

Lotus

Lotus DataLens
Driver for
Paradox Tables

Lotus 1-2-3 Release 3.1+

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Contents

Preface	v
Reading Path	v
System Requirements	v
If You Need Help	vi
Chapter 1 Introduction	1-1
What is DataLens?	1-1
Benefits of DataLens	1-2
Terms and Concepts	1-2
Chapter 2 What this Driver Provides	2-1
Driver Overview	2-1
Capabilities and Options	2-1
Creating Paradox Tables	2-3
Adding and Updating Records	2-5
Appendix A Administration	A-1
Modifying the Registration File	A-1
Database Considerations	A-5

Preface

The DataLens® Driver for Paradox® Tables lets you access data in Paradox tables from within programs that support the DataLens technology, such as Lotus® 1-2-3® Release 3.1.

This guide describes the DataLens Driver for Paradox Tables and provides the information you need to use it. This guide contains the following sections:

- Chapter 1 describes the driver and the benefits it provides you.
- Chapter 2 provides the information you need to know about the DataLens Driver for Paradox Tables. You use the information in this chapter together with the information provided in the /Data External section in Chapter 2 of the 1-2-3 Release 3.1 *Reference* manual to access the data in Paradox tables.
- Appendix A provides information of particular interest to a network administrator, database administrator, or advanced user of the DataLens Driver for Paradox Tables. Topics included in this appendix are advanced options, driver implementation guidelines, database considerations, and networking and communications issues.

Reading Path

Your 1-2-3 Release 3.1 *Reference* manual tells you how to use DataLens drivers with 1-2-3 to access data in external database tables. To understand the features and capabilities of the DataLens Driver for Paradox Tables, read Chapters 1 and 2 in this guide.

If you are a network administrator, database administrator, or advanced user who is installing or setting up the DataLens Driver for Paradox Tables for other users, be sure to read Appendix A.

System Requirements

You must have the following hardware and software to use the DataLens Driver for Paradox Tables on your computer:

- Lotus 1-2-3 Release 3.1.
- IBM® PC or compatible computer that is capable of running your version of 1-2-3.
- MS-DOS® version 3.0 or later.
- 80 KB of random access memory (RAM). These memory requirements are in addition to the memory requirements of 1-2-3.

- 200 KB disk space, in addition to the disk space requirements of 1-2-3.
- The DataLens Driver for Paradox Tables can use tables created by Paradox 3.0 and can create tables for use by Paradox 3.0.

You must also know the following information to use the driver:

- The name of the directory or directories containing the Paradox table or tables you want to access.
- The name of the Paradox table or tables you want to access.

If You Need Help

If you need help installing or using the DataLens Driver for Paradox Tables, refer to Appendix 2 of the *Setting Up* manual. This appendix contains the Customer Assurance Plan, which provides information about Lotus Customer Support and tells you how to replace defective disks or documentation, transfer a software license, and upgrade to possible future releases.

Chapter 1

Introduction

This chapter introduces DataLens drivers and basic DataLens concepts.

What is DataLens?

DataLens is a technology developed by Lotus Development Corporation to help you bring the data you need from other sources into your data analysis applications, such as 1-2-3. The data can be located on a corporate mainframe, a network server, a CD-ROM, or a PC. You can also use the DataLens technology to create and update data in sources other than 1-2-3.

DataLens is integrated with 1-2-3, so you do not need to learn new, complicated programs and commands. You simply work with familiar commands and menu choices to access the data when you need it and to generate your own database queries.

DataLens gives you this flexibility by using a driver to communicate between 1-2-3 and the database management system (DBMS) or file system that controls the data you want to access. The DataLens driver sends requests from 1-2-3 to the DBMS or file system and returns the data to 1-2-3. You need one DataLens driver for each DBMS or file system you want to access.

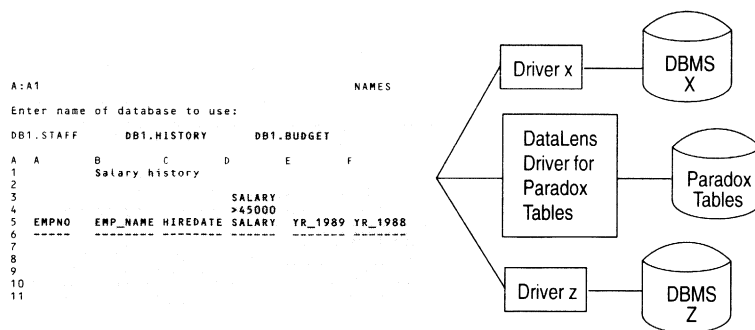


Figure 1-1 Using DataLens drivers

This guide describes a driver that lets you access data in Paradox tables. You can use the DataLens Driver for Paradox Tables with any DataLens-capable application such as 1-2-3 Release 3.1 on an IBM or compatible PC running MS-DOS.

Benefits of DataLens

With DataLens, you can access data in Paradox tables from 1-2-3, without learning new tools or data query languages. Depending on specific features of the application and the driver, you can

- Create a table
- Request data from a table
- Add information to a table
- Update or delete information already stored in a table
- Select specific records from a table
- Perform calculations on information in a table

Terms and Concepts

The terms and concepts defined below are used throughout this guide.

DataLens is a technology that allows applications such as 1-2-3 to access data in external data sources.

An **application** is a program or package of programs, such as payroll or spreadsheet, that performs a task or group of related tasks for a user. A **DataLens application** is an application that can use the DataLens technology to access data outside of the application. 1-2-3 Release 3.1 is an example of a DataLens application.

In this guide, a **driver** is a program that allows a DataLens application (such as 1-2-3) to access data in a specific external data source, for example, Paradox tables.

In this guide, **capabilities** refer to the specific DataLens features supported by a DataLens application (such as 1-2-3) or a DataLens driver.

A **character set** is a group of computer representations of all the characters in a specific language, such as English, French, or German.

A **database** is a directory, on your local disk or on a server, that contains one or more Paradox tables and associated primary indexes, forms, reports, and scripts.

A **database management system (DBMS)** is a program that stores and manipulates data, for example, Paradox.

A **table** is a file that contains a collection of related information in a database, such as employee benefit options or quarterly sales information. Each column in a table contains one type of information, such as salary or revenue. Each row contains the same number and type of items of information. A table is *external* to a given DBMS or application if it is not managed by that DBMS.

A **record** is a group of related columns of information in a table, such as all the information about one employee in an employee table or all the sales information for a specific branch in a sales table. In a table, a record is a row.

A **field** is one category of information in a table, such as employee ID numbers or the dollar amounts of sales in the month of November. In a table, a field is a column that contains the same kind of information for each record in the table.

Data type refers to the classification of values that are stored in a worksheet cell or database field. Some common data types are character, integer, floating point, and double precision. **DataLens transfer types** are the data types that DataLens recognizes.

An **index** is a list of one or more fields used to order and identify the records in a table. For example, the employee ID or branch name field might be used to index an employee table or a sales table. A **primary index** is built from all the fields marked as index fields. Index fields are marked with an asterisk before the field data type when you use 1-2-3 to list the fields in a table. You must also use an asterisk to indicate index fields in the table definition that you use to create a new database table.

In this guide, **privileges** refer to database access privileges granted to the user, such as read-only access or write access.

A **registration system** is a method that 1-2-3 uses to determine what drivers and what databases are available to 1-2-3 and the user. The DataLens registration system uses the registration file (LOTUS.BCF) to store this information.

Database administrator refers to the individual or department responsible for managing the databases and for granting user access privileges.

Network administrator refers to the individual or department responsible for managing the communications link between the user's computer and the computer where the data is located.

Chapter 2

What this Driver Provides

This chapter contains information you need to know about the DataLens Driver for Paradox Tables. It describes the driver's features, benefits, and capabilities, and describes driver performance considerations.

/Data External in Chapter 2 of the 1-2-3 Release 3.1 *Reference* manual describes how to use DataLens drivers with 1-2-3 to access data in external database tables. Use the information in this chapter with your 1-2-3 documentation to make the most of your data access capabilities. Additional information for advanced users and network administrators is included in Appendix A of this guide.

Driver Overview

The DataLens Driver for Paradox Tables lets you access information in Paradox tables from within 1-2-3 Release 3.1. You can retrieve data from existing Paradox tables; add, delete, or modify data from existing Paradox tables; delete Paradox tables and associated files; create new Paradox tables; select specific records from a table; and perform calculations on information in a table.

The DataLens Driver for Paradox Tables works directly with Paradox tables. It does not use the Paradox program to access the tables. This means that you do not need to have Paradox up and running to use the DataLens Driver for Paradox Tables.

The DataLens Driver for Paradox Tables can create and use any Paradox table, except those that are password protected. If a table is write protected, you can retrieve information from the table, but you cannot add to, delete from, update, or modify the table. You can use the DataLens Driver for Paradox Tables to create and access tables with primary indexes.

Capabilities and Options

This section describes the driver's capabilities and the data types, character sets, and database commands it supports.

Capabilities

In general, the DataLens Driver for Paradox Tables relies on the functionality of the DataLens application. Since 1-2-3 provides record selection, data query, and calculation functions, for example, the DataLens Driver for Paradox Tables passes the entire Paradox table to 1-2-3, which then performs the functions you request. You can

use 1-2-3 /Data Query commands and 1-2-3 @functions on Paradox tables simply by specifying the range name you assigned to the Paradox table as the input range.

All DataLens drivers are capable of sequentially reading the rows in a table. The following list describes the additional general capabilities of the DataLens Driver for Paradox Tables:

- Modify table definition and structure (create and delete tables)
- Modify rows of a table (insert, update, and delete rows)

Supported Data Types

Because different DBMS and file systems use different types of data, DataLens must convert the various data types into a common format so you can use the data in 1-2-3 and add or update data in the database tables. This data type conversion is handled automatically by 1-2-3 and the DataLens Driver for Paradox Tables.

Occasionally you may want more information about how specific data types are converted. Table 2-1 shows the 1-2-3 data types that each Paradox data type may be converted to.

Table 2-1 Converting Paradox data types to 1-2-3 data types

Paradox data type¹	Table creation type²	Description	1-2-3 data type
[*]Alphanumeric (A)	[*]Character	Strings containing letters, numbers, and special characters	Label
[*]Number (N)	[*]Number	Floating point numbers	Value
[*]Currency (\$)	[*]Currency	Number fields with a default currency display format	Value
[*]Date (D)	[*]Date	Date values, for example, 06/21/90, 29-Jul-89, or 19.01.96	Date/Time
[*]Short (S)	[*]Short	Integers	Value

1 – An optional asterisk next to the data type indicates that the field is a primary index field.

2 – Use this data type name in the table definition when you create a table.

Supported Character Sets

The DataLens Driver for Paradox Tables supports the Paradox character set, which is U.S. ASCII code page 437.

Paradox Sort Orders

Paradox uses alternative sort orders to allow users to sort records in indexed tables based on their native language. The DataLens Driver for Paradox Tables supports the Paradox sort orders ASCII, Intl (International), SwedFin (Swedish/Finnish), and NorDan (Norwegian/Danish) for indexed tables. The DataLens Driver for Paradox Tables maintains the index in the sort order that was used when the table was created. When creating a new indexed Paradox table, the driver uses the ASCII sort order unless you specify a different sort order in the table creation string. Valid table creation strings are shown in the following table. Refer to the /Data External Other Command section in Chapter 2 of the 1-2-3 Release 3.1 *Reference* manual for more information about specifying table creation strings.

Table 2-2 Table creation strings for Paradox tables

Table creation string	Description
SORT ASCII	ASCII sorting order
SORT INTL	International ASCII sorting order
SORT NORDAN	Norwegian/Danish sorting order
SORT SWEDFIN	Swedish/Finnish sorting order

Driver-Supported Paradox Commands

The DataLens Driver for Paradox Tables does not use the Paradox program to access the tables. Therefore, you cannot execute Paradox commands from 1-2-3.

Creating Paradox Tables

When you use a DataLens driver to create a new database table, you must first create a table definition following the instructions in the /Data External Create section in Chapter 2 of the 1-2-3 Release 3.1 *Reference* manual. The table definition contains six columns of information: the names of the fields you want to create, the data type for each field, the field widths, field labels, field descriptions, and field creation strings.

Figure 2-1 illustrates a table definition. Note that the column headings in this illustration are not part of the definition; they are added for clarity.

Field Name	Data Type	Field Width	Field Label	Field Description	Field Creation String
EMPID	*Number				
LASTNAME	Character	12			
FIRSTNAME	Character	12			
DOH	Date				
SALARIED	Character	1			
DEPTNUM	Number				

Figure 2-1 Sample table definition

If you use the DataLens Driver for Paradox Tables to create new Paradox table files, keep these rules in mind:

- Field names must be unique; uppercase and lowercase versions of the same character are not unique. For example, "NAME" and "Name" are not unique field names.
- Field names can be a maximum of 25 characters long.
- Valid data types are Character, Date, Number, Currency, and Short. See "Supported Data Types" earlier in this chapter for more information.
- To create an indexed table, precede the data type of the index fields with an asterisk, for example, *Number.
- To create an indexed table, list all the index fields first, in order of precedence. All of the index fields must appear before any non-index fields. Note that all of the index fields combined comprise the primary index for the table.
- The field width indicates the maximum width of a character field. Do not specify a field width for non-character fields. 1-2-3 will return an error if a field width is specified for non-character fields.
- The DataLens Driver for Paradox Tables requires that you specify the field name and data type for all fields, and the field width for character fields. The driver ignores the field label, field description, and field creation string fields of the table definition.

Adding and Updating Records

Before you begin modifying an existing Paradox table, use your operating system commands to make a backup copy of the table file (.DB). If the table is indexed, you should also make a backup copy of the index file (.PX). Then, if you receive an error message while you are adding or updating records, and the table is only partially updated, you can correct the cause of the error, copy the backup file, and restart your insert or update procedure.

The DataLens Driver for Paradox Tables does not modify primary index fields or insert records whose index is identical to an existing index. To achieve the same results, you can delete the existing record and insert the new, modified record. The index file (.PX) must be located in the same directory as the table file (.DB).

Appendix A

Administration

This appendix describes issues of particular interest to a network administrator, database administrator, or advanced user. Topics include modifying the registration file and database considerations.

Modifying the Registration File

The registration file (LOTUS.BCF) contains information about DataLens drivers and databases you want to make available to your users. DataLens applications, such as 1-2-3, use the information in the registration file to connect to drivers and databases.

The registration file consists of driver records and database records. **Driver records** tell 1-2-3 which drivers to list for users to select from and which parameters and configuration options to use with those drivers. **Database records** allow you to tell 1-2-3 which databases to list for users to select from. Database records are not required.

Driver Record Parameters

When 1-2-3 installs the DataLens Driver for Paradox Tables, the registration file contains a driver record to give users access to the driver. The driver record will look similar to this:

```
DN="ParaLens" DL="ParaLens"  
DD="DataLens Driver for Paradox Tables"  
DC="C:\123R3";
```

The database administrator may want to change the parameters or options in a driver record in order to customize the driver for users.

The registration file must contain at least one driver record. A driver record can have several parts (parameters). When creating or editing a driver record for the DataLens Driver for Paradox Tables, you can use the following parameters, three of which are required with this driver:

Table A-1 Driver record parameters

Parameter	Required	Example	Description
DN= <i>"Drivername"</i>	Yes	DN="ParaLens"	DN identifies the record as a driver record and must be the first parameter in the record. <i>Drivername</i> is the name 1-2-3 will display to the user. The driver name cannot include spaces and must be enclosed in " " (quotation marks). This name must be unique for each driver record.
DL= <i>"DriverFilename"</i>	Yes	DL="ParaLens"	DL specifies the file name (without the extension) of the driver program (ParaLens for the DataLens Driver for Paradox Tables). Enclose the name in " " (quotation marks).
DD= <i>"Driver Description"</i>	No	DD="DataLens Driver for Paradox Tables"	DD specifies a description of the driver. 1-2-3 displays this description to the user when the user is selecting a driver. Enclose the description in " " (quotation marks).
DC= <i>"Driver Configuration Information"</i>	Yes	DC="C:\123R3"	DC sends configuration information to the driver. Enclose the configuration information in " " (quotation marks). For the DataLens Driver for Paradox Tables, this parameter lists the path of your 1-2-3 Release 3.1 program directory. The driver files must be in the 1-2-3 program directory.

Driver and Database Record Syntax

This section describes the syntax rules for records in the registration file. Follow these rules when adding or editing records in the registration file.

Parameter syntax

- Use = (equal sign) to separate the parameter name from the value of the parameter, such as DN="ParaLens". Do not include a space before or after the equal sign.
- When using the DN, DL, DC, and DD parameters, enclose the value of the parameter in "" (quotation marks), such as DL="ParaLens".

Record syntax

- Include at least one space between parameters in a record.
- Include a ; (semicolon) after the last parameter in a record. 1-2-3 interprets all parameters as being part of one record until it encounters a ; (semicolon). A record can wrap to several lines.
- Driver and database records can be in any order in the registration file.

Database Record Parameters

Database records are optional. You can add and delete database (directory) entries in the DataLens registration file (LOTUS.BCF). If a database is listed in the registration file, a user can select that database name from the list that 1-2-3 displays. If a database is not listed in the registration file, 1-2-3 cannot display the database name, but a user can still type any valid database name to select a database.

When creating or editing a database record, you can use the following parameters, two of which are required:

Table A-2 Database record parameters

Parameter	Required	Example	Description
DB="DatabaseName"	Yes	DB="C:\STAFF"	DB identifies the record as a database record and must be the first parameter in the record. <i>DatabaseName</i> is the database (directory path) name. 1-2-3 displays this path to the user. Do not include spaces in the database name. Enclose the name in " " (quotation marks).
DN="DriverName"	Yes	DN="ParaLens"	DN specifies the name of the driver as you specified it in the DN parameter of the driver record. In a database record, the DN parameter must follow the DB parameter. Enclose the name in " " (quotation marks). If the driver name in this record does not match the driver name in any driver record in the file, 1-2-3 ignores this database record.
DD="Database Description"	No	DD="Employees throughout the world"	DD specifies a description of the database. 1-2-3 may display this description to users. Enclose the description in " " (quotation marks).

An example database record is

```
DB="C:\STAFF" DN="ParaLens"
DD="Employees throughout the world";
```

Sequence of Records in the Registration File

The driver and database records in the registration file are not required to be in any specific sequence. However, the sequence of the records does affect the order in which drivers and databases are listed for the user. The driver named in the first driver record in the registration file is the first driver displayed when the user wants to use a driver. Likewise, the first database record names the first database (directory) that is displayed to the user. You can rearrange the sequence of records in the registration file to suit your needs.

Standard Registration Files

The sequence of the records in the registration file determines the order in which drivers and databases are listed for the user. To maintain a consistent user interface and support shared macros, create and distribute one registration file for all users or each group of users.

NOTE The registration file lists the directory that contains the driver files. If this directory is not the same for all users, you or the users can edit the DC parameter of the driver record in the LOTUS.BCF file.

Database Considerations

The following sections describe how the driver works with the DBMS, and identify database factors that can affect data integrity, driver performance, and ease of use.

DBMS and Driver Communication

The DataLens Driver for Paradox Tables works directly with Paradox tables. It does not use the Paradox program to access the tables, which means that users do not need to have Paradox up and running.

The use of the DataLens Driver for Paradox Tables for anything other than single-user access of Paradox tables is not recommended. The driver supports read-only access on shared drives and is not intended for concurrent access of tables with either other driver users or other Paradox users.

When a user deletes a table, the DataLens Driver for Paradox Tables also deletes the primary index file (.PX), if it exists. The driver does not delete other files — forms, reports, and scripts — in the table's family.

Security and Privileges

Users cannot create or use password-protected Paradox tables from the DataLens Driver for Paradox Tables. If a Paradox table is write protected, users can read the data in the table using the DataLens Driver for Paradox Tables, but cannot write to the table, delete records in the table, or delete the table.

To prevent users of the DataLens Driver for Paradox Tables from reading a Paradox table, use any level of Paradox password protection.

To prevent users from modifying or deleting a Paradox table, write protect the table from within Paradox.

You can also use standard operating system or network security mechanisms to control user access to Paradox tables.

Removing the Driver

To remove the DataLens Driver for Paradox Tables from your hard disk, erase the following files from your 1-2-3 Release 3.1 program directory:

File	Description
PARALENS.DLD	Driver program file
PARALENS.DL2	Driver program file
PARALENS.INI	Driver configuration file
PARALENS.RI	Driver message file

You or your database administrator or network administrator can delete the driver and database entries from your LOTUS.BCF file so 1-2-3 does not display them.