How to Use This Book

DataLens® Drivers for 1-2-3® describes what DataLens is, gives you information about the three drivers included with 1-2-3 for Windows™, and tells you how to use those drivers with 1-2-3.

Who should read this book

Topic

DataLens Drivers for 1-2-3 is designed for readers who have a working knowledge of 1-2-3 and want to work with dBASE IV®, Paradox®, or SQL Server tables from within 1-2-3.

Terms and concepts

Topic

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

In this book, **capabilities** are the specific database tasks supported by 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.

Data type refers to the type of information that is stored in a worksheet cell or database field. Each data source (such as 1-2-3, SQL Server, dBASE IV, or Paradox) has its own list of acceptable data types. The 1-2-3 data types are value and label. When using 1-2-3 to create external tables, the data type you assign to each field in a table determines the type of information you can enter in that field.

A **database** is a collection of related information, organized systematically in tables, such as an employee or sales database. A database can contain one or more tables. When using the Paradox and dBASE IV DataLens drivers, a database is a directory on disk that contains one or more tables.

A **database administrator** is the person or department responsible for maintaining the data source and databases and for granting users access privileges.

A **database management system (DBMS)** is a program (such as dBASE IV, Paradox, or SQL Server) that creates and manipulates databases.

DataLens lets 1-2-3 and other applications access data from external data sources.

A **data source** is the location of data you are accessing. In this book, a data source can be a database management system, such as SQL Server, or an external table, such as a dBASE IV or a Paradox table.

In this book, a **driver** is a program that lets 1-2-3 access data from a specific external data source, such as a dBASE IV table.

An **external table** is a table that is stored in a file that is not a 1-2-3 file, such as a dBASE IV, Paradox, or SQL Server file.

A **field** is a labeled column of information in a table. For instance, a table about employees may contain a field (column) labeled "Name" that contains employee names. A field contains the same kind of information for each record in the table. The terms field and column are often used interchangeably.

An **index** is a list of one or more fields that are used to order (and sometimes identify) the records in a table.

A **record** is a group of related fields 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 **table** is a collection of related records of information in a database, such as information about employees or about sales for a specific period. Each field in a table is a column and contains one type of information, such as salary. Each row contains one record.

Conventions used in this book

Topic

DataLens Drivers for 1-2-3 uses the following conventions to indicate notes, tips, cautions, references to Help, and sample files:

Note introduces additional technical information about a command or procedure.

Tip introduces additional information you may find helpful when you perform a command or procedure.

Caution introduces information that is essential to the safety of data and software.

Help introduces a reference to Help.

Sample file introduces a step in a procedure using the sample files for DataLens that come with 1-2-3.

DataLens Drivers for 1-2-3 uses the following conventions for functions keys, key names, 1-2-3 commands, and information that you are to type:

- Function keys appear in small capitals and are identified by the 1-2-3 key name. For example, F1 (HELP)**.**
- Key names separated by a + (plus sign) indicate that you must press and hold down the first key, press the second key, and then release both keys. For example, ALT+BACKSPACE.
- Most 1-2-3 commands refer to the 1-2-3 for Windows menu, such as Data Connect to External. Some commands refer to the 1-2-3 Classic® menu and begin with a / (slash), such as /Data External Delete.
- Information that you are to type appears in a different typeface. For example, Operating Expenses.

DataLens Drivers for 1-2-3 uses the conventions below to refer to mouse and keyboard instructions in a procedure.

Mouse introduces a procedure using the mouse.

Keyboard introduces a procedure using the keyboard.

Organization

Topic

This book is designed so that you need to read only information about 1-2-3 and the DataLens driver you are using. The book contains five chapters and three appendixes.

- **Chapter 1, "About DataLens,"** describes DataLens and its capabilities.
- **Chapter 2, "About the DataLens Driver for dBASE IV Tables,"** describes the DataLens driver for dBASE IV tables (the dBASE driver).
- **Chapter 3, "About the DataLens Driver for Paradox Tables,"** describes the DataLens driver for Paradox tables (the Paradox driver).
- **Chapter 4, "About the DataLens Driver for the SQL Server,"** describes the DataLens driver for SQL Server (the SQL Server driver).
- **Chapter 5, "Using 1-2-3 with DataLens Drivers,"** describes how to use the drivers with 1-2-3 and includes examples that you can follow by using sample files.

  Note Depending on your preference, you may want to read Chapter 5 before you read the chapter that describes your driver. As you read Chapter 5, you can look at the chapter about your driver when there is information you need.

- **Appendix A, "For Administrators Using dBASE IV,"** which is primarily for database administrators, describes administrative tasks for the dBASE driver.
- **Appendix B, "For Administrators Using Paradox,"** which is primarily for database administrators, describes administrative tasks for the Paradox driver.
- **Appendix C, "For Administrators Using SQL Server,"** which is primarily for database administrators, describes administrative tasks for the SQL Server driver.

Contents

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1 About DataLens

This chapter describes the DataLens technology and the capabilities of DataLens.

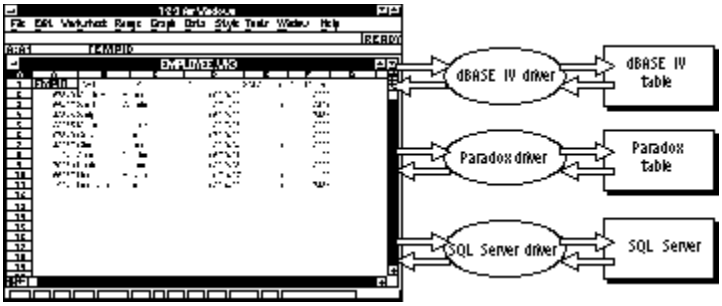
What is DataLens?

Topic

DataLens lets you read data from and write data to external tables without leaving your data analysis applications, such as 1-2-3 for Windows. The external table can be on a personal computer, a network server, a corporate mainframe, or a CD-ROM.

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

DataLens gives you this flexibility by using a **driver** to communicate between 1-2-3 and the data source**,** as shown in the figure on the next page. If the driver communicates directly with a database management system (DBMS), such as the DataLens driver for SQL Server, then the **data source** is the DBMS. If the driver manipulates data in external tables without going through a DBMS, such as the DataLens driver for dBASE IV tables and the DataLens driver for Paradox tables, then the data source is an external database table in a particular file format. The DataLens driver sends commands from 1-2-3 to the external table and returns results to 1-2-3.



DataLens capabilities

Topic

With DataLens, you can use data in external tables from 1-2-3 without learning new tools or data query languages. Depending on the specific features of the DataLens driver you are using, you can do the following:

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

2 About the DataLens Driver for dBASE IV Tables

Subtopics +

The DataLens driver for dBASE IV tables (the dBASE IV driver) is compatible with the table format of dBASE IV, as well as dBASE III Plus®. This chapter describes the capabilities of the dBASE IV driver and gives information you should know when you create external dBASE IV tables from within 1-2-3 for Windows. (The term "tables" refers to dBASE IV .DBF files.)

> **Note** Although this chapter refers to dBASE IV tables, the information also applies to dBASE III Plus tables, unless otherwise noted.

2 About the DataLens Driver for dBASE IV Tables

Subtopics

The DataLens driver for dBASE IV tables (the dBASE IV driver) is compatible with the table format of dBASE IV, as well as dBASE III Plus®. This chapter describes the capabilities of the dBASE IV driver and gives information you should know when you create external dBASE IV tables from within 1-2-3 for Windows. (The term "tables" refers to dBASE IV .DBF files.)

> **Note** Although this chapter refers to dBASE IV tables, the information also applies to dBASE III Plus tables, unless otherwise noted.

Capabilities of the dBASE IV driver

Topic

By using the dBASE IV driver with 1-2-3, you can access, create, and modify information in existing external dBASE IV tables and create new external tables from within 1-2-3. To use the 1-2-3 Data Query commands and database @functions with external tables, you specify the range name you assigned to the dBASE IV table as the input range.

Basic database tasks

The table below lists the basic database tasks you can perform on external tables using the dBASE IV driver and the 1-2-3 commands you use to accomplish those tasks.

Database task	Description	1-2-3 commands
Extract data	Copy records or specific fields from an external table to 1-2-3	Data Query Extract
Create tables	Create external tables	Data External Options Create Table or /Data External Create
Delete rows	Delete records from external tables	Data Query Delete
Delete tables	Delete external tables	/Data External Delete
Insert rows	Add records to external tables	Data Query Modify Insert
Update rows	Edit records in external tables	Data Query Modify Extract and Data Query Modify Replace

In addition, you can use database @functions to perform calculations in 1-2-3 with data that resides in external tables.

> **Note** When you use the dBASE IV driver to delete records in 1-2-3, the dBASE IV driver merely marks them for deletion. Although the records are no longer visible in 1-2-3, they still exist in the file. When you use dBASE IV, dBASE IV displays these records as marked for deletion. Use dBASE IV to actually delete them from the file.

Using dBASE IV index files

dBASE IV uses index files to change the sort order it displays for records in tables. You can use the dBASE IV driver to access and update tables that use multiple index files (.MDX files) and single index files (.NDX files). .MDX files can contain up to 47 indexes, each with its own name, called a **tag**.

The dBASE IV driver automatically updates all tags in an .MDX file when you modify the table associated with the .MDX file. When you extract data from a table, however, you must first use a tag in the .MDX file if you want the driver to sort the extracted records in a specific order. To use a tag from the .MDX file, choose Data External Options Send Command and enter the following command string:

set order to tag [*tag name*] table [*table name*]

where *tag name* is the name of the tag you want to use and *table name* is the name of the table you are using.

The dBASE IV driver updates an .NDX file only if you have opened the file. To open an .NDX file from 1-2-3, choose Data External Options Send Command and enter the following command string:

set index to file [*file name*] table [*table name*]

where *file name* is the name of the .NDX file and *table name* is the name of the table you want to use with the index. Do not enter file extensions or paths in the command. (If you do not open the .NDX file, you can use REINDEX in dBASE IV to update the index.)

After specifying the index file to use, when you extract data from a table, the records are sorted in the manner specified by the index file.

Note dBASE III Plus supports only .NDX files, not .MDX files.

You can have only one index or tag open per table. To change the index or tag you want to use with a table, you must close the open index or tag, if there is one. To close an index or a tag, choose Data External Options Send Command and enter the following command string:

close index table [*table name*]

where *table name* is the name of the table you are using. Do not enter the file extension or path in the command.

For more information about sending command strings to the driver, see **"Sending driver-specific commands to the driver"**.

Driver-supported dBASE IV files and commands

The dBASE IV driver supports only .DBF, .MDX, and .NDX files. It does not use or update other types of dBASE IV files. In addition, when you use 1-2-3 to delete a table, the dBASE IV driver deletes only the .DBF file; it does not delete any associated files, such as forms, reports, and index files.

Because the dBASE IV driver does not use dBASE IV to access external tables, you cannot execute dBASE IV or SQL commands from within 1-2-3. The driver can read tables created with SQL commands, but cannot modify these tables in any way.

Creating dBASE IV tables

Topic

With the dBASE IV driver, you can use 1-2-3 to create dBASE IV tables. To create a dBASE IV table, you first create a table definition and then use Data External Options Create Table.

This section describes the table definition for dBASE IV tables and the various dBASE IV data types. Use this information with the directions in **"Creating external tables"** to create external tables.

Note You cannot use the dBASE IV driver to create index files.

About the table definition

The table definition contains information that tells the driver how to set up the dBASE IV table. A table definition contains six columns of information, although the dBASE IV driver only uses information from columns 1, 2, 3, and 6, which are described below.

- Column 1 contains field names. This information is required for each field in the table.

  Field names must be unique. Because dBASE IV is not case-sensitive, it considers uppercase and lowercase versions of the same character to be the same. For example, "NAME" and "Name" are considered the same field name.

  Field names can contain as many as 10 characters, which can include letters, numbers, and _ (underscores). The first character, however, must be a letter.

  When using the dBASE IV driver, the maximum number of fields in an external table is 255.

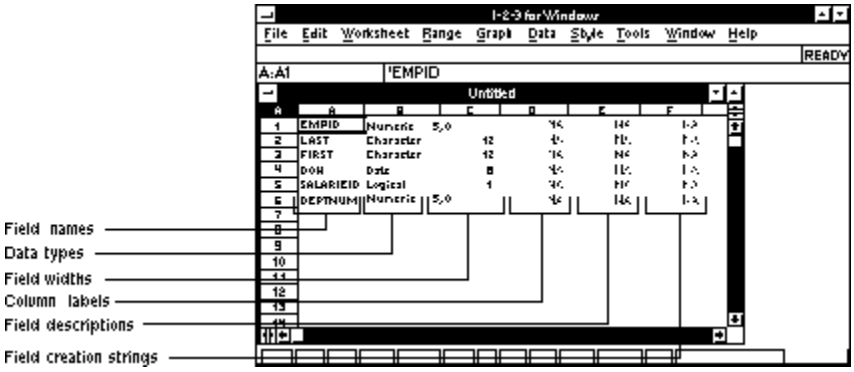
- Column 2 contains data types. This information is required for each field in the table. For information about data types, see **"About dBASE IV data types"**.

- Column 3 contains field widths. An entry in this column is required for character fields.

  The field width indicates the maximum width of a field. For numeric fields, you can also specify the maximum number of decimals allowed. The driver ignores field widths that you enter in the table definition for date fields, which always have a width of 8, and for logical fields, which always have a width of 1. The maximum combined width of all fields in a record is 4,000.

- Column 6 contains field creation strings. You use field creation strings with the dBASE IV driver to specify the number of decimal places for a field whose data type is float. For details, see **"About float fields"**.

The figure below shows a table definition for a dBASE IV table. Although columns 4 and 5 must be present in the table definition, the dBASE IV driver ignores entries in these columns because they are not applicable to dBASE IV tables.



Each column in a table definition corresponds to a column generated when you use Data External Options Paste Fields. When you use Data External Options Paste Fields, however, 1-2-3 always displays NA in column 6, even if you entered a field creation string in the table definition.

About dBASE IV data types

Databases let you use many different types of data. It is important for you to know the data types dBASE IV supports when you create new tables (as well as when you enter and analyze data). 1-2-3 uses these data types in table definitions when you use Data External Options Paste Fields or Data External Options Create Table.

When you send data between 1-2-3 and dBASE IV tables, the dBASE IV driver converts dBASE IV data types to 1-2-3 data types, and vice versa, so that both programs can use and understand the same data. The following table shows dBASE IV data types and the data types the driver converts them to in 1-2-3. The table also shows the field widths and the values allowed for the various data types.

dBASE IV data type	Field width	Values accepted by dBASE IV	Data type in 1-2-3
Character	1-254	Character strings containing letters, numbers, and special characters	Label
Date	8	Date values from January 1, 100 through December 31, 9999	Value (date number)
Float	1-17	Numbers with up to 20 digits and 18 decimal places	Value
Logical	1	T, F, t, f, Y, N, y, and n for true, false, yes, and no	Value (1 or 0 only)
Memo	-----	Not supported by 1-2-3	-----
Numeric	1-19	Numbers with up to 20 digits and 18 decimal places	Value

About character fields

You can enter up to 254 characters in a character field, depending on the width you create for the field.

About date fields

When you extract date fields from dBASE IV tables, 1-2-3 enters the dates as date numbers in the worksheet and formats the cells with the Date 4: Long Intl Date format. Although 1-2-3 cannot display dates before January 1, 1900 or after December 31, 2099, it can store all dates from dBASE IV tables and return them to the tables. When you format cells that contain dates outside the range that 1-2-3 can display, 1-2-3 displays *** (asterisks) in the cells.

About float fields

When you use Data External Options Paste Fields, column 3 shows the width for float fields but does not show the number of decimal places. When you create a table definition, you specify the width in column 3 and the number of decimal places in column 6. To specify the number of decimal places for a float field, enter DEC=*xx* in column 6, where *xx* represents the number of decimal places you want the field to have. You can enter any number from 0 through 15, but the number of decimal places must be at least 2 less than the field width in column 3.

If you do not specify a number of decimal places, the driver uses the following rules to determine the number of decimal places:

- If the width is 1 or 2, there are no decimal places.
- If the width is 3 through 17, the number of decimal places is 2 less than the width. For example, if the width is 15, there are 13 decimal places.

The dBASE IV driver accepts numbers in float fields with up to 17 digits and 15 decimal places. If a number in dBASE IV is outside of this range, the driver displays a message.

Note dBASE III Plus does not support float fields.

About logical fields

1-2-3 displays logical values as 1 (for dBASE IV entries T, t, Y, and y) and 0 (for dBASE IV entries F, f, N, and n). When you use 1-2-3 to add or modify records in external tables, entering 1 in 1-2-3 is entered as T in the dBASE IV table. Entering 0 in 1-2-3 is entered as F in the dBASE IV table.

About memo fields

The dBASE IV driver does not support memo fields. When you extract records from dBASE IV tables that contain memo fields, 1-2-3 displays blanks for the entries in memo fields.

You cannot create a dBASE IV table that contains a memo field. You can, however, add records to a table that already contains a memo field, as long as the field names for the new records do not include the field name of the memo field.

When you use Data External Options Paste Fields to list the fields in an external table that contains a memo field, 1-2-3 includes the memo field in the list.

About numeric fields

When you use Data External Options Paste Fields to copy field information about an external table to the worksheet, the field width of a numeric field is displayed as two numbers separated by a , (comma), such as 11,2. The number preceding the , (comma) represents the field width; the number after the , (comma) represents the number of decimal places. 11,2 indicates that a numeric field has a width of 11 with 2 decimal places. To enter a width and a number of decimal places in the table definition, you must precede the entry with a label prefix, such as '11,2. The number of decimal places you specify must be at least two fewer than the field width.

The dBASE IV driver accepts numbers in numeric fields with up to 19 digits and 15 decimal places. If a number in dBASE IV is outside of this range, the driver displays a message.

Note When you extract records from dBASE IV tables that contain blank fields, the blank fields become empty cells in 1-2-3, except 1-2-3 enters a single space in the worksheet for each character field that is blank.

Caution When you use negative entries in numeric fields, the - (minus sign) is counted in the size of the entry. With a field width of 5, for example, you can enter four numerals and a - (minus sign). If you enter five numerals and a - (minus sign), the rightmost numeral is truncated from the entry.

Creating tables from a 1-2-3 model range

There are two common ways of creating an external table from within 1-2-3 -- you can use a range of data as a model for the new table, in which case the driver creates the table definition for you, or you can modify an existing table definition and use that to determine the structure of the new table. If you use a model range to create a table, the driver uses the default data types when creating the table.

The table below shows 1-2-3 data types and the default data types the driver converts them to when it creates a dBASE IV table.

1-2-3 data type	Data type in dBASE IV table
Label	Character
Value	Numeric
Value formatted as a date	Date

When sharing files on a network, you can use 1-2-3 to write to a table only if no one else is using the table. However, multiple users can read a table concurrently.

> **Note** Most write operations in 1-2-3 are accomplished by using Data Query Modify Insert, Data Query Modify Replace, and Data Query Delete. Read operations are accomplished by using Data Query Extract and Data Query Modify Extract.

If a dBASE IV table is a read-only table, you can read the data in the table but you cannot write to the table.

Table security

Topic

The dBASE IV driver does not support passwords or user IDs. To use a dBASE IV table, you must be able to access the table without using a password or user ID.

Supported character sets

Topic

The dBASE IV driver supports the following character sets: United States (code page 437), Multilingual (code page 850), Portuguese (code page 860), French-Canadian (code page 863), and Nordic (code page 865). The default character set is United States. To access a different character set, use /Data External Other Translate from the 1-2-3 Classic menu. For more information, see **"Changing character sets"**.

Note Although 1-2-3 stores characters from the character sets listed above, it displays and prints characters from the ANSI character set, which is the character set that Windows supports.

3 About the DataLens Driver for Paradox Tables Subtopics +

The DataLens driver for Paradox tables (the Paradox driver) is compatible with the table format of Paradox Release 3.0 and Release 3.5. This chapter describes the capabilities of the Paradox driver and gives information you should know when you create external Paradox tables from within 1-2-3 for Windows.

3 About the DataLens Driver for Paradox Tables

Subtopics −

The DataLens driver for Paradox tables (the Paradox driver) is compatible with the table format of Paradox Release 3.0 and Release 3.5. This chapter describes the capabilities of the Paradox driver and gives information you should know when you create external Paradox tables from within 1-2-3 for Windows.

Capabilities of the Paradox driver

Topic

By using the Paradox driver with 1-2-3, you can access, create, and modify information in existing external Paradox tables and create new external tables from within 1-2-3. To use the 1-2-3 Data Query commands and database @functions with external tables, you specify the range name you assigned to the Paradox table as the input range.

Basic database tasks

The table below lists the basic database tasks you can perform on external tables using the Paradox driver and the 1-2-3 commands you use to accomplish those tasks.

Database task	Description	1-2-3 commands
Extract data	Copy records or specific fields from an external table to 1-2-3	Data Query Extract
Create tables	Create external tables	Data External Options Create Table or /Data External Create
Delete rows	Delete records from external tables	Data Query Delete
Delete tables	Delete external tables	/Data External Delete
Insert rows	Add records to external tables	Data Query Modify Insert
Update rows	Edit records in external tables	Data Query Modify Extract and Data Query Modify Replace

In addition, you can use database @functions to perform calculations in 1-2-3 with data that resides in external tables.

Driver-supported Paradox commands

Because the Paradox driver does not use Paradox to access the external tables, you cannot use Paradox commands from within 1-2-3.

Driver-supported Paradox files

The Paradox driver supports only .DB and .PX files. It does not use or update other types of Paradox files. When you use 1-2-3 to delete a table, the Paradox driver also deletes the associated primary index (.PX) file, if it exists. The driver does not delete other associated files, such as forms, reports, scripts, or secondary index files.

Creating Paradox tables

Topic

With the Paradox driver, you can use 1-2-3 to create Paradox tables. To create a Paradox table, you first create a table definition and then use Data External Options Create Table.

This section describes the table definition for Paradox tables and the various Paradox data types. Use this information with the directions in **"Creating external tables"** to create external tables.

About the table definition

The table definition contains information that tells the driver how to set up the Paradox table. A table definition contains six columns of information, although the Paradox driver only uses information from columns 1, 2, and 3, which are described below.

- Column 1 contains field names. This information is required for each field in the table.

  Field names must be unique. Because Paradox is not case-sensitive, it considers uppercase and lowercase versions of the same character to be the same. For example, "NAME" and "Name" are considered the same field name.

  Field names can contain as many as 25 characters.

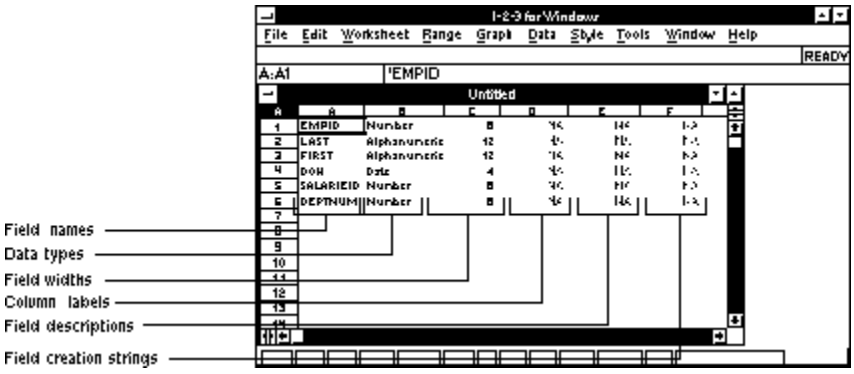
  When using the Paradox driver, the maximum number of fields in an external table is 255.

- Column 2 contains data types. This information is required for each field in the table. For information about data types, see **"About Paradox data types"**. For information using data types to create an indexed table in 1-2-3, see **"Using an index with the Paradox driver"**.

- Column 3 contains field widths. An entry in this column is required for alphanumeric fields.

  The field width indicates the maximum width of a field. The driver uses field widths from the table definition for alphanumeric fields only. Do not enter field widths for other data types in the table definition.

The figure below shows a table definition for a Paradox table. Although columns 4, 5, and 6 must be present in the table definition, the Paradox driver ignores entries in these columns because they are not applicable to Paradox tables.



Each column in a table definition corresponds to a column generated when you use Data External Options Paste Fields.

About Paradox data types

Databases let you use many different types of data. It is important for you to know the data types Paradox supports when you create new tables (as well as when you enter and analyze data). 1-2-3 uses these data types in table

definitions when you use Data External Options Paste Fields or Data External Options Create Table.

When you send data between 1-2-3 and Paradox tables, the Paradox driver converts Paradox data types to 1-2-3 data types, and vice versa, so both programs can use and understand the same data. The table below shows Paradox data types and the data types the driver converts them to in 1-2-3. The table also shows the field widths and the values allowed for the various data types.

Paradox data type	Field width	Values accepted by Paradox	Data type in 1-2-3
Alphanumeric	1-255	Character strings containing letters, numbers, and special characters	Label
Number	8	±1.7E-308 through ±1.7E+308 with 15-digit precision	Value
Currency	8	Number entries with a currency display format	Value
Date	4	Dates from January 1, 100 through December 31, 9999	Value (date number)
Short	2	Integers from -32,767 through 32,767	Value

Notes about Paradox data types

- The Paradox driver uses the field width in the table definition only when creating fields whose data type is alphanumeric. The driver ignores the field width for all other data types.
- When you extract date fields from Paradox tables, 1-2-3 enters the dates as date numbers in the worksheet and formats the cells with the Date 4: Long Intl Date format. Although 1-2-3 cannot display dates before January 1, 1900 or after December 31, 2099, it can store all dates from Paradox tables and return them to the tables. When you format cells that contain dates outside the range that 1-2-3 can display, 1-2-3 displays *** (asterisks) in the cells.
- Although 1-2-3 can only display numbers from ±1.0E-99 through ±9.99E+99, it can store all numbers from Paradox tables and return them to the tables. 1-2-3 displays *** (asterisks) in cells that contain numbers outside the range that 1-2-3 can display.
- Paradox does not support time entries from 1-2-3. If a 1-2-3 record includes an entry with a date portion and a time portion, when you enter that record in Paradox, Paradox maintains only the date portion of the entry.

Creating tables from a 1-2-3 model range

There are two common ways of creating an external table from within 1-2-3 -- you can use a 1-2-3 database table as a model range for the new table, in which case the driver creates the table definition for you, or you can modify an existing table definition and use that to determine the structure of the new table. When you use a model range to create a table, the driver uses the default data types when creating the table. In addition, you cannot specify index fields when you create a table from a model range.

The table below shows 1-2-3 data types and the default data types the driver converts them to when it creates a Paradox table.

1-2-3 data type	Data type in Paradox table
Label	Alphanumeric
Value	Number
Value formatted as a date	Date

Using an index with the Paradox driver

When you use or create tables with index files, keep the following points in mind:

- You can use the Paradox driver to create, access, update, and delete tables with primary indexes. To create an indexed table in 1-2-3, precede the data type of index fields with an * (asterisk), such as *Alphanumeric, in the table definition. List all the index fields first, in order of precedence. All of the index fields must appear before any non-index fields. All of the index fields combined comprise the primary index for the table.

  For more information about creating tables in 1-2-3, see **"Creating external tables"**.
- If you delete tables with primary indexes, the Paradox driver deletes the associated primary index (.PX) files, but does not delete other associated files, such as form, graph, report, image setting, validity check, or secondary index files.
- You can access and update information in tables with secondary indexes, but you cannot create tables with secondary indexes. If you use the Paradox driver to update information in tables with secondary indexes, the secondary indexes are updated by Paradox the next time you use the tables with Paradox. (Primary indexes are updated by the Paradox driver.)
- The Paradox driver does not modify primary fields in an indexed record or insert records whose entries in the indexed fields are identical to entries in the indexed fields of existing records. To insert the new record, you must delete the existing record.
- The index (.PX) file must be located in the same directory as the table (.DB) file.

Paradox sort orders

Paradox uses alternative sort orders to allow users to sort records in indexed tables based on their native language. The Paradox driver supports the Paradox sort orders ASCII, Intl (International), SwedFin (Swedish and Finnish), and NorDan (Norwegian and Danish) for indexed tables. The Paradox driver 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 when you use 1-2-3 to create a new table. Valid table creation strings are shown in the table below.

Table creating string	Description
SORT ASCII	ASCII sort order
SORT INTL	International ASCII sort order
SORT NORDAN	Norwegian and Danish sort order
SORT SWEDFIN	Swedish and Finnish sort order

When sharing files on a network, the following rules apply:

- You can write to a table only if no one else is using the table.
- Multiple users can read a table concurrently.
- You can use 1-2-3 to read a table when someone is using Paradox to coedit the table.

Note Most write operations in 1-2-3 are accomplished by using Data Query Modify Insert, Data Query Modify Replace, and Data Query Delete. Read operations are accomplished by using Data Query Extract and Data Query Modify Extract.

Table security

Topic

You can use the Paradox driver to encrypt and decrypt your tables and to change the current password. To **encrypt** a table is to jumble the data in the table so that no one can read the table without knowing the correct password. To **decrypt** a table is to unscramble the data. The **current password** is the last password you entered while using Data Connect to External or Data External Options.

To encrypt a table, choose Data External Options Send Command and enter the following command string:

ENCRYPT=*filename*[,*password*]

where *filename* is the name of the file you want to encrypt and *password* is an optional password you can enter for the table. If you do not enter a password, the driver uses the current password.

To decrypt a table, choose Data External Options Send Command and enter the following command string:

DECRYPT=*filename*[,*password*]

where *filename* is the name of the file you want to decrypt and *password* is the password you assigned to this table when you encrypted it. If you do not enter a password, the driver uses the current password.

To change the current password, choose Data External Options Send Command and enter the following command string:

PASSWORD=*password*

where *password* is the password you want to make current.

For more information about using Data External Options Send Command, see **"Sending driver-specific commands to the driver"**.

Supported character sets

Topic

The Paradox driver supports the following character sets: United States (code page 437), Multilingual (code page 850), Portuguese (code page 860), French-Canadian (code page 863), and Nordic (code page 865). The default character set is United States. To access a different character set, use /Data External Other Translate from the 1-2-3 Classic menu. For more information, see **"Changing character sets".**

Note Although 1-2-3 stores characters from the character sets listed above, it displays and prints characters from the ANSI character set, which is the character set that Windows supports.

4 About the DataLens Driver for SQL Server

Subtopics +

The DataLens driver for SQL Server (the SQL Server driver) is compatible with Microsoft®SQL Server and Sybase® SQL Server. This chapter describes the capabilities of the SQL Server driver and gives information you should know when you create external SQL Server tables from within 1-2-3 for Windows.

4 About the DataLens Driver for SQL Server

Subtopics −

The DataLens driver for SQL Server (the SQL Server driver) is compatible with Microsoft®SQL Server and Sybase® SQL Server. This chapter describes the capabilities of the SQL Server driver and gives information you should know when you create external SQL Server tables from within 1-2-3 for Windows.

Capabilities of the SQL Server driver

Topic

By using the SQL Server driver with 1-2-3, you can access, create, and modify information in existing external SQL Server tables and create new external tables from within 1-2-3. The SQL Server driver communicates directly with SQL Server and much of the query work is actually done by SQL Server. To use the 1-2-3 Data Query commands and database @functions with external tables, you specify the range name you assigned to the external table as the input range.

Basic database tasks

The following table lists the basic database tasks you can perform on external tables using the SQL Server driver and the 1-2-3 commands you use to accomplish those tasks.

Database task	Description	1-2-3 commands
Extract data	Copy records or specific fields from an external table to 1-2-3	Data Query Extract
Create tables	Create external tables	Data External Options Create Table or /Data External Create
Delete rows	Delete records from external tables	Data Query Delete
Drop tables	Delete external tables	/Data External Delete
Insert rows	Add records to external tables	Data Query Modify Insert
Update rows	Edit records in external tables	Data Query Modify Extract and Data Query Modify Replace

In addition, you can use database @functions to perform calculations in 1-2-3 with data that resides in external tables. You can also use Data External Options Send Command to send commands to the SQL Server driver and to send executable SQL commands to SQL Server.

Operators and functions

The table below contains the data analysis operators and functions that 1-2-3 and the SQL Server driver send to the database for analyzing data in external tables. To use these, you place them in the 1-2-3 criteria range.

> **Note** If you use other 1-2-3 functions to analyze data in external tables, you may notice an increase in the time the analysis takes because 1-2-3 must bring all of the rows in the external table into memory in order to analyze the data.

Type	Description	Example of use in 1-2-3
Arithmetic Operators	Add	+ (plus for addition)
	Subtract	- (minus for subtraction)

	Multiply	* (asterisk for multiplication)
	Divide	/ (slash for division)
	Exponentiation	^ (caret to raise a number to a power)
	Negation	- (minus for a negative expression)
Logical Operator	Equal to	=
	Not equal to	< >
	Greater than	>
	Less than	<
	Greater than or equal to	> =
	Less than or equal to	< =
	Logical AND	Two or more criteria in the same row in the criteria range or a formula criterion that includes #AND#
	Logical NOT	Label criteria preceded by ~ (tilde) or formula criteria preceded by #NOT#
	Logical OR	Criteria in two or more rows in the criteria range or a formula criterion that includes #OR#
	Wildcard matches	Criteria entries that use * (asterisk) or ? (question mark) to match characters (When using the SQL Server driver, you can use the * (asterisk) wildcard character anywhere in a label criterion, not just at the end.)
Date functions	Create a date number	@DATE
	Determine the day of the month	@DAY
	Determine the hour of the day	@HOUR
	Determine the minute of the hour	@MINUTE
	Determine the month of the year	@MONTH
	Determine the current date and time	@NOW
	Determine the second of the minute	@SECOND
	Create a time number	@TIME
	Determine today's date	@TODAY

	Determine the year	@YEAR
Mathematical functions	Absolute value	@ABS
	Arc cosine	@ACOS
	Arc sine	@ASIN
	Two-quadrant arc tangent of a value	@ATAN
	Four-quadrant arc tangent of two values	@ATAN2
	Cosine	@COS
	e (the constant used as the base in natural logarithms) raised to a power	@EXP
	Integer part of a value	@INT
	Natural logarithm	@LN
	Base 10 logarithm	@LOG
	Modulus (remainder) of a division	@MOD
	Value of	@PI
	Rounded value	@ROUND
	Sine	@SIN
	Square root	@SQRT
	Tangent	@TAN
String functions	Concatenate strings	Using a 1-2-3 string formula, such as +"Data"&"base", to combine character strings
	Generate a character from its ASCII value	@CHAR
	Generate the ASCII value of a character	@CODE
	Return the first characters of a string	@LEFT
	Return the length of a string	@LENGTH
	Convert a string to lowercase	@LOWER
	Repeat a string more than once	@REPEAT

	Return the last characters of a string	@RIGHT
	Convert a string to uppercase	@UPPER
	Convert a string to a value	@VALUE
Other functions	Send SQL Server operators from 1-2-3 to SQL Server	@DQUERY

Creating external tables

Topic

If authorized by your database administrator, you can create external tables from within 1-2-3. To create an external table, you first create a table definition and then use Data External Options Create Table.

This section describes the table definition for SQL Server and the various SQL Server data types. Use this information with the directions in **"Creating external tables"** to create external tables.

About the table definition

The table definition contains information that tells the driver how to set up the external table. A table definition contains six columns of information, although the SQL Server driver only uses information from columns 1, 2, 3, and 6, which are described below.

- Column 1 contains field names. This information is required for each field in the table.

  When using the SQL Server driver, the maximum number of fields in an external table is 250.

  Field names can contain as many as 30 characters and can contain letters, numbers, _ (underscore), and $ (dollar sign). The first character of a field name must be a letter or _ (underscore).

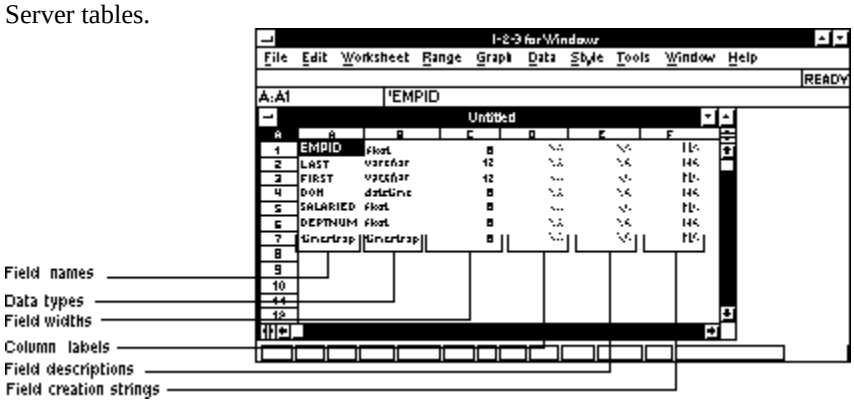
  Field names within a table must be unique.

  You cannot use SQL reserved words as field names. For a list of these reserved words, see the *SQL Server Language Reference*.

  For information about using field names with case-sensitive servers, see **"Using 1-2-3 with case-sensitive servers"**.
- Column 2 contains data types. This information is required for each field in the table. For information about data types, see **"About SQL Server data types"**.
- Column 3 contains field widths. Many data types have a fixed field width and ignore the field width you enter in the table definition. For information about field widths allowed with each data type, see **"About SQL Server data types"**.
- Column 6 contains field creation strings. You use field creation strings with the SQL Server driver to specify whether a field accepts null entries. In 1-2-3, the following are null entries: a blank cell, @NA in a cell, or NA placed in a cell by Data External Options Paste Fields. If you do not want a field to accept null entries, use the creation string NOT NULL for that field in the table definition. If you want a field to accept null entries, do not enter any creation string. Fields with binary, bit, or char data types are always created as NOT NULL, regardless of the creation string you enter.

The figure below shows a table definition for a SQL Server table. Although columns 4 and 5 must be present in the

table definition, the SQL Server driver ignores entries in these columns because they are not applicable to SQL Server tables.



Each column in a table definition corresponds to a column generated when you use Data External Options Paste Fields. When you use Data External Options Paste Fields, however, 1-2-3 always displays NA in column 6, even if you entered a field creation string in the table definition.

About SQL Server data types

Databases let you use many different types of data. It is important for you to know the data types SQL Server supports when you create new tables (as well as when you enter and analyze data). 1-2-3 uses these data types in table definitions when you use Data External Options Paste Fields or Data External Options Create Table.

When you send data between 1-2-3 and SQL Server, the SQL Server driver converts SQL Server data types to 1-2-3 data types, and vice versa, so both programs can use and understand the same data. The table below shows SQL Server data types and the data types the driver converts them to in 1-2-3. The table also shows the field widths (the storage size in SQL Server databases) and the values allowed for the various data types.

SQL Server data type	Field width	Values accepted by SQL Server	Data type in 1-2-3
Binary	1-255	Binary data equal to the length specified by the field width	None
Bit	1	0, 1	Value
Char	1-255	Character strings equal to the length specified by the field width	Label
Datetime	8	Dates from January 1, 1753 through December 31, 9999 and all times of day	Value (date or time number)
Float	8	±1.7E-308 through ±1.7E+308 with 15-digit precision	Value
Image	16	Binary data up to 2,147,483,647 bytes	None
Int	4	-2,147,483,647 through 2,147,483,647	Value
Money	8	-922,337,203,685,447.5807 through 922,337,203,685,447.5807	Value
Smallint	2	-32,767 through 32,767	Value
Text	16	Character strings up to	Label

		2,147,483,647 characters in length	
Timestamp	8	Binary row ID	None
Tinyint	1	0 through 255	Value
Varbinary	1-255	Binary data up to the length specified by the field width	None
Varchar	1-255	Character strings up to the length specified by field width	Label

Notes about SQL Server data types

- SQL Server uses the field width in the table definition only when creating fields that have char, varchar, binary, or varbinary as the data type. SQL Server ignores the field width for all other data types.
- Do not include in a 1-2-3 criteria or output range the name of a field whose SQL Server data type does not have a 1-2-3 data type (SQL Server data types whose 1-2-3 data type is None in the table above). The data in these fields is usable by SQL Server only. If you extract these data types into 1-2-3, 1-2-3 displays ERR. You can, however, include these data types in the table definition when you create a table.
- If you enter more characters in a character field than the field width allows, SQL Server truncates the entry after the last character the field width allows.
- If the SQL Server driver is set to automatically add a timestamp field to new tables, which is the default setting, do not include a timestamp field in the table definition that you use to create a table, even if the timestamp field is listed when you use Data External Options Paste Fields. If you are not sure if the driver is set to add a timestamp field, see your database administrator.
- Dates from SQL Server are entered as date numbers in 1-2-3 and formatted in Date 4: Long Intl Date format. Times from SQL Server are entered as time numbers in 1-2-3 and formatted in Date 8: Long Intl Time format. Datetimes from SQL Server are entered as datetime numbers (values with a date number preceding the decimal point and a time number following the decimal point) in 1-2-3 and formatted in Date 4: Long Intl Date format.

  Although 1-2-3 can only display dates from January 1, 1900 through December 31, 2099, it can store all dates from SQL Server and return them to SQL Server. When you format cells that contain dates outside the range that 1-2-3 can display, 1-2-3 displays *** (asterisks) in the cells.
- Although 1-2-3 can only display numbers from ±1.0E-99 through ±9.99E+99, it can store all numbers from SQL Server tables and return them to the tables. 1-2-3 displays *** (asterisks) in cells that contain numbers outside the range that 1-2-3 can display.
- Binary, bit, and char SQL Server fields are always created NOT NULL, regardless of the creation string you enter in column 6 of the table definition when you create the table. Fields created NOT NULL never allow null entries.
- Datetime, float, image, int, money, smallint, text, tinyint, varchar, and varbinary SQL Server fields allow null entries unless you enter NOT NULL as the creation string in column 6 of the table definition when you create the table.
- Null entries from SQL Server become empty cells in 1-2-3.
- You cannot create tables that contain user-defined data types.

Creating tables from a 1-2-3 model range

There are two common ways of creating an external table from within 1-2-3 -- you can use a range of data as a model for the new table, in which case the driver creates the table definition for you, or you can modify an existing table definition and use that to determine the structure of the new table. If you use a model range to create a table,

the driver uses the default data types when creating the table.

The table below shows 1-2-3 data types and the default data types the driver converts them to when it creates an SQL Server table.

1-2-3 data type	Data type in SQL Server table
Label	Varchar
Value	Float
Value formatted as a date or time	Datetime

Supported character sets

The SQL Server driver supports the following character sets: United States (code page 437), Multilingual (code page 850), Portuguese (code page 860), French-Canadian (code page 863), and Nordic (code page 865). The default character set is United States. To access a different character set, use /Data External Other Translate from the 1-2-3 Classic menu. For more information, see **"Changing character sets"**.

> **Note** Although 1-2-3 stores characters from the character sets listed above, it displays and prints characters from the ANSI character set, which is the character set that Windows supports.

5 Using 1-2-3 with DataLens Drivers

This chapter describes how to use DataLens drivers with 1-2-3 for Windows to retrieve, modify, and analyze data from existing external tables and to create new external tables. (Before using a DataLens driver for the first time, use the Install program to install the driver.)

Except where noted, the information applies to all DataLens drivers shipped with 1-2-3 for Windows.

5 Using 1-2-3 with DataLens Drivers

This chapter describes how to use DataLens drivers with 1-2-3 for Windows to retrieve, modify, and analyze data from existing external tables and to create new external tables. (Before using a DataLens driver for the first time, use the Install program to install the driver.)

Except where noted, the information applies to all DataLens drivers shipped with 1-2-3 for Windows.

Database tasks supported by 1-2-3

The table below lists the basic database tasks you can perform on external tables and the 1-2-3 commands you use to accomplish those tasks.

Database task	Description	1-2-3 commands
Basic extract	Copy records or specific fields from an external table to 1-2-3	Data Query Extract
Create tables	Create external tables	Data External Options Create Table or /Data External Create
Delete rows	Delete records from external tables	Data Query Delete
Delete tables	Delete external tables	/Data External Delete
Insert rows	Add records to external tables	Data Query Modify Insert
Update rows	Edit records in external tables	Data Query Modify Extract and Data Query Modify Replace

Using the sample files

1-2-3 includes a sample file for each of the three DataLens drivers included with 1-2-3. You can use these sample files to try out the procedures in this chapter. Most of the procedures include directions for using 1-2-3 with and without the sample files.

To obtain the same results as the procedures that use the sample files, you should follow the sections in this chapter in order.

> **Note** Before using the sample files, use Tools User Setup to make sure your default worksheet directory is the directory that contains the sample files.

For dBASE IV and Paradox driver users

If you are using the dBASE IV driver or the Paradox driver, you will change the data in the sample file when you follow the procedures in this chapter. Therefore, it is a good idea to save a copy of the file in a different directory beforehand, in case you want to use the file again. The sample file for the dBASE IV driver is named EMPLOYEE.DBF, and the sample file for the Paradox driver is named EMPLOYEE.DB. Both of these files are in the subdirectory SAMPLE in your 1-2-3 program directory. (If you are using the network version of 1-2-3, SAMPLE is a subdirectory in your personal directory.)

The first step in using a sample file is to connect to it. During the connection procedure, you specify the name of the database that contains the sample files. The database that contains the sample files is *X*:*1-2-3 program*

directory\SAMPLE, where *X* is the letter of the drive that contains the sample files, and *1-2-3 program directory* is the name of the directory that contains the 1-2-3 program files (usually 123W). (If you are using the network version of 1-2-3, the database name is *X*:*your personal directory*\SAMPLE.)

To begin using the sample files, see **"Connecting to external databases and tables"**.

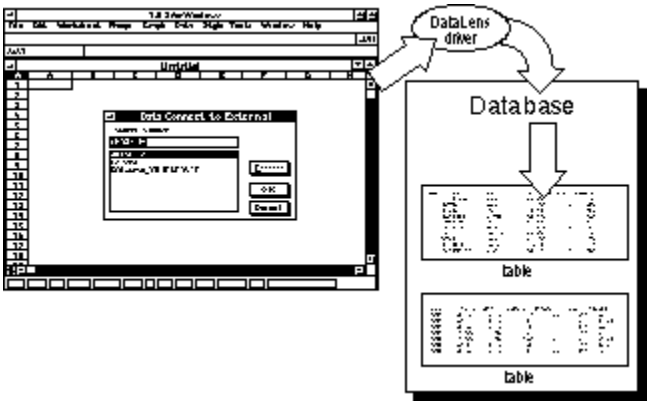
For SQL Server driver users

If you are using the SQL Server driver, and you want to follow the procedures that use sample files, you must first create an external table using the sample worksheet file supplied for the SQL Server driver (EMPLOYEE.WK3). To create the table, follow the directions in **"Creating external tables".** Then return to **"Connecting to external databases and tables"**.

Connecting to external databases and tables

To use data from an external table, you must first connect 1-2-3 to the external table. To do this, you specify the name of the DataLens driver you want to use, the name of the external database, and the name of the table that contains the data. You also designate a range name that 1-2-3 associates with the table during data operations.

The illustration below shows how the connection is made between 1-2-3 and an external table.



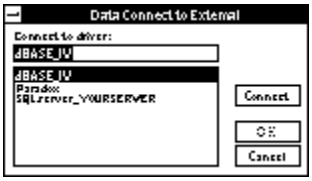
Note Depending on the DataLens driver you select and how it is configured, 1-2-3 may prompt you for a driver or database user ID and password when you connect to an external table. If so, enter the user ID and password in the appropriate text boxes and select OK or press ENTER. If you are connecting to the Paradox driver and are prompted for a user ID and password but do not need one to connect to the driver, select OK or press ENTER without entering a user ID or password.

Sample file If you are using a sample file, use Tools User Setup to make sure your worksheet directory is the directory that contains the sample files.

To connect to an external table

1. Choose Data Connect to External.

   The Data Connect to External dialog box displays the Connect to driver text box and list box.



   Tip If you know the names of the driver, the database, and the external table, you can combine steps 2 through 4 by entering all of these names, separated by spaces, in the Connect to driver text box. For example, if the driver is named dBASE_IV, the database is named C:\123W\SAMPLE and the table is named EMPLOYEE, you can enter the following:

   DBASE_IV C:\123W\SAMPLE EMPLOYEE

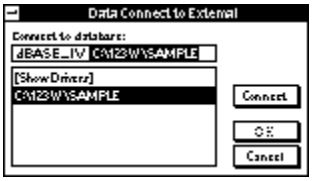
   You will be prompted only for a range name for the table.

2. Connect to the driver.

Mouse Double-click a driver name from the list box.

Keyboard Enter a driver name in the text box.

The Connect to database text box and list box appear.



Note If you connected to the dBASE IV or Paradox driver, the list box lists the worksheet directory as a database. If the list box does not display the directory you want, use Tools User Setup to change the worksheet directory.

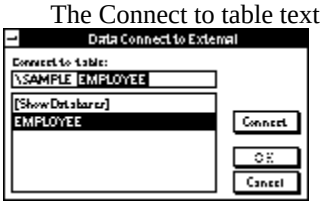
3. Connect to the database.

Mouse Double-click a database name from the list box. If the list box does not display the name of the database you want, enter the database name in the text box.

Keyboard Enter a database name in the text box.

Sample file If you are using a sample file, connect to the database that contains the sample files. If you are not sure of the database name, see **"Using the sample files"** or your database administrator.

The Connect to table text box and list box appear.



4. Connect to the table.

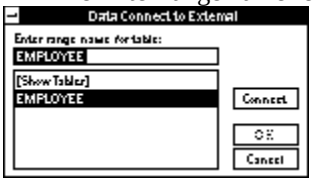
Mouse Double-click a table name from the list box.

Keyboard Enter a table name in the text box.

If you selected the SQL Server driver and want to use a table created by someone else, you may have to enter an owner name as part of the table name. If so, type the owner name, a space, and the table name, such as BMARTIN PERSONNEL. (An owner name is usually the user ID of the user who created the table.)

Sample file If you are using a sample file, connect to the table named EMPLOYEE.

The Enter range name for table text box and list box appear.



5. Enter a range name for the table.

The range name is the name you will use in 1-2-3 when you refer to this table in Data Query commands, Data External Options commands, and database @functions.

1-2-3 displays the table name as the default range name. If you already used that range name in the current

worksheet or if you are using the SQL Server driver and the name of the table you specified exceeds 15 characters, 1-2-3 displays ???? (question marks) instead of a default name.

Mouse Double-click a range name in the list box. If the list box does not contain the name you want to use, enter the name in the text box.

Keyboard Enter a range name in the text box.

The Connect to table text box and list box appear again. To connect to another table in the same database, repeat steps 4 and 5. To connect to a table in a different database, select Show Databases from the list box and repeat steps 3 through 5.

Sample file If you are using a sample file, accept the default range name EMPLOYEE.

6. Select OK or press ENTER to complete the command.

After you connect to the external table, follow the procedure in the next section, **"Getting information about the fields in a table."**

Getting information about the fields in a table

Before retrieving data from an external table, you may want to see the field names, data types, and field widths in the table. You can use this information to set up your criteria and output ranges for query operations and to create new external tables.

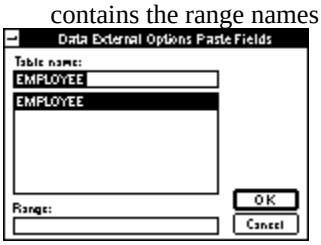
To get information about fields

1. If you have not already done so, connect to the external table by using Data Connect to External.

   Sample file If you are using a sample file, you already connected to the external table named EMPLOYEE.

2. Choose Data External Options Paste Fields.

   The Data External Options Paste Fields dialog box displays the Table name text box and list box. The list box contains the range names you gave to all connected external tables.



3. Specify a table name.

   Select a name from the list box or enter the range name of a connected external table in the text box.

   Sample file If you are using a sample file, specify EMPLOYEE as the table name.

4. Specify the range where you want 1-2-3 to place the field information in the Range text box.

   You can specify the entire range or just the first cell of the range.

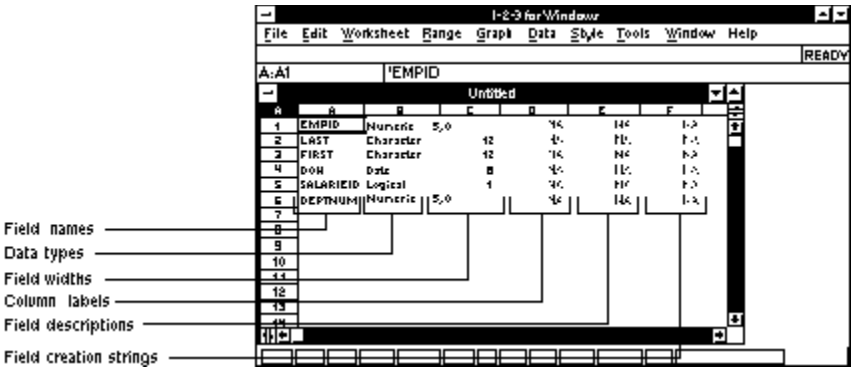
   Sample file If you are using a sample file, specify A1 as the range.

   Caution The field information is six columns wide and contains one row more than the number of fields in the table. Before specifying the range, be sure the field information will not write over other important information in that area of the worksheet.

5. Select OK.

   1-2-3 copies the field information to the specified range.

The figure below shows field information for a dBASE IV table.



Each column in the field information corresponds to a column in a table definition. For more information about table definitions, see **"About the table definition"**.

Setting up input, criteria, and output ranges

Before you use the Data Query commands to extract or manipulate external data, you must set up an input range, a criteria range, and an output range. Before you use the database @functions, you must set up an input range and a criteria range.

> **Note** In this section you will set up input, criteria, and output ranges. You do not specify these ranges until subsequent sections when you use the Data Query commands to query tables.

The **input range** tells 1-2-3 where the data you are querying is located. When using external tables, the input range is the range name of the external table.

The **criteria range** tells 1-2-3 which records to search for in the input range. The criteria range contains at least two rows. The first row of the criteria range contains one or more field names from the input range. Subsequent rows in the criteria range contain the criteria you want to use to select data.

The **output range** tells 1-2-3 where to put the records that meet the criteria you specified. The first row of the output range contains one or more field names from the input range. 1-2-3 extracts only information about the field names in the first row of the output range, even if there are more field names in the input range. 1-2-3 places the extracted records in the rows below the field names in the output range. (When using Data Query Modify Insert, the output range is the range that contains the new records you want to add to a table.)

To set up the input range

When using external tables, you do not have to set up an input range in the worksheet prior to using the Data Query commands. You can specify the name of the external table as the input range when you use the Data Query commands.

> **Sample file** If you are using a sample file, do not set up an input range at this time.

To set up the criteria range

1. Find an area of the current worksheet or another worksheet for the criteria range.

   The criteria range must not overlap the input or output ranges.

   Sample file If you are using a sample file, you will use the range A8..F9 as the criteria range. Make sure no important data is in this range.

2. Copy some or all of the field names in the input range to the first row of the criteria range.

   Depending on the number of field names you want to copy, use Range Transpose or Edit Quick Copy to copy the field names from the first column of the field information to the first row of the area you want to use as the criteria range.

   Sample file If you are using a sample file, choose Range Transpose to copy all of the field names. Specify A1..A6 as the From range and A8 as the To range. 1-2-3 copies the field names to A8..F8.

3. Enter the criteria in the row or rows under the field names.

   If your criteria range includes date or time values, the following rules apply:

   - You must format date and time values so they will be recognized as dates and times.
   - You cannot reference date and time values indirectly. For example, +DATE=A2, where A2 is a date value, is not valid.
   - If you are using logical operators, you must use the @DATE function to specify a date value in the criteria range. For example, use +DATE=@DATE(85,9,13) instead of +DATE=31303.

Sample file If you are using a sample file, do not enter any criteria under the field names.

4. (Optional) Use Range Name Create to name the criteria range.

   You may find it easier to use a range name to refer to the criteria range in query operations.

For information about specifying selection criteria, see **"Setting up the worksheet for queries"** in Chapter 12 of the *User's Guide*.

To set up the output range

1. Determine which fields you want to appear in the output range and where you want the output range to appear in the worksheet.

   Sample file If you are using a sample file, you will use the range A11..F11 as the output range. Make sure no important data is in this range or in the rows below this range to the bottom of the worksheet.

2. Copy some or all of the field names that are in the input range to the first row of the output range.

   You can use different field names in the output range than in the criteria range. Use Range Transpose or Edit Quick Copy to copy the field names from the first column of the field information to the first row of the area you want to use as the output range.

   Sample file If you are using a sample file, choose Range Transpose to copy all of the field names from the first column of the field information. Specify A1..A6 as the From range and A11 as the To range. 1-2-3 copies the field names to A11..F11.

3. (Optional) Use Range Name Create to name the output range.

   You may find it easier to use a range name to refer to the output range in query operations.

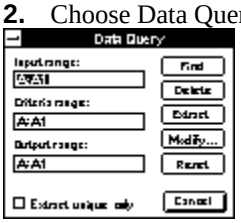
For more detailed information about setting up the input, criteria, and output ranges, see **"Setting up the worksheet for queries"** in Chapter 12 of the *User's Guide*.

Copying external data to a 1-2-3 worksheet

You can use the Data Query commands to copy (extract) records from one or more external tables into 1-2-3. 1-2-3 copies the records that meet the criteria you specify.

To copy external data

1. If you have not already done so, use Data Connect to External to connect to an external table or tables.
2. Choose Data Query.



3. Specify the input range in the Input range text box.

   Specify the range name you gave to the external table or tables. To extract data from more than one table at the same time, you must join the tables. For more information, see **"Joining database tables"** in Chapter 12 of the *User's Guide*.

   Sample file If you are using a sample file, specify employee as the input range.

4. Specify the criteria range in the Criteria range text box.

   Be sure the criteria range includes the field names and at least one additional row.

   Sample file If you are using a sample file, specify A8..F9 as the criteria range.

5. Specify the output range in the Output range text box.

   Specify either the single row of field names that is at the top of the output range or specify the entire output range. If you specify the entire output range, be sure the range is large enough to contain all of the records that 1-2-3 will copy.

   Caution If you specify the single row of field names, 1-2-3 erases all data below the field names to the bottom of the worksheet and then places the extracted records below the field names. If you use this method, be sure there is no important data in the rows below the field names. If you mistakenly write over information, return 1-2-3 to READY mode, and press ALT+BACKSPACE to retrieve the lost data.

   Sample file If you are using a sample file, specify A11..F11 as the output range.

6. Select Extract to copy all records that meet the criteria to the output range.

   To copy only unique records that meet the criteria, select the Extract unique only check box prior to selecting Extract.

7. Select Cancel to return to READY mode.

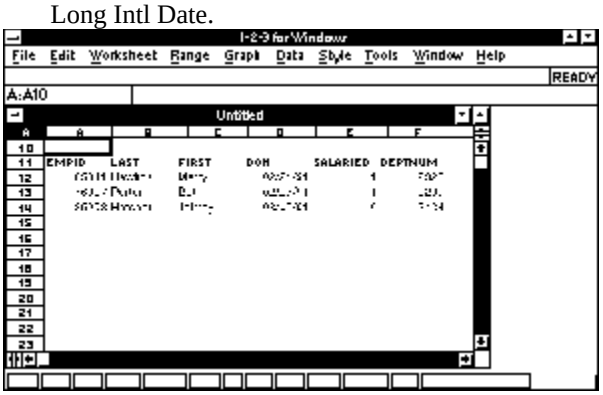
Adding records to an external table

To add records to an external table, you enter the new records in the output range and then use Data Query Modify Insert to add those records to the external table.

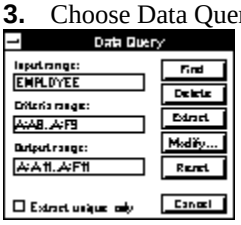
To add records to an external table

1. If you have not already done so, use Data Connect to External to connect to an external table.
2. Enter the new records directly below the field names in the output range.

   Sample file If you are using a sample file, highlight A12..F21 and then choose Edit Cut to erase A12..F21. Then enter records in A12..F14 as shown in the figure below. Use Range Format to format the dates as Date 4: Long Intl Date.



3. Choose Data Query.



4. Specify the input range in the Input range text box.

   Specify the range name you gave to the external table.

   Sample file If you are using a sample file, keep EMPLOYEE as the input range.

5. Specify the output range in the Output range text box.

   The output range you specify must include all the records you want to insert into the external table. You cannot specify a single-row output range that contains only the field names when adding records to an external table.

   Sample file If you are using a sample file, specify A11..F14 as the output range.

   Note This method of adding records ignores the criteria range.

6. Select Modify.

   1-2-3 displays the Data Query Modify dialog box.

7. Select Insert.

   1-2-3 inserts the records from the output range into the external table and then displays the Data Query dialog box.

8. Select Cancel to return to READY mode.

   Tip You can use Data Query Modify Insert to combine the records from two external tables if the tables have the same data format and field names. To do so, specify the range name of the table to which you want to add records as the input range, and specify the range name of the table containing the records to be inserted as the output range.

   Note You can also use Data Query Extract to add records to external tables. To do so, specify the range where you entered the new records as the input range and the external table name as the output range. You must also specify a criteria range. Data Query Extract inserts only records that meet the criteria.

Modifying records in an external table

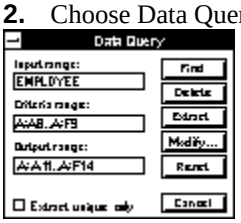
To modify records in an external table, you must first use Data Query Modify Extract to copy the records from the external table to the 1-2-3 worksheet. After you edit the records in 1-2-3, you use Data Query Modify Replace to return the modified records to the external table, replacing the original records.

To modify records

1. If you have not already done so, use Data Connect to External to connect to an external table.

   Sample file If you are using a sample file, type 2323 in F9 under the field name DEPTNUM. This will become the criterion.

2. Choose Data Query.



3. Specify the input range in the Input range text box.

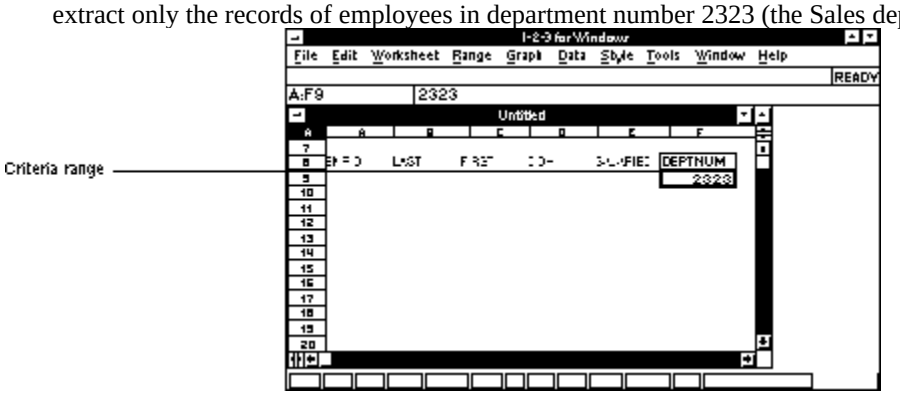
   Specify the range name you gave to the external table.

   Sample file If you are using a sample file, keep EMPLOYEE as the input range.

4. Specify the criteria range in the Criteria range text box.

   Be sure the criteria range includes the field names and at least one additional row.

   Sample file If you are using a sample file, specify F8..F9 as the criteria range. This criterion tells 1-2-3 to extract only the records of employees in department number 2323 (the Sales department).



5. Specify the output range in the Output range text box.

   Specify either the single row of field names that is at the top of the output range or specify the entire output range. If you specify the entire output range, be sure the range is large enough to contain all of the records that 1-2-3 will copy.

   Caution If you specify the single row of field names, 1-2-3 erases all data below the field names to the

bottom of the worksheet and then places the extracted records below the field names. Be sure no important data is in the rows below the field names. If you mistakenly write over information, return 1-2-3 to READY mode, and press ALT+BACKSPACE to retrieve the lost data.

Sample file If you are using a sample file, specify A11..F11 as the output range.

Note If you are using the SQL Server driver to query a table that does not contain a timestamp field, using Data Query Modify Extract may result in duplicate records in the output range. If so, the driver may not be able to copy the modified records back to the external table. You can decrease the chance of extracting duplicate records if you include more fields in the output range.

6. Select Modify, then select Extract.

   1-2-3 copies records from the external table to the output range and then displays the Data Query dialog box.

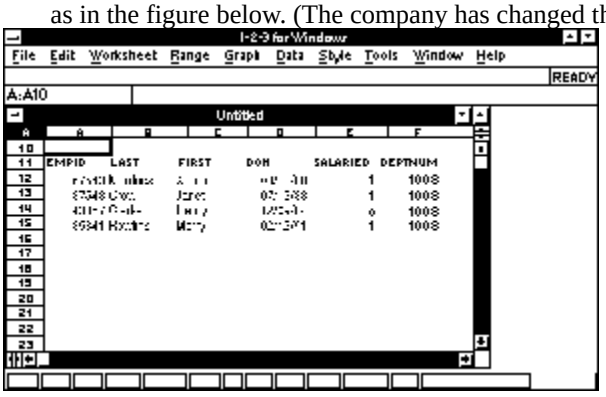
7. Select Cancel to return to READY mode.

8. Modify the records in the output range, as necessary.

   When modifying records, be sure to follow these rules:

   - Do not use any other Data Query commands before you use Data Query Modify Replace. Doing so cancels the modify procedure, and you will have to start over again.
   - Do not add records to or delete records from the output range.
   - Do not change the order of the records in the output range.
   - Be sure the length of the entry in each field does not exceed the maximum allowed for that field.

   Sample file If you are using a sample file, change the department numbers in the extracted records to 1008, as in the figure below. (The company has changed the number of the Sales department from 2323 to 1008.)



Note If you decide not to replace the records in the external table, choose Data Query Modify Finish to cancel the entire procedure.

9. Choose Data Query.

10. Select Modify, then select Replace.

    1-2-3 copies the modified records from the output range to the external table. If 1-2-3 cannot copy one of the records to the external table, it does the following: With the SQL Server driver, the entire replacement procedure is canceled and no records are replaced. With the dBASE IV and Paradox drivers, 1-2-3 copies records until it reaches the record it cannot copy and then ends the procedure.

11. Select Cancel to return to READY mode.

    Note If you want to check to be sure the driver placed the modified records into the external table, use Data Query Extract to copy the records from the external table to 1-2-3. You may have to change the entry in the criteria range first. If you are using the sample files, for example, change the entry in F9 in the criteria range to

1008, so 1-2-3 extracts the records you just modified.

Deleting records from an external table

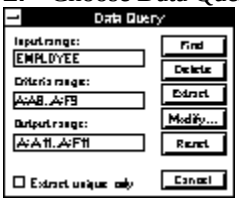
Deleting records from an external table is similar to deleting records from a 1-2-3 database table.

To delete records from an external table

1. If you have not already done so, use Data Connect to External to connect to an external table.

Sample file If you are using a sample file, use Edit Cut to erase F9, and then type 66357 in A9 under the field name EMPID. This will become the criterion.

2. Choose Data Query.



3. Specify the input range in the Input range text box.

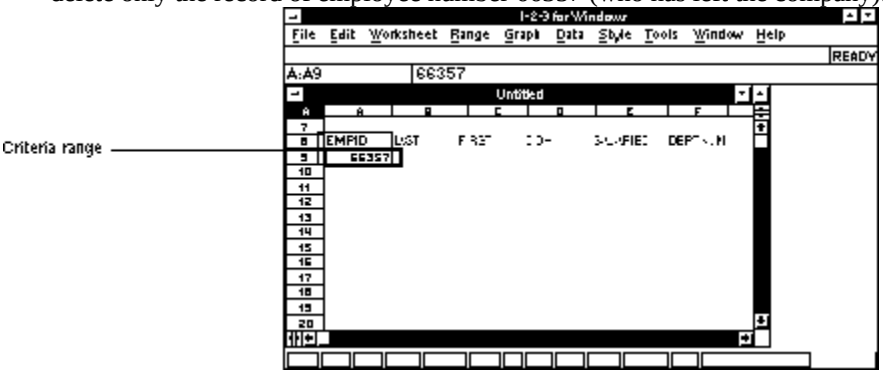
Specify the range name you gave to the external table.

Sample file If you are using a sample file, keep EMPLOYEE as the input range.

4. Specify the criteria range in the Criteria range text box.

Be sure the criteria range includes the field names and at least one additional row.

Sample file If you are using a sample file, specify A8..A9 as the criteria range. This criterion tells 1-2-3 to delete only the record of employee number 66357 (who has left the company).



Note If you are using the SQL Server driver and you leave the criteria range empty, 1-2-3 displays a message. To delete all of the records from an external SQL Server table, enter a single formula that equates a field name to itself in the criteria range. If AMOUNT is a field name in the table, for example, enter the formula +AMOUNT=AMOUNT in the criteria range.

Tip If you want to see which records the driver will delete from the external table, select Extract. Doing so copies the records to the output range. If the records are different than those you intended to delete, check to be sure you specified the criteria correctly.

5. Select Delete.

   1-2-3 asks you to confirm that you want to delete the records that match the criteria.

6. Select OK to delete the records in the input range that meet the criteria or select Cancel to cancel the command and return to the Data Query dialog box.

Analyzing external data

You can use the 1-2-3 database @functions to analyze data in an external table without bringing the table into the worksheet. The database @functions, with the exception of @DQUERY, use the following syntax: *@DFUNCTION*(*input*,*field*,*criteria*). To use the database @functions with external tables, follow these rules:

- Connect to the external table or tables you want to analyze.
- Enter the range name you gave the external table as the *input* argument in the database @function.
- Enter the field name as it appears in the external table, enclosed in " " (quotation marks), as the *field* argument in the database @function.
- Enter the range that contains the criteria, including the field headings, as the *criteria* argument in the database @function.

For example, if you are connected to an external table that contains sales figures and you want to find the total commission paid to all salespeople, you might use the formula

@DSUM(SALES,"COMMISSION",CRIT)

where SALES is the range name you gave the external table when you connected to it, COMMISSION is the name of the field in the external table that contains the amount of each commission, and CRIT is the range name you gave to the criteria range.

If you are using the SQL Server driver, you can use @DQUERY in the 1-2-3 criteria range to access SQL Server built-in functions, such as DATALENGTH, which returns the length of variable length data. For example, if you are connected to the table STORES in the database PUBS and you want to extract all store names that have fewer than 30 characters, you would enter the following in the criteria range:

@DQUERY("DATALENGTH",STOR_NAME)<30

Help For more information about using database @functions, choose Help, select @Functions, select @Function Categories, and select Database. For more information about using Help, see **"Using Help"** in Chapter 1 of the *User's Guide*.

Creating external tables

Before creating an external table, the DataLens driver must know certain information about the table, such as field names, field widths, and data types. This information is contained in the **table definition.** Depending on the method you choose to create the table, either the driver creates the table definition for you, or you create the table definition yourself.

There are two common ways of creating external tables from within 1-2-3 -- you can use a 1-2-3 database table as a model range for the new table, in which case the driver creates the table definition for you, or you can modify an existing table definition and use that to determine the structure of the new table. (You can also create a table definition by entering the entire definition into the worksheet yourself, but that is usually time-consuming and unnecessary.)

When you use a 1-2-3 database table as a model range, the DataLens drivers create the table definition using the default data types, no field creation strings, and the column widths of label fields as the corresponding field widths in the table definition. If you want to change any of these entries, you can modify the table definition and create a new table. For more information about default data types, see "Creating tables from a 1-2-3 model range" for the **dBASE** driver, the **Paradox** driver, and the **SQL Server** driver.

> **Sample file** This section contains directions for using the sample files with the SQL Server driver only. If you are using the SQL Server driver, you must create an external table before you can follow the rest of the directions for using the sample files. For directions to create this table, see **"To create a table by using a model range"**.

About the table definition

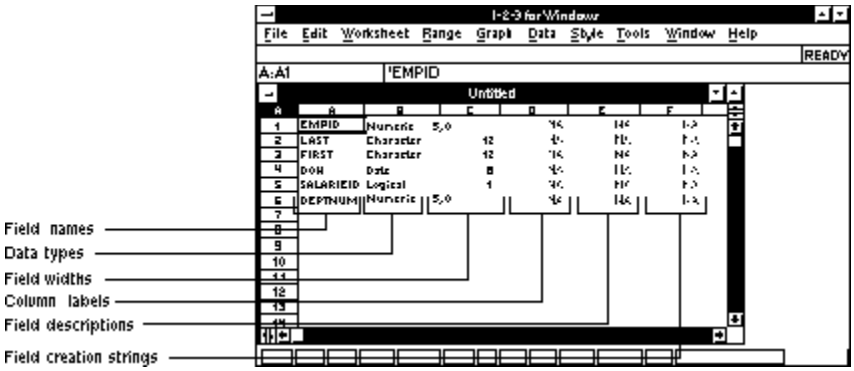
The table definition sends information to the driver so the driver knows how to set up the external table. Each column in a table definition corresponds to a column generated when you use Data External Options Paste Fields. A table definition contains six columns of information, although the Paradox driver uses information from only the first three columns, and the dBASE IV and SQL Server drivers use information from only the first three columns and the last column. The table definition contains six columns, as described below.

- Column 1 contains field names. This information is required for each field in the table.
- Column 2 contains data types. This information is required for each field in the table.
- Column 3 contains field widths. Many data types have a fixed field width and ignore the field width you enter in the table definition.
- Column 4 contains field labels. A field label is an alternative version of a field name. Field labels let you define a new, perhaps abbreviated, version of a field name, making it easier to designate the various fields in a table.
- Column 5 contains field descriptions. A field description is a short description of the contents of a field.
- Column 6 contains field creation strings. You use a field creation string with the SQL Server driver to specify whether a field allows null entries, and you use a field creation string with the dBASE IV driver to specify the number of decimal places in a float field. You do not use field creation strings with the Paradox driver.

Although columns 4 and 5 must be present in the table definition, the dBASE IV, Paradox, and SQL Server drivers ignore entries in these columns.

> **Note** Although you may enter a field creation string in 1-2-3 in the table definition, when you use Data External Options Paste Fields, 1-2-3 always displays NA in column 6.

The figure below shows a table definition for a dBASE IV table.



For information and rules about creating a table definition with your driver, see **Chapter 2** for the dBASE IV driver, **Chapter 3** for the Paradox driver, or **Chapter 4** for the SQL Server driver.

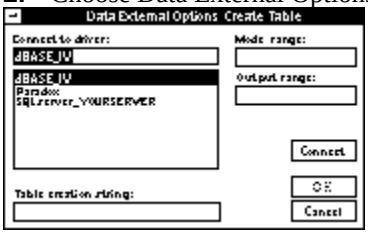
To create a table by using a model range

1. To use a 1-2-3 database table as a model range, open the file that contains the database table or enter a new database table in the worksheet.

   To use an external table as a model, connect to the external table.

   Sample file If you are using the SQL Server driver and want to use the sample files, open EMPLOYEE.WK3.

2. Choose Data External Options Create Table.



   Tip If you know the names of the driver and the database and the name you want to assign to the external table, you can combine steps 3 through 5 by entering all of these names, separated by spaces, in the Connect to driver text box. For example, if the driver is named dBASE_IV, the database is named C:\123W\WORK, and the name you want to assign to the table is BUDGET, you can enter the following in the Connect to driver text box:

   DBASE_IV C:\123W\WORK BUDGET

   You will be prompted only for a range name for the table.

3. Connect to the driver.

   Sample file If you are using the SQL Server driver and want to use the sample files, connect to the SQL Server driver.

   If you are prompted for a user ID and password, enter the user ID and password in the appropriate text boxes and select OK. If you are connecting to the Paradox driver and do not need a user ID or password, select OK or press ENTER without entering a user ID or password.

4. Connect to the database.

   Sample file If you are using the SQL Server driver and want to use the sample files, connect to the database in which you want to create this table.

If you are prompted for a user ID and password, enter the user ID and password in the appropriate text boxes and select OK.

5. Enter a name for the new table in the Enter name for table text box.

   Sample file If you are using the SQL Server driver and want to use the sample files, enter employee as the name of the table.

6. Enter a range name for the table.

   The range name is the name you will use in 1-2-3 when referring to this table with Data Query commands, Data External Options commands, and database @functions. 1-2-3 displays the table name as the default range name. If you already used that range name in the current worksheet, 1-2-3 displays ???? (question marks) instead of a default name.

   Select the default range name or enter a different range name in the text box.

   Sample file If you are using the SQL Server driver and want to use the sample files, accept the default range name EMPLOYEE.

7. (Optional) Specify a table creation string, if one is supported or required by your DataLens driver.

   The table creation string specifies additional information about the table. The Paradox driver, for example, lets you use a table creation string to specify a sort order for the table. The Paradox driver is the only driver in this book that uses table creation strings.

   Sample file If you are using a sample file to create a table you can use with SQL Server, do not enter a table creation string.

8. Specify the model range in the Model range text box.

   If you are using a 1-2-3 database table as a model, the model range is the range that contains that table. If you are using an external table as a model, the model range is the range name you gave the external table when you connected to it.

   Sample file If you are using the SQL Server driver and want to use the sample files, specify A1..F11 as the model range.

9. Specify the output range in the Output range text box.

   The output range is the range in which the driver will create the table definition. You can enter the entire range or just the first cell of the range.

   Caution The table definition is six columns wide and contains one row more than the number of fields in the table. Before specifying the output range, be sure the field information will not write over other important information in that area of the worksheet. If you mistakenly write over information, return 1-2-3 to READY mode, and press ALT+BACKSPACE to retrieve the lost data.

   Sample file If you are using the SQL Server driver and want to use the sample files, specify A13 as the output range.

10. Select OK.

1-2-3 creates the table definition and the new external table. You can now add records to the table.

Note Follow the procedure in **"Adding records to an external table"** to add records to the table you created.

To create a table by modifying an existing table definition

1. To create a table in this manner, you can either modify the table definition of an external table or you can modify the table definition created by using a 1-2-3 database table as a model range.

   If you want to modify the table definition of an external table, use Data Connect to External to connect to the external table whose table definition you want to use.

   If you want to modify the table definition created by using a 1-2-3 database table as a model range, follow the

directions in **"To create a table by using a model range"**.

2. If you decided to modify the table definition of an external table in step 1, use Data External Options Paste Fields to copy the table definition of the external table to the worksheet.

   If you decided to modify the table definition created by using a 1-2-3 database table as a model range in step 1, the driver already created the table definition in the worksheet. Use that table definition in step 3.

3. Modify the table definition the way you want. For example, you may want to change the field names, the data types, or the widths of some fields or add field creation strings. If you are using the Paradox driver, you may want to specify some fields as index fields.

   Note If you are using the SQL Server driver, do not include a timestamp field in the table definition when you create a table, even if the field information contained a timestamp field when you used Data External Options Paste Fields.

4. Choose /Data External Create Name from the 1-2-3 Classic menu.

   1-2-3 prompts you to enter the name of the table to create and displays the names of DataLens drivers.

   Tip If you know the names of the driver and the database and the name you want to assign to the external table, you can combine steps 5 through 7 by entering all of these names, separated by spaces. For example, if the driver is named dBASE_IV, the database is named C:\123W\WORK, and the name you want to assign to the table is BUDGET, you can enter the following:

   DBASE_IV C:\123W\WORK BUDGET

   You will be prompted only for a range name for the table.

5. Specify a DataLens driver name.

   1-2-3 continues to prompt you to enter the name of the table to create and displays the names of databases.

6. Specify a database name.

   1-2-3 continues to prompt you to enter the name of the table to create and displays the names of existing external tables in the database you specified. 1-2-3 displays these names to remind you of the table names you have already used. When you enter a name for the new table, do not use one of these names.

7. Enter a name for the new table.

   1-2-3 prompts you for a range name for the table.

8. Enter a range name for the table.

   1-2-3 displays the table name as the default range name. Select the default range name or enter a different range name.

   The range name is the name you will use in 1-2-3 when referring to this table in Data Query commands, Data External Options commands, and database @functions.

   1-2-3 prompts you for a table creation string.

9. (Optional) Specify a table creation string, if one is supported or required by your DataLens driver. If you do not want to specify a table creation string, press ENTER.

   The table creation string specifies additional information about the table. The Paradox driver, for example, lets you use a table creation string to specify a sort order for the table. The Paradox driver is the only driver in this book that uses table creation strings.

10. Select Definition Use-Definition and enter the range that contains the modified table definition.

11. Select Go.

    The driver creates the table.

Deleting external tables

You can use 1-2-3 and the DataLens drivers to delete external tables. You do not have to use Data Connect to External to connect to a table prior to deleting it.

To delete an external table

1. Choose /Data External Delete from the 1-2-3 Classic menu.

   1-2-3 prompts you to enter the name of the table to delete and displays the names of DataLens drivers.

2. Enter the name of the driver associated with the table you want to delete.

   If you are prompted for a user ID and password, enter the user ID and password in the appropriate text boxes and select OK. If you are connecting to the Paradox driver and do not need a user ID or password, select OK or press ENTER without entering a user ID or password.

   1-2-3 displays the names of databases.

3. Enter the name of the database that contains the table you want to delete.

   If you are prompted for a user ID and password, enter the user ID and password.

   1-2-3 displays the names of tables in the database you specified.

4. Enter the name of the table you want to delete.

   1-2-3 prompts you to confirm that you want to delete this table.

5. Select No to cancel the command and return to the /Data External menu or select Yes to delete the table.

Sending driver-specific commands to the driver

Depending on the DataLens driver you are using, you may be able to send driver-specific commands directly to the DataLens driver or database management system. This section describes the type of commands you can send when using the dBASE IV, Paradox, and SQL Server drivers and the procedure you use to send these commands.

The driver-specific commands available

This section describes the type of driver-specific commands that are available with each driver.

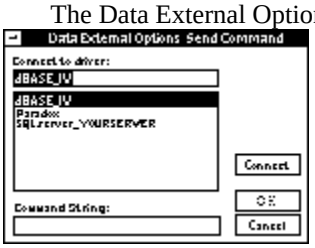
- When using the dBASE IV driver, you can send commands to tell the driver which index file or tag to use. For information about the specific commands you can use, see **"Using dBASE IV index files"**.
- When using the Paradox driver, you can send commands to encrypt and decrypt tables and to change the current password. For information about the specific commands you can use, see **"Table security"**.
- When using the SQL Server driver, you can send SQL commands directly to SQL Server. This is useful for submitting administrative commands and using SQL Server stored procedures. However, you cannot send commands directly to SQL Server that would result in SQL Server returning data to 1-2-3. For example, you cannot use SELECT or stored procedures that return data. To use a SQL command to return data from SQL Server, extract data into a SQL Server view, and perform a query on that view.

  When using SQL Server, you can also send driver and database configuration options to the driver to override the current settings for some of the options available in the DC parameter in the registration file. The configuration options you can override are $AT*b*, $CP*n*, $SD*n*, $TS*b*, and $OU*t*. For an explanation of these options, see your database administrator or **Appendix C**.

To send a driver-specific command

1. If you have not already done so, use Data Connect to External to connect to an external table in the database to which you want to send a command.
2. Choose Data External Options.
3. Select Send Command.

   The Data External Options Send Command dialog box displays the Connect to driver text box and list box:



4. Specify a driver name.

   Select a DataLens driver name from the list box or enter the driver name in the text box.

   The Connect to database text box and list box appear.
5. Specify the name of a database to which 1-2-3 is already connected.
6. In the Command String text box, enter the command you want to send.
7. Select OK.

Changing character sets

Some drivers let you use more than one character set. If a table was created with a character set other than the character set 1-2-3 is using, you may have to use /Data External Other Translate from the 1-2-3 Classic menu to change the character set in order to read all of the data from the table.

For information about the character sets that are supported by your driver, see "Supported character sets" for the **dBASE** driver, the **Paradox** driver, and the **SQL Server** driver.

To change a character set

1. If you have not already done so, use Data Connect to External to connect to an external table in the database whose character set you want to change.
2. Choose /Data External Other Translate from the 1-2-3 Classic menu.

   1-2-3 prompts you to enter the name of the database whose character set you want to change and displays the names of DataLens drivers.
3. Enter the name of the driver associated with the database whose character set you want to change.

   1-2-3 displays the names of databases.
4. Enter the name of the database for which you want to select a different character set.
5. Select the character set you want to use.

   Note The character set you select remains in use for all of the external tables in the external database you specified until you end the current work session or select another character set for that external database.

Using @INFO to get information from the driver or DBMS

When 1-2-3 receives an error from a DataLens driver or a DBMS, it displays a generic message, such as "External database processing error" or "Backend database error." You can use @INFO("dbdrivermessage") to display the actual message from the driver or DBMS, and you can use @INFO("dbreturncode") to display the number that corresponds to the most recent driver or SQL Server message. This information can be particularly helpful when using a macro.

When you query an external table, it is sometimes helpful to know the number of records that were processed during the query operation. To display the number of records that were processed during the last query operation, use @INFO("dbrecordcount").

Using 1-2-3 with case-sensitive servers (SQL Server driver only)

When you use 1-2-3 and the SQL Server driver to query a case-sensitive server, there are several rules you should follow:

- Make sure the case of field names you use in the 1-2-3 input, criteria, and output ranges matches the case of the corresponding field names in the SQL Server table you are querying. To see the case of field names in a SQL Server table, use Data External Options Paste Fields.
- If you use a field name in a formula in the criteria range or in a field heading for a computed column in the output range, be sure there is a column with that field name in the output range. For example, if you use the formula +PRICE>200 in the criteria range or +PRICE*2 as the heading for a computed column in the output range, be sure there is a column with the field name PRICE in the output range.
- Use aggregate formulas only when the field names in the external table are stored in uppercase. If the field names are not stored in uppercase and you want to generate a summary table, use Data What-if Table 1-Way.

Using macros for transaction control (SQL Server driver only)

When you use a macro to modify an external table, the database management system does not actually modify the table until the driver **commits** (finalizes) the modification transaction. The driver commits a transaction when any of the following occurs:

- The macro uses another command that modifies the external table.
- The macro ends.
- The macro uses the advanced macro command {COMMIT}.

Rolling back transactionsWhen a command is waiting to be committed, no one using a different program can access the table that the command modifies. If the macro uses Data External Options Disconnect or the connection to the external table is disconnected in some other way, the driver does not commit the command that is waiting but instead **rolls back** (deletes) the command.

To be sure macro transactions are committed, use {COMMIT} after each of the following commands, which do database inserts, deletes, and updates: Data Query Modify Replace, Data Query Modify Insert, Data Query Delete, and Data Query Extract when the external table is the output range.

{COMMIT} uses two optional arguments: {COMMIT "*drivername?*", "*databasename?*"}. If you use the optional arguments, the driver commits only the transaction pending for the driver and database you specify. Be sure to enclose the driver name and database name in " " (quotation marks). If you do not use the optional arguments, the driver commits all pending transactions.

Use the advanced macro command {ROLLBACK} to cancel a command in a macro that modifies an external table. To be effective, you must use {ROLLBACK} before the macro commits the command you want to rollback. {ROLLBACK} also uses two optional arguments: {ROLLBACK *drivername, databasename*}.

A For Administrators Using dBASE IV

Among the files that the 1-2-3 for Windows Install program transfers to the 1-2-3 program directory is the registration file, which is named LOTUS.BCF. The purpose of the registration file is to give 1-2-3 information about the DataLens drivers and databases you want to make available to your users. 1-2-3 uses the information in the registration file to browse and 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 when users select Data Connect to External or a Data External Options command and which parameters to use with those drivers. The registration file must include a driver record for each DataLens driver you want to make available to your users. **Database records** tell 1-2-3 which databases to list when users select Data Connect to External or a Data External Options command. Database records are optional.

This appendix describes the following:

- Driver records and the parameters you can include in a driver record
- The syntax of a driver record and a database record
- Database records and the parameters you can include in a database record

A For Administrators Using dBASE IV

Among the files that the 1-2-3 for Windows Install program transfers to the 1-2-3 program directory is the registration file, which is named LOTUS.BCF. The purpose of the registration file is to give 1-2-3 information about the DataLens drivers and databases you want to make available to your users. 1-2-3 uses the information in the registration file to browse and to connect to drivers and databases.

Driver recordThe registration file consists of driver records and database records. **Driver records** tell 1-2-3 which drivers to list when users select Data Connect to External or a Data External Options command and which parameters to use with those drivers. The registration file must include a driver record for each DataLens driver you want to make available to your users. **Database records** tell 1-2-3 which databases to list when users select Data Connect to External or a Data External Options command. Database records are optional.

This appendix describes the following:

- Driver records and the parameters you can include in a driver record
- The syntax of a driver record and a database record
- Database records and the parameters you can include in a database record

Driver records

When users use the 1-2-3 Install program to install the dBASE IV driver, the Install program automatically adds a driver record to the registration file to give users access to the dBASE IV driver. The driver record looks like this:

DN="dBASE_IV" DL="L1WDBASE"
DD="DataLens Driver for dBASE IV Tables, Release 1.0";

As the database administrator, you may want to change the parameters in a driver record in order to customize the driver for your users. You also may want to add records to the registration file in order to make additional drivers available to your users.

Driver record parameters

The registration file must contain at least one driver record. A driver record contains several parts, called **parameters**. This section shows the parameters you can use in a driver record.

The table below describes the parameters you can use when creating or editing a driver record for the dBASE IV driver. Two of the parameters are required.

Parameter	Required	Example	Description
DN=*"Drivername"*	Yes	DN="dBASE_IV"	DN identifies the record as a driver record and must be the first parameter in the record. *Drivername* is the name you want 1-2-3 to display when a user selects Data Connect to External or a Data External Options command that displays driver names. The driver name cannot include spaces, must be enclosed in " " (quotation marks), and can include up to 80 characters. This name must be unique for each driver record.
DL=*"DriverFilename"*	Yes	DL="L1WDBASE"	DL specifies the file name (without the extension) of the driver program (L1WDBASE for the dBASE IV driver). Enclose the name in " " (quotation marks). 1-2-3 requires the file to be in the 1-2-3 program directory.
DD=*"Driver Description"*	No	DD="DataLens Driver for dBASE IV Tables, Release 1.0?"	DD specifies a description of the driver. Use this parameter as annotation in the registration file. The driver description can include up to 80 characters. Enclose the description in " " (quotation marks).

Driver and database record syntax

This section describes the syntax rules for records in the registration file. Follow the rules below 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="dBASE_IV". Do not include a space before or after the = (equal sign).
- When using the DN, DL, and DD parameters, enclose the value of the parameter in " " (quotation marks), such as DL="L1WDBASE".

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.
- Enter driver and database records in the registration file in the order you want 1-2-3 to list driver and database names when it displays them.

Database records

Database records are optional. Database records tell 1-2-3 to list specific databases (directories) when a user selects Data Connect to External or a Data External Options command. If there are no database records, 1-2-3 displays the current directory only.

> **Note** When 1-2-3 displays the names of databases, it first displays the names of registered databases (databases that have a database record in the registration file) and then displays the name of the current directory. If the registration file contains a database record for the current directory, 1-2-3 displays the name of that directory twice.

Database record parameters

The table below describes the parameters you can use when creating or editing a database record for the dBASE IV driver. Two of the parameters are required.

Parameter	Required	Example	Description
DB=*"Databasename"*	Yes	DB="c:\personnel"	DB identifies the record as a database record and must be the first parameter in the record. *Databasename* specifies the database (path) name. Do not include spaces in the database name. The database name can include up to 80 characters. Enclose the name in " " (quotation marks).
DN=*"Drivername"*	Yes	DN="dBASE_IV"	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 the database record does not match the driver name in any driver record in the registration file, 1-2-3 ignores this database record.
DD=*"Database Description"*	No	DD="Employees throughout the world"	DD specifies a description of the database. Use this parameter as annotation in the registration file. The database description can include up to 80 characters. Enclose the description in " " (quotation marks).

A database record may look like the following:

```
DB="c:\personnel" DN="dBASE_IV"
DD="Employees throughout the world";
```

Database and driver communication and security

Keep in mind the following points concerning security and communication as you work with the dBASE IV driver:

- The dBASE IV driver works directly with dBASE IV tables. Users do not have to use dBASE IV to access tables.
- When a user deletes a table, the dBASE IV driver does not delete any associated files, such as forms, reports, and index files.
- When sharing files on a network, you can use 1-2-3 to write to a table only if no one else is using the table. However, multiple users can read the table concurrently.

  Note Most write operations in 1-2-3 are accomplished by using Data Query Modify Insert, Data Query Modify Replace, and Data Query Delete. Read operations are accomplished by using Data Query Extract and Data Query Modify Extract.
- If a dBASE IV table is read-only, users can read the data in the table but cannot write to the table, delete records in the table, or delete the table.
- You can use standard operating system commands or network security mechanisms to control user access to dBASE IV tables.

Creating 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, you can create and distribute one registration file for all users or each group of users.

B For Administrators Using Paradox

Among the files that the 1-2-3 for Windows Install program transfers to the 1-2-3 program directory is the registration file, which is named LOTUS.BCF. The purpose of the registration file is to give 1-2-3 information about the DataLens drivers and databases you want to make available to your users. 1-2-3 uses the information in the registration file to browse and 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 when users select Data Connect to External or a Data External Options command and which parameters to use with those drivers. The registration file must include a driver record for each DataLens driver you want to make available to your users. **Database records** tell 1-2-3 which databases to list when users select Data Connect to External or a Data External Options command. Database records are optional.

This appendix describes the following:

- Driver records and the parameters you can include in a driver record
- The syntax of a driver record and a database record
- Database records and the parameters you can include in a database record

B For Administrators Using Paradox

Among the files that the 1-2-3 for Windows Install program transfers to the 1-2-3 program directory is the registration file, which is named LOTUS.BCF. The purpose of the registration file is to give 1-2-3 information about the DataLens drivers and databases you want to make available to your users. 1-2-3 uses the information in the registration file to browse and 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 when users select Data Connect to External or a Data External Options command and which parameters to use with those drivers. The registration file must include a driver record for each DataLens driver you want to make available to your users. **Database records** tell 1-2-3 which databases to list when users select Data Connect to External or a Data External Options command. Database records are optional.

This appendix describes the following:

- Driver records and the parameters you can include in a driver record
- The syntax of a driver record and a database record
- Database records and the parameters you can include in a database record

Driver records

When users use the 1-2-3 Install program to install the Paradox driver, the Install program automatically adds a driver record to the registration file to give users access to the Paradox driver. The driver record looks like this:

DN="Paradox" DL="PARALENW"
DD="DataLens Driver for Paradox Tables, Release 2.0" AC=UI,PW
DC="*location of the network control file*";

> **Note** If your Paradox files are not on a network, the install program does not include the parameter DC="*location of the network control file*" in the registration file.

As the database administrator, you may want to change the parameters in a driver record in order to customize the driver for your users. You also may want to add records to the registration file in order to make additional drivers available to your users.

Driver record parameters

The registration file must contain at least one driver record. A driver record contains several parts, called **parameters**. This section shows the parameters you can use in a driver record.

The table below describes the parameters you can use when creating or editing a driver record for the Paradox driver. Two of the parameters are required (three if your Paradox files are on a network).

Parameter	Required	Example	Description
DN=*"Drivername"*	Yes	DN="Paradox"	DN identifies the record as a driver record and must be the first parameter in the record. *Drivername* is the name you want 1-2-3 to display when a user selects Data Connect to External or a Data External Options command that displays driver names. The driver name cannot include spaces, must be enclosed in " " (quotation marks), and can include up to 80 characters. This name must be unique for each driver record.
DL=*"DriverFilename"*	Yes	DL="PARALENW"	DL specifies the file name (without the extension) of the driver program (PARALENW for the Paradox driver). Enclose the name in " " (quotation marks). 1-2-3 requires the file to be in the 1-2-3 program directory.
DD=*"Driver Description"*	No	DD="DataLens Driver for Paradox Tables, Release 2.0"	DD specifies a description of the driver. Use this parameter as annotation in the registration file. The driver description can include up to 80 characters. Enclose the description in " " (quotation marks).
AC=UI,PW	No	AC=UI,PW	AC is the access control parameter. AC=UI causes 1-2-3 to prompt for a user ID when a user connects to a driver. The user ID identifies who is using a table when someone is denied access to the table. If a user does not enter a user ID when

			prompted, the driver uses the default ID, ParaLens. If you include PW in this parameter (AC=UI,PW), 1-2-3 also prompts for a password when a user connects to a driver.
DC=*"Driver Configuration Information"*	If Paradox files are on network	DC="P:\PDOXDATA" or DC="NOSHARE"	DC lists the path to the network control file, PARADOX.NET. If PARADOX.NET does not exist in the specified location, the driver creates PARADOX.NET. This parameter is required only if users will be accessing shared tables on a network drive. Enclose the path in " " (quotation marks). If you want to give a user access to files on the network without using the network control program, specify "NOSHARE" as the path in the DC parameter.

Driver and database record syntax

This section describes the syntax rules for records in the registration file. Follow the rules below 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="Paradox". 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="PARALENW".

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.
- Enter driver and database records in the registration file in the order you want 1-2-3 to list driver and database names when it displays them.

Database records

Database records are optional. Database records tell 1-2-3 to list specific databases (directories) when a user selects Data Connect to External or a Data External Options command. If there are no database records, 1-2-3 displays the current directory only.

Note When 1-2-3 displays the names of databases, it first displays the names of registered databases (databases that have a database record in the registration file) and then displays the name of the current directory. If the registration file contains a database record for the current directory, 1-2-3 displays the name of that directory twice.

Database record parameters

The table below describes the parameters you can use when creating or editing a database record for the Paradox driver. Two of the parameters are required.

Parameter	Required	Example	Description
DB=*"Databasename"*	Yes	DB="c:\personnel"	DB identifies the record as a database record and must be the first parameter in the record. *Databasename* specifies the database (path) name. Do not include spaces in the database name. Enclose the name in " " (quotation marks).
DN=*"Drivername"*	Yes	DN="Paradox"	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 the database record does not match the driver name in any driver record in the registration file, 1-2-3 ignores this database record.
DD=*"Database Description"*	No	DD="Employees throughout the world"	DD specifies a description of the database. Use the DD parameter as annotation in the registration file. The database description can include up to 80 characters. Enclose the description in " " (quotation marks).
AC=UI,PW	No	AC=UI,PW	AC is the access control parameter. AC=UI causes 1-2-3 to prompt for a user ID when a user connects to a driver. The user ID identifies who is using a table when someone is denied access to the table. If a user does not enter a user ID when prompted, the driver uses the default ID, ParaLens. If you include PW in this parameter (AC=UI,PW), 1-2-3 also prompts for a password.
DC=*"Driver Configuration Information"*	No	DC="P:\PDOXDATA" or DC="NOSHARE"	DC lists the path to the network control file, PARADOX.NET. Use this in the database record only if this database is on a network that is completely independent from a network control file that is already specified in the DC parameter of the driver record. If you want to give a user access to files on the network without using the network control program, specify "NOSHARE"

as the path in the DC parameter. You can also specify "NOSHARE" as the path to give the user access to a specific database on a local drive while also sharing other files on the network. Enclose the path in " " (quotation marks).

A database record may look like the following:

```
DB="c:\personnel" DN="Paradox"
DD="Employees throughout the world" AC=UI;
```

Database and driver communication and security

Keep in mind the following points concerning security and communication as you work with the Paradox driver:

- The Paradox driver works directly with Paradox tables. Users do not have to use Paradox to access the tables.
- When a user deletes a table, the Paradox driver also deletes the associated primary index (.PX) file, if it exists. The driver does not delete other associated files, such as forms, reports, scripts, or secondary index files.
- On a network, you can use 1-2-3 to write to a table only if no one else is using the table. However, multiple users can read a table concurrently. In addition, you can use 1-2-3 to read a table when someone is using Paradox to coedit the table.

  Note Most write operations in 1-2-3 are accomplished by using Data Query Modify Insert, Data Query Modify Replace, and Data Query Delete. Read operations are accomplished by using Data Query Extract and Data Query Modify Extract.
- To prevent users from accessing a Paradox table, encrypt the file from within Paradox or use Data External Options Send Command and send the ENCRYPT command to the driver. For more information about the ENCRYPT command, see **"Table security"** in Chapter 3.
- To let users read a table but prevent them from modifying or deleting the table, write-protect the table from within Paradox.

Creating 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, you can create and distribute one registration file for all users or each group of users.

Note The DC parameter in the driver record in the registration file lists the directory that contains the network control program. To use the same registration file, all network users must connect to the network using the same drive letter that is specified in the DC parameter. (You specify this letter when you first install 1-2-3 on the network.)

C For Administrators Using SQL Server

Among the files that the 1-2-3 for Windows Install program transfers to the 1-2-3 program directory is the registration file, which is named LOTUS.BCF. The purpose of the registration file is to give 1-2-3 information about the DataLens drivers and databases you want to make available to your users. 1-2-3 uses the information in the registration file to browse and 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 when users select Data Connect to External or a Data External Options command and which parameters to use with those drivers. The registration file must include a driver record for each DataLens driver you want to make available to your users. **Database records** tell 1-2-3 which databases to list when users select Data Connect to External or a Data External Options command. Database records are optional.

This appendix describes the following:

- Driver records and the parameters and configuration options you can include in a driver record
- The syntax of a driver record and a database record
- Database records and the parameters and configuration options you can include in a database record

C For Administrators Using SQL Server

Among the files that the 1-2-3 for Windows Install program transfers to the 1-2-3 program directory is the registration file, which is named LOTUS.BCF. The purpose of the registration file is to give 1-2-3 information about the DataLens drivers and databases you want to make available to your users. 1-2-3 uses the information in the registration file to browse and 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 when users select Data Connect to External or a Data External Options command and which parameters to use with those drivers. The registration file must include a driver record for each DataLens driver you want to make available to your users. **Database records** tell 1-2-3 which databases to list when users select Data Connect to External or a Data External Options command. Database records are optional.

This appendix describes the following:

- Driver records and the parameters and configuration options you can include in a driver record
- The syntax of a driver record and a database record
- Database records and the parameters and configuration options you can include in a database record

Driver records

When users use the 1-2-3 Install program to install the SQL Server driver, the Install program automatically adds a driver record to the registration file to give users access to SQL Server. The driver record looks like this:

DN="SQLserver_*servername*" DL="DLSMW"
DD="DataLens Driver for SQL Server, Release 1.1" AC=UI,PW DC="$CF SQLSDLW $SV LVASQLSW $OP*servername?*";

As the database administrator, you may want to change the parameters or options in a driver record in order to customize the driver for your users. You also may want to add records to the registration file in order to make additional drivers available to your users.

Driver record parameters

The registration file must contain at least one driver record. A driver record contains several parts, called **parameters**. This section shows the parameters you can use in a driver record.

The table below describes the parameters you can use when creating or editing a driver record for the SQL Server driver. Four of the parameters are required.

Parameter	Required	Example	Description
DN=*"Drivername"*	Yes	DN="SQLserver_YOURSERVER"	DN identifies the record as a driver record and must be the first parameter in the record. *Drivername* is the name you want 1-2-3 to display when a user selects Data Connect to External or a Data External Options command that displays driver names. The driver name cannot include spaces, must be enclosed in " " (quotation marks), and can be up to 80 characters long. This name must be unique for each driver record.
DL=*"DriverFilename"*	Yes	DL="DLSMW"	DL specifies the file name (without the extension) of the driver program (DLSMW for Release 1.1 of the SQL Server driver). Enclose the name in " " (quotation marks). The file must be in the 1-2-3 program directory.
DD=*"Driver Description"*	No	DD="DataLens Driver for SQL Server, Release 1.1"	DD specifies a description of the driver. Use this parameter as annotation in the registration file. The driver description can include up to 80 characters. Enclose the description in " " (quotation marks).
AC=UI,PW	Yes	AC=UI,PW	The access control parameter, AC=UI,PW, specifies that the user must enter a user ID and a password.
DC=*"Driver Configuration Information"*	Yes	DC="$CF SQLSDLW $SV LVASQLSW $OP YOURSERVER"	DC sends configuration information to the driver. Enclose the configuration information in " " (quotation marks). For a list of the options you can include in the DC parameter, see the table in "Driver configuration options," which follows.

Driver configuration options

The table below lists the options you can include as part of the driver configuration (DC) parameter.

Note The table indicates several types of arguments these options can use. The argument types are *b* (boolean -- 1 or 0), *n* (number), *t* (text), and *f* (file name).

Option	Required	Example (including delimiter)	Description
AT*b*	No	$AT1	The AT (all tables) option controls which tables 1-2-3 displays when users select Data Connect to External or a Data External Options command that prompts for a user name and then lists the tables in a database. If AT is set to the default (AT1), 1-2-3 displays all tables in the database. If AT is set to 0 (AT0), 1-2-3 displays only tables created with the user's owner name.
CF*f*	Yes	$CF SQLSDLW	CF (configuration file) specifies the name of the driver configuration file, which contains information about the character set the driver uses, as well as the names and locations of the message and template files. The message file contains messages, such as error messages, status messages, and application-specific options. The template file supplies the syntax SQL Server uses in formatting SQL Strings.
CP*n*	No	$CP437	CP (code page) specifies the code page of the data stored on the server. The default is 437 (Code Page 437).
OP*t*	Yes	$OP YOURSERVER	OP (open path) specifies the name of the file server on which SQL Server resides.
SB*n*	No	$SB3072	SB (statement buffer) specifies the size of the SQL statement buffer in bytes. The size of the buffer determines the maximum size of the SQL statement the driver can send to the server. The default is 3072, which is the maximum size. The minimum is 255.
SD*n*	No	$SD15	SD (significant digits) specifies the number of significant digits the SQL Server driver uses for conversion from 8-byte real numbers to strings. The default is 15. The other acceptable values are 14 and 16. The SD value can affect whether criteria in a 1-2-3 criteria range match real numbers in an external table.
SV*f*	Yes	$SV LVASQLSW	SV specifies the name of the system services library module.
TS*b*	No	$TS1	TS (timestamp) specifies whether to generate a timestamp field automatically when creating an external table. TS1 generates a timestamp field; TS0 does not. The default is TS1. Updates may not work on tables that do not contain timestamp fields because the driver may not be able to uniquely identify rows.

This section describes the syntax rules for records in the registration file and gives an example of a driver record for

the SQL Server driver.

When adding or editing records or parts of records in the registration file, follow the rules below.

Parameter syntax

- Use = (equal sign) to separate the parameter name from the value of the parameter, such as DN="SQLserver_YOURSERVER".
- When using the DN, DL, DC, and DD parameters, enclose the value of the parameter in " " (quotation marks), such as DL="DLSMW".

Configuration option syntax

- Precede each option in the DC parameter with a **delimiter**. The delimiter can be any character that does not appear in the command itself. The driver automatically considers the first character of any option statement to be the delimiter.
- Space between an option name and an option value is optional. For example, AT1 is the same as AT 1.

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 ; (semicolon). A record can wrap to several lines.
- Enter driver and database records in the registration file in the order you want 1-2-3 to list driver and database names when it displays them.

Example of a driver record

The following example shows the default driver record for the SQL Server driver. This driver record is created by the 1-2-3 Install program after it prompts the user for the name of the server on which SQL Server is installed. In this record, the name of the server is YOURSERVER. The delimiter in this record is $ (dollar sign), although you can use any delimiter you want. The tables that follow the example explain each parameter and configuration option in the record.

DN="SQLserver_YOURSERVER" DL="DLSMW" DD="DataLens Driver for SQL Server, Release 1.1" AC=UI,PW DC="$CF SQLSDLW $SV LVASQLSW $OP YOURSERVER";

Parameter	Description
DN="SQLserver_YOURSERVER"	Specifies "SQLserver_YOURSERVER" as the driver name. It is also the name 1-2-3 displays when users select Data Connect to External or a Data External Options command that displays driver names.
DL="DLSMW"	Identifies DLSMW as the name of the driver program.
DD="DataLens Driver for SQL.Server, Release 1.1"	Annotates the driver as being Release 1.1 of the DataLens driver for SQL Server.
AC=UI,PW	Tells the driver to prompt for both a user ID and a password.
DC="$CF SQLSDLW $SV LVASQLSW $OP YOURSERVER"	Consists of several parts, all of which are required. The parts are explained in the table below.

The table below explains each DC option in the default driver record.

DC option	Description
$CF SQLSDLW	Indicates that the name of the configuration file is SQLSDLW.
$SV LVASQLSW	Indicates that the name of the systems services file is LVASQLSW.
$OP YOURSERVER	Indicates the name of the server is YOURSERVER.

Database records

Database records are optional. Database records tell 1-2-3 to list specific databases when a user selects Data Connect to External or a Data External Options command. The SQL Server driver automatically browses for databases even if there are no database records in the registration file. You can add database records to the registration file to customize the options for a particular database rather than using the default options or the options you specified in the driver record.

> **Note** When 1-2-3 displays the names of databases, it first displays the names of registered databases (databases that have a database record in the registration file) and then displays the names of non-registered databases on the server.

Database record parameters

Similar to the driver record, the database record has several parameters. This section tells you the parameters you can use in a database record.

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

Parameter	Required	Example	Description
DB=*"Databasename"*	Yes	DB="personnel"	DB identifies the record as a database record and must be the first parameter in the record. *Databasename* must be the same as the name of the database on the server. Do not include spaces in the database name. The database name can include up to 80 characters. Enclose the name in " " (quotation marks).
DN=*"Drivername"*	Yes	DN="SQLserver_YOURSERVER"	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 the database record does not match the driver name in any driver record in the registration file, 1-2-3 ignores this database record.
DD=*"Database Description"*	No	DD="Employees throughout the world"	DD specifies a description of the database. Use this parameter as annotation in the registration file. The database description can include up to 80 characters. Enclose the description in " " (quotation marks).
DC=*"Database*	No	DC="$AT0	DC sends configuration information about

Configuration Information"	$OU BMARTIN $SB1000"	this database to the driver. Enclose the configuration information in " " (quotation marks). For a list of the options you can include in the DC parameter, see the table in "Database configuration options," which follows.

Database configuration options

The table below describes the options you can include as part of the database configuration (DC) parameter.

Note The table below indicates several types of arguments these options can use. The argument types are *b* (boolean -- 1 or 0), *n* (number), and *t* (text).

Option	Required	Example (including delimiter)	Description
AT*b*	No	$AT1	For the database specified by DB in this database record, overrides the AT setting in the driver record.
CP*n*	No	$CP437	CP (code page) specifies the code page of the data stored in the server. The default is 437 (Code Page 437).
OU*t*	No	$OU BMARTIN	OU overrides the AT option when displaying 1-2-3 tables for a database. When you enter an owner name in OU, 1-2-3 displays tables created with that owner name, as well as system tables.
SB*n*	No	$SB3072	For the database specified by DB in this database record, overrides the SB setting in the driver record.
SD*n*	No	$SD15	For the database specified by DB in this database record, overrides the SD setting in the driver record.
TS*b*	No	$TS1	For the database specified by DB in this database record, overrides the TS setting in the driver record.

Note You and your users can override many of the driver and database configuration options by using Data External Options Send Command and entering a new option. The options you can override are $AT*b*, $CP*n*, $SD*n*, $TS*b*, and $OU*t*. For details about sending commands to the driver, see **"Sending driver-specific commands to the driver"**.

Creating 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, you can create and distribute one registration file for all users or each group of users.

SQL Server net-library technology

The version of DB-Library™ included with the SQL Server driver has the capability of separating all network-specific code into a separate program file, called a Net-Library™ or **netlib.** Netlibs let you access SQL Server on various platforms. The netlib file included with 1-2-3 for Windows provides access to OS/2® SQL Server. To obtain netlibs for other platforms, such as UNIX® or VMS®, contact Sybase, Inc. at 1-800-8SYBASE.