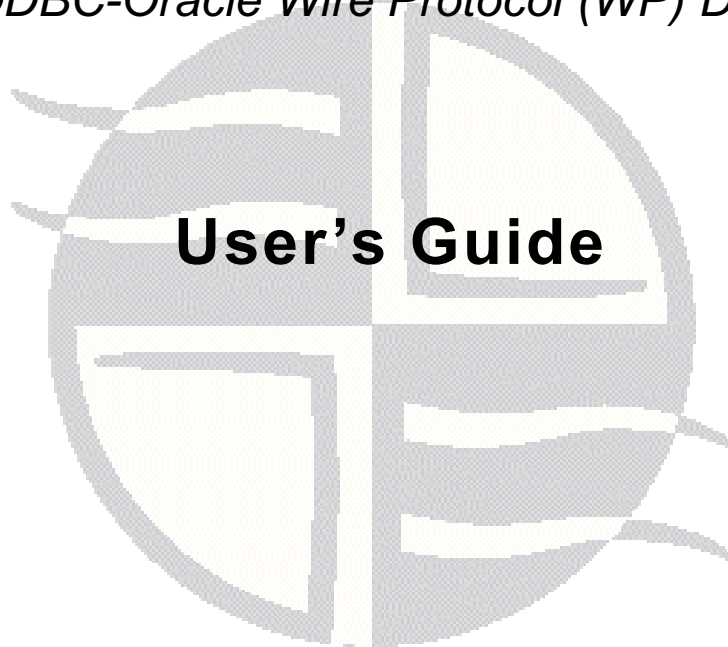


# Easysoft<sup>®</sup> Data Access

*ODBC-Oracle Wire Protocol (WP) Driver*



Version 1.x.

This manual documents version 1.x of the Easysoft ODBC-Oracle Wire Protocol (WP) Driver.

Publisher: Easysoft Limited

Thorp Arch Grange

Thorp Arch

Wetherby

LS23 7BA

United Kingdom

Copyright © 1993-2022 by Easysoft Limited.

All rights reserved.

You may not reverse engineer, decompile or disassemble this manual. Information in this manual is subject to change without notice. Companies, names, and data used in examples are fictitious unless otherwise noted.

The names of companies referred to herein, their corporate logos, the names of their hardware and software may be trade names, trademarks or registered trademarks of their respective owners.

Easysoft and the Easysoft logo are registered trademarks of Easysoft Limited.

The software described in this document is provided under a licence agreement and may be used only in accordance with the terms of that agreement (see the [Easysoft License Agreement](#)).

# CONTENTS

List of Figures	5
Intended Audience	8
Displaying the Manual	8
Notational Conventions	9
Typographical Conventions	10
Contents	11
Trademarks	12
Chapter 1 Introduction	13
Overview	14
Product Status	14
Deployment	15
Chapter 2 Installation	17
Obtaining the Easysoft ODBC-Oracle WP Driver	18
What to Install	19
Installing the Easysoft ODBC-Oracle WP Driver	21
Uninstalling the Easysoft ODBC-Oracle WP Driver	42
Chapter 3 Configuration	45
Setting Up Data Sources	46
Attribute Fields	55
DSN-less Connections	60

# CONTENTS

*Easysoft ODBC-Oracle WP Driver*

<b>Chapter 4</b>	<b>Interfacing . . . . .</b>	<b>61</b>
	Apache/PHP . . . . .	62
	C . . . . .	62
	FreeRADIUS . . . . .	63
	Lotus Notes/Domino . . . . .	63
	Micro Focus COBOL . . . . .	64
	mxODBC . . . . .	64
	OpenLDAP . . . . .	65
	OpenOffice.org . . . . .	66
	Perl DBI DBD::ODBC . . . . .	66
	PHP/PEAR DB . . . . .	67
	QT . . . . .	67
	Rexx/SQL . . . . .	68
	StarOffice . . . . .	68
<b>Appendix A</b>	<b>Technical Reference . . . . .</b>	<b>69</b>
	ODBC Conformance . . . . .	70
	Supported Data Types . . . . .	71
	Procedures . . . . .	73
	Materialized Views . . . . .	80
	Application Specific Issues . . . . .	81
	Threading . . . . .	81
	Tracing . . . . .	82
<b>Appendix B</b>	<b>Glossary . . . . .</b>	<b>85</b>

# LIST OF FIGURES

Figure 1: Easysoft unixODBC configure line options..... 32

Figure 2: Dynamic linker search path environment variables..... 40

Figure 3: Easysoft ODBC-Oracle WP Driver data source settings. .... 59

**This page left blank intentionally**

# PREFACE



---

## About this manual

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

---

## Chapter Guide

- [Intended Audience](#)
- [Displaying the Manual](#)
- [Notational Conventions](#)
- [Typographical Conventions](#)
- [Contents](#)
- [Trademarks](#)

---

### **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**

- **Introduction**  
Introduces the Easysoft ODBC-Oracle Wire Protocol (WP) Driver
- **Installation**  
Explains how to install the Easysoft ODBC-Oracle Wire Protocol (WP) Driver
- **Configuration**  
Explains how to configure the Easysoft ODBC-Oracle Wire Protocol (WP) Driver
- **Interfacing**  
Third-party programming languages and applications that are commonly used with the Easysoft ODBC-Oracle Wire Protocol (WP) Driver
- **Appendices**  
Comprising a **Technical Reference** and **Glossary**.

---

### Trademarks

Throughout this manual, *Windows* refers generically to Microsoft Windows 98, 2000, NT, XP, ME, 2003 Server or Vista, 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*.

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’.

Oracle is a registered trademark of Oracle Corporation and/or its affiliates.

Easysoft and Easysoft Data Access are trademarks of Easysoft Limited.

# INTRODUCTION

---

## Introducing the Easysoft ODBC-Oracle WP Driver

The Easysoft ODBC-Oracle WP Driver is an ODBC 3.52 driver for Oracle. It lets ODBC-enabled applications access Oracle databases from Linux and Unix platforms.

The Easysoft ODBC-Oracle WP Driver supports:

- Oracle 8.1.7+
- Oracle 9*i.x*
- Oracle 10g Release 1+
- Oracle 11g Release 1+
- Oracle 12c Release 1+
- Oracle 18c Release 1+
- Oracle 19
- Oracle 21c
- Oracle Database XE

---

### Chapter Guide

- **Overview**
- **Product Status**
- **Deployment**



## INTRODUCTION

*Introducing the Easysoft ODBC-Oracle WP Driver*

---

### Overview

The Easysoft ODBC-Oracle WP Driver connects ODBC-enabled applications on Linux and Unix to Oracle databases. For example, access Oracle databases from Apache, ApplixWare, Informatica, OpenOffice.org and StarOffice. In addition, the Easysoft ODBC-Oracle WP Driver supports the Perl DBI and DBD::ODBC modules, PHP, PEAR DB, the Python pyodbc and mxODBC interfaces, C and any other ODBC-enabled programming language or interface.

---

### Product Status

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

[http://www.easysoft.com/products/data\\_access/odbc-oracle-driver/index.html](http://www.easysoft.com/products/data_access/odbc-oracle-driver/index.html)

Software problems can be reported to [support@easysoft.com](mailto: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.

---

### Deployment

The Easysoft ODBC-Oracle WP Driver accesses Oracle directly. The driver does not use Oracle client software.

The Easysoft ODBC-Oracle WP Driver does not require Oracle environment variables such as `ORACLE_HOME` and `TNS_ADMIN` to be set or make use of Oracle configuration files such as `tnsnames.ora`.

**This page left blank intentionally**



# INSTALLATION

---

## Installing the Easysoft ODBC-Oracle WP Driver

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

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

---

### Chapter Guide

- **Obtaining the Easysoft ODBC-Oracle WP Driver**
- **What to Install**
- **Installing the Easysoft ODBC-Oracle WP Driver**
- **Uninstalling the Easysoft ODBC-Oracle WP Driver**

---

## **Obtaining the Easysoft ODBC-Oracle WP Driver**

There are three ways to obtain the Easysoft ODBC-Oracle WP Driver:

- The Easysoft web site is available 24 hours a day at <http://www.easysoft.com> and lets you download product releases and documentation.

Choose **Download** from the Easysoft ODBC-Oracle WP Driver section of the web site and then choose the platform release that you require.

If you have not already done so, you will need to register at the web site to download Easysoft software.

- The Easysoft FTP site is available 24 hours a day at <ftp://ftp.easysoft.com> and lets you download free patches, upgrades, documentation and beta releases of Easysoft products, as well as definitive releases.

Change to the `pub/oraclewp` subdirectory and then choose the platform release that you require.

- You can order Easysoft software on CD. To do this, [contact us](#) by email, telephone or post.

## What to Install

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

- `odbc-oraclewp-x.y.z-platform.tar.gz`

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:

- `odbc-oraclewp-x.y.z-platform-variation.tar`

where *platform-variation* refers to alternative versions available for a single platform.

### 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).

Unix file names may also be suffixed with `.gz` for a gzipped archive, `.bz2` for a bzip2ed archive, or `.z` for a compressed archive.

### Note

If you download a Unix file with a Windows browser, the browser may strip the file name extension. For example, if you download a `.gz` file and the browser strips the file name extension, it may not be obvious that the file is gzipped. Use `file filename` to find out the file type of the downloaded file.

## INSTALLATION

*Installing the Easysoft ODBC-Oracle WP Driver*

### **Caution!**

As long as you stop all Easysoft software first (or software that uses the Easysoft drivers), it is safe to reinstall or upgrade the Easysoft ODBC-Oracle WP 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).

---

## Installing the Easysoft ODBC-Oracle WP Driver

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

### BEFORE YOU INSTALL

#### *Requirements*

To install the Easysoft ODBC-Oracle WP 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.

## INSTALLATION

*Installing the Easysoft ODBC-Oracle WP Driver*

- Depending on the platform, you will need approximately 3 MB of temporary space for the installation files and approximately 3 MB of free disk space for the installed programs.
- For Easysoft Licensing to work, you must do one of the following:
  - Install the Easysoft ODBC-Oracle WP Driver in `/usr/local/easysoft`.
  - Install the Easysoft ODBC-Oracle WP 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-Oracle WP Driver elsewhere and set the `EASYSOFT_ROOT` environment variable.

For more information about setting the `EASYSOFT_ROOT` environment variable, see **"Post installation" on page 37**.

- An ODBC Driver Manager. Easysoft ODBC-Oracle WP 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-Oracle WP 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-Oracle WP Driver.
- The `unixODBC` Driver Manager.

You will need an ODBC Driver Manager to use the Easysoft ODBC-Oracle WP 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.

## INSTALLATION

### *Installing the Easysoft ODBC-Oracle WP Driver*

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-Oracle WP 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. For information about how to correct this manually, see **["Post Installation Steps for non-root Installations" on page 37.](#)**



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-Oracle WP 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 entry for this driver will look similar to this:

```
[Easysoft ODBC-Oracle WP]
Description = Easysoft Oracle ODBC WP Driver
Driver = /usr/local/easysoft/oraclewp/libesorawp.so
Setup = /usr/local/easysoft/oraclewp/libesorawpS.so
FileUsage = 1
```

For information about removing these entries, see **["Installing the Easysoft ODBC-Oracle WP Driver" on page 21.](#)**

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 will look similar to this:

```
[ORACLE_SAMPLE]
driver                = Easysoft ODBC-Oracle WP
description           = Easysoft Oracle ODBC WP driver
server                = server.domain.com
port                  = 1521
sid                   = service_name
user                  = system
password              = master
logging               = No
logfile               =
enable_user_catalog   = yes
enable_synonyms       = yes
metadata_dont_change_case = no
metadata_dont_do_schema = no
metadata_id           = no
limit_long            = 0
```

For information about removing these data sources, see **["Uninstalling the Easysoft ODBC-Oracle WP Driver" on page 42.](#)**

### 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.

## INSTALLATION

*Installing the Easysoft ODBC-Oracle WP 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. There are multiple copies of the same distribution with different levels of compression. You unpack the distribution in one of the following ways.

If the distribution file has been gzipped (`.gz`), use:

```
gunzip odbc-oraclewp-x.y.z-platform.tar.gz
```

If the distribution file has been bziped (`.bz2`), use:

```
bunzip2 odbc-oraclewp-x.y.z-platform.tar.bz2
```

If the distribution file has been compressed (`.Z`), use:

```
uncompress odbc-oraclewp-x.y.z-platform.tar.Z
```

You may have a distribution file which is not compressed at all (`.tar`). To extract the installation files from the tar file, use:

```
tar -xvf odbc-oraclewp-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 28"**. 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
```

## INSTALLATION

### *Installing the Easysoft ODBC-Oracle WP Driver*

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 29**.

- 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-Oracle WP Driver and data sources during the installation.
- Most ODBC-enabled applications and interfaces support unixODBC. The Easysoft ODBC-Oracle WP 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-Oracle WP 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-Oracle WP Driver distribution is not built with the default options in unixODBC's configure line.

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

Option	Description
<code>--enable-iconv=no</code>	This means unixODBC will not look for a libiconv. Warnings about not finding an iconv library were confusing our customers.
<code>--enable-stats=no</code>	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.
<code>--enable-readline=no</code>	This disables readline support in <code>isql</code> . We disabled this because it ties <code>isql</code> 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 <code>isql</code> unusable on these systems.
<code>--prefix=/usr/local/easysoft/unixODBC</code>	This installs unixODBC into <code>/usr/local/easysoft/unixODBC</code> .

**Figure 1: Easysoft unixODBC configure line options.**



### ***Installing the Easysoft ODBC-Oracle WP Driver***

The Easysoft ODBC-Oracle WP Driver installation script:

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

If the Easysoft ODBC-Oracle WP 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-Oracle WP 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-Oracle WP Driver data source.

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

If a data source called "ORACLE\_SAMPLE" already exists, 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.

## INSTALLATION

### *Installing the Easysoft ODBC-Oracle WP Driver*

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

```
Would you like to request a Easysoft ODBC WP Driver  
for Oracle 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-Oracle WP 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

## INSTALLATION

*Installing the Easysoft ODBC-Oracle WP Driver*

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](mailto: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-Oracle WP Driver documentation is installed in  
`installation_path/easysoft/oraclewp/doc:`
  - The Easysoft ODBC-Oracle WP Driver manual in PDF format.
  - The Easysoft ODBC-Oracle WP Driver EULA.

`installation_path/easysoft/oraclewp/doc/CHANGES.txt` lists all the changes in each version of the Easysoft ODBC-Oracle WP Driver.

There are also many resources at the [Easysoft web site](#).

### ***Post Installation Steps for non-root Installations***

If you installed the Easysoft ODBC-Oracle WP Driver as a non-root user (not recommended), there may be some additional steps you will need to do manually:

1. If you attempt to install the Easysoft ODBC-Oracle WP Driver under the unixODBC Driver Manager and you do not have write permission to unixODBC's `odbcinst.ini` file, the driver cannot be added.

You can manually install the driver under unixODBC by adding an entry to the `odbcinst.ini` file. Run `odbcinst -j` to find out the location of the `DRIVERS` file then append the lines from the `drv_template` file to the `odbcinst.ini` file. (`drv_template` is in the directory where the distribution was untarred to).

## INSTALLATION

*Installing the Easysoft ODBC-Oracle WP Driver*

2. No example data sources can be added into unixODBC if you do not have write permission to the `SYSTEM odbc.ini` file. Run `odbcinst -j` to find out the location of the `SYSTEM DATA SOURCES` file then add your data sources to this file.
3. On systems where the dynamic linker has a configuration file defining the locations where it looks for shared objects (Linux), you will need to add:

```
installation_path/easysoft/lib
```

```
installation_path/easysoft/unixODBC/lib
```

The latter entry is only required if you installed the unixODBC included with this distribution. Sometimes, after changing the dynamic linker configuration file, you need to run a program to update the dynamic linker cache. (For example, `/sbin/ldconfig` on Linux.)

4. If you did not install the Easysoft ODBC-Oracle WP Driver in the default location, you need to do one of the following:
  - Link `/usr/local/easysoft` to the `easysoft` directory in your chosen installation path.

For example, if you installed in `/home/user`, the installation will create `/home/user/easysoft` and you need to symbolically link `/usr/local/easysoft` to `/home/user/easysoft`:

```
ln -s /home/user/easysoft /usr/local/easysoft
```

- Set and export the `EASYSOFT_ROOT` environment variable to `installation_path/easysoft`.

5. If your system does not have a dynamic linker configuration file, you need to add the paths listed in step 3 to whatever environment path the dynamic linker uses to locate shared objects. You may want to amend this in a system file run whenever someone logs in such as `/etc/profile`.

The environment variable depends on the dynamic linker. Refer to your `ld` or `ld.so` man page. It is usually:

`LD_LIBRARY_PATH`, `LIBPATH`, `LD_RUN_PATH` or `SHLIB_PATH`.

### 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-Oracle WP 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 27](#).

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.

## INSTALLATION

### *Installing the Easysoft ODBC-Oracle WP Driver*

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

```
installationdir/easysoft/lib
```

where *installationdir* is the directory in which you chose to install the Easysoft ODBC-Oracle WP 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-Oracle WP Driver distribution, you also need to add *installationdir/easysoft/unixODBC/lib* to the dynamic linker search path.

---

## Uninstalling the Easysoft ODBC-Oracle WP Driver

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

### To uninstall the Easysoft ODBC-Oracle WP Driver

1. Change directory to `installation_path/easysoft` and delete the `oraclewp` directory. `installation_path` is the Easysoft ODBC-Oracle WP 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-Oracle WP Driver entry needs to be removed from the `odbcinst.ini` file. To check whether the Easysoft ODBC-Oracle WP Driver is configured under unixODBC, use `odbcinst -q -d`. If the command output contains `[Easysoft ODBC-Oracle WP Driver]`, uninstall the drivers from unixODBC by using:

```
odbcinst -u -d -n 'Easysoft ODBC-Oracle WP'
```

If a reduced usage count message is displayed, repeat this command until `odbcinst` reports that the drivers have been removed.

4. If you created any Easysoft ODBC-Oracle WP Driver data sources under unixODBC, you may want to delete these. To do this, first use `odbcinst -j` to locate USER and SYSTEM `odbc.ini` files. Then check those files for data sources that have the driver attribute set to Easysoft ODBC-Oracle.
5. Remove `oraclewp_install.info` from the `installation_path/easysoft` directory.

**This page left blank intentionally**

# CONFIGURATION

---

## Configuring the Easysoft ODBC-Oracle WP Driver

The Easysoft ODBC-Oracle WP 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 database 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-Oracle WP Driver.

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

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

---

### Chapter Guide

- **Setting Up Data Sources**
- **Attribute Fields**
- **DSN-less Connections**

---

## Setting Up Data Sources

There are two ways to set up a data source to your Oracle 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-Oracle WP Driver installation creates a SYSTEM data source named `[ORACLE_SAMPLE]`. If you are using the unixODBC included in the Easysoft ODBC-Oracle WP 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-Oracle WP 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-Oracle WP Driver is installed into unixODBC, it places an Easysoft ODBC-Oracle WP entry in `odbcinst.ini`. For Easysoft ODBC-Oracle WP Driver data sources therefore, you need to include a `Driver = Easysoft ODBC-Oracle WP` entry.

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

- The host name or IP address of the machine where the Oracle database is running (`Server`).
- The service name that identifies the database you want to connect to (`SID`).
- A valid Oracle user name (`User`) and password (`Password`).
- If your Oracle listener is **not** listening on the default port for database connection requests, 1521, specify the listener port number (`Port`).

For example:

```
[Oracle]
Driver      = Easysoft ODBC-Oracle WP
Server      = my_oracle_database_machine
Port        = 1522
SID         = my_oracle_database_service_name
User        = my_oracle_database_user
Password    = my_oracle_database_user
```

Other optional attribute values may be set in the `odbc.ini` file, and are described in **"Attribute Fields" on page 55**.



**ENVIRONMENT**

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

- `libodbcinst.so`

By default, this is located in

`/usr/local/easysoft/unixODBC/lib.`

- `libeslicshr.so`

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

- `libessupp.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.

<b>Note</b>	The shared object file extension ( <code>.so</code> ) may vary depending on the operating system ( <code>.so</code> , <code>.a</code> or <code>.sl</code> ).
-------------	--

**ESTABLISHING A TEST CONNECTION**

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

**To test the Easysoft ODBC-Oracle WP Driver connection**

1. Change directory into `/usr/local/easysoft/unixODBC/bin`.
2. Type `./isql -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 * from dual;
```

– OR –

Type `help` to return a list of tables:

```
SQL> help
```

**TROUBLESHOOTING DATABASE CONNECTION PROBLEMS**

This section lists some common connection problems and their solutions.

- **Client unable to establish connection: 'Failed to find host address 'myhost'**
- **Client unable to establish connection: OS Error: 'Connection refused'**
- **Client unable to establish connection: ORA-12514, TNS:listener does not currently know of service requested in connect descriptor**
- **ORA-01017: invalid username/password; logon denied**

## CONFIGURATION

*Configuring the Easysoft ODBC-Oracle WP Driver*

***Client unable to establish connection: 'Failed to find host address 'myhost'***

Check the Server attribute in your data source specifies a valid machine name or IP address. Check that the machine name can be looked up by using DNS or is present in `/etc/hosts`. Check that you are on the same network as the target host by pinging the machine:

```
ping myhost
```

If `ping` times out or fails, then either the DNS lookup is not working properly or there is some other networking or routing issue that needs to be resolved. Contact your network administrator.

***Client unable to establish connection: OS Error: 'Connection refused'***

Check with your database administrator that the Oracle listener is running.

If the listener is running, is the Easysoft ODBC-Oracle WP Driver connecting to the correct listener port?

By default, the Easysoft ODBC-Oracle WP Driver tries to connect to the default listener port, 1521. However, when connecting to machines where multiple Oracle instances or versions are running, you may need to specify a different port. Check with your database administrator to find out the correct listener port. Specify this port with the `Port` attribute in your ODBC data source. For example:

```
Port = 1522
```

You can use telnet to check that you can connect to the listener port from you client machine. For example:

```
telnet myoracleserver 1522
```

If the listener is listening on the port you specify, you will see output similar to:

```
Connected to myoracleserver
```

```
Escape character is '^['
```

To exit from telnet, type CTRL-] and then quit.

If you do not see this output or a "Connection refused" error is displayed, the Oracle listener is not listening on the specified port.

***Client unable to establish connection: ORA-12514, TNS:listener does not currently know of service requested in connect descriptor***

Check that you have specified a valid service name with the `SID` attribute in `odbc.ini`.

If the service name is valid, it may be that the database service is not running or has not registered with the listener.

Failure to register with the listener may be a temporary condition. For example, the database may not have registered yet because the listener has only recently been started. It is therefore worth waiting a few moments and then reconnecting to your ODBC data source, before contacting your database administrator.

***ORA-01017: invalid username/password; logon denied***

Check that the `User` and `Password` attributes for the data source in the `odbc.ini` specify a valid Oracle user name and password.

If you are connecting to an Oracle 11g database or later, check that the password specified in `odbc.ini` is the correct case. By default, passwords are case sensitive for new or modified accounts in Oracle 11g and later.

### Attribute Fields

The Easysoft ODBC-Oracle WP Driver supports the following attributes. The attributes may be set in the `odbc.ini` file or the ODBC connection string in a `SQLDriverConnect` call.

Attributes whose value is a text string have this format:

*attribute* = *value*.

Values for logical attributes can contain either 0 (set to off) or 1 (set to on) and have this format:

*attribute* = 0|1

Attribute	Description
Description = <i>value</i>	A single line of descriptive text that may be retrieved by some applications to describe the data source.
Server = <i>value</i>	The host name or IP address of the Oracle database server machine.
Port = <i>num</i>	The TCP port on which the listener is listening for database connection requests. The listener runs on your database server machine and handles incoming client requests. If your listener is listening on the default port for database connection requests, 1521, you can omit the <code>Port</code> setting.
SID = <i>value</i>	The service name that identifies the database you want to connect to. For example, <code>sales</code> . For Oracle Database XE, the service name is XE.

Attribute	Description
User = <i>value</i>	<p>The name of the user that the driver supplies to Oracle to authenticate the connection.</p> <p>If you specify a user in the connection string, any entry in the data source will be ignored. For more information about specifying Easysoft ODBC-Oracle WP Driver attributes in the connection string, see <b>"DSN-less Connections" on page 60</b>.</p>
Password = <i>value</i>	<p>The password for the user name specified by User.</p> <p>Note that passwords are case sensitive for new or modified accounts in Oracle 11g and later.</p> <p>If you specify a password in the connection string, any entry in the data source will be ignored.</p>
Enable_User_Catalog=0 1	<p>When ON (set to 1), the Easysoft ODBC-Oracle WP Driver returns metadata for the current Oracle user only. Setting Enable_User_Catalog to ON reduces the number of rows returned by SQLTables calls.</p> <p>When OFF (set to 0), the driver returns metadata for all users. Note that many ODBC applications will never need this amount of catalog data.</p> <p>By default, Enable_User_Catalog is ON (set to 1).</p>
Enable_Synonyms = 0 1	<p>When ON (set to 1), the Easysoft ODBC-Oracle WP Driver returns private synonyms for table names in metadata result sets.</p> <p>By default, the driver return synonyms. If you do not need to see synonyms, set Enable_Synonyms to OFF (0). Including synonyms in metadata calls may greatly increase the size of metadata result sets for ODBC API calls such as SQLTables.</p>



Attribute	Description
MetaData_ID = 0 1	<p>When ON (set to 1), the default value of the Connection Attribute <code>SQL_ATTR_METADATA_ID</code> is set to <code>SQL_TRUE</code> (see <a href="#">"StarOffice 5.2" on page 81</a>).</p> <p>If <code>SQL_TRUE</code>, the string arguments of catalog functions are treated as identifiers. The case is not significant. For non-delimited strings, the driver removes any trailing spaces, and the string is folded to uppercase. For delimited strings, the driver removes leading and trailing spaces, and takes literally whatever is between the delimiters.</p> <p><b>Note</b> Setting this attribute can cause failures in applications that expect the default for <code>SQL_ATTR_METADATA_ID</code> to be <code>SQL_FALSE</code>. By default, <code>MetaData_ID</code> is OFF (set to 0).</p>
MetaData_Dont_Change_Case=0 1	<p>When ON (set to 1), the Easysoft ODBC-Oracle WP Driver preserves the case of parameter values passed to metadata calls.</p> <p>The default for <code>Metadata_Dont_Change_Case</code> is OFF (set to 0).</p>
Metadata_Dont_Do_Schema=0 1	<p>When ON (set to 1), schema names are not returned by metadata calls. This is a workaround for some applications that do not handle <code>SCHEMA</code> names properly (see <a href="#">"OpenOffice.org 1.0" on page 81</a>).</p> <p>By default <code>Metadata_Dont_Do_Schema</code> is OFF (set to 0).</p>
Limit_Long=0 1	<p>The maximum size in bytes that the Easysoft ODBC-Oracle WP Driver returns for <code>LONG</code>, <code>LONG RAW</code>, <code>BLOB</code>, <code>CLOB</code> and <code>NCLOB</code> columns. Specify a non-zero value for <code>LimitLong</code> to restrict the size returned by the driver when describing these data types.</p>

Attribute	Description
Client_CSet = <i>encoding</i>	<p>Specifies the local encoding of data being passed to or from the Easysoft ODBC-Oracle WP Driver when that data is bound as a SQL wide type (SQL_WCHAR, SQL_WVARCHAR, SQL_WLONGVARCHAR) and stored in Oracle as NCHAR, NVARCHAR2 and NCLOB columns. For example:</p> <pre>SQLPrepare( hstmt, "INSERT INTO MYNCHARTABLE VALUES (?)", SQL_NTS ); SQLBindParameter( hstmt, 1, SQL_PARAM_INPUT, SQL_C_CHAR, <b>SQL_WCHAR</b>, 100, 0, &amp;cval, sizeof( cval ), &amp;len1 );</pre> <p>As an example, if this Client_CSet entry is present in the data source, the Easysoft ODBC-Oracle WP Driver will try to convert character data to and from the UTF-8 encoding:</p> <pre># Convert from UTF-8 when submitting data to Oracle # via a parameterised insert. # Convert to UTF-8 when retrieving data from Oracle. Client_CSet = UTF-8</pre> <p>Use Client_CSet if you experience data loss/corruption when working with character data <i>and</i> your application cannot convert data to and from the encoding scheme it expects.</p> <p><b>Note</b> The version of the Easysoft ODBC-Oracle WP Driver driver that supports the Client_CSet attribute is not currently available on the Easysoft web site, but can be obtained by contacting the Easysoft support team (<a href="mailto:support@easysoft.com">support@easysoft.com</a>).</p>

Attribute	Description
	<p>The Easysoft ODBC-Oracle WP Driver dynamically links to iconv on your machine to do the conversion at run-time. For a list of available encodings for Client_CSet, run this command on the machine where the Easysoft ODBC-Oracle WP Driver is installed:</p> <pre>iconv -l</pre> <p>Set Client_CSet to the encoding that corresponds with the LANG environment variable value on the client machine. For example, if LANG was set to en_US.UTF-8 on the client machine, you would set Client_CSet to UTF-8.</p> <p>If iconv cannot convert a character, the Easysoft ODBC-Oracle WP Driver will omit the character and write this entry to the unixODBC or driver log file (assuming logging is enabled):</p> <pre>Failed converting unicode to char string</pre>
SoKeepalive = 0   1	<p>Whether to use TCP keepalive probes to verify that an idle connection is still intact.</p> <p>When ON (set to 1), keepalive probes are sent, after a period of inactivity, to verify that the connection to the SQL Server machine is still valid. To do this, the Easysoft ODBC-Oracle WP Driver sets the SO_KEEPALIVE socket option by using setsockopt(). If no response to the probes is received, the socket is closed.</p> <p>The duration of the period of inactivity is a system default, and is typically two hours.</p> <p>By default, SoKeepalive is OFF (set to 0).</p>

Figure 3: Easysoft ODBC-Oracle WP Driver data source settings.

---

## 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-Oracle WP};  
                    Server=database_machine;  
                    SID=service_name;UID=user;  
                    PWD=password;"...)
```

where *database\_machine* is the host name or IP address of the Oracle database server machine, *service\_name* is the database service name, *user* and *password* are a valid Oracle login and password. You need to use the Easysoft ODBC-Oracle WP DRIVER keyword to connect to the Easysoft ODBC-Oracle WP Driver.

Other Easysoft ODBC-Oracle WP Driver attribute settings (as described in **"Setting Up Data Sources" on page 46**) can be added to the connection string using the same *PARAMETER=value;* format. For example, the following connection string uses the `PORT` attribute to specify a non-default listener port number:

```
"DRIVER={Easysoft ODBC-Oracle  
WP};SERVER=my_xe_machine;PORT=1522;SID=XE;USER=hr;PWD=hr_password"
```

# INTERFACING

---

## Using the Easysoft ODBC-Oracle WP Driver with other software

This chapter lists some third-party programming languages and applications that are commonly used with the Easysoft ODBC-Oracle WP Driver. Easysoft tutorials are available for the applications and programming languages listed here. Look at the section for your application for a link to the tutorial on the Easysoft web site.

---

### Chapter Guide

- **Apache/PHP**
- **C**
- **FreeRADIUS**
- **Lotus Notes/Domino**
- **Micro Focus COBOL**
- **mxODBC**
- **OpenLDAP**
- **OpenOffice.org**
- **Perl DBI DBD::ODBC**
- **PHP/PEAR DB**
- **QT**
- **Rexx/SQL**
- **StarOffice**

## INTERFACING

*Using the Easysoft ODBC-Oracle WP Driver with other software*

---

### Apache/PHP

PHP's ODBC support enables PHP scripts running under Apache (or standalone) to access ODBC data sources. The Easysoft ODBC-Oracle WP Driver lets Apache/PHP access Oracle databases. For example, use our driver with Apache/PHP to dynamically generate web pages from data stored in Oracle databases.

### TUTORIAL

- [http://www.easysoft.com/developer/languages/php/apache\\_odbc.html](http://www.easysoft.com/developer/languages/php/apache_odbc.html)

### SEE ALSO

- "PHP/PEAR DB" on page 67

---

### C

The Easysoft ODBC-Oracle WP Driver lets you develop C applications that access and manipulate data stored in Oracle databases.

### TUTORIAL

- [http://www.easysoft.com/developer/languages/c/odbc\\_tutorial.html](http://www.easysoft.com/developer/languages/c/odbc_tutorial.html)

---

## **FreeRADIUS**

FreeRADIUS is an open source RADIUS (Remote Authentication Dial-In User Service) server that is used for authentication and accounting various types of network access. FreeRADIUS can use information stored in ODBC databases to authenticate users. The Easysoft ODBC-Oracle WP Driver enables FreeRADIUS to use Oracle as an authorization database.

### **TUTORIAL**

- <http://www.easysoft.com/applications/freeradius/odbc-authorization.html>

---

## **Lotus Notes/Domino**

Domino Enterprise Connection Services (DECS) lets Lotus Domino applications access data in non-Domino databases. The external data is then available to Lotus Notes client applications. By using DECS with the Easysoft ODBC-Oracle WP Driver, your Notes/Domino applications can access data in Oracle databases.

### **TUTORIAL**

- [http://www.easysoft.com/applications/lotus\\_notes\\_domino/odbc.html](http://www.easysoft.com/applications/lotus_notes_domino/odbc.html)

## INTERFACING

*Using the Easysoft ODBC-Oracle WP Driver with other software*

---

### Micro Focus COBOL

The Micro Focus OpenESQL interface translates embedded SQL statements into ODBC API calls, making it easy to develop COBOL applications that access different database systems. On Unix platforms, OpenESQL is provided with Micro Focus Server Express.

Use the Server Express OpenESQL Interface with the Easysoft ODBC-Oracle WP Driver to access Oracle databases from your COBOL applications.

#### TUTORIAL

- <http://www.easysoft.com/applications/micro-focus-cobol/server-express-opensql-odbc.html>

---

### mxODBC

mxODBC is a database API for the Python scripting language that provides an interface to ODBC data sources. Use mxODBC with the Easysoft ODBC-Oracle WP Driver to access Oracle databases from your Python scripts.

#### TUTORIAL

- <http://www.easysoft.com/developer/languages/python/mxodbc.html>



---

## **OpenLDAP**

OpenLDAP is an open source implementation of the Lightweight Directory Access Protocol (LDAP). LDAP is an open-standard protocol for accessing data stored in an information directory. It lets LDAP-aware client applications search for, add, modify and delete directory entries. For example, a user could use an LDAP client to query a directory server for information about specific users, computers, departments or any other information stored in the directory.

By using the Easysoft ODBC-Oracle WP Driver with OpenLDAP and the SQL backend, back-sql, you can expose data in Oracle databases to LDAP client applications.

## **TUTORIAL**

- <http://www.easysoft.com/applications/openldap/back-sql-odbc.html>

## INTERFACING

*Using the Easysoft ODBC-Oracle WP Driver with other software*

---

### OpenOffice.org

OpenOffice.org is the open source project through which Sun Microsystems has released the technology for the StarOffice Productivity Suite. OpenOffice.org can use ODBC data sources in its various applications to link to external data.

The Easysoft ODBC-Oracle WP Driver lets OpenOffice.org applications such as Base, Calc and Writer link to external data in Oracle databases.

#### TUTORIAL

- [http://www.easysoft.com/applications/openoffice\\_org/odbc.html](http://www.easysoft.com/applications/openoffice_org/odbc.html)

#### SEE ALSO

- "OpenOffice.org 1.0" on page 81

---

### Perl DBI DBD::ODBC

DBI is the database interface module for Perl. DBD::ODBC is the ODBC database driver for Perl DBI. When DBD::ODBC is built with an ODBC driver manager, it enables access to ODBC drivers. You can then use DBI/DBD::ODBC with the Easysoft ODBC-Oracle WP Driver to access Oracle databases from your Perl scripts.

#### TUTORIAL

- [http://www.easysoft.com/developer/languages/perl/dbi\\_dbd\\_odbc.html](http://www.easysoft.com/developer/languages/perl/dbi_dbd_odbc.html)

---

## **PHP/PEAR DB**

PEAR (PHP Extension and Application Repository) is a framework and distribution system for reusable PHP classes, libraries, and modules. The PEAR DB package is a database abstraction layer that enables PHP programs written for one database to work with other databases.

The PEAR DB module's ODBC backend lets you access databases for which an ODBC driver is available. By using PEAR DB's ODBC backend with the Easysoft ODBC-Oracle WP Driver you can access Oracle databases from DB on Unix and Linux.

## **TUTORIAL**

- <http://www.easysoft.com/developer/languages/php/pear-db-odbc.html>

## **SEE ALSO**

- ["Apache/PHP" on page 62](#)

---

## **QT**

QT is a multiplatform C++ GUI toolkit. Building QT with ODBC support enables you to access ODBC data sources from QT. The Easysoft ODBC-Oracle WP Driver lets you access data stored in Oracle databases from your QT programs.

## **TUTORIAL**

- <http://www.easysoft.com/developer/libraries/qt/odbc.html>

## INTERFACING

*Using the Easysoft ODBC-Oracle WP Driver with other software*

---

### Rexx/SQL

Rexx/SQL provides Rexx programmers with a consistent, simple and powerful interface to SQL databases.

Use Rexx/SQL with the Easysoft ODBC-Oracle WP Driver to access Oracle databases from Rexx scripts.

### TUTORIAL

- [http://www.easysoft.com/developer/languages/rexx/rexx\\_sql\\_odbc.html](http://www.easysoft.com/developer/languages/rexx/rexx_sql_odbc.html)

---

### StarOffice

StarOffice is a multi-platform office productivity suite. StarOffice can use ODBC data sources in its various applications to link to external data.

The Easysoft ODBC-Oracle WP Driver lets StarOffice applications such as Base, Calc and Writer link to external data in Oracle databases.

### TUTORIAL

- <http://www.easysoft.com/applications/staroffice/odbc.html>

### SEE ALSO

- "StarOffice" on page 68

# TECHNICAL REFERENCE



---

## Technical Reference for the Easysoft ODBC-Oracle WP Driver

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

---

### Appendix Guide

- [ODBC Conformance](#)
- [Supported Data Types](#)
- [Procedures](#)
- [Materialized Views](#)
- [Application Specific Issues](#)
- [Threading](#)
- [Tracing](#)

---

**ODBC Conformance**

The Easysoft ODBC-Oracle WP Driver complies with the ODBC 3.52 specification.

The driver is Level 2 compliant.

**ODBC API SUPPORT**

All ODBC 3.52 calls are supported.

**SQLSETPOS**

The driver partially supports `SQLSetPos`. An application can use the driver to specify a cursor position by calling `SQLSetPos` with the `SQL_POSITION` argument.

**CURSOR SUPPORT**

The Easysoft ODBC-Oracle WP Driver supports `FORWARD_ONLY` and `STATIC` cursors.

**SCALAR FUNCTIONS**

The Easysoft ODBC-Oracle WP Driver supports all scalar functions **apart from:**

- `DIFFERENCE`
- `POSITION`
- `COT`
- `RAND`
- `EXTRACT`
- `TIMESTAMPDIFF`

Functions need to be called by using the ODBC escape sequence {fn *scalar-function*}. For example:

```
SELECT {fn UCASE(Name)} FROM Employees;  
SELECT e.last_name, {fn IFNULL(e.job_id,  
j.job_id)} "Old Job ID"  
FROM employees e, job_history j  
WHERE e.employee_id = j.employee_id  
ORDER BY last_name;
```

---

## Supported Data Types

The Easysoft ODBC-Oracle WP Driver supports the following Oracle data types and subtypes:

- CHAR
- VARCHAR2
- NCHAR
- NVARCHAR2
- LONG

## TECHNICAL REFERENCE

*Technical Reference for the Easysoft ODBC-Oracle WP Driver*

- NUMBER  
DECIMAL  
INTEGER  
FLOAT  
DOUBLE PRECISION
- BINARY\_FLOAT
- BINARY\_DOUBLE
- DATE
- TIMESTAMP
- TIMESTAMP WITH TIME ZONE
- TIMESTAMP WITH LOCAL TIME ZONE
- BLOB
- CLOB
- NCLOB
- BFILE
- RAW
- LONG RAW



---

## **Procedures**

To call procedures, you must use the ODBC escape sequence rather than the native Oracle PL/SQL syntax. If the procedure is contained in a package, include the package name in the procedure call. For example:

```
{CALL mypackage.myprocedure(?)}
```

## **REF CURSORS**

Oracle's `REF CURSOR` data type allows a procedure to return a result set to a client application. Procedures can accept multiple `REF CURSOR` input parameters, which allows them to return multiple result sets.

Because the `REF CURSOR` type is not part of the ODBC specification, the Easysoft ODBC-Oracle WP Driver returns the results from `REF CURSORS` as a standard ODBC result set,

When calling procedures that use `REF CURSORS`, omit any `REF CURSOR` parameters from the procedure call.

If a procedure returns multiple `REF CURSORS`, the Easysoft ODBC-Oracle WP Driver returns them as multiple result sets in the order that the `REF CURSOR` parameters are defined in the `Create Procedure` statement.

## **EXAMPLE**

The C sample in this section shows how to execute and return the results from a packaged procedure that uses two `REF CURSORS` to return two result sets.

Using Employee data in the `HR` sample schema, the procedure returns managers and non managers in a particular department.

**Prerequisites**

The HR sample schema and user is included with Oracle 9i and later. For information about creating the HR sample schemas and unlocking the HR user account, see your Oracle documentation.

1. As the HR user, run this SQL to create the package.

```
create or replace PACKAGE get_employees AS
  TYPE managers_cur IS REF CURSOR;
  TYPE non_managers_cur IS REF CURSOR;
  PROCEDURE get_employee_details(managers in out managers_cur,
                                non_managers in out non_managers_cur,
                                deptid in number);
END get_employees;
```

2. As the HR user, run this SQL to create the procedure in the package body.

```
create or replace PACKAGE BODY get_employees AS
    PROCEDURE get_employee_details(managers in out managers_cur,
                                   non_managers in out non_managers_cur,
                                   deptid in number)
IS
BEGIN
    OPEN managers FOR
        SELECT last_name,
               first_name
        FROM emp_details_view
        WHERE department_id = deptid
        AND job_title LIKE '%Manager%'
        ORDER BY employee_id ASC;
    OPEN non_managers FOR
        SELECT last_name,
               first_name
        FROM emp_details_view
        WHERE department_id = deptid
        AND job_title NOT LIKE '%Manager%'
        ORDER BY employee_id ASC;
    END get_employee_details;
END get_employees;
```

**C Code Sample**

```
/*
 * This C code sample calls get_employees.get_employee_details and
 * returns both REF CURSORS from the packaged procedure as result
 * sets.
 *
 * Before using this sample, you need to have created the
 * get_employees package (see "Prerequisites").
 */
#include <stdio.h>
#include <sql.h>
#include <sqlext.h>

#define DATA_LEN 100

/* See "ODBC from C Tutorial Part 1", on the Easysoft web */
/* site for a definition of extract_error(). */
static void extract_error(
    char *fn,
    SQLHANDLE handle,
    SQLSMALLINT type);
```

```
main() {
    SQLHENV env;
    SQLHDBC dbc;
    SQLHSTMT stmt;
    SQLRETURN ret;

    SQLAllocHandle(SQL_HANDLE_ENV, SQL_NULL_HANDLE, &env);

    /* Set ODBC version */
    SQLSetEnvAttr(env, SQL_ATTR_ODBC_VERSION,
                  (void *) SQL_OV_ODBC3, 0);

    ret = SQLAllocHandle( SQL_HANDLE_DBC, env, &dbc );

    /* Connect to the Oracle data source as the HR user */
    ret = SQLDriverConnect(dbc, NULL,
                           "DSN=ORACLE_SAMPLE;UID=hr;PWD=hr_password",
                           SQL_NTS, NULL, 0, NULL,
                           SQL_DRIVER_COMPLETE);
}
```

```
if (SQL_SUCCEEDED(ret)) {

    SQLSMALLINT deptid;
    SQLINTEGER deptid_len;

    SQLAllocHandle(SQL_HANDLE_STMT, dbc, &stmt);

    /* The procedure needs to be given a department ID */
    SQLBindParameter(stmt, 1, SQL_PARAM_INPUT, SQL_C_SSHORT,
                     SQL_INTEGER, 0, 0, &deptid, 0, &deptid_len);
    deptid = 100;

    /* Specify both the package name and procedure name in the */
    /* procedure call. Just pass the department ID to the */
    /* procedure, the PL/SQL package is responsible for passing */
    /* the REF CURSORS. */
    ret = SQLExecDirect(stmt, "{call get_employees.get_employee_details(?)}",
                        SQL_NTS);

    if (ret == SQL_SUCCESS || ret == SQL_SUCCESS_WITH_INFO) {
        SQLCHAR data[ 100 ];
        SQLINTEGER data_len;
```

```
SQLBindCol(stmt, 1, SQL_C_CHAR, data, sizeof( data ),
           &data_len);

/* Get the first result set */
printf( "\nManagers\n");
printf( "-----\n");

while (SQL_SUCCEEDED(ret = SQLFetch(stmt))) {
    printf("%s\n", data);
}

/* Get the next result set */
while ( SQLMoreResults(stmt) == SQL_SUCCESS) {
    printf( "\nNon-managers\n");
    printf( "-----\n");
    while (SQL_SUCCEEDED(ret = SQLFetch(stmt))) {
        printf("%s\n", data);
    }
}
} else {
    fprintf(stderr, "Failed to call procedure\n");
    extract_error("SQLExecDirect", stmt, SQL_HANDLE_STMT);
}
```

```
SQLFreeHandle(SQL_HANDLE_STMT, stmt);
SQLDisconnect(dbc);
} else {
    fprintf(stderr, "Failed to connect\n");
    extract_error("SQLDriverConnect", dbc, SQL_HANDLE_DBC);
}

SQLFreeHandle(SQL_HANDLE_DBC, dbc);
SQLFreeHandle(SQL_HANDLE_ENV, env);
}
```

---

## Materialized Views

The Easysoft ODBC-Oracle WP Driver supports materialized views. A materialized view is a database object that contains the results of a query. Materialized views stored in the same database as their base tables can improve query performance through query rewrites.

The query rewrite mechanism reduces response time for returning results from the query. It does this by automatically rewriting the SQL query to use the materialized view instead of accessing the original tables. Query rewrites are particularly useful in a data warehouse environment.

For more information about materialized views, see your Oracle documentation.



---

## **Application Specific Issues**

### **STAROFFICE 5.2**

If problems occur with metadata, the `MetaData_ID` parameter needs to be set to 1 in the `odbc.ini` file.

### **OPENOFFICE.ORG 1.0**

If you are using OpenOffice.org 1.0, you need to set `Metadata_Dont_Do_Schema` to 1 in your `odbc.ini` file. This is not necessary for OpenOffice.org 2.0.

---

## **Threading**

The Easysoft ODBC-Oracle WP Driver is thread-safe in accordance with the ODBC specification and can safely be used behind threaded applications. Usually, applications use one connection handle and multiple threads, which execute SQL statements on that connection.

---

## 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-Oracle WP 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

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 EASYSOFT ODBC-ORACLE WP DRIVER**

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

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

For example:

```
[ORACLE_SAMPLE]
.
.
.
LOGFILE = /tmp/oracle-wp-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/oracle-wp-driver.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).

**This page left blank intentionally**

# GLOSSARY

# B

---

## Terms and definitions

### **Application Programmer Interface (API)**

A published set of function calls and constants allowing different programmers to use 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.

### **Binary Large Object (BLOB)**

A large object data type whose content consists of binary data. Additionally, this data is considered raw as its structure is not recognized by the database.

### **Character Large Object (CLOB)**

The LOB data type whose value is composed of character data corresponding to the database character set. A CLOB may be indexed and searched by the Oracle Text search engine.

### **Column**

Vertical space in a database table that represents a particular domain of data. A column has a column name and a specific datatype. For example, in a table of employee information, all of the employees' dates of hire would constitute one column.

**Commit**

Make permanent changes to data (inserts, updates, deletes) in the database. Before changes are committed, both the old and new data exist so that changes can be stored or the data can be restored to its prior state.

**Client**

In client/server architecture, the front-end database application, which requests, processes and presents data managed by the server.

**Data source**

A database or other data repository coupled with an ODBC Driver, which has been given a Data Source Name (see **“Data Source Name (DSN)” on page 87**) 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 Management System (DBMS)**

Software that handles access to a database.

**Driver**

See **“ODBC driver” on page 88**.

**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.

**Data Source Name (DSN)**

A name associated with an ODBC data source. Driver Managers such as unixODBC 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 location in a record in which a particular type of data is stored. For example, EMPLOYEE-RECORD might contain fields to store Last-Name, First-Name, Address, City, State, Zip-Code, Hire-Date, Current-Salary, Title, Department and so on. Individual fields are characterised by their maximum length and the type of data (for example, alphabetic, numeric, or financial) that can be placed in them. Fields are sometimes referred to as cells.

**Host**

A computer visible on the network.

**License key**

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

**Listener**

A process that resides on the server whose responsibility is to listen for incoming client connection requests and manage the traffic to the server.

Every time a client requests a network session with a server, a listener receives the actual request. If the client information matches the listener information, the listener grants a connection to the server.

**Metadata**

Data that describes data and other structures.

**Open Database Connectivity (ODBC)**

A standard software API specification for using database management systems (DBMS). ODBC is independent of programming language, database system and operating system. The ODBC API is a library of ODBC functions that let ODBC-enabled applications connect to any database for which an ODBC driver is available, execute SQL statements, and retrieve results.

**ODBC driver**

The goal of ODBC is to make it possible to access any data from any application, regardless of which database management system (DBMS) is handling the data. ODBC achieves this by inserting a middle layer called a database driver between an application and the DBMS. This layer translates the application's data queries into commands that the DBMS understands.

**Oracle Call Interface (OCI)**

An API that enables you to create applications that use the native procedures or function calls of a third-generation language to access an Oracle database server and control all phases of SQL statement execution. OCI supports the data types, calling conventions, syntax, and semantics of a number of third-generation languages including C, C++, COBOL and FORTRAN.



**ORACLE\_HOME**

The environment variable which contains the path where Oracle software has been installed.

**PL/SQL**

Oracle's procedural language extension to SQL. PL/SQL enables you to mix SQL statements with procedural constructs. With PL/SQL, you can define and execute PL/SQL program units such as procedures, functions, and packages.

**Result Set**

The output of a SQL query, consisting of one or more rows of data.

**Roll back**

The point in an transaction when all updates to databases involved in the transaction are reversed.

**Row**

A set of attributes or values pertaining to one entity or record in a table. A row is a collection of column information corresponding to a single record.

**Schema**

Collection of database objects, including logical structures such as tables, views, sequences, stored procedures, synonyms, indexes, clusters, and database links. A schema has the name of the user who controls it.

**Server**

In a client/server architecture, the computer that runs Oracle software and handles the functions required for concurrent, shared data access. The server receives and processes the SQL statements that originate from client applications.

**SID**

The Oracle system identifier that distinguishes a database from all other databases on a computer. The SID automatically defaults to the database name portion of the global database name, for example, `sales` in `sales.us.mycompany.com`).

**Structured Query Language (SQL)**

A language used to insert, retrieve, modify, and delete data in a relational database, designed specifically for database queries. SQL also contains statements for defining and administering the objects in a database. SQL is the language supported by most relational databases, and is the subject of standards published by the International Standards Organization (ISO) and the American National Standards Institute (ANSI). Oracle SQL (PL/SQL) includes many extensions to the ANSI/ISO standard SQL language.

**Table**

Basic unit of data storage in Oracle Database. Table data is stored in rows and columns.

**Transaction**

Logical unit of work that contains one or more SQL statements. All statements in a transaction are committed or rolled back together.

## A

---

API Conformance .....	70
-----------------------	----

## C

---

Client_CSet attribute .....	58
conformance levels .....	70
connection	
DSN-less .....	60
testing .....	50
troubleshooting problems with .....	51
connection string .....	60
connection string attributes	
CLIENT_CSET .....	58
ENABLE_SYNONYMS .....	56
ENABLE_USER_CATALOG .....	56
LIMIT_LONG .....	57
LOGGING .....	83
METADATA_DONT_DO_SCHEMA .....	57
METADATA_ID .....	57
PORT .....	55
PWD .....	56, 57
SERVER .....	55
SID .....	55
SOKEEPALIVE .....	59
UID .....	56
core level requirements .....	70
cursor support .....	70

## D

---

data source attributes	
Client_CSet .....	58
Description .....	55
Driver .....	47
Enable_Synonyms .....	56

Enable_User_Catalog .....	56
Limit_Long .....	57
Logging .....	83
METADATA_DONT_CHANGE_CASE .....	57
Metadata_Dont_Do_Schema .....	57
MetaData_ID .....	57
Password .....	56
Port .....	55
Server .....	55
SID .....	55
SoKeepalive .....	59
User .....	56
data sources .....	46-59
adding .....	46
connecting to .....	50
example .....	26
Description attribute .....	55
Driver attribute .....	47
driver manager	
installing .....	23
logging .....	82
DSN-less connections .....	60
DSNs .....	46-59
adding .....	46
connecting to .....	50
example .....	26
dynamic linker search path .....	39

## E

---

Easysoft ODBC-Oracle WP Driver	
adding data sources .....	46
connecting to Oracle with .....	50
downloading .....	18
installing .....	21
licensing .....	33

logging .....	82
setting the environment for .....	49
upgrading .....	20
Enable_Synonyms attribute .....	56
Enable_User_Catalog attribute .....	56
environment .....	49
environment variables	
LD_LIBRARY_PATH .....	40
LD_RUN_PATH .....	40
LIBPATH .....	40
EULA .....	29

## I

---

installation	
changes made to your system .....	25
default installation path .....	24
non-root .....	23
other Easysoft products and .....	27
overview .....	21
running .....	29
system requirements .....	21
unixODBC and .....	30
unpacking the distribution .....	28
what you need to know .....	28
isql .....	50

## K

---

keepalives .....	59
------------------	----

## L

---

LD_LIBRARY_PATH .....	39, 40, 49
LD_RUN_PATH .....	39, 40
level 1 requirements .....	70
level 2 requirements .....	70
LIBPATH .....	39, 40, 49

license.txt .....	29
license_request.txt .....	35, 36
licenses.out .....	36
licensing	
Easysoft ODBC-Oracle WP Driver and .....	33
End-User License Agreement .....	29
Limit_Long attribute .....	57
Logging attribute .....	83
logging ODBC API calls .....	82

## M

---

Materialized Views .....	80
MetaData_Dont_Change_Case attribute .....	57
METADATA_DONT_DO_SCHEMA .....	81
Metadata_Dont_Do_Schema attribute .....	57
MetaData_ID attribute .....	57, 81
multi-threaded applications .....	81

## N

---

non-root installations .....	37
------------------------------	----

## O

---

### ODBC

conformance levels .....	70
tracing API calls .....	82
unixODBC Driver Manager .....	23
odbc.ini .....	46-59
Client_CSet attribute .....	58
Description attribute .....	55
Driver attribute .....	47
Enable_Synonyms attribute .....	56
Enable_User_Catalog attribute .....	56
Limit_Long attribute .....	57
Logging attribute .....	83
MetaData_Dont_Change_Case attribute .....	57

Metadata_Dont_Do_Schema attribute .....	57
MetaData_ID attribute .....	57
Password attribute .....	56
Port attribute .....	55
Server attribute .....	55
SID attribute .....	55
SoKeepalive attribute .....	59
User attribute .....	56
odbcinst.ini .....	47

## P

Password attribute .....	56
Port attribute .....	55
procedures	
calling .....	73
ref cursors and .....	73
result sets and .....	73

## R

ref cursors .....	73
-------------------	----

## S

scalar functions .....	70
Server attribute	
overview .....	55
SHLIB_PATH .....	39, 40, 49
SID attribute .....	55
SoKeepalive .....	59
SoKeepalive attribute .....	59
SQL_ATTR_METADATA_ID .....	57
SQLDriverConnect function .....	60
SQLSetConnectAttr function .....	82
StarOffice .....	81
Supported Data Types .....	71



## T

---

TCP socket options	
keepalives .....	59
thread-safety .....	81
TIMESTAMP .....	72
tracing ODBC API calls .....	82

## U

---

unicode data	
converting to and from client character set .....	58
uninstalling .....	42
unixODBC .....	30
configure options .....	31
Easysoft ODBC-Oracle WP Driver and .....	30
User attribute	
overview .....	56