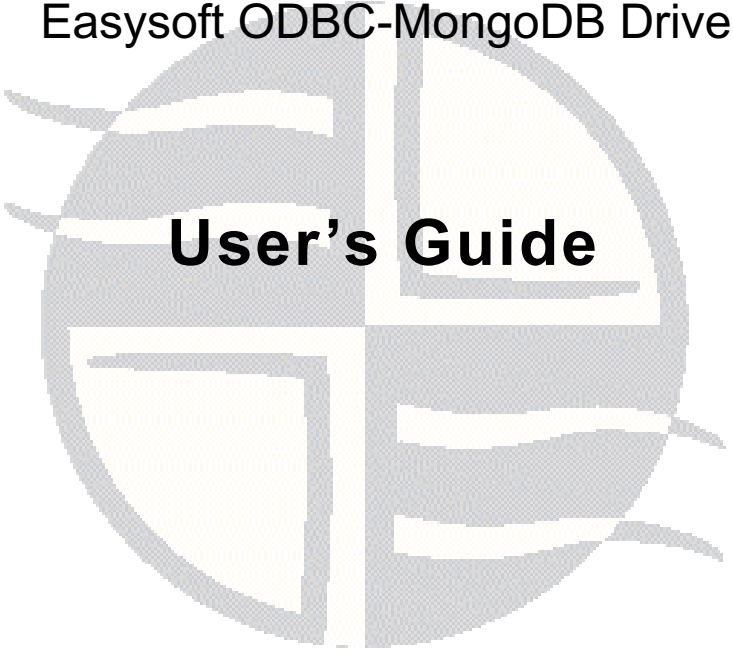
Easysoft Data Access

Easysoft ODBC-MongoDB Driver



User's Guide

This manual documents version 1.0.n of the Easysoft ODBC-MongoDB Driver.

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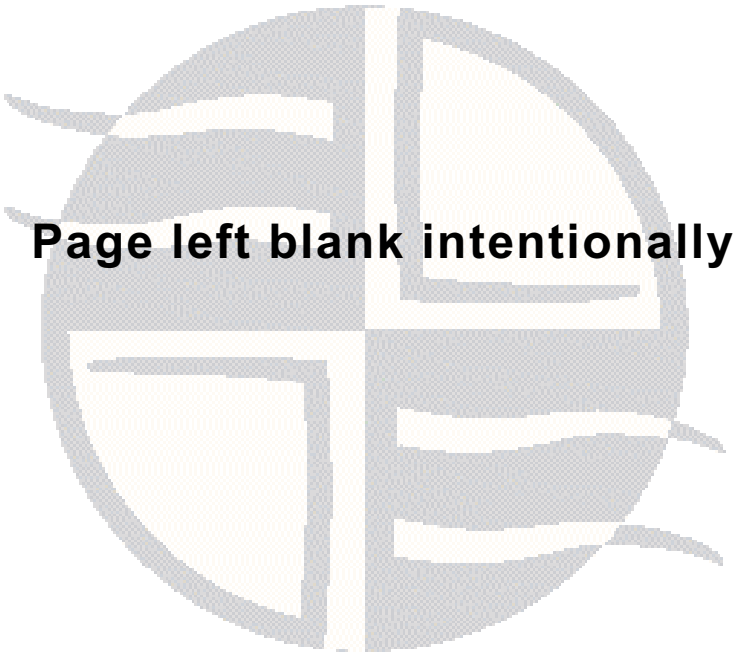

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PREFACE

About this manual

This manual is intended for use by anyone who wants to install the Easysoft ODBC-MongoDB Driver, configure it, and then access MongoDB data sources from an ODBC-enabled application.

Chapter Guide

Intended Audience

The Unix-based sections require experience of using Unix shell commands. You need to be able to do basic tasks such as editing text files. More complex tasks are described in detail, but it helps to understand how your system handles dynamic linking of shared objects.

Displaying the Manual

This manual is available in the following formats:

- Portable Document Format (PDF), which can be displayed and printed by using the Adobe Reader, available free from Adobe at **http://www.adobe.com**.
- HTML.

Notational Conventions

A *note box* provides additional information that may further your understanding of a particular topic in this manual:

Note	Note boxes often highlight information that you may need to be aware of when using a particular feature.

A *platform note* provides platform-specific information for a particular procedural step:

Linux	On Linux, you must log on as the `root` user to make many important changes.

A *caution box* provides important information that you should check and understand, prior to starting a particular procedure or reading a particular section of this manual:

Caution!	Be sure to pay attention to these paragraphs because Caution boxes are important!

Typographical Conventions

This manual uses the following typographical conventions:

- User interface components such as icon names, menu names, buttons and selections are displayed in **bold**, for example:

  Click **Next** to continue.

- Commands to be typed are displayed in a `monotype` font, for example:

  At the command prompt, type `admin`.

- File listings and system names (such as file names, directories and database fields) are displayed in a `monotype` font.

Contents

Trademarks

Throughout this manual, *Windows* refers generically to Microsoft Windows 7, 8, 2012 R2,10, 2016, 2019 which are trademarks of the Microsoft Corporation. The X Window system is specifically excluded from this and is referred to as *The X Window System* or just *X*.

DB2 is a registered trademark of International Business Machines Corporation in the United States or other countries or both.

Note also that although the name UNIX is a registered trademark of The Open Group, the term has come to encompass a whole range of UNIX-like operating systems, including the free, public Linux and even the proprietary Solaris. Easysoft use Unix (note the case) as a general term covering the wide range of Open and proprietary operating systems commonly understood to be Unix ‘flavors’.

Mac OS is a trademark of Apple Computer, Inc., registered in the U.S. and other countries.

Easysoft and Easysoft Data Access are trademarks of Easysoft Limited.

CHAPTER 1 INTRODUCTION

Introducing the Easysoft ODBC-MongoDB Driver

The Easysoft ODBC-MongoDB Driver is an ODBC 3.51 driver for MongoDB. It lets ODBC-enabled applications access MongoDB from Linux, Unix and Windows platforms.

Chapter Guide

Overview

The Easysoft ODBC-MongoDB Driver connects ODBC-enabled applications on Linux, Unix and Windows to MongoDB. Example applications include:

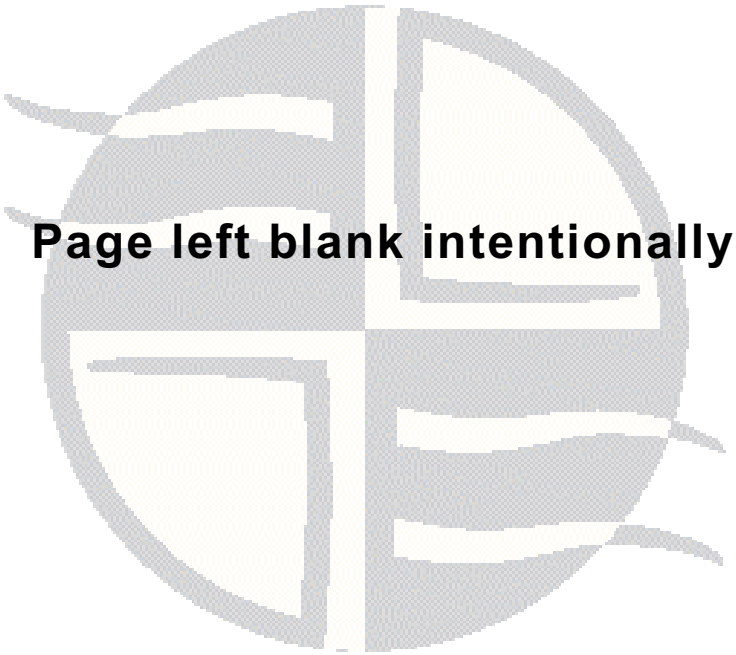
- Cognos
- Microsoft Access
- Microsoft Excel
- Microsoft SQL Server
- MicroStrategy
- Oracle Business Intelligence Enterprise Edition
- Oracle Heterogeneous Services
- QlikView
- SAP BusinessObjects
- SAP Crystal Reports
- Tableau

Product Status

The Easysoft ODBC-MongoDB Driver is currently available on Unix, Linux and Windows platforms. The most up to date list of Easysoft ODBC-MongoDB Driver platforms is available at:

http://www.easysoft.com/products/data_access/odbc-mongodb-driver/index.html

Software problems can be reported to **support@easysoft.com** by users who have either purchased support or registered at the Easysoft web site at **http://www.easysoft.com** and are evaluating Easysoft products.



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CHAPTER 2 INSTALLATION

Installing the Easysoft ODBC-MongoDB Driver

This chapter explains how to install, license and remove the Easysoft ODBC-MongoDB Driver.

The Windows installation can be carried out by anyone with local administrator privileges for the target machine.

The Unix installation instructions assume you are, or are able to consult with, a system administrator.

Chapter Guide

Obtaining the Easysoft ODBC-MongoDB Driver

You can obtain the Easysoft ODBC-MongoDB Driver from the Easysoft web site, **http://www.easysoft.com**.

You will need to register at the web site to download and license Easysoft software.

What to Install

The name of the Easysoft ODBC-MongoDB Driver distribution file varies from platform to platform. The file name format is:

- `odbc-mongodb-x_y_z-windows.exe` (Windows)

– OR –

- `odbc-mongodb-`*`x`*`.`*`y`*`.`*`z`*`-`*`platform`*`.tar` (Unix)

  where *`x`* is the major version number, *`y`* is the minor version number and *`z`* is the build index, which is incremented when minor changes are made.

  `platform` depends on the operating system distribution you require. File names may have this format:

Note Select the highest release available for your platform within your licensed major version number (installing software with a different major version number requires a new Easysoft license).

Caution! On Unix, as long as you stop all Easysoft software first (or software that uses the Easysoft drivers under Unix), it is safe to reinstall or upgrade the Easysoft ODBC-MongoDB Driver without uninstalling.

If you do uninstall, you should first back up any configuration data that you still need, as uninstalling some Easysoft products will result in this information being deleted (license details remain in place).

To continue, refer to the installation instructions for your platform:

- **"Installing the Easysoft ODBC-MongoDB Driver on Unix" on page 21**
- **"Installing the Easysoft ODBC-MongoDB Driver on Windows" on page 40**

Installing the Easysoft ODBC-MongoDB Driver on Unix

These instructions show how to install the Easysoft ODBC-MongoDB Driver on Unix platforms. Please read this section carefully **before** installing the Easysoft ODBC-MongoDB Driver.

BEFORE YOU INSTALL

Requirements

To install the Easysoft ODBC-MongoDB Driver on Unix you need:

- The Bourne shell in `/bin/sh`. If your Bourne shell is not located there, you may need to edit the first line of the installation script.
- Various commonly used Unix commands such as:

  `grep`, `awk`, `test`, `cut`, `ps`, `sed`, `cat`, `wc`, `uname`, `tr`, `find`, `echo`, `sum`, `head`, `tee`, `id`

If you do not have any of these commands, they can usually be obtained from the **Free Software Foundation**. As the `tee` command does not work correctly on some systems, the distribution includes a `tee` replacement.

- For Easysoft Licensing to work, you must do one of the following:

  Install the Easysoft ODBC-MongoDB Driver in `/usr/local/easysoft`.

  Install the Easysoft ODBC-MongoDB Driver elsewhere and symbolically link `/usr/local/easysoft` to wherever you chose to install the software. The installation will do this automatically for you so long as you run the installation as someone with permission to create `/usr/local/easysoft`.

  Install the Easysoft ODBC-MongoDB Driver elsewhere and set the `EASYSOFT_ROOT` environment variable. For more information about setting the `EASYSOFT_ROOT` environment variable, see **"Post installation" on page 36**.

- An ODBC Driver Manager. Easysoft ODBC-MongoDB Driver distributions include the unixODBC Driver Manager.

- You do not have to be the `root` user to install, but you will need permission to create a directory in the chosen installation path. Also, if you are not the `root` user, it may not be possible for the installation to:

  1. Register the Easysoft ODBC-MongoDB Driver with unixODBC.
  2. Create the example data source in the SYSTEM `odbc.ini` file.
  3. Update the dynamic linker entries (some platforms only).

  If you are not `root`, these tasks will have to be done manually later.

  Easysoft recommend you install all components as the `root` user.

What you can Install

This distribution contains:

- The Easysoft ODBC-MongoDB Driver.
- The unixODBC Driver Manager.

You will need an ODBC Driver Manager to use the Easysoft ODBC-MongoDB Driver from your applications. The distribution therefore contains the **unixODBC Driver Manager**. Most (if not all) Unix applications and interfaces support the unixODBC Driver Manager. For example, Perl DBD::ODBC, PHP, Python and so on.

You do not have to install the unixODBC Driver Manager included with this distribution. You can use an existing copy of unixODBC. For example, a version of unixODBC installed by another Easysoft product, a version obtained from your operating system vendor or one that you built yourself. However, as Easysoft ensure that the unixODBC distributed with the Easysoft ODBC-MongoDB Driver has been tested with that driver, we recommend you use it.

If you choose to use an existing unixODBC Driver Manager, the installation script will attempt to locate it. The installation script looks for the Driver Manager in the standard places. If you have installed it in a non-standard location, the installation script will prompt you for the location. The installation primarily needs unixODBC's `odbcinst` command to install drivers and data sources.

Where to Install

This installation needs a location for the installed files. The default location is `/usr/local`.

At the start of the installation, you will be prompted for an installation path. All files are installed in a subdirectory of your specified path called `easysoft`. For example, if you accept the default location `/usr/local`, the product will be installed in `/usr/local/easysoft` and below.

If you choose a different installation path, the installation script will try to symbolically link `/usr/local/easysoft` to the `easysoft` subdirectory in your chosen location. This allows us to distribute binaries with built in dynamic linker run paths. If you are not `root` or the path `/usr/local/easysoft` already exists and is not a symbolic link, the installation will be unable to create the symbolic link.

Note that you cannot license Easysoft products until either of the following is true:

- `/usr/local/easysoft` exists either as a symbolic link to your chosen installation path or as the installation path itself.
- You have set `EASYSOFT_ROOT` to *`installation_path`*`/easysoft`.

Changes Made to Your System

This installation script installs files in subdirectories of the path requested at the start of the installation, Depending on what is installed, a few changes may be made to your system:

1. If you choose to install the Easysoft ODBC-MongoDB Driver into unixODBC, unixODBC's `odbcinst` command will be run to add an entry to your `odbcinst.ini` file. You can locate this file with `odbcinst -j`. (`odbcinst` is in *`installation_path`*`/easysoft/unixODBC/bin`, if you are using the unixODBC included with this distribution.)

   The `odbcinst.ini` entry for the Easysoft ODBC-MongoDB Driver will look similar to this:

```
[Easysoft ODBC-MongoDB]
Description    = Easysoft ODBC-MongoDB Driver
Driver         = /usr/local/easysoft/sf/lib/libessf.so
Setup          = /usr/local/easysoft/sf/lib/libessfS.so
DontDLClose    = 1
FileUsage      = 1
UsageCount     = 1
```

For information about removing these entries, see **"Uninstalling the Easysoft ODBC-MongoDB Driver on Unix" on page 39**.

2. The installation script installs example data sources into unixODBC. The data sources will be added to your SYSTEM `odbc.ini` file. You can locate your SYSTEM `odbc.ini` file by using `odbcinst -j`. The data source for the standard driver will look similar to this:

   For information about removing these data sources, see **"Uninstalling the Easysoft ODBC-MongoDB Driver on Unix" on page 39**.

3. Dynamic Linker.

   On operating systems where the dynamic linker has a file listing locations for shared objects (Linux), the installation script will attempt to add paths under the path you provided at the start of the installation to the end of this list. On Linux, this is usually the file `/etc/ld.so.conf`.

Reinstalling or Installing When You Already Have Other Easysoft Products Installed

Each Easysoft distribution contains common files shared between Easysoft products. These shared objects are placed in *`installation_path`*`/easysoft/lib`. When you run the installation script, the dates and versions of these files will be compared with the same files in the distribution. The files are only updated if the files being installed are newer or have a later version number.

You should ensure that nothing on your system is using Easysoft software before starting an installation. This is because on some platforms, files in use cannot be replaced. If a file cannot be updated, you will see a warning during the installation. All warnings are written to a file called `warnings` in the directory you unpacked the distribution into.

If the installer detects you are upgrading a product, the installer will suggest you delete the product directory to avoid having problems with files in use. An alternative is to rename the specified directory.

If you are upgrading, you will need a new license from Easysoft to use the new driver.

Gathering Information Required During the Installation

During the installation, you will be prompted for various pieces of information. Before installing, you need to find out whether you have unixODBC already installed and where it is installed. The installation script searches standard places like `/usr` and `/usr/local`. However, if you installed the Driver Manager in a non-standard place and you do not install the included unixODBC, you will need to know the location.

INSTALLATION

Unpacking the Distribution

The distribution for Unix platforms is a tar file (`.tar`). To extract the installation files from the tar file, use:

```
tar -xvf odbc-mongodb-x.y.z-platform.tar
```

This will create a directory with the same name as the tar file (without the `.tar` postfix) containing further archives, checksum files, an installation script and various other installation files.

Change directory into the directory created by unpacking the tar file.

License to Use

The End-User License Agreement is contained in the file `license.txt`. Be sure to understand the terms of the agreement before continuing, as you will be required to accept the license terms at the start of the installation.

Answering Questions During the Installation

Throughout the installation, you will be asked to answer some questions. In each case, the default choice will be displayed in square brackets and you need only press Enter to accept the default. If there are alternative responses, these will be shown in round brackets; to choose one of these, type the response and press Enter.

For example:

```
Do you want to continue? (y/n) [n]:
```

The possible answers to this question are `y` or `n`. The default answer when you type nothing and press Enter is `n`.

Running the Installer

Before you run the installer, make sure you have read **"Installation" on page 27**. If you are considering running the installation as a non `root` user, we suggest you review this carefully as you will have to get a `root` user to manually complete some parts of the installation afterwards. Easysoft recommend installing as the `root` user. (If you are concerned about the changes that will be made to your system, see **"Changes Made to Your System" on page 25**.)

To start the installation, run:

```
./install
```

You will need to:

- Confirm your acceptance of the license agreement by typing "yes" or "no".

  For more information about the license agreement, see **"License to Use" on page 28**.

- Supply the location where the software is to be installed. Easysoft recommend accepting the default installation path.

  For more information, see **"Where to Install" on page 24**.

> **Note** If you are upgrading, you will need a new license from Easysoft.

Locating or Installing unixODBC

Easysoft strongly recommend you use the unixODBC Driver Manager because:

- The installation script is designed to work with unixODBC and can automatically add Easysoft ODBC-MongoDB Driver and data sources during the installation.
- Most ODBC-enabled applications and interfaces support unixODBC. The Easysoft ODBC-MongoDB Driver and any data sources that you add during the installation will be automatically available to your applications and interfaces therefore.
- The unixODBC project is currently led by Easysoft developer Nick Gorham. This means that there is a great deal of experience at Easysoft of unixODBC in general and of supporting the Easysoft ODBC-MongoDB Driver running under unixODBC. It also means that if you find a problem in unixODBC, it is much easier for us to facilitate a fix.

The installation starts by searching for unixODBC. There are two possible outcomes here:

1. If the installation script finds unixODBC, the following message will be output:

   ```
   Found unixODBC under /unixODBC_path
      and it is version n.n.n
   ```

2. If the installation script cannot find unixODBC in the standard places, you will be asked whether you have it installed.

   If unixODBC is installed, you need to provide the unixODBC installation path. Usually, the path required is the directory above where `odbcinst` is installed. For example, if `odbcinst` is in `/opt/unixODBC/bin/odbcinst`, the required path is `/opt/unixODBC`.

   If unixODBC is not installed, you should install the unixODBC included with this distribution.

   If you already have unixODBC installed, you do not have to install the unixODBC included with the distribution, but you might consider doing so if your version is older than the one included.

   The unixODBC in the Easysoft ODBC-MongoDB Driver distribution is not built with the default options in unixODBC's configure line.

Option	Description
--prefix=/etc	This means the default SYSTEM `odbc.ini` file where SYSTEM data sources are located will be `/etc/odbc.ini`.
--enable-drivers=no	This means other ODBC drivers that come with unixODBC are not installed.

Option	Description
--enable-iconv=no	This means unixODBC will not look for a libiconv. Warnings about not finding an iconv library were confusing our customers.
--enable-stats=no	Disables unixODBC statistics, which use system semaphores to keep track of used handles. Many systems do not have sufficient semaphore resources to keep track of used handles. In addition, the statistics are only available in the GUI ODBC Administrator.
--enable-readline=no	This disables readline support in `isql`. We disabled this because it ties `isql` to the version of libreadline on the system we build on. We build on as old a version of the operating system as we can for forward compatibility. Many newer Linux systems no longer include the older readline libraries and so enabling readline support makes `isql` unusable on these systems.
--prefix=/usr/local/easysoft/unixODBC	This installs unixODBC into `/usr/local/easysoft/unixODBC`.

Figure 1: Easysoft unixODBC configure line options.

Installing the Easysoft ODBC-MongoDB Driver

The Easysoft ODBC-MongoDB Driver installation script:

- Installs the driver.
- Registers the driver with the unixODBC Driver Manager.

  If the Easysoft ODBC-MongoDB Driver is already registered with unixODBC, a warning will be displayed that lists the drivers unixODBC knows about. If you are installing the Easysoft ODBC-MongoDB Driver into a different directory than it was installed before, you will need to edit your `odbcinst.ini` file after the installation and correct the Driver and Setup paths. unixODBC's `odbcinst` will not update these paths if a driver is already registered.
- Creates an example Easysoft ODBC-MongoDB Driver data source.

  If unixODBC is installed and you registered the Easysoft ODBC-MongoDB Driver with unixODBC, an example data source will be added to your `odbc.ini` file.

  If a data source called "MONGODB_SAMPLE", the existing data source will be displayed and you have the option to replace it.

Licensing

The *`installation_path`*`/easysoft/license/licshell` program lets you obtain or list licenses.

Licenses are stored in the *`installation_path`*`/easysoft/license/licenses` file. After obtaining a license, you should make a backup copy of this file.

The installation script asks you if you want to request an Easysoft ODBC-MongoDB Driver license:

```
Would you like to request a Easysoft ODBC-MongoDB
Driver license now (y/n) [y]:
```

You do not need to obtain a license during the installation, you can run `licshell` after the installation to obtain or view licenses.

If you answer yes, the installation runs the `licshell` script. The process of obtaining a license is best described in the **Licensing Guide**.

To obtain a license automatically, you will need to be connected to the Internet and allow outgoing connections to `license.easysoft.com` on port 8884. If you are not connected to the Internet or do not allow outgoing connections on port 8884, the License Client can create a license request file that you can mail or fax to Easysoft. You can also supply the details to us by telephone.

Start the License Client. The following menu is displayed:

```
[0] exit

[1] view existing license

[n] obtain a license for the desired product.
```

To obtain a license, select one of the options from `[2]` onwards for the product you are installing. The License Client will then run a program that generates a key that is used to identify the product and operating system (we need this key to license you).

After you have chosen the product to license (Easysoft ODBC-MongoDB Driver), you need to supply:

- Your full name.
- Your company name.
- An email contact address. This **must** be the email address that you used when you registered on the Easysoft web site.
- Your telephone number (you need to specify this if you telephone us to request a license).
- Your fax number (you need to specify this if you fax the license request to us).
- A reference number. When applying for a trial license, just press Enter when prompted for a reference number. This field is used to enter a reference number that we will supply you for full (paid) licenses.

You will then be asked to specify how you want to obtain the license. The choices are:

```
[1] Automatically by contacting the Easysoft
License Daemon
```

This requires a connection to the Internet and the ability to support an outgoing TCP/IP connection to `license.easysoft.com` on port 8884.

```
[2] Write information to file so you can fax,
telephone it
```

The license request is output to `license_request.txt`.

```
[3] Cancel this operation
```

If you choose to obtain the license automatically, the License Client will start a TCP/IP connection to `license.easysoft.com` on port 8884 and send the details you supplied and your machine number. No other data is sent. The data sent is transmitted as plain text, so if you want to avoid the possibility of this information being intercepted by someone else on the Internet, you should choose `[2]` and telephone or fax the request to us. The License daemon will return the license key, print it to the screen and make it available to the installation script in the file `licenses.out`.

If you choose option `[2]`, the license request is written to the file `license_request.txt`. You should then exit the License Client by choosing option `[0]` and complete the installation. After you have mailed, faxed or telephoned the license request to us, we will return a license key. Add this to the end of the file *`installation_path`*`/easysoft/license/licenses`.

If any warnings or errors are output during this process, please mail the output to **support@easysoft.com** and we will correct the problem.

POST INSTALLATION

Supplied Documents and Examples

The last part of the installation runs a post install script that lists the resources available to you.

- The Easysoft ODBC-MongoDB Driver documentation is installed in *installation_path*/easysoft/mongodb/doc:
- The Easysoft ODBC-MongoDB Driver manual in PDF format.
- The Easysoft ODBC-MongoDB Driver EULA.

installation_path/easysoft/mongodb/doc/CHANGES.txt lists all the changes in each version of the Easysoft ODBC-MongoDB Driver.

There are also many resources at the **Easysoft web site**.

SETTING DYNAMIC LINKER SEARCH PATHS

Your applications will be linked against an ODBC Driver Manager, which will load the ODBC Driver you require. The dynamic linker needs to know where to find the ODBC Driver Manager shared object. The ODBC Driver Manager will load the Easysoft ODBC-MongoDB Driver, which is dependent on further common Easysoft shared objects; the dynamic linker needs to locate these too.

On operating systems where the dynamic linker has a file specifying locations for shared objects (Linux, for example), the installation will attempt to add paths under the path you provided at the start of the installation to the end of this list; no further action should be required. For more information, see **"Dynamic Linker." on page 26**.

On other Unix platforms, there are two methods of telling the dynamic linker where to look for shared objects:

1. You add the search paths to an environment variable and export it.

   This method always works and overrides the second method, described below.

2. At build time, a run path is inserted into the executable or shared objects. On most System V systems, Easysoft distribute Easysoft ODBC-MongoDB Driver shared objects with an embedded run path. The dynamic linker uses the run path to locate Easysoft ODBC-MongoDB Driver shared object dependencies.

   For the first method, the environment variable you need to set depends on the platform (refer to the platform documentation for `ld(1)`, `dlopen` or `ld.so(8)`).

Environment Variable	Platform
LD_LIBRARY_PATH	System V based operating systems and Solaris.
LIBPATH	AIX
SHLIB_PATH	HP-UX
LD_RUN_PATH	Many platforms use this in addition to those listed above.

Figure 2: Dynamic linker search path environment variables.

To use the Easysoft ODBC-MongoDB Driver, you need to add:

installationdir`/easysoft/lib`

where *installationdir* is the directory in which you chose to install the Easysoft ODBC-MongoDB Driver. If you accepted the default location, this is `/usr/local`.

An example of setting the environment path in the Bourne shell on Solaris is:

```
LD_LIBRARY_PATH=$LD_LIBRARY_PATH:/usr/local/easysoft/lib

export LD_LIBRARY_PATH
```

> **Note** The exact command you need to set and export an environment variable depends on your shell.

If you installed the unixODBC Driver Manager included in the Easysoft ODBC-MongoDB Driver distribution, you also need to add *installationdir*`/easysoft/unixODBC/lib` to the dynamic linker search path.

Uninstalling the Easysoft ODBC-MongoDB Driver on Unix

There is no automated way to remove the Easysoft ODBC-MongoDB Driver in this release. However, removal is quite simple. To do this, follow these instructions.

To uninstall the Easysoft ODBC-MongoDB Driver

1. Change directory to *installation_path*/easysoft and delete the mongodb directory. *installation_path* is the Easysoft ODBC-MongoDB Driver installation directory, by default /usr/local.
2. If you had to add this path to the dynamic linker search paths (for example, /etc/ld.so.conf on Linux), remove it. You may have to run a linker command such as /sbin/ldconfig to get the dynamic linker to reread its configuration file. Usually, this step can only be done by the root user.
3. If you were using unixODBC, the Easysoft ODBC-MongoDB Driver entry needs to be removed from the odbcinst.ini file. To check whether the Easysoft ODBC-MongoDB Driver is configured under unixODBC, use odbcinst -q -d. If the command output contains [Easysoft ODBC-MongoDB Driver], uninstall the drivers from unixODBC by using:

   ```
   odbcinst -u -d -n 'Easysoft ODBC-MongoDB'
   ```

Installing the Easysoft ODBC-MongoDB Driver on Windows

Installing the Easysoft ODBC-MongoDB Driver

- Execute the file distribution that you downloaded in **"Obtaining the Easysoft ODBC-MongoDB Driver" on page 18**

  Follow the on screen instructions.

Updating Files That are in Use

To avoid rebooting your computer, the Easysoft ODBC-MongoDB Driver installer prompts you when files that it needs to update are in use by another application or service. This frees the locked files and allows the installation to complete without a system restart.

On Windows Vista and later, the Easysoft ODBC-MongoDB Driver installer uses the Restart Manager to locate the applications that are using files that need updating. These applications are displayed in the Files in Use dialog box. To avoid a system restart, choose **Automatically close applications and attempt to restart them after setup is complete**. The Easysoft ODBC-MongoDB Driver installer then uses the Restart Manager to try to stop and restart each application or service in the list. If possible, the Restart Manager restores applications to the same state and with the same data that they were in before it shut them down.

On earlier versions of Windows, when the Files in Use dialog is displayed, manually shut down each application in the list and then click **Retry** to avoid a system restart.

LICENSING ON WINDOWS

The install program starts the Easysoft License Manager (documented in the **Licensing Guide**), because you cannot use the Easysoft ODBC-MongoDB Driver until a license is obtained.

The following types of license are available:

- a *free time-limited trial license* which gives you free and unrestricted use of the product for a limited period (usually 14 days).
- a *full license* if you have purchased the product. On purchasing the product you are given an authorization code, which you use to obtain a license.

4. Enter your contact details.

   You **MUST** enter the **Name**, **E-Mail Address** and **Company** fields.

   The **Telephone** and **Facsimile** fields are important if you require Easysoft to contact you by those methods.

   The **E-Mail Address MUST** be the same as the address used to register and download from the Easysoft web site or you will be unable to obtain trial licenses.

5. Click **Request License**.

   You are asked for a license type.

6. For a trial license click **Time Limited Trial** and then click **Next**.

   The License Manager asks what software you are licensing:

   Select your required version of the Easysoft ODBC-MongoDB Driver (Standard or Remote, for example) from the drop-down list and then click **Next**.

   – OR –

   If you have obtained an authorization code for a purchased license, select **Non-expiring License** and then click **Next**.

   The License Manager requests your authorization code.

   Enter the authorization code and then click **Next**.

7. The License Manager displays a summary of the information you entered and allows you to choose the method of applying for your license.

8. Choose **On-line Request** if your machine is connected to the internet and can make outgoing connections to port 8884.

The License Manager then sends a request to the Easysoft license server to activate your license key automatically. This is the quickest method and results in your details being entered immediately into our support database. You can now go to **step 9 on page 44**.

NB	Only your license request identifier and contact details as they are displayed in the main License Manager screen are sent to Easysoft.

The remaining three options (**Email Request**, **Print Request** and **View Request**) are all ways to obtain a license if your machine is off-line (i.e. does not have a connection to the internet).

Each of these methods involves providing Easysoft with information including your machine number (a number unique to your machine) and then waiting to receive your license key.

Instead of emailing your details to Easysoft, you can enter them directly at the Easysoft web site and your license key will be emailed to you automatically.

To use this method, click **View Request**, and then visit:

- **http://www.easysoft.com/support/licensing/trial_license.html**

  (trial licenses)

- **http://www.easysoft.com/support/licensing/full_license.html**

  (purchased licenses)

In the Licensing page, enter your machine number (and authorization code for purchased license), click **Submit** and your license key will be emailed to you.

NB	You can copy your machine number from the **View Request** dialog box using `CTRL-C` and then paste it into the License Generator by using `CTRL-V`.

When you receive the license key, you can activate it either by double-clicking the email attachment or by clicking **Enter License** on the License Manager main screen and pasting the license key into the dialog box.

9. A message tells you how many licenses have been added.

> **NB** If you use the **Email Request** option, the license key is emailed to the email address as displayed on the License Manager screen, not the `from:` address of your email.

For more information about the licensing procedure refer to the **Licensing Guide**.

10. Click **Finish** in the License Manager.

The installation is complete.

REPAIRING THE EASYSOFT ODBC-MONGODB DRIVER INSTALLATION

The installer can repair a broken Easysoft ODBC-MongoDB Driver installation. For example, you can use the installer to restore missing Easysoft ODBC-MongoDB Driver files or registry keys.

In Windows Vista and later versions of Windows:

1. In **Control Panel**, open **Programs and Features**.
2. Right-click **Easysoft ODBC-MongoDB Driver**, and then click **Repair**.

In earlier versions of Windows:

1. In **Control Panel**, open **Add or Remove Programs**.
2. Select **Easysoft ODBC-MongoDB Driver** and click **Change/Remove**.

Uninstalling the Easysoft ODBC-MongoDB Driver on Windows

This section explains how to remove the Easysoft ODBC-MongoDB Driver from your system.

Removing Easysoft ODBC-MongoDB Driver Data Sources

Easysoft ODBC-MongoDB Driver data sources are not removed when you uninstall. You therefore do not need to recreate your Easysoft ODBC-MongoDB Driver data sources if you reinstall or upgrade. If you do not want to keep your Easysoft ODBC-MongoDB Driver data sources, use ODBC Administrator to remove them, **before** uninstalling the Easysoft ODBC-MongoDB Driver.

1. In **Control Panel**, double-click **Administrative Tools** and then **Data Sources (ODBC)**.
2. Select the data source in the **ODBC Administrator** and click the **Remove** button.

64-bit Windows

There is both a 32-bit and a 64-bit version of ODBC Administrator. The 64-bit ODBC Administrator is located in Control Panel under Administrative tools. To access the 32-bit ODBC Administrator, in the Windows Run dialog box, type:

```
%windir%\syswow64\odbcad32.exe
```

If you do not see the data source in the 64-bit ODBC Administrator, look for it in the 32-bit ODBC Administrator.

REMOVING THE EASYSOFT ODBC-MONGODB DRIVER

In Windows Vista and later versions of Windows:

1. In **Control Panel**, open **Programs and Features**.
2. Double-click **Easysoft ODBC-MongoDB Driver**.

In earlier versions of Windows:

1. In **Control Panel**, open **Add or Remove Programs**.
2. Select **Easysoft ODBC-MongoDB Driver** and click **Change/Remove**.

The uninstall process is complete.

Any licenses you obtained for the Easysoft ODBC-MongoDB Driver and other Easysoft products are held in the Windows registry.

When you uninstall, your licenses are not removed so you do not need to relicense the product if you reinstall or upgrade.

CHAPTER 3 CONFIGURATION

Configuring the Easysoft ODBC-MongoDB Driver

The Easysoft ODBC-MongoDB Driver is installed on the computer where your applications are running. ODBC applications access ODBC drivers through the ODBC Driver Manager and a data source. The data source tells the Driver Manager which ODBC driver to load, which MongoDB server to connect to and how to connect to it. This chapter describes how to create data sources, use DSN-less connections and configure the Easysoft ODBC-MongoDB Driver.

Before setting up a data source, you must have successfully installed the Easysoft ODBC-MongoDB Driver.

For Easysoft ODBC-MongoDB Driver installation instructions, see **"Installation" on page 17**.

Chapter Guide

Configuring the Easysoft ODBC-MongoDB Driver

This section describes how to configure the Easysoft ODBC-MongoDB Driver to connect to MongoDB by using a data source or a DSN-less connection string.

Setting Up Data Sources on Unix

There are two ways to set up a data source to your MongoDB data:

- Create a SYSTEM data source, which is available to anyone who logs on to this Unix machine.

– OR –

- Create a USER data source, which is only available to the user who is currently logged on to this Unix machine.

By default, the Easysoft ODBC-MongoDB Driver installation creates a SYSTEM data source named `[MONGODB_SAMPLE]`. If you are using the unixODBC included in the Easysoft ODBC-MongoDB Driver distribution, the SYSTEM `odbc.ini` file is in `/etc`.

If you built unixODBC yourself, or installed it from some other source, SYSTEM data sources are stored in the path specified with the configure option `--sysconfdir=`*`directory`*. If `sysconfdir` was not specified when unixODBC was configured and built, it defaults to `/usr/local/etc`.

If you accepted the default choices when installing the Easysoft ODBC-MongoDB Driver, USER data sources must be created and edited in `$HOME/.odbc.ini`.

Note

To display the directory where unixODBC stores SYSTEM and USER data sources, type `odbcinst -j`.

By default, you must be logged in as `root` to edit a SYSTEM data source defined in `/etc/odbc.ini`.

You can either edit the sample data source or create new data sources.

Each section of the `odbc.ini` file starts with a data source name in square brackets [ ] followed by a number of *attribute=value* pairs.

> **Note** Attribute names in `odbc.ini` are not case sensitive.

The `Driver` attribute identifies the ODBC driver in the `odbcinst.ini` file to use for a data source.

When the Easysoft ODBC-MongoDB Driver is installed into unixODBC, it places an `Easysoft ODBC-MongoDB` entry in `odbcinst.ini`. For Easysoft ODBC-MongoDB Driver data sources therefore, you need to include a `Driver = Easysoft ODBC-MongoDB` entry.

To configure a MongoDB data source, in your `odbc.ini` file, you need to specify:

- The host name or IP address of the machine where your MongoDB instance is running.
- The MongoDB database that you want to connect to.

For example:

```
[MongoDB]
Driver    = Easysoft ODBC-MongoDB
Server    = localhost
Database = Demo
```

If you need to supply a user name and password to access your MongoDB database, specify these authentication details in the data source as well. For example:

```
User      = myuser
Password = mypassword
```

ENVIRONMENT

The Easysoft ODBC-MongoDB Driver must be able to find the following shared objects, which are installed during the Easysoft ODBC-MongoDB Driver installation:

- `libodbcinst.so`

  By default, this is located in `/usr/local/easysoft/unixODBC/lib`.

- `libeslicshr_r.so`

  By default, this is located in `/usr/local/easysoft/lib`.

- `libessupp_r.so`

  By default, this is located in `/usr/local/easysoft/lib`.

You may need to set and export `LD_LIBRARY_PATH`, `SHLIB_PATH` or `LIBPATH` (depending on your operating system and run-time linker) to include the directories where `libodbcinst.so`, `libeslicshr.so` and `libessupp.so` are located.

Note The shared object file extension (`.so`) may vary depending on the operating system (`.so`, `.a` or `.sl`).

ESTABLISHING A TEST CONNECTION

The `isql` query tool lets you test your Easysoft ODBC-MongoDB Driver data sources.

To test the Easysoft ODBC-MongoDB Driver connection

1. Change directory into `/usr/local/easysoft/unixODBC/bin`.
2. Type `./isql.sh -v` *`data_source`*, where *data_source* is the name of the target data source.
3. At the prompt, type an SQL query. For example:

   ```
   SQL> select city from scratch;
   ```

   – OR –

   Type `help` to return a list of tables:

   ```
   SQL> help
   ```

Setting Up Data Sources on Windows

To connect an ODBC application on a Windows machine to a MongoDB database:

1. Open ODBC Data Source Administrator:

   - For Microsoft Windows 8 and Windows 2012, in the Windows desktop, point to the upper-right corner of the screen, move the mouse pointer down, and then choose **Settings** > **Control Panel** > **Administrative Tools** > **ODBC Data Sources (64-bit)**.
   - For Microsoft Windows Vista and Windows 7, choose **Start** > **Control Panel** > **Administrative Tools** > **Data Sources (ODBC)**.
   - For Microsoft Windows Server 2008 and Windows Server 2008 R2, choose **Start** > **Administrative Tools** > **Data Sources (ODBC)**.
   - For Microsoft Windows 2000, Windows XP and Windows Server 2003, choose **Start** > **Settings** > **Control Panel** > **Administrative Tools** > **Data Sources**.

   The **ODBC Data Source Administrator** dialog box is displayed:

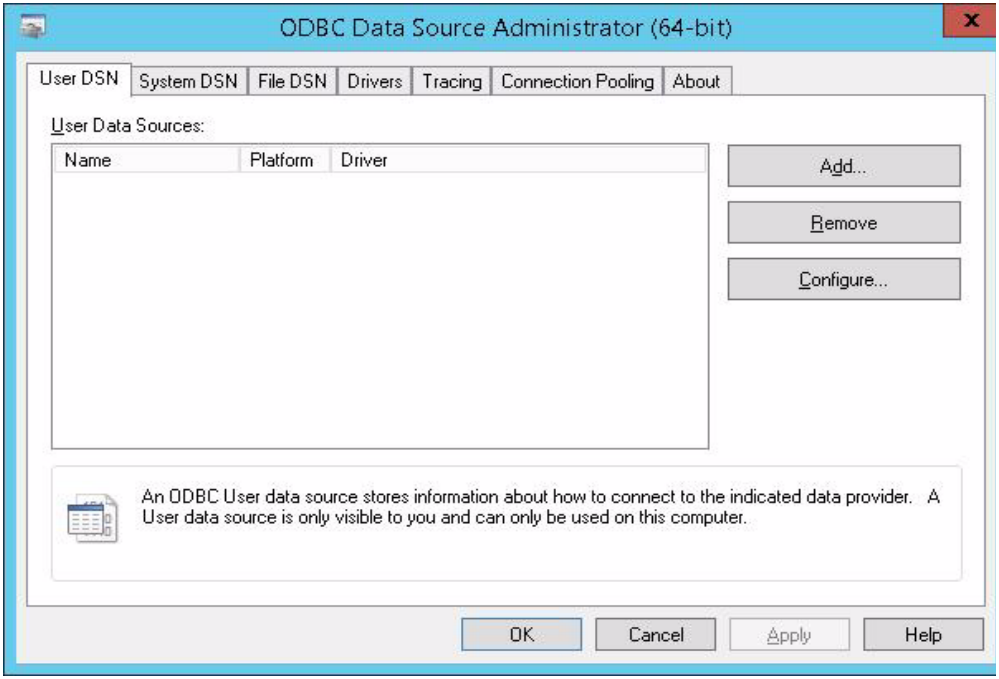


Figure 3: The ODBC Data Source Administrator dialog box

2. Select the **User DSN** tab to set up a data source that only you can access.

   – OR –

   Select the **System DSN** tab to create a data source which is available to anyone who logs on to this Windows machine.

3. Click **Add...** to add a new data source.

   The **Create New Data Source** dialog box displays a list of drivers:

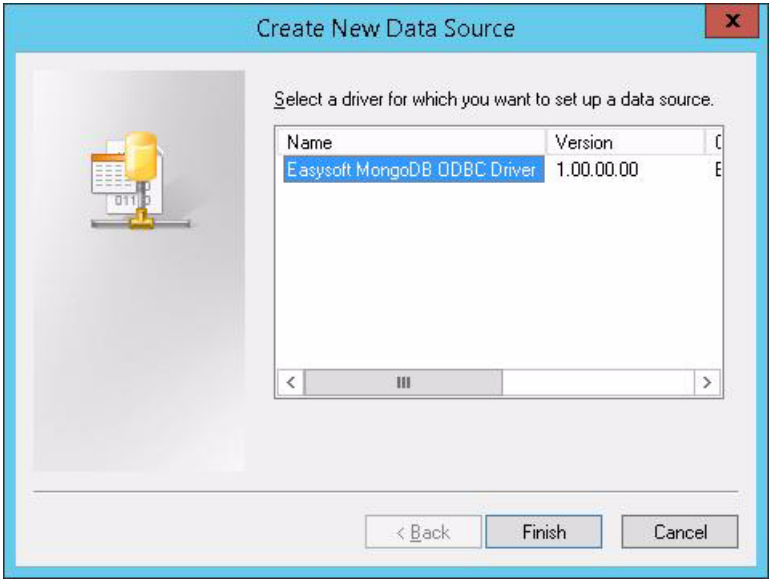


Figure 4: The Create New Data Source dialog box

4. Select `Easysoft ODBC-MongoDB Driver` and click **Finish**.

The Easysoft ODBC-MongoDB Driver DSN Setup dialog box is displayed:

For details of the attributes that can be set on this dialog box, see **"Attribute Fields" on page 58**.

64-bit Windows

The Easysoft installer program installs both a 32-bit and a 64-bit version of the Easysoft ODBC-MongoDB Driver. If you want to use a 64-bit ODBC application, you need to use the 64-bit Easysoft ODBC-MongoDB Driver. If you want to use a 32-bit ODBC application, you need to use the 32-bit Easysoft ODBC-MongoDB Driver.

There is both a 32-bit and a 64-bit version of ODBC Administrator. The 64-bit ODBC Administrator is located in Control Panel under Administrative tools. To access the 32-bit ODBC Administrator in Windows 7 and earlier, in the Windows Run dialog box, type:

```
%windir%\syswow64\odbcad32.exe
```

On Windows 8 and Windows 2012, both the 32-bit and 64-bit ODBC Administrator are located in Control Panel under Administrative tools: ODBC Data Sources (32-bit) and ODBC Data Sources (64-bit).

Easysoft ODBC-MongoDB Driver data sources created in the 64-bit ODBC Administrator will specify the 64-bit version of the Easysoft ODBC-MongoDB Driver. Easysoft ODBC-MongoDB Driver data sources created in the 32-bit ODBC Administrator will specify the 32-bit version of the Easysoft ODBC-MongoDB Driver.

If you want to create an Easysoft ODBC-MongoDB Driver System data source for use with a 64-bit application, use the 64-bit ODBC Administrator. If you want to create an Easysoft ODBC-MongoDB Driver System data source for use with a 32-bit application, use the 32-bit ODBC Administrator.

For Easysoft ODBC-MongoDB Driver User data sources, it does not matter which version of the ODBC Administrator that you use.

Attribute Fields

This section lists the attributes which can be set for the Easysoft ODBC-MongoDB Driver in a table showing:

- The label of the attribute on the Windows dialog box
- The entry required when editing the Unix `odbc.ini` file.
- The string to be used in a call to `SQLDriverConnect` or in a connect string for ADO type use.

Attributes which are text fields are displayed as *`value`*.

Attributes which are logical fields can contain either 0 (to set to off) or 1 (to set to on) and are displayed as "`0|1`".

If an attribute can contain one of several specific values then each possible entry is displayed and separated by a pipe symbol.

For example, in the statement:

```
DIALECT=1|2|3
```

the value entered may be "1", "2" or "3".

DSN

The name of the User or System data source to be created, as used by the application when calling the `SQLConnect` or `SQLDriverConnect` functions.

Interface	Value
DSN Dialog Box (Windows)	DSN
odbc.ini file (Unix)	[*value*]
Connect String	DSN=*value*

DESCRIPTION

Descriptive text that may be retrieved by certain applications to describe the data source.

Interface	Value
DSN Dialog Box (Windows)	Description
odbc.ini file (Unix)	Description=*value*
Connect String	Not Used

SERVER

The hostname or IP address of the MongoDB database server that you want to connect to.

By default, the Easysoft ODBC-MongoDB Driver attempts to connect to the default MongoDB port, 27017. If MongoDB is listening on a different port at your site, append `:port` to the Server attribute value. For example, `mymachine:27018`.

Interface	Value
DSN Dialog Box (Windows)	Server
odbc.ini file (Unix)	Server=*value*
Connect String	SERVER=*value*

DATABASE

The MongoDB database that you contains the data that you want to access.

Interface	Value
DSN Dialog Box (Windows)	Database
odbc.ini file (Unix)	Database=*value*
Connect String	DATABASE=*value*

USER NAME

If you need to supply a user name to access your MongoDB database, supply it with the `User Name` attribute.

To retrieve MongoDB data, the user needs to have the `read` database role. To update MongoDB data, the user needs to have the `readWrite` database role.

Interface	Value
DSN Dialog Box (Windows)	User Name
odbc.ini file (Unix)	User=*value*
Connect String	UID=*value*

PASSWORD

If you need to supply a user name to access your MongoDB database, supply the password for this user name with the `Password` attribute.

Interface	Value
DSN Dialog Box (Windows)	Password
odbc.ini file (Unix)	Password=*value*
Connect String	PWD=*value*

SCHEMA SERVER

If you store a custom schema generated with the Easysoft MongoDB Schema Editor in a MongoDB server, supply the hostname or IP address of this server with the `Schema Server` attribute. If you do not want to use a custom schema or want the schema to be stored on the same host as `Server`, omit this attribute.

By default, the Easysoft ODBC-MongoDB Driver samples your MongoDB data to generate the schema it needs to describe the data to ODBC client applications. If you choose to customise the schema (for example, you do not want to expose all fields in a document to your client application), you have the option to store the schema in a MongoDB server.

Interface	Value
DSN Dialog Box (Windows)	Schema Server
odbc.ini file (Unix)	MD_Server=*value*
Connect String	MD_SERVER=*value*

SCHEMA DATABASE

If you store a custom schema generated with the Easysoft MongoDB Schema Editor in a MongoDB server, specify the database where the schema is located with the `Schema Database` attribute. Otherwise omit this attribute.

Interface	Value
DSN Dialog Box (Windows)	Schema Database
odbc.ini file (Unix)	MD_Database=*value*

Interface	Value
Connect String	MD_DATABASE=*value*

SCHEMA USER NAME

If you need to supply a user name to access the database where your custom schema is stored, supply it with the `Schema User Name` attribute. To view the schema, the user needs to have the read database role. To create a schema, the user needs to have:

- The `readWrite` and `dbAdmin` roles.

– OR –

- The `dbOwner` role.

Interface	Value
DSN Dialog Box (Windows)	Schema User Name
odbc.ini file (Unix)	MD_User=*value*
Connect String	MD_USER=*value*

SCHEMA PASSWORD

If you need to supply a user name to access the database where your custom schema is stored, supply the password for this user name with the `Schema User Name` attribute.

Interface	Value
DSN Dialog Box (Windows)	Schema Password
odbc.ini file (Unix)	MD_Password=*value*
Connect String	MD_PASSWORD=*value*

DEFAULT TO WCHAR

When set to Yes, MongoDB types that the Easysoft ODBC-MongoDB Driver would normally map to SQL_VARCHARs are mapped to SQL_WVARCHARs instead. By default, `Default to WCHAR` is OFF (Set to No). Enable this setting if you are using a Unicode ODBC application that expects Unicode data types. For example, Perl DBD ODBC when built with Unicode support.

You can also use the Easysoft Schema Editor to define how MongoDB data types are mapped to ODBC data types.

Interface	Value
DSN Dialog Box (Windows)	Default to WCHAR
odbc.ini file (Unix)	DefaultW=*value*
Connect String	DEFAULTW=Yes | No

IGNORE AUTH

Some applications (for example MicroStrategy, Oracle Heterogeneous Services (DG4ODBC), Oracle BI Administration Tool) always pass a user name and password on the ODBC connection string, regardless of whether they are required by the target database. If your application behaves in this way and your MongoDB database does not require a user name and a password, enable this setting.

Interface	Value
DSN Dialog Box (Windows)	Ignore Auth
odbc.ini file (Unix)	IgnoreAuth=Yes | No
Connect String	IGNOREAUTH=Yes | No

CHARLEN

The string column length to use. MongoDB does not provide the length for string columns in its column metadata. By default, the Easysoft ODBC-MongoDB Driver uses a string length of 255, which you can override with this setting.

Interface	Value
DSN Dialog Box (Windows)	Not available
odbc.ini file (Unix)	Charlen=*num*
Connect String	CHARLEN=*num*

PREVIEW ROWS

When in schema discovery mode, the Easysoft ODBC-MongoDB Driver scans 100 documents to generate a schema for a collection. To change the number of documents that the driver scans, use the `Preview Rows` attribute. For example, if the 101st document contained a field whose value was a different type to that of the preceding 100 documents, you would set `Preview Rows` to 101. You may also need to increase the `Preview Rows` size, if a field contained a value whose length exceeded the maximum length of that field's value in the first 100 documents. (In this circumstance, you may get an error similar to "The (maximum) expected data length is x while the returned data length is y.")

To scan all documents in a collection (which will have performance implications for large collections), set `Preview` to -1.

Interface	Value
DSN Dialog Box (Windows)	Preview Rows
odbc.ini file (Unix)	Preview=*num*
Connect String	PREVIEW=*num*

SSL

Enable `SSL` if you want to connect to MongoDB over an encrypted connection and the target MongoDB server has been started with `--sslMode allowSSL` or `--sslMode preferSSL`. If the target MongoDB server has been started with `--sslMode requireSSL`, you must enable `SSL`, otherwise you will get the error "An error occurred: Failed to read 4 bytes from socket" when the driver attempts to do some work (e.g. executes a query).

Interface	Value
DSN Dialog Box (Windows)	SSL
odbc.ini file (Unix)	SSL=Yes | No
Connect String	SSL=Yes | No

WEAK VALIDATION

Enable Weak Validation to connect to MongoDB over an SSL connection without presenting a certificate. The MongoDB server needs to permit such a connection, i.e, have been started with `--sslWeakCertificateValidation` or `--sslAllowConnectionsWithoutCertificates`. If you want to connect without presenting a certificate, you need to enable `SSL` and `Weak Validation` only. None of the other SSL attributes (`PEM File`, `CA File` etc.) are required.

If you attempt to connect to a MongoDB server that permits an SSL connection without a certificate you will get the error "Failed to handshake and validate TLS certificate" unless you enable `Weak Validation`.

Interface	Value
DSN Dialog Box (Windows)	Weak Validation
odbc.ini file (Unix)	weak_cert_validation= Yes | No
Connect String	WEAK_CERT_VALIDATION=Yes | No

PEM FILE

The path to the PEM file for the MongoDB server certificate. For example, `C:\SSL\MongoDB.pem`.

Interface	Value
DSN Dialog Box (Windows)	PEM File
odbc.ini file (Unix)	pem_file=*file*
Connect String	PEM_FILE=*file*

PEM PASSWORD

The password for PEM File.

Interface	Value
DSN Dialog Box (Windows)	PEM Password
odbc.ini file (Unix)	pem_pwd=*value*
Connect String	PEM_PWD=*value*

CA FILE

The file containing trusted certificates. For example, `C:\SSL\MongoDB.crt`. The file must include the Certificate Authority (CA) file for the MongoDB server certificate.

Interface	Value
DSN Dialog Box (Windows)	CA File
odbc.ini file (Unix)	ca_file=*file*
Connect String	CA_FILE=*file*

CA DIRECTORY

The directory containing trusted certificates. For example, `C:\SSL`. The directory must contain the CA file for the MongoDB server certificate . The CA file name must be in "hash format", for example `bd035bae.0`. If you specify the `CA Directory` attribute, omit the `CA File` attribute.

Interface	Value
DSN Dialog Box (Windows)	CA Directory
odbc.ini file (Unix)	ca_directory=*path*
Connect String	CA_DIRECTORY=*path*

CRL FILE

To prevent a connection to a MongoDB server with a revoked certificate, use `CRL File` specify the file that contains revoked certificates.

Interface	Value
DSN Dialog Box (Windows)	CRL File
odbc.ini file (Unix)	crl_file=*file*
Connect String	CRL_FILE=*file*

SRV_DNS

Enable this setting if you are connecting to a cloud-based MongoDB instance. For example, MongoDB Atlas.

Interface	Value
DSN Dialog Box (Windows)	SRV_DNS
odbc.ini file (Unix)	SRV_DNS = Yes | No
Connect String	SRV_DNS = Yes | No

SCHEMA SRV_DNS

If you have specified a `Schema Database` and are connecting to a cloud-based MongoDB instance, enable this setting.

Interface	Value
DSN Dialog Box (Windows)	SCHEMA SRV_DNS
odbc.ini file (Unix)	MD_SRV_DNS = Yes | No
Connect String	MD_SRV_DNS = Yes | No

SASL

Use SASL authentication.

Interface	Value
DSN Dialog Box (Windows)	SASL
odbc.ini file (Unix)	SASL = Yes | No
Connect String	SASL = Yes | No

AUTH SOURCE

The authentication database for `User Name`.

Interface	Value
DSN Dialog Box (Windows)	AUTH Source
odbc.ini file (Unix)	AuthSource = *value*
Connect String	AUTH_SOURCE = *value*

INSERT_NULLS

Whether NULLS are inserted. When `insert_nulls` is set to No (the default), this example INSERT statement:

```
insert into table t1 ( c1, c2 ) values( 'value', NULL )
```

will insert:

```
{ c1 : 'value' }
```

When `insert_nulls` is set to Yes, this example INSERT statement:

```
insert into table t1 ( c1, c2 ) values( 'value',
NULL )
```

will insert:

{ c1 : 'value', c1 : null }

Interface	Value
DSN Dialog Box (Windows)	Not currently available
odbc.ini file (Unix)	insert_nulls = Yes | No
Connect String	INSERT_NULLS = Yes | No

DSN-less Connections

In addition to using a data source, you can also connect to a database by using a DSN-less connection string of the form:

```
SQLDriverConnect(..."DRIVER={Easysoft ODBC-MongoDB};
                Server=mymachine;Database=mydb;"...)
```

where *user* and *password* are a valid MongoDB user name and password. You need to use the `Easysoft ODBC-MongoDB` DRIVER keyword to identify the Easysoft ODBC-MongoDB Driver.

Other Easysoft ODBC-MongoDB Driver attribute settings, as described in **"Setting Up Data Sources on Unix" on page 49**, can be added to the connection string using the same `PARAMETER=value;` format.

Creating a Schema for your MongoDB Data

Running the Easysoft MongoDB Schema Editor on Windows

Do one of the following:

- In ODBC Data Source Administrator, open the Easysoft ODBC-MongoDB Driver data source that specifies the MongoDB database whose data you want to create a schema for. Use the Configure button to open the Easysoft ODBC-MongoDB Driver DSN Setup dialog box. Choose the Schema button.

  -Or-

- Run the Easysoft ODBC-MongoDB Driver executable, `esmgse.exe`.

  On 64-bit Windows, `esmgse.exe` is located in the `%programfiles(x86)%\Easysoft Limited\Easysoft MongoDB ODBC Driver\Schema Editor` folder.

  On 32-bit Windows, `esmgse.exe` is located in the `%programfiles%\Easysoft Limited\Easysoft MongoDB ODBC Driver\Schema Editor` folder.

  `esmgse.exe` accepts these command line arguments:

.

Option	Description
-dsn *data source name*	The ODBC data source that specifies the MongoDB database whose data you want to create a schema for. At a minimum, the ODBC data source needs to specify the MongoDB database. If the data source contains other values that are relevant to the schema editor, for example, the MongoDB server where you want to store the schema, there is no need to specify these values on the command line. Any values you do specify on the command line override ones specified in the data source. The Easysoft MongoDB Schema Editor looks for a User data source with the name you specify and then a System data source. (On 64-bit Windows, the Easysoft MongoDB Schema Editor looks first for a 32-bit System data source and then a 64-bit System data source.) The Easysoft MongoDB Schema Editor uses the first data source it finds with the specifed name.
[-ds *database server*]	The MongoDB server that serves the MongoDB database whose data you want to create a schema for.
[-db *database name*]	The MongoDB database whose data you want to create a schema for.

Option	Description
[-du *database user name*]	If MongoDB authentication is enabled, the user name required to access *database name*.
[-dp *database password*]	The password for *database password*.
[-ss *schema server*]	The MongoDB server where you want to store the schema. If you omit this attribute on the Easysoft MongoDB Schema Editor command line and in the data source, the schema will be stored on the same machine as *database server*.
[-sc *schema name*]	The name of the schema. The Easysoft MongoDB Schema Editor creates a database with this name to store the schema collections in.
[-su *schema user name*]	If MongoDB authentication is enabled, the user name required to access *schema name*.
[-sp *schema password*]	The password for *schema password*.
[-cw *sample data max display width*]	The Easysoft MongoDB Schema Editor enables you to view your MongoDB data, Use `-cw` to limit the amount of text data that appears in this view. For example, if you set `-cw` to `1000`, the maximum amount of data for each text column that will display will be 1000 characters. Use `-cw` if you are experiencing performance problems with the Easysoft MongoDB Schema Editor.

Option	Description
[-debug *filename*]	Where to write schema information for a document. For example, `c:\windows\temp\schema.txt`. If you include the `-debug` option, a Dump Schema buttom will be available in the Easysoft MongoDB Schema Editor. Choose this button to write the schema for the selected MongoDB document to *filename*.
[-ssl y]	Include this option if you want to connect to MongoDB over an encrypted connection and the target MongoDB server has been started with `--sslMode allowSSL` or `--sslMode preferSSL`.
[-wcv y]	Include this option to connect to MongoDB over an SSL connection without presenting a certificate. The MongoDB server needs to permit such a connection, i.e, have been started with `--sslWeakCertificateValidation` or `--sslAllowConnectionsWithoutCertificates`. If you want to connect without presenting a certificate, you need to enable -ssl and `-wcv` only. None of the other SSL attributes (`-cafile`, `-pemfile` etc.) are required.

Option	Description
[-cafile *filename*]	Use this option to specify the file containing trusted certificates. For example, `C:\SSL\MongoDB.crt`. The file must include the Certificate Authority (CA) file for the MongoDB server certificate.
[-cadir *path*]	Use this option to specify the directory containing trusted certificates. For example, `C:\SSL`. The directory must contain the CA file for the MongoDB server certificate . The CA file name must be in "hash format", for example `bd035bae.0`. If you specify the `-cadir` option, omit the `-cafile` option.
[-pemfile *filename*]	Use this option to specify the path to the PEM file for the MongoDB server certificate. For example, `C:\SSL\MongoDB.pem`.
[-pempwd *password*]	Use this option to specify the password for PEM File.

If you start the Easysoft MongoDB Schema Editor without specifying the MongoDB server where the schema is stored, the editor starts in View Only mode. In this mode, you can examine your MongoDB data and the default schema generated by the editor, but cannot make any changes.

The Easysoft MongoDB Schema Editor Interface

The Easysoft MongoDB Schema Editor contains three panes. The left hand pane, **Database and Tables**, displays the collections in the MongoDB database that was specified in the data source or on the command line.

The bottom right hand pane, **Data Sample**, shows the documents that were used to generate the schema. By default, the Data Sample pane shows the first 100 documents.

The top right hand pane, **Current Table**, displays the schema for the choosen collection:

SQL Name

The column name that will be returned by the Easysoft ODBC-MongoDB Driver to the application. This will same as the corresponding field in the MongoDB document. You may need to change the column name if the MongoDB field on which it is based contains character that the ODBC layer / application cannot handle. To change the column name, double-click the column name and then type the new value.

SQL Type

The ODBC SQL data type that will be returned by the Easysoft ODBC-MongoDB Driver to the application. To change the ODBC SQL data type, choose a different type from the list. For example, you might change a Boolean MongoDB field from a `SQL_TINYINT` to a `SQL_BIT`.

SQL Index

If the field is part of a MongoDB index, `Yes` displays in **SQL Index** column. If you hover over the column with your mouse pointer, a popup window displays to show you all the indexes that field is included in. The popup window also show you the order in which the field is included in a compound index, if applicable.

MongoDB Name

The MongoDB field name.

MongoDB Type

The BSON type for the MongoDB field value.

Length

The string length, if a string data type is shown in the SQL Type column. The Easysoft ODBC-MongoDB Driver reports the length shown here to the application. To change the string length, double-click the length and then type the new value.

Precision

The precision, if a SQL_NUMERIC data type is shown in the SQL Type column. The Easysoft ODBC-MongoDB Driver reports the precision shown here to the application. To change the precision, double-click the precision and then type the new value.

Scale

The scale, if a SQL_NUMERIC data type is shown in the SQL Type column. The Easysoft ODBC-MongoDB Driver reports the scale shown here to the application. To change the scale, double-click the scale and then type the new value.

Hide

Whether the column's contents and meta data are visible to the ODBC application.

Creating a Schema for your MongoDB Data

If you have not already configured an Easysoft ODBC-MongoDB Driver data source, please refer to thE instructions in **Setting Up Data Sources on Windows**.

1. Open ODBC Data Source Administrator:

   - For Microsoft Windows 8 and Windows 2012, in the Windows desktop, point to the upper-right corner of the screen, move the mouse pointer down, and then choose **Settings** > **Control Panel** > **Administrative Tools** > **ODBC Data Sources (64-bit)**.
   - For Microsoft Windows Vista and Windows 7, choose **Start** > **Control Panel** > **Administrative Tools** > **Data Sources (ODBC)**.
   - For Microsoft Windows Server 2008 and Windows Server 2008 R2, choose **Start** > **Administrative Tools** > **Data Sources (ODBC)**.
   - For Microsoft Windows 2000, Windows XP and Windows Server 2003, choose **Start** > **Settings** > **Control Panel** > **Administrative Tools** > **Data Sources**.

   The **ODBC Data Source Administrator** dialog box is displayed:

2. Select your Easysoft ODBC-MongoDB Driver data source and then choose **Configure**.
3. Type the hostname or IP address of the server where you want to store the schema in the **Schema Server** box.
4. Type the name of the schema in the **Schema Database** box.

   The Easysoft ODBC-MongoDB Driver creates a MongoDB database with the name you specify to store the schema collections in.
5. If MongoDB authentication is enabled on the server where the schema is stored, type a valid user name for this server in the **Schema User Name** box.
6. Type the password for this user name in the **Schema Password** box.
7. Choose the Schema button to launch the Easysoft MongoDB Schema Editor.
8. Choose **Yes** when prompted whether to create a new Schema.
9. In the **Easysoft MongoDB Schema Editor** make the changes you want.
10. Choose **Save** and then choose **Exit**.

Adding Columns

For the Easysoft ODBC-MongoDB Driver to be able to retrieve a MongoDB field value, that field needs to be described in a schema. The schema can be either the one that the Easysoft ODBC-MongoDB Driver generates automatically or one that you create in the Easysoft MongoDB Schema Editor. If a field is not described in a schema, the Easysoft ODBC-MongoDB Driver returns NULL rather than the field's value.

If you add document to a collection that contains types that are different to those in the documents sampled by the driver or schema editor, you may need to manually add columns. For example, you generated a schema in the Easysoft MongoDB Schema Editor based on a sample size of 100 documents; document 500 contains fields with different types. Rather than regenerate the schema based on a sample size of 500, you choose to manually add columns for the new fields.

1. In the Easysoft MongoDB Schema Editor, in the Tables pane, select the row below which you want the new column to appear.
2. Choose **Insert**.
3. In **SQL Name**, double click the column name and type a new value if you want a different column name to be returned to the application.
4. In **SQL Type**, select the ODBC SQL data type that will be returned to the application.
5. In **MongoDB Name**, double click the column name and type the name of the corresponding MongoDB field name.
6. In **MongoDB Type**, select the BSON type for the MongoDB field value.
7. If **SQL Type** is a string data type, in **Length**, double-click the length and type the length of the field to be returned to the application.
8. If **SQL Type** is a `SQL_NUMERIC` data type, in **Precision**, double-click the precision and type the precision of the field to be returned to the application.
9. If **SQL Type** is a `SQL_NUMERIC` data type, in **Scale**, double-click the scale and type the scale of the field to be returned to the application.
10. When you have finished adding columns, choose **Save**.

Hiding and Deleting Columns

If do not want MongoDB field to be visible in your application you can either hide or delete the corresponding column in the Easysoft ODBC-MongoDB Driver.

1. Locate the column in the Easysoft MongoDB Schema Editor and then choose **Hide**.
2. Choose **Save**.

To delete a column:

1. Select the column in the Easysoft MongoDB Schema Editor and then choose **Remove**.
2. Choose **Save**.

Virtual Tables

Top-level arrays can be expanded into virtual tables. The Easysoft MongoDB Schema Editor displays a Virtual Table check box next to eligible fields. Select this check box to expland an array into virtual tables.

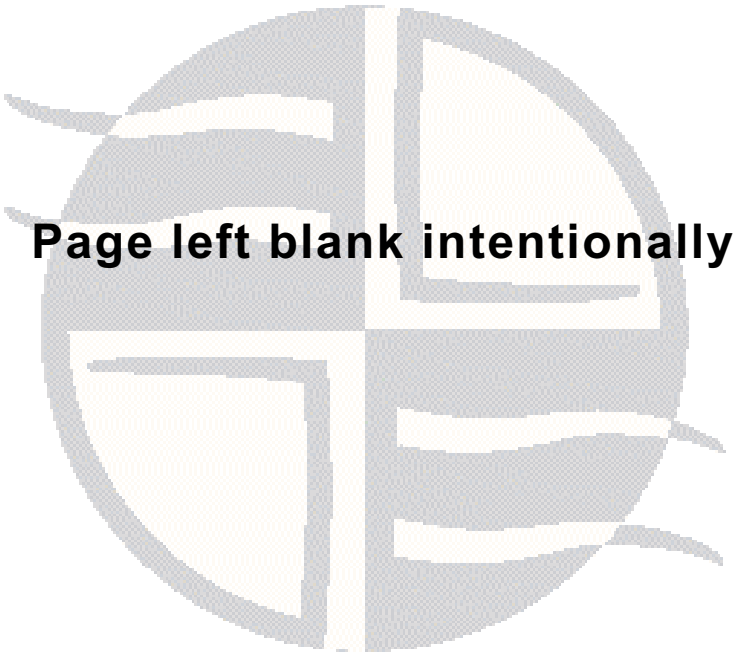
To illustrate the virtual tables feature, here is an example based on this MongoDB document:

```
db.inventory.insert(
   {
     item: "ABC1",
     details: {
        model: "14Q3",
        manufacturer: "XYZ Company"
     },
```

```
      stock: [ { size: "S", qty: 25 }, { size: "M", qty: 50 } ],
      category: "clothing"
    }
)
```

Stock is an array and so can be expanded into a virtual table. The resultant table is `inventory_stock`:

```
select * from inventory_stock
"_id", "stock$index", "stock$value"
"54cf68badc5ac264551cb974", 0, "{ "size" : "S", "qty" : 25.000000 }"
"54cf68badc5ac264551cb974", 1, "{ "size" : "M", "qty" : 50.000000 }"
```



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APPENDIX A TECHNICAL REFERENCE

Technical Reference for the Easysoft ODBC-MongoDB Driver

This section contains extra information relating to the deployment of the Easysoft ODBC-MongoDB Driver.

Appendix Guide

ODBC Conformance

The Easysoft ODBC-MongoDB Driver complies with the ODBC 3.51 specification.

UNICODE

The Easysoft ODBC-MongoDB Driver is a Unicode ODBC driver and supports the Unicode ODBC APIs and data types.

The Easysoft ODBC-MongoDB Driver does not support Unicode strings in SQL statements.

To work with Unicode data, use parameterised SQL and bind the statement parameters as Unicode data types. If your application calls `SQLGetData`, request that the data be returned as a Unicode data type.

Features

SQL Engine

To enable client applications to use SQL statements against MongoDB, the Easysoft ODBC-MongoDB Driver uses the SQL Engine feature to translate standard SQL-92 queries into equivalent MongoDB API calls.

Authentication

The Easysoft ODBC-MongoDB Driver enforces MongoDB's built in authentication. If your MongoDB instance uses authentication, you need to supply the user name and password for a user who has the necessary privileges, when configuring your data source. To retrieve MongoDB data, the user needs to have the `read` database role. To update MongoDB data, the user needs to have the `readWrite` database role.

Catalog Support

The Easysoft ODBC-MongoDB Driver uses the name of the MongoDB database as the catalog to make it easy for the driver to work with the various ODBC applications that expect a catalog name.

Embedded Documents

The Easysoft ODBC-MongoDB Driver flattens an embedded document into a relational structure. The driver also returns the original (i.e non flattened) embedded document in a separate column, which you have the option of hiding in the Schema Editor Tool.

To illustrate how the Easysoft ODBC-MongoDB Driver handles embedded documents, here is an example. Given this document to retrieve:

```
{
   _id: "joe",
   name: "Joe Bookreader",
   address: {
              street: "123 Fake Street",
              city: "Faketon",
              state: "MA",
              zip: "12345"
            }
}
```

The Easysoft ODBC-MongoDB Driver returns:

```
"_id", "name", "address", "address_street", "address_city",
"address_state", "address_zip"

"joe", "Joe Bookreader", "{ "street" : "123 Fake Street", "city" :
"Faketon", "state" : "MA", "zip" : "12345" }", "123 Fake Street",
"Faketon", "MA", "12345"
```

The embedded document containing the address is returned as the `address` column value. The fields in the embedded document are flattened into the columns `address_street`, `address_city`, `address_state` and `address_zip`.

ARRAYS

The Easysoft ODBC-MongoDB Driver flattens an array into a relational structure. The column names include the index of the item in the array that the column represents, starting with an index of 0. The driver also returns the original (i.e non flattened) array in a separate column, which you have the option of hiding in the Schema Editor Tool.

To illustrate how the Easysoft ODBC-MongoDB Driver handles arrays, here is an example. Given this document to retrieve:

```
db.inventory.insert(
   {
     item: "ABC1",
     details: {
        model: "14Q3",
        manufacturer: "XYZ Company"
     },
     stock: [ { size: "S", qty: 25 }, { size: "M", qty: 50 } ],
     category: "clothing"
   }
)
```

The Easysoft ODBC-MongoDB Driver returns:

```
"_id", "item", "details", "details_model", "details_manufacturer",
"stock", "stock_0_size", "stock_0_qty", "stock_1_size",
"stock_1_qty", "category"

"542ac8247bbc8c71916b3eb9", "ABC1", "{ "model" : "14Q3",
"manufacturer" : "XYZ Company" }", "14Q3", "XYZ Company", "[ { "0"
: { "size" : "S", "qty" : 25.000000 }, "1" : { "size" : "M", "qty"
: 50.000000 } } ]", "S", 25.000000, "M", 50.000000, "clothing"
```

The array containing the stock is returned as the `stock` column value. The fields in the array are flattened into the columns `stock_0_size`, `stock_0_qty`, `stock_1_size` and `stock_1_qty`.

This behaviour can be changed using the Easysoft MongoDB Schema Editor to split a top-level array into virtual tables. For more information, see **"Creating a Schema for your MongoDB Data" on page 81**.

Tracing

The ODBC calls an application makes can be traced:

- Within the Driver Manager by an application.
- From within the Driver Manager.
- From within the Easysoft ODBC-MongoDB Driver.

Within the driver manager by an application

An application can turn tracing on in the Driver Manager by using the ODBC API `SQLSetConnectAttr` (...,`SQL_ATTR_TRACE`,...).

The trace file name may also be specified with the `SQLSetConnectAttr` attribute `SQL_ATTR_TRACEFILE`.

From within the driver manager on Unix

For the unixODBC Driver Manager, add two attributes to the [`ODBC`] section (create one if none exists) in `odbcinst.ini`.

```
Trace = Yes
TraceFile = logfile
```

For example:

```
[ODBC]
Trace = Yes
TraceFile = /tmp/unixodbc.log
```

Ensure that the user who is running the application to be traced has write permission to the log file (and to the directory containing it), or no tracing information will be produced.

FROM WITHIN THE DRIVER MANAGER ON WINDOWS

- For Microsoft Windows 8 and Microsoft Windows 2012, in the Windows desktop, point to the upper-right corner of the screen, move the mouse pointer down, and then choose **Settings** > **Control Panel** > **Administrative Tools** > **ODBC Data Sources (64-bit)**.
- For Microsoft Windows Vista and Windows 7, choose **Start** > **Control Panel** > **Administrative Tools** > **Data Sources (ODBC)**.
- For Microsoft Windows Server 2008 and Windows Server 2008 R2, choose **Start** > **Administrative Tools** > **Data Sources (ODBC)**.
- For Microsoft Windows 2000, Windows XP and Windows Server 2003, choose **Start** > **Settings** > **Control Panel** > **Administrative Tools** > **Data Sources**.

  Click on **Tracing**, ensure the specified filename is valid and click **Start Tracing Now**.

64-bit Windows

There is both a 64-bit and 32-bit version of the ODBC Data Source Administrator. The 64-bit version enables you to trace the ODBC API calls that are made by a 64-bit application. The 32-bit version enables you to trace the ODBC API calls that are made by a 32-bit application.

The 64-bit version is located in Control Panel (see the previous step). To run the 32-bit version on Windows 7 and earlier, in the Windows Run dialog box, type:

```
%windir%\syswow64\odbcad32.exe
```

On Windows 8 and Windows 2012, both the 32-bit and 64-bit ODBC Administrator are located in Control Panel under Administrative tools: ODBC Data Sources (32-bit) and ODBC Data Sources (64-bit).

If you are not sure which version to use, and do not get a log file after completing the steps in this article, try enabling tracing in the other version of ODBC Data Source Administrator.

FROM WITHIN THE EASYSOFT ODBC-MONGODB DRIVER ON UNIX

Driver manager trace files show all the ODBC calls applications make, their arguments and return values. Easysoft ODBC-MongoDB Driver driver tracing is specific to the Easysoft driver and is of most use when making a support call.

To enable Easysoft ODBC-MongoDB Driver logging, add a `LOGFILE` and a `LOGGING` attribute to the relevant DSN section of the `odbc.ini` file.

For example:

```
[MONGODB_SAMPLE]
.
.
.
LOGFILE = /tmp/mongodb-driver.log
LOGGING = Yes
```

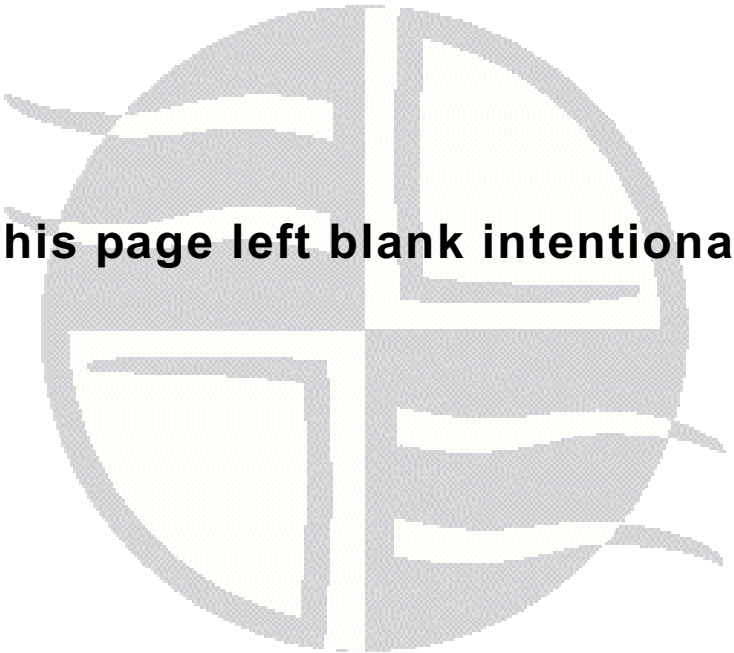
The `LOGFILE` value is the path and file name of the log file. The value shown in the example specifies a log file named `/tmp/mongodb.log`. The `LOGGING` value specifies the actions to log. The value shown in the example specifies that all actions should be logged.

Ensure that the user who is running the application to be traced has write permission to the log file (and to the directory containing it).

From within the Easysoft ODBC-MongoDB Driver on Windows

To enable logging:

1. Open the relevant Easysoft ODBC-MongoDB Driver data source in ODBC Data Source Administrator.
2. Select **Driver Logging**.
3. Type the file name and path of the file you want the driver to write log information to in the space provided.



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APPENDIX B GLOSSARY

Terms and definitions

Application Programmer Interface (API)

A published set of function calls and constants allowing different programmers to utilize a ready-written library of subroutines.

Authorization code

You must have an authorization code for the Easysoft product you wish to license in order to obtain a purchased license. When you purchase a product your authorization code is emailed to you. You do not need an authorization code to obtain a trial license.

Collection

A grouping of MongoDB documents. A collection is the equivalent of an RDBMS table. A collection exists within a single database. Documents within a collection can have different fields. Typically, all documents in a collection have a similar or related purpose.

Column

The vertical component of a database table. A column has a name and a particular data type (for example, character, decimal, or integer).

Commit

To end a unit of work by releasing locks so that the database changes made by that unit of work can be perceived by other processes. This operation makes the data changes permanent.

Cursor

An entity that maps over a result set and establishes a position on a single row within the result set. After the cursor is positioned on a row, operations can be performed on that row, or on a block of rows starting at that position. The most common operation is to fetch (retrieve) the current row or block of rows.

Data Definition Language

The subset of SQL statements that define all attributes and properties of a database and its objects. DDL statements typically start with CREATE, ALTER, or DROP.

Data Manipulation Language

The subset of SQL statements that is used to retrieve and manipulate data. DML statements typically start with SELECT, INSERT, UPDATE, or DELETE.

Data source

A database or other data repository coupled with an ODBC Driver, which has been given a Data Source Name (see **"DSN" on page 103**) to identify it to the ODBC Driver Manager.

Data type

An attribute that specifies what type of information can be stored in a column, parameter, or variable.

Database

A physical container for collections. Each database gets its own set of files on the file system. A single MongoDB server typically has multiple databases.

DBMS

Database Management System -- software that handles access to a database.

document

A record in a MongoDB collection and the basic unit of data in MongoDB.

Driver

See **"ODBC driver" on page 104**.

Driver Manager

Software whose main function is to load ODBC drivers. ODBC applications connect to the Driver Manager and request a data source name (DSN). The Driver Manager loads the driver specified in the DSN's configuration file. On Windows, the ODBC Data Source Administrator is used to set up the Driver Manager.

DSN

Data Source Name. A name associated with an ODBC data source. Driver Managers, such as unixODBC or the Microsoft Windows Driver Manager, use the Data Source Name to cross-reference configuration information and load the required driver.

DSN-less connection

A type of data connection that is created based on information in a data source name (DSN), but is stored as part of a project or application. DSN-less connections are especially useful for Web applications because they let you move the application from one server to another without re-creating the DSN on the new server.

Field

A name-value pair in a document. A document has zero or more fields. Fields are analogous to columns in relational databases.

Host

A computer visible on the network.

Index

A data structure that optimizes queries.

License key

A string that is provided by Easysoft for use in the licensing process.

NULL

An entry that has no explicitly assigned value. `NULL` is not equivalent to zero or blank. A value of `NULL` is not considered to be greater than, less than, or equivalent to any other value, including another value of `NULL`.

ODBC

Open Database Connectivity -- a programming interface that enables applications to access data in database management systems that use Structured Query Language (SQL) as a data access standard.

ODBC driver

Software that accesses a proprietary data source, providing a standardised view of the data to ODBC.

Primary Key

A record's unique immutable identifier. In an RDBMS, the primary key is typically an integer stored in each row's id field. In MongoDB, the _id field holds a document's primary key.

Record

A group of related fields (columns) of information treated as a unit. A record is more commonly called a row in a relational database.

Result set

A set of row values as returned by, for example, a cursor or procedure.

Row

The horizontal component of a table, consisting of a sequence of values, one for each column of the table.

Structured Query Language (SQL)

A standardised language for defining and manipulating data in a relational database.

SQL-92

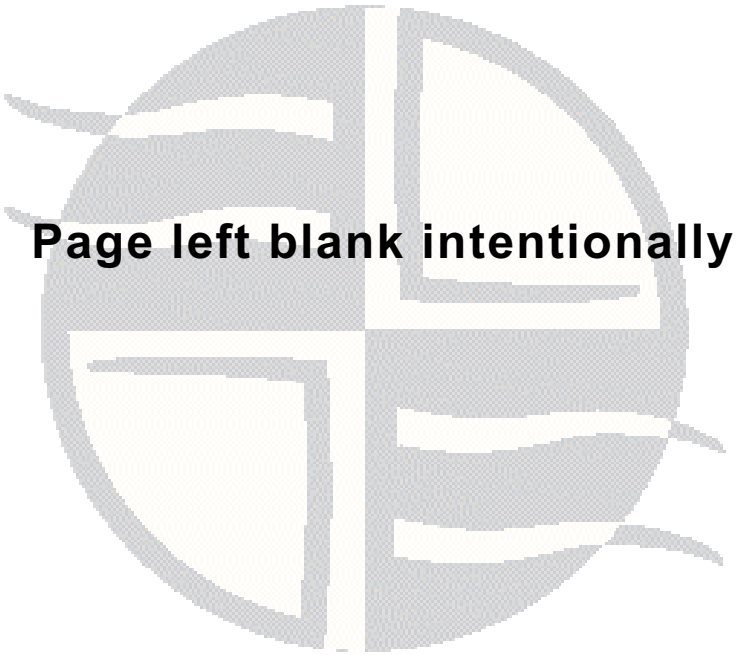
The version of the SQL standard published in 1992. The international standard is ISO/IEC 9075:1992 Database Language SQL. The American National Standards Institute (ANSI) also published a corresponding standard (Data Language SQL X3.135-1192), so SQL-92 is sometimes referred to as ANSI SQL in the United States.

Table

A data set in a relational database, composed of rows and columns.

Transaction

An atomic series of SQL statements that make up a logical unit of work. All of the data modifications made during a transaction are either committed together as a unit or rolled back as a unit.



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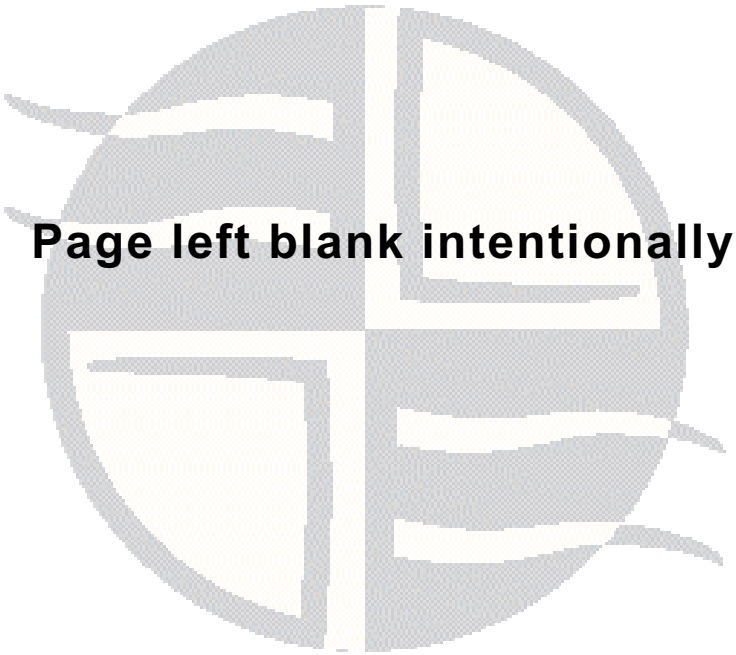

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