

# Database Server-Specific Notes for SQL Adapters



PAS supports the following database client libraries: DB2, Microsoft SQL Server, MySQL, MariaDB, Oracle and SQLite. If you want to use other database systems, please contact the [PAS support team](#).

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## DB2

You can use any valid DB2 connection string, which is either a catalog database alias or the database name. The catalog database stores database location information in the system database directory.

## MySQL

Use one of the following formats for the database connection string:

- `""` or `"@"`: Empty string or '@' character, connects to a local server.
- `<database name>` or `@ <database name>`: Connects to a database with the specified name on local server.
- `<server name>@`: Connects to the specified server.
- `<server name>@<database name>`: Connects to a database with the specified name on the specified server.

`<server name>` can have the following formats:

- `host name[,port]`
- path name of the Unix socket that is used to connect to the server

## SQL Server

Use one of the following formats for the database connection string:

- `""` or `"@"`: Empty string or '@' character: Connects to a default database on a local server.
- `<database name>` or `@ <database name>`: Connects to a database with the specified name on your local server.
- `<server name>@`: Connects to a default database on the specified server.
- `<server name>@<database name>`: Connects to a database with the specified name on the specified server.

To connect to a named instance of SQL Server 2000 use `<server name\instance name>` instead of `<kloserver name>`: `<server name\instance name>@<database name>`.

## SQLite

Using SQLite as DBMS, you can reference a database file located in the file system (e.g. `C:\temp\db.sqlite`). Holding the database in memory only, without creating a database file, is not possible.

When creating an SQL alias, you can use attribute [options](#) to set the following SQLite specific options:

- `BusyTimeout=<time in milliseconds>`. The default is 60000 milliseconds. Used to avoid some [well known problems](#).
- SQLite PRAGMA statements: Used mainly for performance tuning. Insert PRAGMA statements as a comma-separated list. [Details see below](#).

## SQLite Pragma Statements

The [SQLite PRAGMA statement](#) is an SQL extension specific to SQLite and used to modify the behavior of the SQLite database. The syntax is `sqlite_pragma_<pragma_name>=<pragma_value>`.

The main use case is performance tuning. For example, the following PRAGMA options speed up inserting data (but also reduce data safety):

```
sqlite_pragma_synchronous=OFF, sqlite_pragma_temp_store=MEMORY,  
sqlite_pragma_journal_mode=TRUNCATE
```

- `sqlite_pragma_synchronous=OFF`: Disable wait for writes to complete (may increase performance by factor 50). Potential of database corruption on power failure.
- `sqlite_pragma_temp_store=MEMORY`: Store temporary tables to memory.
- `sqlite_pragma_journal_mode=TRUNCATE`: The TRUNCATE journaling mode commits transactions by truncating the rollback journal to zero-length instead of deleting it.

## Known Problems Using SQLite

Using the SQL Adapter with SQLite database, you may get the following error:

```
[SQLSM][6][Error Message: 5 "database is locked". SQL Statement: ...]
```

This occurs, if multiple threads or processes want to read/write the SQLite database simultaneously. In case of concurrent writes, one write will fail. The xUML Runtime will retry to execute the write for 60 seconds. After the time-out, the message above is written to the bridgeserver log.

There are two possible approaches to solve this conflict (they may also be combined):

- Add value `BusyTimeout=<time in milliseconds>` to attribute [options](#) of the SQL alias. Default is 60000 milliseconds. **Increase this value.**
- Re-model the service to have short database transactions (including select) and add explicit commits to unlock the database frequently.