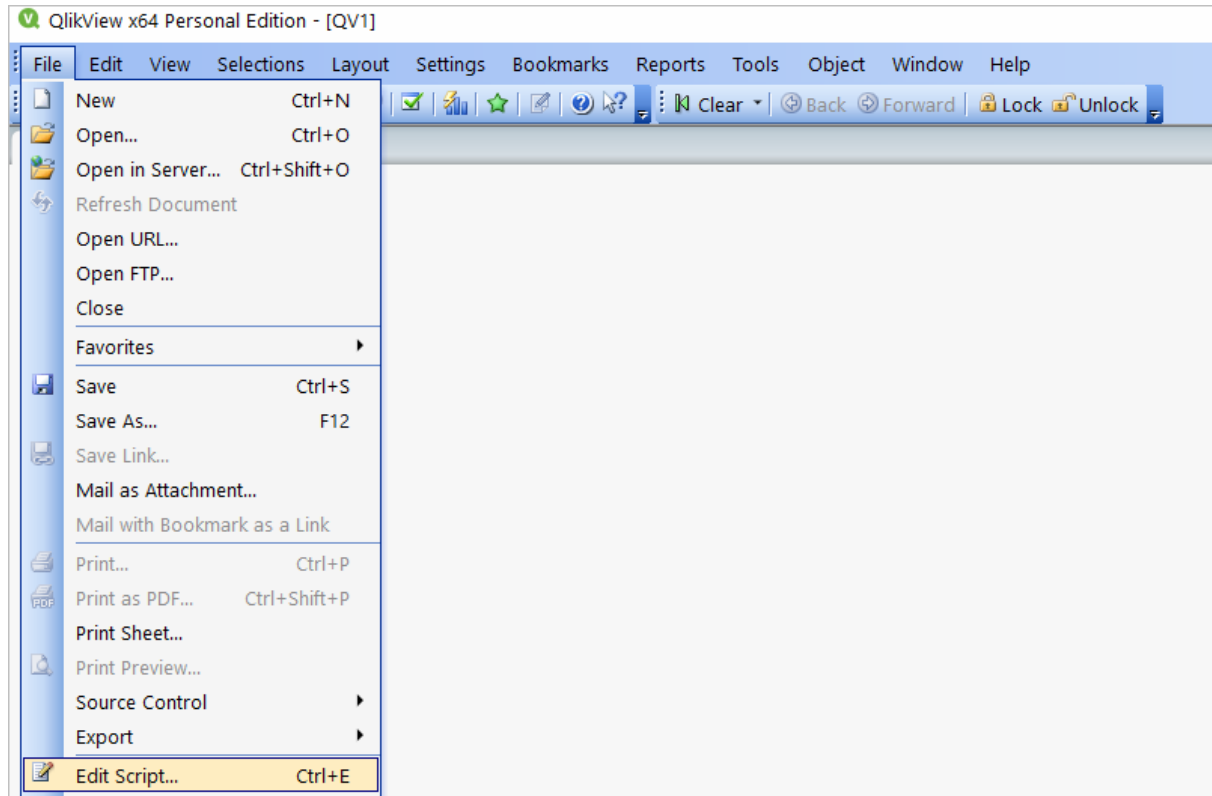
Connecting to SQLite from QlikView using ODBC Driver for SQLite

This tutorial describes how to connect and configure QlikView to retrieve data from SQLite for further analysis. QlikView is a data visualization tool that connects and pulls data from different popular databases like MySQL, MongoDB, Oracle, SQL Server, Postgres, etc. to present it in a single view. The business intelligence platform identifies relationships in your data and discovers patterns and opportunities to support your decision making.

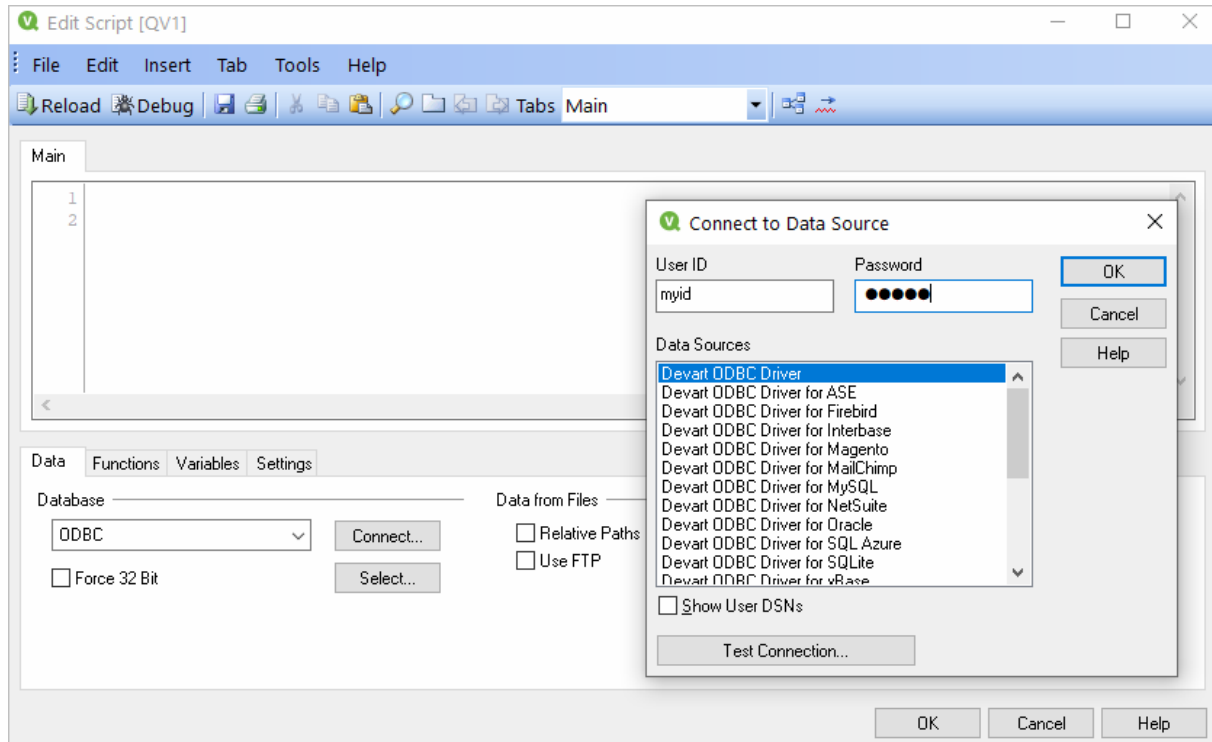
QlikView supports the ODBC connectivity interface for communication with external data sources. An ODBC data source must be configured for the database you want to access. You can create an ODBC connection using a DSN during the ODBC driver installation or later.

To connect to an ODBC data source from QlikView using our driver for SQLite, perform the steps below:

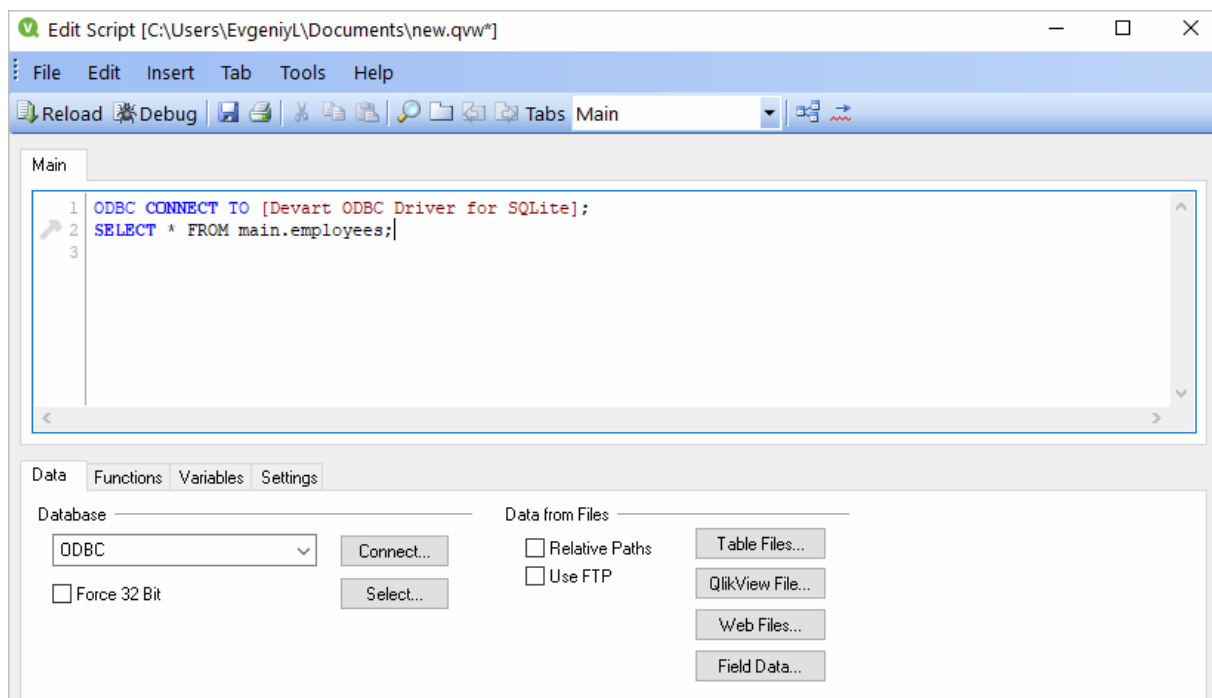
1. Open the QlikView client application and click **File > New**. Close the **Getting Started** wizard and open **File > Edit Script (CTRL+E)**.

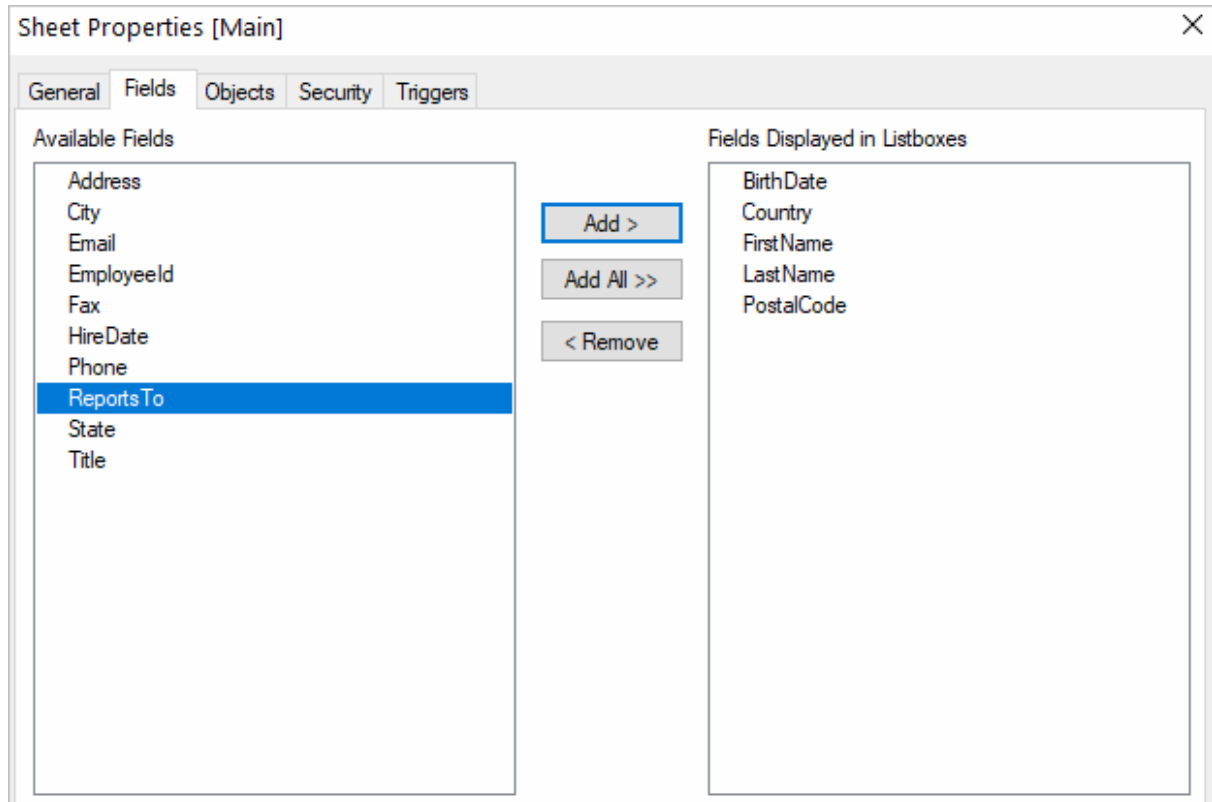


2. In the **Data** tab, choose **ODBC** from the **Database** drop-down and click **Connect**. Select the **Data Source** you created earlier, type in the **User ID** and **Password** if your database is password-protected. You can test the connection by choosing **Test Connection**. The **Connection Test succeeded** message should appear. Click **OK** to connect to your data source.

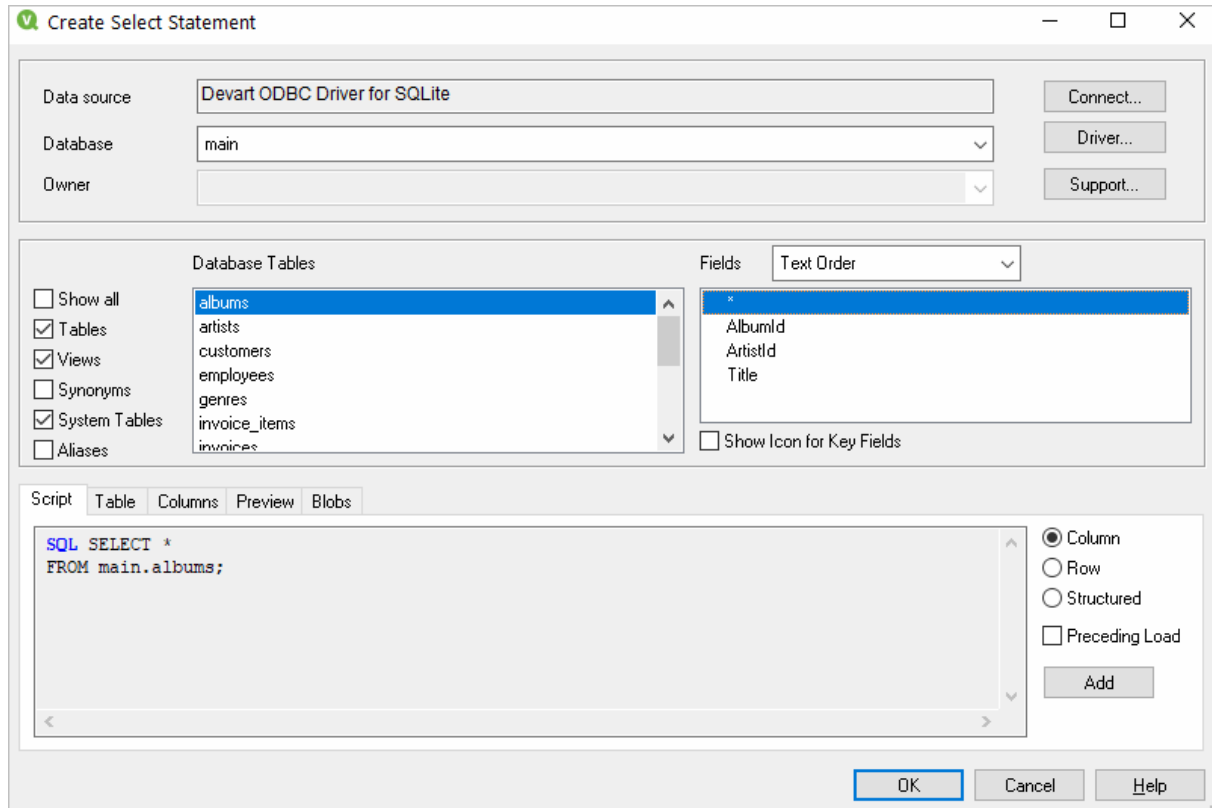


3. To retrieve the data from your data source, you can enter an SQL query and press **F5**. You will be suggested to choose fields to be displayed.

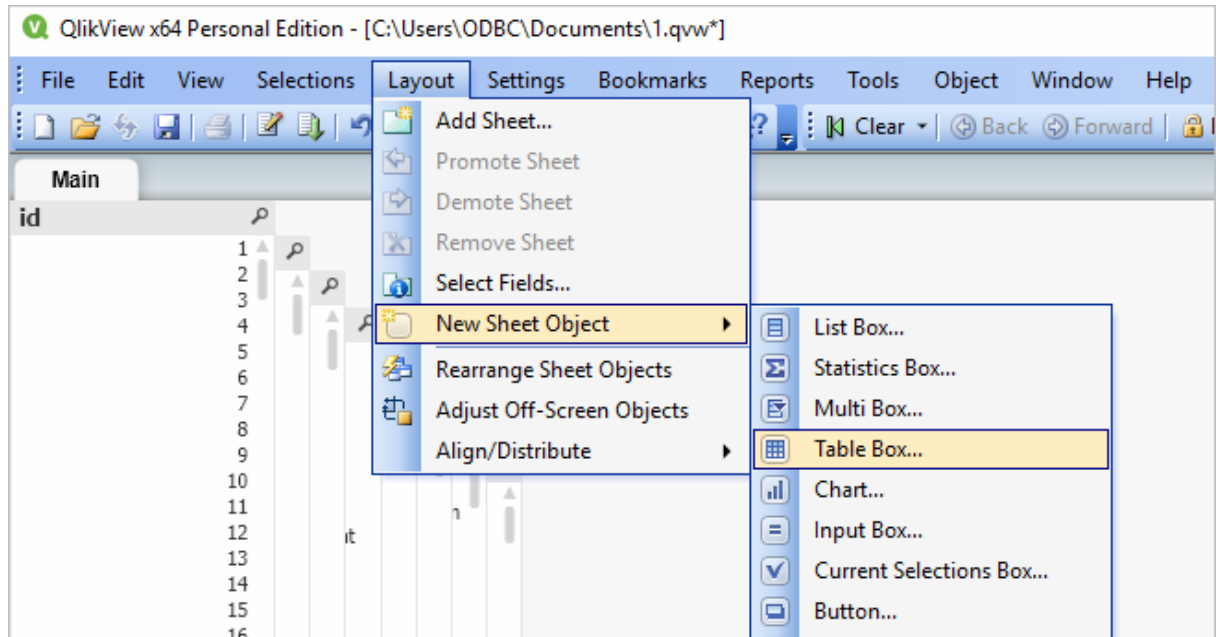




4. Alternatively, you can click **Select**, and QlikView will show you the database structure window where you can compose a SELECT statement for the data to be fetched. You can choose a different database from the database drop-down list. Select the necessary tables and fields. You can retrieve data from multiple tables and fields by selecting them and clicking **Add**. When you are ready with your SELECT statement, click **OK**. You will get back to the main script editor with your SQL statement. Press **F5** to execute the script and select the fields to be displayed in QlikView.



5. Once the data has been fetched, you can choose a table layout to present the data in a table. Choose **Layout > New Sheet Object > Table Box**. Select the fields to be added to the tablebox and click **OK**.



The screenshot shows the QlikView x64 Personal Edition interface with a table of employee data. The table has columns: Address, BirthDate, City, Country, Email, EmployeeId, Fax, FirstName, HireDate, and LastName. The data is as follows:

Address	BirthDate	City	Country	Email	EmployeeId	Fax	FirstName	HireDate	LastName
590 Columbia Boulevard West	29.05.1970 0:00:00	Lethbridge	Canada	robert@chinookcorp.com	7	+1 (403) 456-8485	Robert	02.01.2004 0:00:00	King
683 10 Street SW	19.09.1947 0:00:00	Calgary	Canada	margaret@chinookcorp.com	4	+1 (403) 263-4289	Margaret	03.05.2003 0:00:00	Park
825 8 Ave SW	08.12.1958 0:00:00	Calgary	Canada	nancy@chinookcorp.com	2	+1 (403) 262-3322	Nancy	01.05.2002 0:00:00	Edwards
923 7 ST NW	09.01.1968 0:00:00	Lethbridge	Canada	laura@chinookcorp.com	8	+1 (403) 467-8772	Laura	04.03.2004 0:00:00	Callahan
1111 6 Ave SW	29.08.1973 0:00:00	Calgary	Canada	jane@chinookcorp.com	3	+1 (403) 262-6712	Jane	01.04.2002 0:00:00	Peacock
5827 Bowness Road NW	01.07.1973 0:00:00	Calgary	Canada	michael@chinookcorp.com	6	+1 (403) 246-9899	Michael	17.10.2003 0:00:00	Mitchell
7727B 41 Ave	03.03.1965 0:00:00	Calgary	Canada	steve@chinookcorp.com	5	(780) 836-9543	Steve	17.10.2003 0:00:00	Johnson
11120 Jasper Ave NW	18.02.1962 0:00:00	Edmonton	Canada	andrew@chinookcorp.com	1	+1 (780) 428-3457	Andrew	14.08.2002 0:00:00	Adams

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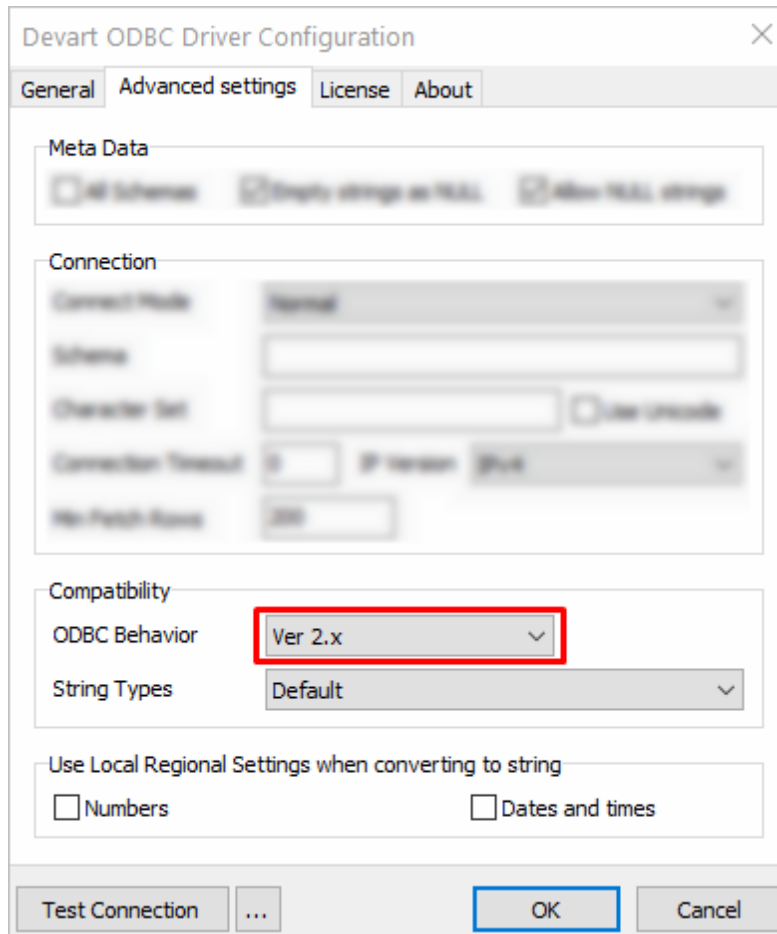
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4.11 Using in SSIS

SQL Server Integration Services (SSIS) is a component of SQL Server that is designed to perform various data migration tasks. When using Devart ODBC Driver for SQLite as a translation layer between the data source and SSIS, the driver and SSIS communicate via Microsoft ODBC version 3.x.

Note that when you extract data from an ODBC data source using the `SQLExecDirect` function,

an issue may occur: SSIS expects the ODBC 2.x behavior, while the ODBC driver continues to fetch data from a data source via ODBC version 3.x. To prevent any issues when using `SQLExecDirect`, you should force the ODBC 2.x behavior in the DSN settings: open the **Advanced Settings** tab and select `Ver 2.x` from the **ODBC Behavior** dropdown.



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4.12 Using in Tableau

This section describes how to establish and troubleshoot a connection to SQLite from Tableau using ODBC Driver for SQLite.

- [Using in Tableau](#)
- [Troubleshooting in Tableau on macOS](#)

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4.12.1 Using in Tableau

Importing SQLite Data Into Tableau Through an ODBC Connection

This article explains to establish an ODBC connection to SQLite from Tableau Desktop. Tableau is a data visualization tool that allows you to pull in raw data, perform analysis on it, and create meaningful reports to get actionable insights. With Tableau Desktop and our suite of [ODBC drivers](#), you can connect to various relational and non-relational databases, both cloud and on-premise.

1. Run Tableau Desktop.
2. On the start page, select **More...** in the **Connect** pane.
3. Choose **Other Databases (ODBC)**.
4. Expand the **DSN** drop-down list and select the DSN that you have created and configured for SQLite. Alternatively, if you have not created a DSN, you can choose the **Driver** option and select Devart ODBC Driver for SQLite from the drop-down.
5. Click **Connect**.
6. After a successful connection, click **Sign in**.
7. Select the needed database and schema in SQLite.
8. You should see the list of all tables you have access to in the connected data source.
9. Drag-and-drop the table name to the area where it says **Drag tables here** to retrieve the data, or click **New Custom SQL** to write a query that will select only specific data from the table.
10. Hit **Update Now** to retrieve and display the data.

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4.12.2 Troubleshooting in Tableau on macOS

Troubleshooting ODBC Connection in Tableau on

macOS

The iODBC driver manager incorrectly handles the SQL_WCHAR and SQL_WVARCHAR ODBC data types. To work with these data types in Tableau, create a Tableau Datasource Customization (.tdc) file in 'Users\[your name]\Documents\My Tableau Repository\Datasources\' — for example, *devart-sqlite.tdc*, and add the following capabilities to the file:

```
<?xml version='1.0' encoding='utf-8' ?>
<connection-customization class='genericodbc' enabled='true' version='1.0'>
<vendor name='SQLite' />
<driver name='Devart ODBC Driver for SQLite' />
  <customizations>
    <customization name='CAP_ODBC_BIND_SUPPRESS_WIDE_CHAR' value='yes' />
  </customizations>
</connection-customization>
```

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