Connecting to InterBase

Borland
SQL Link

Version 1.0

Borland International, Inc. 1800 Green Hills Road
P.O. Box 660001, Scotts Valley, CA 95067-0001

Borland International, Inc.

1800 Green Hills Road, P.O. Box 660001, Scotts Valley, CA 95067-0001

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Introduction

Borland SQL Link 1.0 enables you to access SQL data stored in an InterBase database using the same tools with which you now access non-SQL data. This product supports Borland Paradox or Quattro Pro for Windows versions which are licensed for use with SQL Link.

Note Quattro Pro users access SQL data with SQL Link using the Database Desktop (DBD.EXE), not the Quattro Pro product itself (QPW.EXE). Database Desktop, which provides a look and feel compatible with Paradox for Windows, is included on the Quattro Pro installation disks.

SQL Link enables you to access SQL data in one of two ways:

- If you are a Paradox for Windows or a Quattro Pro for Windows user, you can access SQL data by using Borland's Table View and QBE features. Paradox for Windows users can also use Borland's Form View feature and SQL Link's SQL Editor window.
- If you are familiar with Paradox ObjectPAL, you can access SQL data by writing ObjectPAL applications and embedding SQL statements. This provides full access to all of the features and functions of database servers, including stored procedures, triggers, and data dictionaries.

Where to find information

This manual describes how to install SQL Link, configure the SQL Link InterBase driver, and connect to an InterBase database. It also discusses aspects of database access that are unique to InterBase.

The manual is meant to be used with:

- *The Borland SQL Link User's Guide*
- *READIB.TXT* (the SQL README file for the SQL Link InterBase driver)
- Your InterBase server documentation
- Your Borland desktop product user documentation

The following table lists SQL Link topics and directs you to the corresponding manuals.

Topic	Where to find information
SQL Link installation prerequisites What happens during SQL Link installation Installing SQL Link Testing your SQL Link installation	*Connecting to InterBase*, Chapter 1
Configuring your Borland desktop product for use with SQL Link Managing aliases for SQL databases	*Connecting to InterBase*, Chapter 2

Topic	Where to find information
Connecting to the SQL server Troubleshooting connection problems Supported data types	*Connecting to InterBase*, Chapter 3
Aspects of using SQL Link that are unique for your SQL server	*Connecting to InterBase*, Chapter 3 Your server-specific README file

Terms and conventions

The SQL Link manuals use special typefaces to help you distinguish between keys you press, names of objects, menu commands, and text you type. The following table lists these conventions.

Convention	Applies To	Examples
Bold type	Method names, Database Desktop status messages and text that you type in	**insertRecord** Paradox displays the message **Index error on key field** Type **a:\install**
Italic type	Names of Database Desktop objects, glossary terms, variables, emphasized words	*Answer table*, *searchButton*, *searchVal*
ALL CAPS	DOS files and directories, reserved words, operators, types of queries	PARADOX.EXE, C:\WINDOWS, CREATE
Initial Caps	Applications, fields, menu commands	Sample application, Price field, Form | View Data command
Keycap Font	Keys on your computer's keyboard	*F1*, *Enter*
`Monospaced font`	Code examples, ObjectPAL code	`myTable.open("sites.db")`

The following table lists conventions used for ObjectPAL syntax.

ObjectPAL Convention	Element	Examples	Meaning
Normal font	Keyword	setPosition	Type exactly as shown.
Italic	Fill-in	tablevar	Replace with an expression.
{ | } (braces and bar)	Choice	{ Yes | No }	You *must* choose one of the elements separated by the vertical bar.
[ ] (brackets)	Optional	[, *tableVar2*] [ELSE]	You *can* choose whether or not to include this.
* (asterisk)	Repeat	[, *tableVar2*] *	You can repeat this argument.

Chapter

1

Installing SQL Link

This chapter describes how to install Borland SQL Link.

Once you install SQL Link at the client workstation, you are ready to configure your Borland desktop application to run with SQL Link, as described in Chapter 2.

Note Be sure you have already installed your SQL Link licensed Borland desktop product (either Paradox for Windows or Quattro Pro for Windows with Database Desktop), as described in your desktop product documentation.

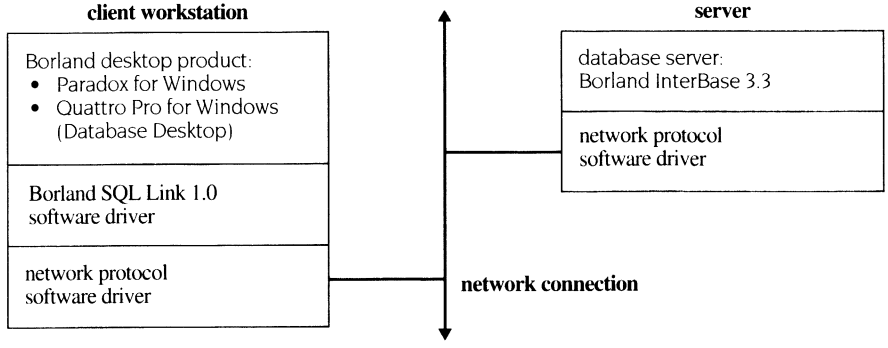
Before you begin

This section describes how to prepare for SQL Link installation.

Figure 1.1 illustrates all the software that must be installed and running before you install SQL Link. The subsections that follow list specific requirements for the servers and client workstations.

For information on network protocol software, network rights, and the server IP address, see your system administrator.

Figure 1.1 SQL Link for InterBase required components



Information you need

To perform the installation, you need to know:

- *The drive (or directory) from which you are installing SQL Link.* Usually this is drive A or drive B.
- *The directory where you want to store the SQL Link files.* The installation program normally installs the SQL Link files in the same directory with your desktop product ODAPI files. If your desktop product ODAPI files are stored in a directory other than C:\ODAPI, you need to know exactly where that directory is.
- *The directory where you want to store the InterBase message and log files.* The default directory is C:\INTERBAS.
- *Which of the following network software packages is used to access the database server:*
  - LAN WorkPlace for DOS from Novell, Inc.
  - PC/TCP Network Software for DOS from FTP Software, Inc.
  - PC-NFS for DOS from Sun Microsystems, Inc.

InterBase server requirements

Table 1.1 lists software that should already be installed and running at the InterBase server.

Table 1.1 Server software requirements

Category	Description
Database server software	InterBase version 3.3
Network protocol software	Network protocol software compatible with both the database server and the client workstation network protocol

Client workstation requirements

Table 1.2 lists software that should already be installed and running at the client workstation. It also lists related files and parameters.

Table 1.2 Client workstation requirements

Category	Description
Borland desktop product(s)	Supported Borland desktop product, installed as required by the product documentation
Hardware and operating system requirements	1.5 MB of free disk space 4 MB RAM (6MB recommended) Hardware and operating system that meets the requirements of your Borland desktop product
Access rights (for desktop products installed on the network server *only*)	If your Borland desktop product is installed on a network file server, make sure your network user account has Read and Write access rights to the product ODAPI installation directory. This directory is modified during SQL Link installation.

Table 1.2 Client workstation requirements (continued)

Category	Description
Network protocol software	Network protocol software compatible with both the server network protocol and the client workstation client database communication driver.
HOSTS file	A HOSTS file containing the name and IP address of each server that you plan to attach. This file must contain the name and IP address of at least one host. For example: `128.127.50.12 mis_server`
SERVICES file	A SERVICES file containing the protocol for InterBase server access. This file should contain at least the following line: `gds_db 3050/tcp`

Database access requirements

To access the SQL database, you need a valid user identification and password on the InterBase server. You also need at least read access privileges for the SQL database.

Your database administrator can help you obtain these privileges.

What happens during installation?

During installation, the SQL Link installation program:

- Installs the SQL Link files and the InterBase message file (INTERBAS.MSG).
- Installs an additional ODAPI driver that enables your Borland desktop product to access InterBase databases (SQLD_IB.DLL and supporting files).
- Adds a new option (INTRBASE) to the Alias Manager dialog box that reflects the presence of the new SQL Link driver.
- Adds new options to the ODAPI Configuration Utility.
- Installs the CONNECT utility allowing you to test your connection to InterBase.
- Installs a text file (READIB.TXT) containing information too recent to be included in the printed documentation.
- Copies the appropriate WINSOCK.DLL for either NFS or LAN WP, depending on what is specified during installation.

Note If you use FTP, your system administrator needs to contact your network vendor for the appropriate FTP window socket library.

Installing the software

To run the SQL Link INSTALL program:

1 Insert SQL Link Disk 1 in the client workstation external disk drive. (This is usually drive A or drive B.)

2 If Windows is not already running, but is in the workstation DOS PATH, enter **a:\install** at the workstation DOS prompt. The SQL Link Install procedure loads Windows and displays the initial dialog box.

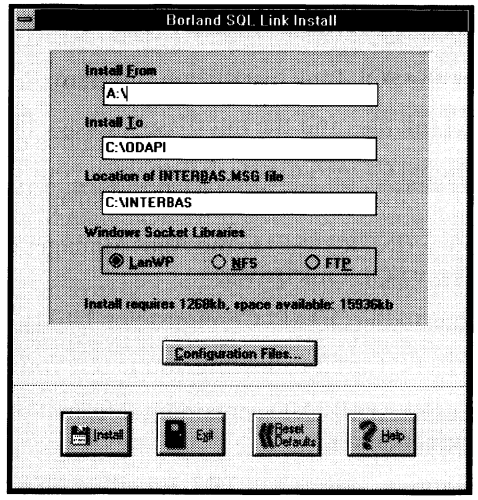
If Windows is already running:

1 Choose File | Run from the Program Manager menu bar. The Run dialog box appears.

2 Enter **a:\install** in the Command Line text box. The Borland SQL Link Install dialog box appears.

Note Drive A is shown in this example. If your SQL Link software is in Drive B, enter **b:\install**.

Figure 1.2 Borland SQL Link Install dialog box



3 Select a Windows Socket Library that matches the networking protocol through which you access the InterBase server.

4 Edit the other parameters in the Install dialog box as needed:

Parameter	When to edit
Install To	If you installed ODAPI files in a directory other than C:\ODAPI, enter the name of that directory in this text box.
Location of INTERBAS.MSG file	If you want to install the InterBase message file in a directory other than C:\INTERBAS, enter the name of that directory in this text box.
Configuration Files	If you installed ODAPI.CFG in a directory other than C:\ODAPI, choose the Configuration Files button. The Configuration Files dialog box appears. Enter the name of the directory for the new ODAPI.CFG, then choose OK. The program saves a backup copy of the existing ODAPI.CFG as ODAPICFG.BAK.

Note If you install INTERBAS.MSG in a directory other than C:\INTERBAS, you must set the INTERBASE environment variable in your AUTOEXEC.BAT file to reflect the new location. For example, if you install the InterBase message file in C:\MESSAGE, you need to add the following line to your AUTOEXEC.BAT file:

```
SET INTERBASE=C:\MESSAGE
```

The new variable takes effect as soon as you reboot the PC.

5 Choose Install to begin the installation.

When the installation is complete, the file READIB.TXT appears. Read this file to find out about late-breaking information.

Testing InterBase connection existence

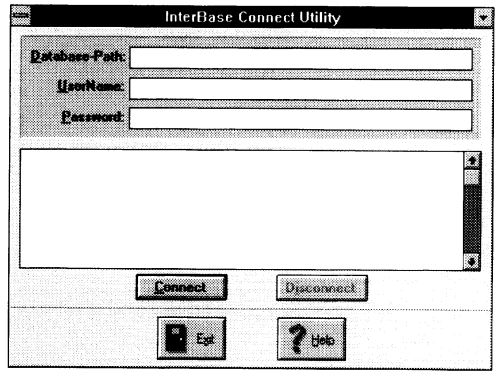
To test whether you can connect to InterBase successfully, use the InterBase CONNECT utility (CONNECT.EXE). The CONNECT utility is stored in the same directory as the ODAPI files.

1 Choose File | Run from the Program Manager menu bar. The Run dialog box appears.

2 In the Command Line text box, enter the command to run CONNECT. (If you installed ODAPI files in C:\ODAPI, the command is **c:\odapi\connect.exe**.)

3 Choose OK. The InterBase Connect Utility dialog box appears.

Figure 1.3 InterBase Connect Utility dialog box



4 Enter information in each text box:

Text box	Information required
Database Path	The path to an InterBase database, in the format: `serverName:/usr/databaseDirectory/databaseName.gdb` Be sure to use Unix-style forward-slash characters, and recall that Unix path names are case-sensitive.
User Name	A valid user name for the database you specified.
Password	A valid password for the user name you specified.

5 Choose Connect to test your network connection.

If the connection succeeds, a status message appears.

If the connection does not succeed, an error message appears. (For information on how to troubleshoot your installation, see Chapter 3.)

Chapter 2

Configuring your desktop product

When you install your Borland desktop product, you also install the ODAPI Configuration Utility (ODAPICFG.EXE). The Configuration Utility modifies a configuration file (ODAPI.CFG) that your desktop product reads at startup to determine various operating parameters. Both files are usually located in the directory you specify for ODAPI files during desktop product installation (normally C:\ODAPI).

This chapter describes how to configure your Borland desktop product for use with an SQL Link InterBase driver. It is recommended that you exit all other Borland desktop products before you begin to configure SQL Link.

Once you configure your desktop product you are ready to connect to the network and access InterBase, as described in Chapter 3.

Note Be sure you have already installed the SQL Link software as described in Chapter 1.

For general instructions on how to use the Configuration Utility, see your desktop product documentation.

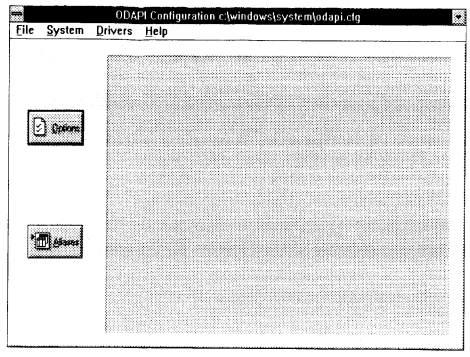
Specifying default InterBase driver settings

The first time you set up an InterBase alias, the configuration program uses the current driver settings. You must specify the default settings that match your installation before you create any aliases for InterBase databases.

To specify default InterBase driver settings:

1. Open your desktop product program group in the Windows Program Manager.
2. To start the ODAPI Configuration Utility, select the Configuration Utility icon. The ODAPI Configuration window appears.

Figure 2.1 ODAPI Configuration window

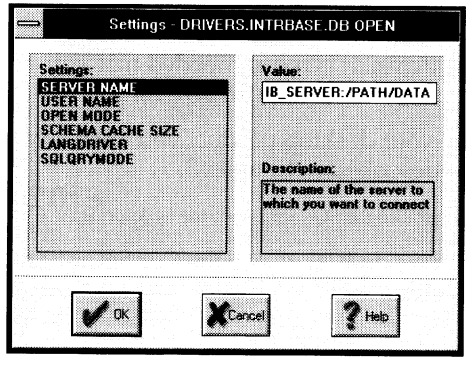


3 Select the Drivers | InterBase menu item. Two categories appear: "Init" and "Db Open".

Note Although it is possible to modify settings in the DB INIT category, it is not recommended.

4 Highlight the Db Open category. The Settings dialog box appears.

Figure 2.2 ODAPI.CFG Settings dialog box



5 Edit the Settings dialog box to reflect the category you selected. Table 2.1 describes the meaning of each setting.

Table 2.1 InterBase driver settings

Setting	Meaning
SERVER NAME	Default path name for an InterBase database server, written in the form: `IB_SERVER:/PATH/DATABASE.GDB`. Be sure to use Unix-style forward-slash characters (/) in the path names, and recall that Unix path names are case-sensitive.
USER NAME	Default InterBase server user name.
OPEN MODE	Default mode in which SQL Link opens the InterBase database. Possible values are `READ/WRITE` and `READ ONLY`.
SQLQRYMODE	Specifies the method for handling queries. For possible modes and their meanings, see Table 2.2. For further information see the *Borland SQL Link User's Guide*.

Table 2.1 InterBase driver settings (continued)

Setting	Meaning
SCHEMA CACHE SIZE	Default number of tables whose schema information will be cached. Possible values are 0 - 32. The default value is 8.
LANGDRIVER	Default language driver. For possible values see the short driver names in Table 2.3 at the end of this chapter.

Table 2.2 SQLQRYMODE settings

Setting	Mode	Meaning
NULL (blank setting)	Server-local	(Default mode) In server-local query mode, the query goes first to the InterBase server. If the server is unable to perform the query, the query is performed locally.
SERVER	Server-only	In server-only query mode, the query is sent to the InterBase server. If the server is unable to perform the query, no local processing is performed.
LOCAL	Local-only	In local-only query mode, the query is always performed locally.

6 When you finish, save your changes and exit the Configuration Utility.

Your changes take effect the next time you start your desktop product.

Managing aliases for InterBase databases

An *alias* is a name and a set of parameters that describe a network resource. Borland desktop products use aliases to connect with shared databases. Before you can access a database, you must first create its alias.

Setting up a standard alias consists of assigning a name to, and specifying the path name for, a directory containing Paradox or dBASE files. Setting up an alias for an SQL database consists of specifying such settings as:

- User name
- Server name
- Open mode
- Default SQL query mode
- Schema cache size
- Language driver

Once the SQL database alias is established, use it the same way you use a standard alias. (For more information on using aliases, see your desktop product documentation.)

The following subsections describe how to use the Configuration Utility to add, modify, and delete aliases.

Adding a new InterBase alias

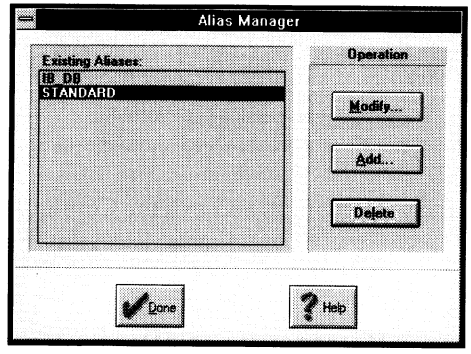
To add a new alias:

1 Open your desktop product program group in the Windows Program Manager.

2 To start the ODAPI Configuration Utility, select the Configuration Utility icon. The ODAPI Configuration window appears.

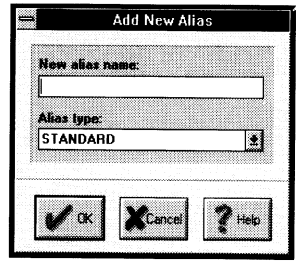
3 Select the Aliases button. The Alias Manager dialog box appears.

Figure 2.3 Alias Manager dialog box.



4 Select Add. The Add New Alias dialog box appears.

Figure 2.4 Add New Alias dialog box

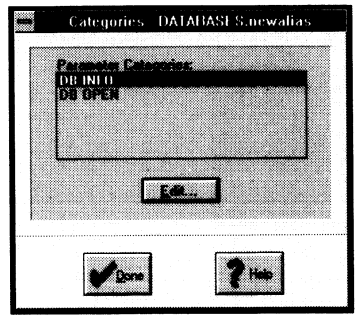


5 Enter the new alias name and select the INTRBASE alias type.

6 Choose OK to save the new alias name. The Configuration Manager displays the Categories dialog box.

Note Although it is possible to modify settings in the Init category, it is not recommended.

Figure 2.5 Categories dialog box



7 Highlight the DB OPEN category, then choose Edit. The Settings dialog box appears (see Figure 2.2, earlier in this chapter).

The Settings dialog box is the same one used to set up the default InterBase driver configuration.

8 Use the Settings dialog box to edit the settings for the category you selected. If you leave any categories blank, the default for driver type is used instead. For a description of each setting you can change, see Tables 2.1 and 2.2, earlier in this chapter.

9 When you are finished, choose Done.

Save your changes and exit the Configuration Utility. Your changes take effect the next time you start your desktop product.

Modifying an existing InterBase alias

To modify an existing alias:

1 Open your desktop product program group in the Windows Program Manager.

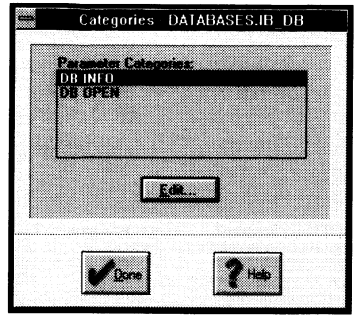
2 To start the ODAPI Configuration Utility, select the Configuration Utility icon. The ODAPI Configuration window appears.

3 Choose the Aliases button. This opens the Alias Manager dialog box.

4 Highlight the existing alias for which you want to modify the settings.

5 Choose Modify. The Categories dialog box appears.

Figure 2.6 Modifying an existing alias



6 Highlight the DB OPEN category and select Edit. The Settings dialog box appears (see Figure 2.2, earlier in this chapter).

The Settings dialog box is the same one used to set up the default InterBase driver configuration.

7 Use the Settings dialog box to edit the settings for the category you selected. If you leave any categories blank, the default for driver type is used instead. For a description of each setting you can change, see Tables 2.1 and 2.2, earlier in this chapter.

8 When you are finished, choose Done.

Save your changes and exit the Configuration Utility. Your changes take effect the next time you start your desktop product.

Deleting an InterBase alias

To delete an alias:

1 Open your desktop product program group in the Windows Program Manager.

2 To start the ODAPI Configuration Utility, select the Configuration Utility icon. The ODAPI Configuration window appears.

3 Choose the Aliases button to open the Alias Manager dialog box.

4 Highlight the existing alias you want to delete.

5 Choose Delete.

6 When you are finished, choose Done.

Save your changes and exit the Configuration Utility. Your changes take effect the next time you start your desktop product.

Borland language drivers

When a specific language driver is associated with a server alias, your desktop product uses this driver to manipulate all data that originates from the server. This includes all tables you view in Table View and all Answer tables that result from a query.

Note For further information about language drivers, see the *Borland SQL Link User's Guide*.

The following table lists language drivers available for use with InterBase and their corresponding InterBase subtypes. The language driver you choose must correspond to the InterBase subtype specified when defining text or varying fields in a relation. If an InterBase subtype is not specified, leave LANGDRIVER blank.

InterBase supports subtypes for different fields in the same relation. However, rules of a language driver you specify will apply to a relation as a whole. The result of a query on a relation containing fields of different subtypes may vary according to where it was processed. In such a case, set SQLQRYMODE to SERVER to produce consistent query results.

Table 2.3 Language driver names

Long driver name	Short driver name	InterBase subtype
Paradox "ascii"	ascii	0 (default),1,100,101
Borland DAN Latin-1	BLLT1DA0	139
DEU LATIN1	BLLT1DE0	144
ENG LATIN1	BLLT1UK0	152
ENU LATIN1	BLLT1US0	153
ESP LATIN1	BLLT1ES0	149
FIN LATIN1	BLLT1FI0	141
FRA LATIN1	BLLT1FR0	142
FRC LATIN1	BLLT1CA0	143
ISL LATIN1	BLLT1IS0	145
ITA LATIN1	BLLT1IT0	146
NLD LATIN1	BLLT1NL0	140
NOR LATIN1	BLLT1NO0	105
PTG LATIN1	BLLT1PT0	154
Paradox INTL	INTL	102
Pdox NORDAN4	NORDAN40	105
Pdox SWEDFIN	SWEDFIN	106
SVE LATIN1	BLLT1SV0	151

Chapter

3

Accessing InterBase

This chapter describes how to connect to an InterBase database and troubleshoot common problems. It also discusses various topics about using Borland SQL Link that are unique to InterBase.

Once you know how to access an InterBase database through SQL Link, you are ready to start using SQL Link to display and manipulate InterBase data described in the *SQL Link User's Guide*.

Note Be sure you have already configured SQL Link for use with your Borland desktop product as described in Chapter 2.

Connecting to InterBase

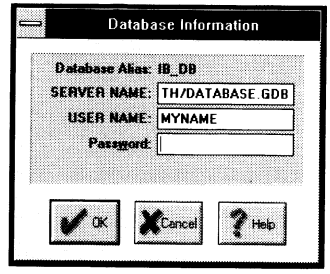
This section describes how to connect automatically or manually to an InterBase database.

Connecting automatically

Whenever you attempt an operation against a target InterBase database for the first time in a session (like opening a table or running a query), you trigger an automatic connection process. The object of this process is to determine whether you have the right to access the database, and, if so, what kind of access permission you have (read only or read/write).

As the first step in this process, SQL Link displays the Database Information dialog box.

Figure 3.1 Database Information dialog box



To complete the connection, enter your password.

If the connection is successful, your desktop product continues with the operation you requested. The database to which you connected remains connected for the rest of the current session.

If the connection fails, an error message is displayed.

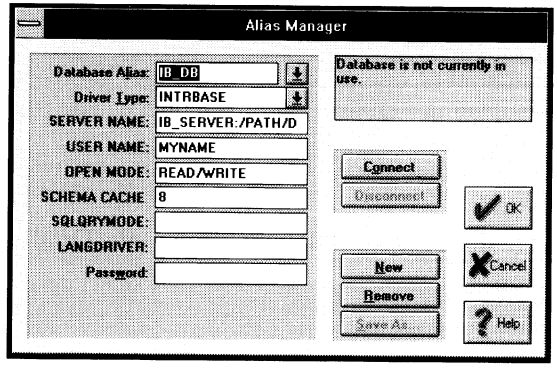
Connecting and disconnecting manually

If you ever want to connect to a database without first performing a database action, you can connect manually.

To connect manually:

1 Select the Files | Aliases menu item. The Alias Manager dialog box appears.

Figure 3.2 Alias Manager dialog box



2 Select the alias for the database to which you want to connect. If you need to change any settings, do so now. If the alias represents an InterBase database, the Alias Manager displays the Connect and Disconnect buttons and some additional text boxes.

1 To connect manually, enter your password and choose Connect. If the connection is successful, the database to which you connected remains connected for the remainder of the current session. If the connection fails, an error message appears.

2 To disconnect manually, enter your password and choose Disconnect.

Troubleshooting common connection problems

If you have problems establishing an InterBase connection with SQL Link, try to isolate the problem the following way:

1 Run the CONNECT utility to determine if you can connect to the InterBase server from your client workstation. (For detailed information, see "Testing InterBase connection existence ," in Chapter 1.)

If the CONNECT utility is successful, it returns the InterBase version ID of each link between your client workstation and the database.

If CONNECT is successful but you are unable to access your InterBase server database through your Borland desktop product, you may have installed SQL Link incorrectly. Reinstall SQL Link by following the procedures in Chapter 1.

Also, check the SERVICES file for the correct protocol for InterBase server access. The line should be similar to:

```
gds_db                  3050/tcp
```

2 If the CONNECT utility is unsuccessful, test the lower-level protocols:

Note The following steps require a TELNET program and a PING program. These DOS programs are not included in the SQL Link product package, but they are available from your TCP/IP network software vendor. (Your TCP/IP network software package may use different names for these programs.)

If you do not have these programs on your client workstation, ask your network administrator to perform these tests for you.

1 Enter the TELNET command to ensure that the TCP libraries are correctly installed.

If the TCP libraries are correctly installed, the `login:` prompt is displayed. Login to the network and check for the presence of the database you are trying to attach.

If the message `can't resolve hostname` is displayed, check your workstation HOSTS file to ensure that you have an entry for your host name and IP address. The entry looks similar to:

```
128.127.50.12          mis_server
```

If TELNET is successful and CONNECT is not, you may have a problem with your InterBase installation. See your database administrator for assistance.

2 PING the server to check that the InterBase server itself is running and visible to your desktop application. (If PING is successful, the message `servername is alive` is displayed.)

If PING is successful but the TELNET command is not, there may be a problem with the **inet** daemon.

If you cannot PING the server, you may have a routing problem. Report the problem to your network administrator.

Note If you don't have PING on your DOS client, you can PING the DOS client from the server node (if you have access to the server node). Ask your network administrator for instructions.

If you can successfully attach the database from the server node, but not from your DOS client, you may not have a login set in the security database, *isc.gdb*. See your database administrator for assistance.

Working with InterBase servers

This section provides information about InterBase servers and their implementation of SQL. The topics discussed in this section cover aspects of InterBase that differ from other SQL database products.

Table 3.1 lists the general items that you might find helpful in working with InterBase.

Table 3.1 General information about InterBase servers

Item	Description
Dynamic Link Library (DLL) name	SQL_IB.DLL
Case-sensitive for data?	Yes (including pattern matching)
Case-sensitive for objects (such as tables, columns, indexes)?	No
Does the server require an explicit **begin Transaction()** for multistatement transaction processing in ObjectPAL?	Yes
Does the server require that you explicitly start a transaction for multistatement transaction processing in pass-through SQL?	No
Implicit row IDs	No
Blob handles	InterBase blobs have handles. However, InterBase CHAR and VARCHAR columns that are more than 255 characters long are treated as non-handle blobs.
Maximum size of single blob read (if blob handles are not supported)	32K

InterBase data type translations

Certain database operations cause SQL Link to convert data from Paradox or dBASE format to InterBase format. For example, an ObjectPAL application that copies or appends data from a local Paradox table to an InterBase table causes SQL Link to convert the Paradox data to InterBase format before performing the copy or append operation.

Other database operations cause SQL Link to convert data from InterBase format to Paradox or dBASE format. For example, suppose you run a QBE (Query By Example) against one or more InterBase tables. During the query, SQL Link converts any data originating in an SQL database to Paradox or dBASE format (depending on the Answer Table Type specified in the Answer Table Properties dialog box) before placing the data in the local answer table.

Tables 3.2, 3.3, and 3.4 list InterBase, Paradox, and dBASE data types and show how SQL Link translates between them.

Table 3.2 InterBase to Paradox and dBASE data type translations

FROM: InterBase	TO: Paradox	TO: dBASE
SHORT	Short Number	Number 6.0
LONG	Number	Number 10.0
FLOAT	Number	Number 20.4
DOUBLE	Number	Number 20.4
DATE[1]	Date	Date
BLOB	Binary	Memo
CHAR(1-255)	Alphanumeric(n)	Character(n)[2]
CHAR(greater than 255)	Memo	Memo
VARYING(1-255)	Alphanumeric(n)	Character(n)[2]
VARYING(greater than 255)	Memo	Memo
ARRAY[3]	Binary	Memo

1. For example, from InterBase, QBE maps InterBase DATE to Paradox Date. Copy table maps InterBase DATE to Paradox Char(n).
2. dBASE character data type supports only 254 characters. If you exceed this limit your data will be truncated.
3. Although an InterBase ARRAY is mapped to Paradox and dBASE data types, the resulting fields appear to be empty when displayed within your client product.

Table 3.3 Paradox to InterBase and dBASE data type translations

FROM: Paradox	TO: InterBase	TO: dBASE
Alphanumeric(n)	VARYING(n)	Character(n)
Number	DOUBLE	Number 20.4
Currency	DOUBLE	Number 20.4
Date	DATE	Date
Short number	SHORT	Number 6.0
Memo	BLOB (Text)	Memo
Formatted memo	BLOB (Binary)	Memo
Binary	BLOB (Binary)	Memo
Graphic	BLOB (Binary)	Memo
OLE	BLOB (Binary)	Memo

Table 3.4 dBASE to InterBase and Paradox data type translations

FROM: dBASE	TO: InterBase	TO: Paradox
Character(n)	VARYING(n)	Alphanumeric(n)
Number Float number[1]	SHORT, DOUBLE	Short number, Number
Date	DATE	Date

Table 3.4 dBASE to InterBase and Paradox data type translations (continued)

FROM: dBASE	TO: InterBase	TO: Paradox
Logical	SHORT	Alphanumeric (1)
Memo	BLOB	Memo

1. dBASE data types Number and Float translate to different InterBase and Paradox data types depending on the WIDTH and DEC specification. dBASE Number and Float values with a WIDTH less than 5 and a DEC equal to 0 translate to InterBase SHORT or Paradox Short Number data types.

InterBase equivalents to standard SQL data types

When you use pass-through SQL commands to create or alter an InterBase table, you must use standard SQL data types. Table 3.5 lists standard SQL data types and their corresponding InterBase data types.

Table 3.5 SQL to InterBase data type translations

FROM: SQL	TO: InterBase
SMALLINT	SHORT
INTEGER	LONG
DATE	DATE
CHAR(n)	CHAR(n)
VARCHAR(n)	VARYING
DECIMAL	LONG
FLOAT	FLOAT
LONG FLOAT	DOUBLE
BLOB	BLOB

Note SQL does not support the InterBase ARRAY data type.

InterBase System Relations

InterBase includes a special set of tables called *system relations*. System relations describe privileges, indexes, SQL table structures, and other items that define relationships within a database. You can access system relations with pass-through SQL from your desktop product through the SQL Editor (see the "Advanced concepts" chapter of the *SQL Link User's Guide).*

Table 3.6 lists InterBase system relations you can access through SQL Link.

Table 3.6 Selected InterBase System Relations

Table name	Use
RDB$RELATIONS	Lists all tables and views
RDB$RELATION_FIELDS	Lists columns of tables and views
RDB$INDICES	Lists indexes

InterBase field-naming rules

Table 3.7 lists field-naming rules for Paradox, dBase, and InterBase.

Table 3.7 InterBase field-naming rules

Naming rule	Paradox	dBASE	InterBase
Max length (characters)	25	10	31
Valid characters[1]	All	All except punctuation marks, blank spaces, and other special characters	Letters, digits, $, or _
Must begin with...	Any valid character except space	A letter	Letters only (A-Z, a-z)

1. Paradox field names should not contain square brackets [], curly braces {}, pipes |, parentheses (), or the combination ->, or the symbol # alone.

Note You cannot use InterBase reserved words for table names. See the InterBase *Programmer's Reference* for a list of reserved words.

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