

# Natural

## Database Management System Interfaces

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This document applies to Natural Version 9.3.2 and all subsequent releases.

Specifications contained herein are subject to change and these changes will be reported in subsequent release notes or new editions.

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## Database Management System Interfaces

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This documentation provides an overview of the Natural database management system interfaces and a short summary of their functions.

The following topics are covered:

<a href="#">Natural and Adabas Access</a>	This document describes how to prepare Natural for its use with Adabas under Windows and Linux.
<a href="#">Natural and Entire Access</a>	This document describes how to prepare Natural for its use with Software AG's Entire Access under Windows and Linux.
<a href="#">Natural for Tamino</a>	The Natural interface to Tamino enables Natural users to access data in a Tamino database.



**Note:** See also *Database Access* (in the *Programming Guide*) on how to access data in Adabas.

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# 1 About this Documentation

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## Document Conventions

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Convention	Description
<b>Bold</b>	Identifies elements on a screen.
Monospace font	Identifies service names and locations in the format <i>folder.subfolder.service</i> , APIs, Java classes, methods, properties.
<i>Italic</i>	Identifies:  Variables for which you must supply values specific to your own situation or environment. New terms the first time they occur in the text. References to other documentation sources.
Monospace font	Identifies:  Text you must type in. Messages displayed by the system. Program code.
{ }	Indicates a set of choices from which you must choose one. Type only the information inside the curly braces. Do not type the { } symbols.
	Separates two mutually exclusive choices in a syntax line. Type one of these choices. Do not type the   symbol.
[ ]	Indicates one or more options. Type only the information inside the square brackets. Do not type the [ ] symbols.
...	Indicates that you can type multiple options of the same type. Type only the information. Do not type the ellipsis (...).

## Online Information and Support

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### Product Training

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- Ask questions and find answers in our discussion forums.
- Get the latest Software GmbH news and announcements.
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- Download products, updates and fixes.
- Search the Knowledge Center for technical information and tips.
- Subscribe to early warnings and critical alerts.
- Open and update support incidents.
- Add product feature requests.

## Data Protection

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Software AG products provide functionality with respect to processing of personal data according to the EU General Data Protection Regulation (GDPR). Where applicable, appropriate steps are documented in the respective administration documentation.

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# 2 Natural and Adabas Access

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This document describes how to prepare Natural in order to use it with Adabas.

## Adabas ADALNK Access

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The Adabas ADALNK access method is the classic access method based on IPC communication.

The database can either be accessed locally or remote via Entire Net-Work. The ADALNK method is used, when no specific connect string is provided in the parameter section of an Adabas DBID in the global configuration file and hence the ADALNK method is the default method.

## Adabas ADATCP Access

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If you want to use the ADATCP access method for connecting an Adabas database there are some prerequisites:

- Your Adabas version must support the ADATCP access method.
- The Adabas database to be accessed must have been enabled for ADATCP.

Please refer to your *Adabas* documentation and especially to the section *Adabas Remote Database Access* for further details about how to setup your databases correctly.

In order to access such an ADATCP-enabled Adabas database you need to add a connect string for some Adabas DBID in the parameter section of the Natural global configuration file.

### » To access an ADATCP-enabled Adabas database

- 1 Invoke the Natural Configuration Utility (NATPARM).
- 2 Select **Natural Configuration Files > Global Configuration File > Database Management System Assignments > DBMS Assignments**.
- 3 Select the DBID you want to enable for ADATCP access and assure that the type is set to ADA or ADA2.
- 4 In the parameter section, enter the connect string in a format like `adatcp://<fqdn>:<port>` where `<fqdn>` is the fully qualified domain name of the server hosting your database and `<port>` is the port number which has been defined for that database's ADATCP listener.

For a complete description of the connect string syntax, please refer to the section *Adabas Remote Database Access* in the *Adabas* documentation again.

- 5 Save the global configuration file.

From now on, all requests for that specific Adabas database are performed via ADATCP. Please note, that it is not necessary to recatalog your Natural application to use ADATCP. And of course, you can access one DBID via ADATCP and some other DBID via ADALNK at the same time.



**Note:** Because the ADATCP interface only supports Adabas calls in ACBX format, all other database calls in ACB format are automatically converted to ACBX before being sent and converted back to ACB when being returned to Natural.



# 3 Natural and Entire Access

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This document describes how to prepare Natural for its use with Software AG's Entire Access.

## Purpose of Entire Access

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Via Entire Access, Natural applications can transparently access multiple relational database management systems (RDBMSs), in both client-server and single-platform environments.

Entire Access has been designed to provide a common SQL-compliant application programming interface (API) for both local and remote database access. It represents a client-server solution for Software AG's database systems Adabas SQL Server and Adabas, as well as for various third-party products, for example, ODBC-compliant databases under Windows.

With Entire Access, a Natural user can access data in a relational database. In general, there is no difference between using Natural with Entire Access and using Natural with Adabas. Entire Access supports Natural DML and SQL statements which can both be used from within *one* Natural program accessing *multiple* database systems.

Natural converts Natural native DML and Natural SQL statements within Natural applications into calls to Entire Access, which performs the required data format translations and transfers these requests to the underlying database system via the appropriate database driver.

All operations requiring interaction with the database are performed by Entire Access. It supports local and/or remote databases and contains a series of database drivers, one for each supported RDBMS, so that multiple heterogeneous RDBMSs can be accessed concurrently from within the same Natural application.

For remote access, the transport media for SQL data are provided by Entire Net-Work, which establishes the communication link, or by TCP/IP.

## Configuring Entire Access

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- [Modifying the Global Configuration File](#)
- [Connecting Databases](#)
- [Making Entire Access Operational](#)
- [Accessing Database Tables - the Natural DDM](#)

Under Windows, Entire Access can be used to access either local ODBC-compliant databases and/or remote databases on Windows and Linux hosts.



**Note:** If you want to access remote databases, you also have to install and use the Entire Access server component on the host platform; for further information and prerequisites, see the Installation chapter of the Entire Access documentation.

To be able to use Entire Access, you have to modify your global configuration file, establish a connection to the database(s) to be used, create database tables with the appropriate database tools, and generate a Natural data definition module (DDM) for each database table to be accessed by a Natural program.

## Modifying the Global Configuration File

To be able to work with Entire Access, you have to modify the global configuration file (default name: NATCONF.CFG) as follows:

### ➤ To modify the global configuration file

- 1 Invoke the Natural Configuration Utility.

The Natural Parameter Setting window appears with the name of the parameter file currently active or edited displayed in the title bar.

- 2 Select the path `Global Configuration File / DBMS Assignments` in the tree view.

A dialog appears in which you have to specify the `DBID` parameter.

For all SQL databases that can be accessed via Entire Access, you always specify the same DBMS type: `SQL`.

Via the `DBMS` parameter, you must then establish the connection to the actual database as described in the following section.



**Note:** For each database you want to be accessed by Entire Access, you must repeat the specification of the corresponding `DBID` and `DBMS` parameter.

- 3 Save the updated global configuration file.

## Connecting Databases

The connection to the database(s) you want to work with must be established only once for each database. Subsequently, you merely have to log on to Natural and the database connection(s) will be established automatically.

Entire Access can support up to 7 different database drivers. Since the database drivers are reentrant, you can establish multiple separate connections to the same driver via a so-called database connect string.

### Database Connect String

The database connect string represents the DBMS parameter you or your system administrator must specify with the Natural **Configuration Utility** during the modification of your global configuration file. It consists of the following syntax:

```
dbms:[db-name][@server-number:host-name!driver]
```

Syntax Element Description:

Syntax Element	Description
<i>dbms</i>	<p><i>dbms</i> is mandatory and specifies any supported driver; currently the following drivers are supported under Windows:</p> <p><b>For ODBC-compliant databases:</b></p> <p>ODBC for local and remote ODBC-compliant data sources.</p> <p><b>For remote database access:</b></p> <p>For remote access, you have to connect the Entire Access network component by specifying NET; see the Entire Access documentation for further information.</p>
<i>db-name</i>	<p><b>For ODBC-compliant databases:</b></p> <p><i>db-name</i> is mandatory and represents the name of your data source as it was defined to the ODBC Administrator.</p> <p><b>Note:</b> The name of the data source is case-sensitive and must not contain any blanks.</p> <p><b>For remote databases:</b></p> <p><i>db-name</i> is the name of your database if your database system requires a name; if not, it must be omitted. See the Entire Access documentation for further information.</p>
<i>server-number</i>	<p><i>server-number</i> is required for remote access only; see the Entire Access documentation for further information.</p>
<i>host-name</i>	<p><i>host-name</i> is required for remote access only; see the Entire Access documentation for further information.</p>
<i>driver</i>	<p><i>driver</i> specifies the database driver to be used; see the Entire Access documentation for further information.</p>

### Sample ODBC Connect String

To connect to an ODBC-compliant database with a data source called "sample", specify:

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ODBC: *sample*

## Making Entire Access Operational

Now Entire Access is connected to the database(s) to be accessed. The user ID of the default administrator is `sag`.

### ➤ To make Entire Access operational

- 1 Start your local ODBC-compliant database(s) in the usual way; for remote databases, refer to the Entire Access documentation.
- 2 Start Natural.

Entire Access can now be used and you can start a Natural session as usual.

## Accessing Database Tables - the Natural DDM

To be able to work with Entire Access, you must create database tables or views using the appropriate tools provided by your database system(s).

To be able to access a relational database table or view with a Natural program, you must then generate a Natural data definition module (DDM) for the defined database table or view.

The DDM name must match the name of the corresponding table or view. Thus, you can create only one DDM for each table or view. It is recommended that the DDM name include the name of the table creator (owner) separated by a hyphen. The DBID in the DDM must correspond to the DBID assigned by the Natural Configuration Utility.

Once a DDM has been defined for a relational table or view, it is possible to access the data stored in this table or view by using a Natural program.

Entire Access translates the statements of a Natural program into SQL statements. It automatically provides for the preparation and execution of each statement.

In addition to the Natural native DML statements, Natural provides Natural SQL statements, which are described in the Natural *Statements* documentation; for further information, see also the Entire Access documentation.

For a description of how to create DDMs from relational database tables, refer to the section *Creating DDMs* in the Natural *Editors* documentation.



# 4 Natural for Tamino

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- Authorization Aspects ..... 17

This document describes how to prepare Natural in order to use it with Tamino.

## Preparing Tamino

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Natural accesses Tamino through HTTP requests. Therefore, Tamino must be set up with an HTTP server component as a connection to the X-Machine. This can be configured during the Tamino installation. See the Tamino *Installation* documentation for more details.

### Prerequisites:

See also *Database Access with Natural for Tamino* (in the *Natural Programming Guide*).

## Configuring Natural for Tamino Access

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Configuring Natural in order to be able to access a Tamino database involves three important steps:

- Defining a new DBID.
- Defining the DBMS type “XML” for this DBID.
- Introducing a new parameter string for this DBID.

To be able to work with Natural for Tamino, you must modify the global configuration file.

### ➤ To modify the global configuration file

- 1 Invoke the Natural Configuration Utility.
- 2 Edit by selecting the path `Global Configuration File/DMBS Assignments` in the tree view. A dialog appears in which you must specify the `DBID` parameter.
- 3 Enter a new DBID under which you want to access the Tamino database in the **DBID** column. Valid DBIDs for Tamino access are from 1 to 65535.
- 4 Select the type `XML` in the **Type** column.
- 5 Enter a valid parameter string in the **Parameter** column. See the section [Parameter Strings for Tamino Access](#) for more information.
- 6 Save the global configuration file.

## Parameter Strings for Tamino Access

The parameter string for a Tamino database consists of the URL of the database server, the name of the database itself and the name of the collection which is to be accessed within this database.

This following is an example of a generic parameter string:

```
http://<hostaddress>/tamino/<dbname>/<collectionname>
```

Parameter Description:

Parameter	Description
<i>hostaddress</i>	The <i>hostaddress</i> is the address of the machine running the web server which communicates with Tamino.
tamino	The keyword <i>tamino</i> is used by the web server as an identifier to open a connection with Tamino.
<i>dbname</i>	The <i>dbname</i> is the name of your existing database on the Tamino database server.
<i>collectionname</i>	<p>The <i>collectionname</i> is the name of the collection within this database to be accessed from your Natural application.</p> <p>All database accesses are based on collection granularity and not on complete databases. If you want to access a different collection within the same database, you will have to add a separate DBID entry for this in the NATCONF.CFG, as described above.</p> <p>For more information on collections, see the <i>DDM Editor</i> .</p>

### Sample Parameter String

The following is an example of a valid XML database parameter string:

```
http://taminohost.xyz.com/tamino/employeedb/NATDemoData
```

## Authorization Aspects

Natural for Tamino supports the following methods of authorization as provided by Tamino:

- Non-authenticated authorization.
- Authorization using web server authentication.
- Authorization using the internal Tamino authentication.

For a detailed description of the authorization methods refer to the Tamino documentation.

If authorization is necessary, Natural for Tamino will ask for the required user and password combination. Alternatively, the user and password data can be provided in environment variables:

- The variables `XML_HTTP_USER` and `XML_HTTP_PASSWORD` are used for web server authentication.
- The variables `XML_DB_USER` and `XML_DB_PASSWORD` are used for the internal Tamino authentication.

Alternatively, the user and password data can be provided in the table **XML Authorization** in the global configuration file. Here a DBID specific setting is possible. Please refer to the *Configuration Utility* documentation.

When using the environment variables for authorization, each connection to a Tamino database will be established with the same pair of user and password. If different users and passwords should be provided for different DBIDs then the usage of the **XML Authorization** table in the global configuration file or the interactive prompting are recommended.