DBISAM Version 4 ODBC Driver Manual

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Chapter 1
Before You Begin

1.1 Application Compatibility

Supported Applications

The DBISAM ODBC driver is an ODBC level 3 driver. We have tested the driver successfully with Microsoft Data Access Components (MDAC) version 2.7 or higher and the following applications:

Application	Versions and Notes
Crystal Reports	8.5 and later Version 9 requires a patch in order to run correctly. Please see the technical bulletin regarding this issue for more information: Problems with ODBC Driver and Crystal Reports 9
Microsoft Office	2000 and later Microsoft Access has problems with using an auto-increment field as part of the primary index since the Jet engine cannot "discover" the keys properly when they are not populated explicitly by the client application.
Microsoft Visio	2000 and later
Borland Database Engine (BDE)	5.01 and later With the BDE there are problems with using an auto-increment field as part of the primary index since the BDE cannot "discover" the keys properly when they are not populated explicitly by the client application.
ODBCExpress	5.06 and 7
Microsoft IIS ASP	5 and later It is recommended that you only use the ODBC functionality in ASP and not the ADO->OLEDB->ODBC bridge driver through the ADO functionality. The bridge driver does not function correctly in most cases.
Microsoft Visual Basic	6 and later It is recommended that you only use the ODBC functionality in VB 6 and not the ADO->OLEDB->ODBC bridge driver through the ADO functionality. The bridge driver does not function correctly in most cases.
Microsoft Visual Studio .NET	2002 and later

	It is recommended that you only use the ODBC.NET data provider with any .NET application (VB.NET, ASP.NET, C#, Delphi.NET, Chrome). Also, since the ODBC.NET data provider is accessing and using unmanaged resources and handles in the ODBC driver during operation, you should always call the Dispose method for any ODBCConnection, ODBCCommand, ODBCCommandBuilder, or ODBCDataAdapter objects when you are done using them (deterministic destruction). Failure to do so can cause major failures in the driver due to the resources and handles being freed up re-entrantly when the .NET garbage collector thread finalizes these objects.

Missing Features

There are still a few things missing from the driver, but they should not affect most environments. These missing items are:

- Support for bulk operations (specifically the SQLBulkOperations call)
- Support for a few ODBC extended scalar functions

More Information

The driver can completely handle all updating of data via SQL statements and the SQLExecute or SQLExecDirect calls, including BLOB data. Parameters are also completely supported, including BLOB parameters.

The driver provides scrollable cursor support via SQLFetchScroll and SQLExtendedFetch. The only two types of scrollable cursors supported are Static and Dynamic. Keyset-Driven cursors are not supported.

The driver cannot performed positioned updates using the SQL syntax WHERE CURRENT OF and using the SQLSetCursorName and SQLGetCursorName calls. This functionality is not supported in DBISAM.

Even though the driver supports parameter arrays, you still cannot request multiple result sets with the SQLMoreResults call. This is not supported in DBISAM.

If any of the DBISAM tables being accessed via the ODBC driver has an index that includes the special DBISAM RecordID field, it is possible that you could encounter an error (sometimes fatal) in the client application. This is due to the fact that the RecordID field is virtual and doesn't actually exist in the parent table. The DBISAM ODBC Driver takes the proper steps to inform the client application that this is the case by flagging the field as a "pseudo-column" in the index catalog information returned by the driver. However, some client applications appear to not pay any attention to this flag at all.

Chapter 2
Using the ODBC Driver

2.1 Configuring a Data Source

Introduction

A data source, or DSN (Data Source Name), is used by applications that use ODBC to locate and access a specific database in a specific location. Once you have configured a data source in the ODBC Administrator, you may use this data source name in any application that can access ODBC. However, you should check out the Application Compatibility notes in this manual for more information on applications that have been specifically tested with the DBISAM ODBC Driver.

Step-By-Step Instructions

Complete the following steps to properly configure a data source that uses the DBISAM ODBC Driver:

1) Run the ODBC Administrator (odbcad32.exe). This program is located in the Start menu under Programs/Administrative Tools/Data Sources (ODBC).

Note
By default, 32-bit versions of Windows use the 32-bit ODBC Administrator, and 64-bit versions of Windows use the 64-bit ODBC Administrator, when launching the ODBC Administrator via the Administrative Tools link. If you're using a 64-bit version of Windows, then you must use the 32-bit ODBC Administrator located here in order to configure 32-bit data sources for use with 32-bit applications and the 32-bit DBISAM ODBC Driver:

```
<WindowsInstallDir>\SysWoW64\odbcad32.exe
```

where <WindowsInstallDir> is the base Windows installation directory, usually c:\Windows.

2) If you want the data source to be accessible by all users, then click on the System DSN tab. If you want the data source to only be accessible to the current user, then click User DSN tab (the default page).

3) Click on the Add button to begin adding a data source. This will bring forward a dialog with a list of the installed ODBC drivers. Select the DBISAM ODBC Driver from the list and click on the Finish button.

Note
It is possible that there may be more than one DBISAM ODBC Driver listed due to multiple, different major versions of the driver being installed on the system.

4) A DBISAM ODBC Driver configuration wizard dialog will now be shown. Follow the instructions on this wizard to complete the data source configuration.

If at any time you wish to re-configure the data source, simply choose the appropriate tab page (User DSN or System DSN), select the data source name that you previously added from the list of data sources, and then click on the Configure button. This will bring forward the same configuration wizard dialog as before, except in this case you cannot specify a name for the data source.

2.2 Registry Entries

Location

ODBC data sources are stored in the registry in Windows. The location of both user and system data sources is detailed below:

Data Source Type	Location
User DSN	HKEY_CURRENT_USER\Software\ODBC\ODBC.INI\<Data Source Name>
System DSN	HKEY_LOCAL_MACHINE\Software\ODBC\ODBC.INI\<Data Source Name>

Also, a list of data sources defined on the system can be found here:

Data Source Type	Location
User DSN	HKEY_CURRENT_USER\Software\ODBC\ODBC.INI\ODBC Data Sources
System DSN	HKEY_LOCAL_MACHINE\Software\ODBC\ODBC.INI\ODBC Data Sources

64-bit Windows

Under 64-bit Windows, the above registry keys/values are for 64-bit DSNs only, and are only configurable via the 64-bit ODBC Administrator that is accessible from the Control Panel. In order to configure 32-bit DSNs on 64-bit Windows, one must use the 32-bit ODBC Administrator located here:

```
<WindowsInstallDir>\SysWoW64\odbcad32.exe
```

where <WindowsInstallDir> is the base Windows installation directory, usually c:\Windows.

In addition, 32-bit ODBC Administrator uses the special 32-bit registry values here for data sources:

Data Source Type	Location
User DSN	HKEY_CURRENT_USER\Software\Wow6432Node\ODBC\ODBC.INI\ODBC Data Sources
System DSN	HKEY_LOCAL_MACHINE\Software\Wow6432Node\ODBC\ODBC.INI\ODBC Data Sources

and here for a list of data sources:

Data Source Type	Location

User DSN	HKEY_CURRENT_USER\Software\Wow6432Node\ODBC\ODBC.INI\<Data Source Name>
System DSN	HKEY_LOCAL_MACHINE\Software\Wow6432Node\ODBC\ODBC.INI\<Data Source Name>

DBISAM Data Source Settings

The following registry values are defined under the <Data Source Name> key in the registry (see above):

Name	Description
ConnectionType	This string value is set to either "Local" if the data source is accessing the database (also called a catalog) directly, or "Remote" if the data source is accessing the database remotely via a database server.
CatalogName	This string value is the name of the database, or catalog, being used for the data source. The name can be either a directory name, if the data source is configured for local access (ConnectionType="Local"), or a database name, if the data source is configured for remote access to a database server (ConnectionType="Remote").
ReadOnly	This string value is set to "True" if the data source is read-only, and "False" if the data source is read-write.
Driver	This string value is always set to the directory and file name of the DBISAM ODBC driver itself.
ForceBufferFlush	This string value controls whether DBISAM forces the operating system to flush any buffered writes to disk immediately after the data is written to the operating system. If it is "False" (the default), then DBISAM will leave the flushing up to the operating system. If it is "True", then DBISAM will force a buffer flush after every write.
StrictChangeDetection	This string value controls whether DBISAM checks for changes every time it performs any read operation. If it is "False" (the default), DBISAM will use lazy change detection, which causes the engine to only check for changes by another user whenever it has to read from disk. If it is "True", DBISAM will check for changes before every read operation. This change detection configuration only applies to read operations - write operations always use strict change detection.
LockRetryCount	This string value controls the number of lock attempts DBISAM should make before issuing an error. The default is "15".
LockWaitTime	This string value controls the amount of time (in milliseconds) to wait between each lock attempt. The default is "100".
PrivateDirectory	This string value specifies the directory for any temporary files that DBISAM may create for query results, altering the structure of tables, or other operations. This setting must be a valid directory or DBISAM will issue errors when it tries to create any needed temporary files.

UID	This string value specifies the user ID to use for accessing a remote DBISAM database server. This value is only used when the ConnectionType registry value is set to "Remote". This value is encrypted using a lightweight XOR encryption method to prevent prying eyes, but it is not recommended that you rely on it for serious security. If this value is left blank, the user will be prompted for the user ID when accessing the database server.
PWD	This string value specifies the password to use for accessing a remote DBISAM database server. This value is only used when the ConnectionType registry value is set to "Remote". This value is encrypted using a lightweight XOR encryption method to prevent prying eyes, but it is not recommended that you rely on it for serious security. If this value is left blank, the user will be prompted for the password when accessing the database server.
RemoteEncryption	This string value controls whether the connection to a remote DBISAM database server will be encrypted. If it is "False" (the default), then the connection will not be encrypted. If it is "True", then the RemoteEncryptionPassword registry value (see below) will specify the password to use.
RemoteEncryptionPassword	This string value specifies the password to use for encrypting all requests and responses to and from a remote DBISAM database server when the connection is encrypted (see RemoteEncryption registry value above). This value is encrypted using a lightweight XOR encryption method to prevent prying eyes, but it is not recommended that you rely on it for serious security. The default value is "elevatesoft".
RemoteHostName	This string value specifies the host name of the machine that is running the remote DBISAM database server that you are accessing. Either the RemoteHostName or RemoteIPAddress registry values must be populated along with the RemoteService or RemotePort registry values in order to correctly access a remote DBISAM database server. The default value is "".
RemoteIPAddress	This string value specifies the IP address of the machine running the remote DBISAM database server that you are accessing. Either the RemoteHostName or RemoteIPAddress registry values must be populated along with the RemoteService or RemotePort registry values in order to correctly access a remote DBISAM database server. The default value is "127.0.0.1".
RemoteService	This string value specifies the service name of the remote DBISAM database server that you are accessing. Either the RemoteService or RemotePort registry values must be populated along with the RemoteHostName or RemoteIPAddress registry values in order to correctly access a remote DBISAM database server. The default value is "".
RemotePort	This string value specifies the port number of the remote DBISAM database server that you are accessing. Either the RemoteService or RemotePort registry values must be populated along with the RemoteHostName or

	RemoteIPAddress registry values in order to correctly access a remote DBISAM database server. The default value is "12005".
RemoteCompression	This string value specifies the amount of compression to use when communicating with a remote DBISAM database server. The default value is "0", for no compression. A value of "1" to "10" specifies the amount of compression from fast, but not very thorough, to very thorough, but not as fast.
RemotePing	This string value controls whether pinging will be used to keep the connection to a remote DBISAM database server alive, even when the connection is inactive for long periods of time. If it is "False" (the default), then pinging will not be used. If it is "True", then the RemotePingInterval registry value (see below) will specify how often the pinging will occur.
RemotePingInterval	This string value specifies the interval (in seconds) to use when pinging has been enabled for the connection to a remote DBISAM database server (see RemotePing registry value above). The default value is "60" seconds.
RemoteReadAhead	This string value specifies the default number of records to use for forward-only cursors that use a rowset size of 1. The default value is "50".
TablePassword*	These string values are numbered as "TablePassword1", "TablePassword2", etc. and are used as passwords for opening encrypted tables. These values are encrypted using a lightweight XOR encryption method to prevent prying eyes, but it is not recommended that you rely on it for serious security.
MRUDatabase*	These string values are used by the DBISAM ODBC Driver configuration wizard dialog for storing the most-recently-used database names.
MRUPrivateDirectory*	These string values are used by the DBISAM ODBC Driver configuration wizard dialog for storing the most-recently-used private directory names.

2.3 Connection Strings

Introduction

Connection strings are used when the SQLDriverConnect and SQLBrowseConnect ODBC API functions are called. They may specify as little as a data source name or as much as an entire data source configuration. The SQLDriverConnect function will interactively complete a connection string, if necessary and if the calling program indicates that it wants this behavior, by prompting the user for the missing information. On the other hand, the SQLBrowseConnect function will do so programmatically by iteratively interacting with the calling program. For more information on the SQLDriverConnect and SQLBrowseConnect API calls, please refer to the ODBC Programmers Reference from Microsoft. For more information on what function calls are used in your application program, please ask the vendor of the application program being used.

Pre-Configured Data Source Connection Strings

Connection strings that connect to a pre-configured data source, do so by specifying the DSN keyword in the connection string:

```
DSN=MyDataSource
```

Any other keywords that are specified in the connection string are overridden with the settings present in the data source configuration for the specified data source.

In addition, you can also use the FILEDSN keyword to load a data source configuration from a specific file instead of the registry:

```
FILEDSN=c:\windows\temp\mydatasource.dsn
```

That will load the configuration values from the mydatasource.dsn file. For more information on using the FILEDSN keyword, please refer to the ODBC Programmers Reference from Microsoft.

Direct Connection Strings

Direct connection strings bypass using a pre-configured data source altogether and specify all of the keywords necessary to configure and access a given data source. The first keyword in a direct connection string must always be the special DRIVER keyword. For the DBISAM ODBC Driver, it would look like this:

```
DRIVER={DBISAM 4 ODBC Driver}
```

Notice the use of the required braces {} around the DRIVER keyword.

The keywords that can be used with direct connection strings and the DBISAM ODBC driver are listed below. Here is an example direct connection string that connects to a remote DBISAM database server and a database called "Elevate" (case-insensitive) on that database server:

```
DRIVER={DBISAM 4 ODBC Driver};
ConnectionType=Remote;
CatalogName=Elevate;
RemoteIPAddress=192.168.0.28
```

Note
The line breaks inserted above are only for readability and should not be used in an actual connection string.

DBISAM Connection String Keywords

The following keywords are used with connection strings. The only required keyword for local connections is the CatalogName keyword. For remote connections, the required keyword is either the RemoteIPAddress or RemoteHostName keyword.

Keyword	Description
ConnectionType	This string value is set to either "Local" if the data source is accessing the database (also called a catalog) directly, or "Remote" if the data source is accessing the database remotely via a database server.
CatalogName	This string value is the name of the database, or catalog, being used for the data source. The name can be either a directory name, if the data source is configured for local access (ConnectionType="Local"), or a database name, if the data source is configured for remote access to a database server (ConnectionType="Remote").
ReadOnly	This string value is set to "True" if the data source is read-only, and "False" if the data source is read-write.
ForceBufferFlush	This string value controls whether DBISAM forces the operating system to flush any buffered writes to disk immediately after the data is written to the operating system. If it is "False" (the default), then DBISAM will leave the flushing up to the operating system. If it is "True", then DBISAM will force a buffer flush after every write.
StrictChangeDetection	This string value controls whether DBISAM checks for changes every time it performs any read operation. If it is "False" (the default), DBISAM will use lazy change detection, which causes the engine to only check for changes by another user whenever it has to read from disk. If it is "True", DBISAM will check for changes before every read operation. This change detection configuration only applies to read operations - write operations always use strict change detection.
LockRetryCount	This string value controls the number of lock attempts DBISAM should make before issuing an error. The default is "15".
LockWaitTime	This string value controls the amount of time (in milliseconds) to wait between each lock attempt. The default is "100".

PrivateDirectory	This string value specifies the directory for any temporary files that DBISAM may create for query results, altering the structure of tables, or other operations. This setting must be a valid directory or DBISAM will issue errors when it tries to create any needed temporary files.
UID	This string value specifies the user ID to use for accessing a remote DBISAM database server. This value is only used when the ConnectionType registry value is set to "Remote". If this value is left blank, the user will be prompted for the user ID when accessing the database server.
PWD	This string value specifies the password to use for accessing a remote DBISAM database server. This value is only used when the ConnectionType registry value is set to "Remote". If this value is left blank, the user will be prompted for the password when accessing the database server.
RemoteEncryption	This string value controls whether the connection to a remote DBISAM database server will be encrypted. If it is "False" (the default), then the connection will not be encrypted. If it is "True", then the RemoteEncryptionPassword keyword (see below) will specify the password to use.
RemoteEncryptionPassword	This string value specifies the password to use for encrypting all requests and responses to and from a remote DBISAM database server when the connection is encrypted (see RemoteEncryption keyword above). The default value is "elevatesoft".
RemoteHostName	This string value specifies the host name of the machine running the remote DBISAM database server that you are accessing. Either the RemoteHostName or RemoteIPAddress registry values must be populated along with the RemoteService or RemotePort registry values in order to correctly access a remote DBISAM database server. The default value is "".
RemoteIPAddress	This string value specifies the IP address of the machine running the remote DBISAM database server that you are accessing. Either the RemoteHostName or RemoteIPAddress registry values must be populated along with the RemoteService or RemotePort registry values in order to correctly access a remote DBISAM database server. The default value is "127.0.0.1".
RemoteService	This string value specifies the service name of the remote DBISAM database server that you are accessing. Either the RemoteService or RemotePort registry values must be populated along with the RemoteHostName or RemoteIPAddress registry values in order to correctly access a remote DBISAM database server. The default value is "".
RemotePort	This string value specifies the port number of the remote DBISAM database server that you are accessing. Either the RemoteService or RemotePort registry values must be populated along with the RemoteHostName or RemoteIPAddress registry values in order to correctly access a remote DBISAM database server. The default value is

	"12005".
RemoteCompression	This string value specifies the amount of compression to use when communicating with a remote DBISAM database server. The default value is "0", for no compression. A value of "1" to "10" specifies the amount of compression from fast, but not very thorough, to very thorough, but not as fast.
RemotePing	This string value controls whether pinging will be used to keep the connection to a remote DBISAM database server alive, even when the connection is inactive for long periods of time. If it is "False" (the default), then pinging will not be used. If it is "True", then the RemotePingInterval keyword (see below) will specify how often the pinging will occur.
RemotePingInterval	This string value specifies the interval (in seconds) to use when pinging has been enabled for the connection to a remote DBISAM database server (see RemotePing keyword above). The default value is "60" seconds.
RemoteReadAhead	This string value specifies the default number of records to use for forward-only cursors that use a rowset size of 1. The default value is "50".
TablePassword*	These string values are numbered as "TablePassword1", "TablePassword2", etc. and are used as passwords for opening encrypted tables.

2.4 Custom Driver Installation

Location

ODBC drivers are installed and configured using the registry in Windows. The location of the driver entries is the following registry key:

```
HKEY_LOCAL_MACHINE\Software\ODBC\ODBCINST.INI\<Driver Name>
```

In addition, the name of the driver must also be added to the following registry key:

```
HKEY_LOCAL_MACHINE\Software\ODBC\ODBCINST.INI\ODBC Drivers
```

The name of the registry value is the name of the ODBC driver, and the data for the registry value is a string with the value "Installed" (without surrounding double quotes). For example, for the DBISAM 4 ODBC Driver, the entire registry key and value would be the following:

```
Key: HKEY_LOCAL_MACHINE\Software\ODBC\ODBCINST.INI\ODBC Drivers

Value Name: DBISAM 4 ODBC Driver
Value Type: STRING
Value Data: Installed
```

64-bit Windows

Under 64-bit Windows, the above registry keys/values are for 64-bit drivers only. In order to configure 32-bit drivers on 64-bit Windows, one must use the following registry key instead:

```
HKEY_LOCAL_MACHINE\Software\Wow6432Node\ODBC\ODBCINST.INI\<Driver Name>
```

In addition, the name of the driver must also be added to the following registry key:

```
HKEY_LOCAL_MACHINE\Software\Wow6432Node\ODBC\ODBCINST.INI\ODBC Drivers
```

DBISAM ODBC Driver Settings

The following registry values are defined under the <Driver Name> key in the registry (see above). These registry settings are all required, and should be specified exactly as indicated in order to ensure proper operation.

Value Name	Type and Description

APILevel	STRING This value should always be set to "1" (without surrounding double quotes).
ConnectFunctions	STRING This value should always be set to "YYY" (without surrounding double quotes).
Driver	STRING This value should always be set to the location of the ODBC driver DLL (dbodbc.dll, by default). This location can be anywhere on a local machine drive.
DriverODBCVer	STRING This value should always be set to "03.00" (without surrounding double quotes).
FileExtns	STRING This value should always be set to "*.dat,*.idx,*.blb" (without surrounding double quotes). If you have customized the table file extensions for your DBISAM databases, then please specify the custom extensions here instead.
FileUsage	STRING This value should always be set to "1" (without surrounding double quotes).
SQLLevel	STRING This value should always be set to "0" (without surrounding double quotes).
Setup	STRING This value should always be set to the location of the ODBC driver DLL (dbodbc.dll, by default). This location can be anywhere on a local machine drive.
UsageCount	DWORD This value should always be set to "1" (without the surrounding double quotes).