

DBEngine (Version 2.0)
Custom Control Reference Guide

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Table of Contents

Introduction	3
DBEngine Custom Control Reference	5
Appendix - DBEngine / Paradox Engine Error Codes	42

Introduction

What is the DBEngine?

The DBEngine product is a Microsoft Windows compatible Custom Control (DBENG2.VBX) designed to provide Visual Basic and Visual C++ programmers with a sophisticated, yet easy-to-use tool for building database management applications. Using the DBEngine, Visual Basic and Visual C++ programmers can build sophisticated multi-user, network compatible database management applications and distribute the DBENG2.VBX (DBENG2R.VBX renamed as DBENG2.VBX) file with those applications on an unlimited, royalty-free basis. The DBEngine product presents the Visual Basic and Visual C++ programmer with a simple, easy-to-use interface to Borland International's Paradox Engine. The Paradox Engine is a complete multi-user, network compatible API written in the C programming language. The DBEngine product is a visual Custom Control interface to the Paradox Engine specifically designed for Visual Basic and Visual C++ programmers. DBEngine (version 2.0) is compatible with:

- + Microsoft Windows 3.X.
- + Microsoft Visual Basic 1.0, 2.0 and 3.0.
- + Microsoft Visual C++ 1.0.

The DBEngine (version 2.0) custom control product is shipped with two versions of the .VBX file:

- 1.) DBENG2.VBX (This is the DBEngine custom control for application development.)
- 2.) DBENG2R.VBX (This is the royalty-free runtime DBEngine custom control to be distributed with your completed applications. Just rename the file to DBENG2.VBX with your distribution disks.)

This documentation describes the DBEngine (2.0) custom control. It is the official reference documentation for the DBEngine (2.0) custom control. For information on programming and the DBEngine custom control (example programs, etc. please see the **DBEngine Programmer's Guide** (Visual Basic and/or Visual C++ edition.)

Douglas A. Bebbler
June 6, 1993

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PARADOX is a registered trademark of Borland International.
PARADOX Engine is a registered trademark of Borland International.

DBEngine was written in Borland C++ (version 3.0) by Douglas A. Bebbber. Address inquiries and bug reports (preferably Dr. Watson along with a listing of the suspected code) to

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Testing

This release of the DBEngine custom control (version 2.0) has been tested on a variety of 286, 386, and 486 machines. It has been tested on machines connected to Novell and Lantastic LANs. If you discover any bugs or problems, I would appreciate a Dr. Watson UAE (General Protection Fault) report sent to my Internet address. Please describe your operating environment in detail and include a listing of your CONFIG.SYS and WIN.INI files.

Note: DBEngine based programs will not be able to execute properly if the **PXENGWIN.DLL** file is not in a directory included in your MSDOS PATH statement (WINDOWS\SYSTEM is recommended). You must also have **SHARE.EXE** loaded to properly run the database engine environment. Version 2.0 will run with the Paradox Engine 2.X or 3.X version of (**PXENGWIN.DLL**).

Note: DBEngine will only execute in Windows Standard and 386 Enhanced modes.

Compatability and New Releases

The DBEngine (version 2.0) is compatible with Borland International's Paradox Engine version 2.X.

Technical Support

Registered users of the DBEngine product can get free product technical support by calling (309) 786-9602 Monday - Friday 8 A.M. - 6 P.M. CST. Before calling for technical support have your serial number handy.

Correspondence with the Douglas A. Bebbber can be done via CompuServe. Direct all correspondence to User ID: 72123,3661.

Correspondence with the Douglas A. Bebbler can be done via America Online. Direct all correspondence to user DBTech.

How to Register

You can obtain a registered version of the DBEngine 3.0 Custom Control for \$49.00 plus shipping and handling costs. For more information contact:

Douglas A. Bebbler
1834 37th Street
Rock Island, Illinois 61201
(309) 786-9602

DBEngine Custom Control

DBEngine

Description

DBEngine objects provide Visual Basic and Visual C++ programmers with the ability to interface with database files and the information present in them.

File Name

DBENG2.VBX

Object Type

DBEngine

Remarks

The DBEngine custom control is used to interface Visual Basic and Visual C++ to database tables (files). Using this custom control Visual Basic and Visual C++ programmers have access to multi-user, network compatible database resources.

The control has a few standard properties along with several DBEngine specific properties. Since this control has been designed primarily to support Visual Basic and Visual C++ programmers through code, there are no special "Visual" properties or elements in the DBEngine custom control. As a matter of fact, the custom control itself is intended to be invisible at run-time.

You are able to interactively manipulate database tables at design time with the DBEngine control. Examples detailing how to interact with the DBEngine custom control in design mode are present in the DBEngine 2.0 Custom Control Programmer's Guide - Visual Basic Edition. (You may wish to practice DBEngine operations at design time to get familiar with the control.)

Before you are able to manipulate database tables those tables must already exist. The VBENGINE DATABASE TABLE MAKER utility program (distributed as shareware) allows you to create PARADOX tables (those used with the DBEngine custom control) interactively. **With the DBEngine (version 2.0) custom control, you are now able to create Paradox tables in**

design mode as well as through code using the CreateTable Action.

Distribution Note

When you create and distribute applications which use the DBEngine custom control you should install the files DBENG2R.VBX (renamed as DBENG201.VBX) and PXENGWIN.DLL in the customer's Microsoft Windows \SYSTEM subdirectory.

Note: The DBENG2R.VBX Custom Control is available only to registered users. Application prototypes completed with the pre-registration evaluation control are not directly compatible with the release version of the control. Registered users are provided with translation procedures to port pre-registration evaluation prototypes to the registered release of the DBEngine Custom Control.

Properties

The properties for this control are listed below. Properties that apply only to this control are marked with an asterisk.

*Action	*KeySearch	*RecordLocked	*TableName
*FieldBlank	Left	*RecordNumber	*TableProtected
*FieldName	Name	*SaveEveryChange	Tag
*FieldNumber	*NFields	*SearchMode	Top
*FieldType	*NKeyFields	*TableChanged	Visible
*FieldValue	*NRecords	*TableFieldNames	
*IndexID	*OtherTable	*TableFieldTypes	
*IndexNFields	*Password	*TableFound	
*IndexType	*Reaction	*TableLockType	

Action

Description

All database operations such as opening a database file, getting a record, getting a value from a field, etc. are classified as **Actions**. There are fifty DBEngine Actions available for use in this version 2.0 release of the DBEngine.

Remarks

The Action property settings are:

Setting	Description
----------------	--------------------

0	None (No action)
1	AddPassword
2	AddRecords
3	AppendRecord
4	ClearRecord
5	CloseTable
6	CopyTable
7	CreateIndex
8	CreateTable
9	DecryptTable
10	DeleteIndex
11	DeleteRecord
12	DeleteTable
13	EncryptTable
14	FindTable
15	FirstRecord
16	FlushBuffers
17	GetField
18	GetFieldName
19	GetFieldNumber
20	GetFieldType
21	GetRecord
22	GetRecordNumber
23	GotoLock
24	GotoRecord
25	InsertRecord
26	IsFieldBlank
27	IsRecordLocked
28	IsTableProtected
29	LastRecord
30	LockRecord
31	LockTable
32	NextRecord
33	NFields
34	NKeyFields
35	NRecords
36	OpenTable
37	PreviousRecord
38	PutBlank
39	PutField
40	RefreshTable
41	RemovePassword
42	RemoveRecords
43	RenameTable
44	SearchField
45	SearchKey
46	TableChanged
47	UnlockRecord
48	UnlockTable
49	UpdateRecord

Note: These Actions are defined in the **DBENG2.TXT** file as symbolic constants. Programmers working in the Visual Basic 3.0 development environment should use the constants provided in

the **DB2VB3.TXT** file.

DataType

Integer (Enumerated)

DBEngine Actions

0-None

Description

This Action does nothing.

1-AddPassword

Description

Enters a password into the system.

Remarks

This Action enters a password into the system. Up to 50 passwords can be concurrently active. No password may exceed 15 characters. The password to be added should be present in **DBEngine.Password**. Upon a successful **AddPassword** Action, the **Reaction** property will contain a zero (0). In the event of an error, a non-zero error number is placed in the **Reaction** property.

See Also

RemovePassword, EncryptTable, DecryptTable, and IsTableProtected.

2-AddRecords

Description

Adds records from one table to another table.

Remarks

This Action adds records from the table specified in **DBEngine.TableName** to the table specified in **DBEngine.OtherTable**. If a key violation occurs, the record is overwritten. Both tables must exist and have compatible structures. Upon a successful **AddRecords** Action the

Reaction property will contain a zero (0). In the event of an error, a non-zero error number is placed in the **Reaction** property.

See Also

RemoveRecords.

3-AppendRecord

Description

Appends a record to a database table.

Remarks

This Action writes (appends) the record to the database file. If the database is indexed the **AppendRecord** Action works similar to the **InsertRecord** Action and the record is inserted into the database file at a place determined by the database index. If the database file is not indexed the appended record is added to the end of the database file. In both cases the newly appended record becomes the current record. Upon a successful Action the **Reaction** property will contain a zero (0). In the event of an error, a non-zero error number is placed in the **Reaction** property.

See Also

InsertRecord, UpdateRecord, DeleteRecord.

4-ClearRecord

Description

Clears out the current record for the specified database table.

Remarks

This function clears the DBEngine's internal record information. Specifically all internal information for the DBEngine's record structure is erased. It is a convenient way to clear all the field values for a specific record and is functionally equivalent to doing the **PutBlank** Action for each and every field. Upon a successful **ClearRecord** Action, an integer value of zero (0) is placed in the DBEngine's **Reaction** property. In the event of an error, a non-zero integer error value is placed in the **Reaction** property.

See Also **PutBlank**

5-CloseTable

Description

Closes a previously opened database table.

Remarks

This Action ensures that all buffered data is saved to disk and all memory allocated for the open table is released when the table is properly closed. When a Visual Basic or a Visual C++ Program is finished with a database table it should do a **CloseTable** Action to insure that the table is properly closed and that no data is lost.

Upon a successful **CloseTable** Action, an integer value of zero (0) is placed in the DBEngine's **Reaction** property. In the event of an error, a non-zero integer error value is placed in the **Reaction** property.

See Also

OpenTable

6-CopyTable

Description

Copies one table family to another.

Remarks

This Action copies a complete table (records included) and any family members (indexes, etc.) to another identical table. The target destination table will be created if it does not exist. The table copied is the table specified in **DBEngine.TableName** and the target destination table is specified in **DBEngine.OtherTable**. Upon a successful **CopyTable** Action, an integer value of zero (0) is placed in the DBEngine's **Reaction** property. In the event of an error, a non-zero integer error value is placed in the **Reaction** property.

7-CreateIndex

Description

Creates an index for a database table.

Remarks

This Action creates an index (primary or secondary) on a table. The database table is specified in **DBEngine.TableName**. The number of key fields in the index is specified in **DBEngine.IndexNFields** (this should be 1 for all secondary indexes). The field number of the key field is specified in **DBEngine.IndexID** (for primary indexes this should always be 1, for secondary indexes it should be the field number of the field of interest). The type of index to be created is specified in **DBEngine.IndexType**. This property can have the following values:

0-Primary

1-NonMaintainedSecondary
2-MaintainedSecondary

Upon a successful **CreateIndex** Action, an integer value of zero (0) is placed in the DBEngine's **Reaction** property. In the event of an error, a non-zero integer error value is placed in the **Reaction** property.

See Also

DeleteIndex.

8-CreateTable

Description

Creates a database table.

Remarks

This Action creates a database table. The name of the new table is specified in **DBEngine.TableName**. The number of fields that make up the new table's record structure is specified in **DBEngine.NFields**.

The name of each field (each field name separated by a comma) is specified in **DBEngine.TableFieldNames**. The sequence of the field names placed in **DBEngine.TableFieldNames** determines the sequence of the fields in the new table's record structure.

Each of the fields specified in **DBEngine.TableFieldNames** must have a corresponding field type specified in **DBEngine.TableFieldTypes**. Again each field type is separated by a comma. The ordering sequence of the field types should follow a one-to-one correspondence with the field names placed in **DBEngine.TableFieldNames**.

Field names can each have a maximum of 25 characters. Field types 4 characters.

Each field name is separated from other field names by a comma. Note that the last field name in the list of field names should not have a comma after it.

Each field type is separated from other field types by a comma. Note that the last field type in the list of field types should not have a comma after it.

Upon a successful **CreateTable** Action, an integer value of zero (0) is placed in the DBEngine's **Reaction** property. In the event of an error, a non-zero integer error value is placed in the **Reaction** property.

See Also

CreateIndex, and DeleteTable.

9-DecryptTable

Description

Decrypts a database table.

Remarks

This Action decrypts a previously encrypted table. The target table is specified in **DBEngine.TableName**. In order to successfully decrypt a table you must have previously entered the required password via a **AddPassword** Action. Upon a successful **DecryptTable** Action, an integer value of zero (0) is placed in the DBEngine's **Reaction** property. In the event of an error, a non-zero integer error value is placed in the **Reaction** property.

See Also

EncryptTable, AddPassword, RemovePassword, and IsTableProtected.

10-DeleteIndex

Description

Deletes a database index.

Remarks

This Action deletes either a primary or secondary index for the table specified in **DBEngine.TableName**. The specific index to be deleted is specified in **DBEngine.IndexID**. Upon a successful **DeleteIndex** Action, an integer value of zero (0) is placed in the DBEngine's **Reaction** property. In the event of an error, a non-zero integer error value is placed in the **Reaction** property.

See Also

CreateIndex.

11-DeleteRecord

Description

Deletes the current record from the database table.

Remarks

This Action deletes the current record in the database table. The database table and the current record are contained inside the DBEngine control. Upon a successful **DeleteRecord** Action, an integer value of zero (0) is placed in the DBEngine's **Reaction** property. In the event of an error, a non-zero integer error value is placed in the **Reaction** property.

12-DeleteTable

Description

Deletes a database table.

Remarks

This Action deletes a database table (and any of the tables family objects). The database table to be deleted is specified in **DBEngine.TableName** . Upon a successful **DeleteTable** Action, an integer value of zero (0) is placed in the DBEngine's **Reaction** property. In the event of an error, a non-zero integer error value is placed in the **Reaction** property.

See Also

DeleteIndex, and **CreateTable**.

13-EncryptTable

Description

Encrypts a database table.

Remarks

This Action encrypts a database table. The database table to be encrypted is specified in **DBEngine.TableName** . In order to successfully encrypt a database table you must have previously entered a valid password into the system via a **AddPassword** Action. Upon a successful **EncryptTable** Action, an integer value of zero (0) is placed in the DBEngine's **Reaction** property. In the event of an error, a non-zero integer error value is placed in the **Reaction** property.

See Also

AddPassword, **RemovePassword**, **DecryptTable**, and **IsTableProtected**.

14-FindTable

Description

Checks to see if a table exists.

Remarks

This Action checks to see if the table specified in **DBEngine.TableName** exists. If the table is found the **TableFound** property is set to 1-True. If the table was not found the **TableFound** property is set to 0-False. Upon a successful **FindTable** Action, an integer value of zero (0) is placed in the DBEngine's **Reaction** property. In the event of an error, a non-zero integer error value is placed in the **Reaction** property.

15-FirstRecord

Description

Positions the current record on the first record in the database table.

Remarks

This Action, if successful, moves to the first record in the database table and makes that record the current record. The database table and the current record for that table exist in the DBEngine control.

Upon a successful **FirstRecord** Action, an integer value of zero (0) is placed in the DBEngine's **Reaction** property. In the event of an error, a non-zero integer error value is placed in the **Reaction** property.

See Also

LastRecord, NextRecord and PreviousRecord.

16-FlushBuffers

Description

Saves all changes to disk.

Remarks

This Action, if successful, saves all changes to disk. This action is used when the **SaveEveryChange** property is set to 0-False. Upon a successful **FlushBuffers** Action, an integer value of zero (0) is placed in the DBEngine's **Reaction** property. In the event of an error, a non-zero integer error value is placed in the **Reaction** property.

See Also

SaveEveryChange property.

17-GetField

Description

Reads the value of a specified field from the current record of a database table.

Remarks

This Action reads the value of the field specified by **DBEngine.FieldName** and places that field's value in **DBEngine.FieldValue**. The field value read is that of the current record in the database table. All field values placed in **DBEngine.FieldValue** are of type string regardless of the actual data type stored in the table itself (The DBEngine custom control automatically performs data type conversion of field values based on the field's data type as specified in the database table.) Upon a successful **GetField** Action, an integer value of zero (0) is placed in the DBEngine's **Reaction** property. In the event of an error, a non-zero integer error value is placed in the **Reaction** property.

See Also

GetFieldName, GetFieldNumber, GetFieldType, and PutField.

18-GetFieldName

Description

Reads the name of a database field.

Remarks

This Action reads the value of the field specified by **DBEngine.FieldNumber** and places that field's name in **DBEngine.FieldName**. Upon a successful **GetFieldName** Action, an integer value of zero (0) is placed in the DBEngine's **Reaction** property. In the event of an error, a non-zero integer error value is placed in the **Reaction** property.

See Also

GetField, GetFieldNumber, GetFieldType, and PutField.

19-GetFieldNumber

Description

Reads the field number of a database field.

Remarks

This Action reads the number of the field specified by **DBEngine.FieldName** and places that

field's number in **DBEngine.FieldNumber**. Upon a successful **GetFieldNumber** Action, an integer value of zero (0) is placed in the DBEngine's **Reaction** property. In the event of an error, a non-zero integer error value is placed in the **Reaction** property.

See Also

GetField, GetFieldName, GetFieldType, and PutField.

20-GetFieldType

Description

Gets the data type for a database field.

Remarks

This Action returns the data type of the field specified in **DBEngine.FieldName**. You use this function when you wish to determine the actual data type of the field as it is stored in the database table. The possible data types returned are as follows:

Field Type	Data Type
N	Numeric
S	Short number
\$	Currency
Annn	Alphanumeric
D	Date

The field type is returned in the **DBEngine.FieldType** property. Upon a successful **GetFieldType** Action, an integer value of zero (0) is placed in the DBEngine's **Reaction** property. In the event of an error, a non-zero integer error value is placed in the **Reaction** property.

21-GetRecord

Description

Reads the current record in the database table.

Remarks

This Action, if successful, reads the current record in the database table. The database table and the current record for that table are present in the DBEngine control. Upon a successful **GetRecord** Action, an integer value of zero (0) is placed in the DBEngine's **Reaction** property. In the event of an error, a non-zero integer error value is placed in the **Reaction** property.

See Also

FirstRecord, LastRecord, NextRecord and PreviousRecord.

22-GetRecordNumber

Description

Gets the database record number of the current record.

Syntax

Remarks

The **GetRecordNumber** Action gets the record number of the current record. The current record and database table are present in the DBEngine control. The record number is placed in the **DBEngine.RecordNumber** property. Upon a successful **GetRecordNumber** Action, an integer value of zero (0) is placed in the DBEngine's **Reaction** property. In the event of an error, a non-zero integer error value is placed in the **Reaction** property.

23-GotoLock

Description

Moves to a previously locked record.

Remarks

This Action, if successful, moves to the previously locked record. Upon a successful **GotoLock** Action, an integer value of zero (0) is placed in the DBEngine's **Reaction** property. In the event of an error, a non-zero integer error value is placed in the **Reaction** property.

See Also

LockRecord.

24-GotoRecord

Description

Goes to the specified record number in the database table and makes that record the current record.

Remarks

This Action moves to the **DBEngine.RecordNumber** record in the database table and makes that record the current record. Upon a successful **GotoRecord** Action, an integer value of zero (0) is placed in the DBEngine's **Reaction** property. In the event of an error, a non-zero integer

error value is placed in the **Reaction** property

25-InsertRecord

Description

Inserts a record into the database table file.

Remarks

This Action inserts a record into the database table file. If the database file is indexed the **InsertRecord** Action works similar to the **AppendRecord** Action and the record is inserted in the database file at a location specified by the database index. If the database file is not indexed the new record is inserted before the current record. In both cases the newly inserted record becomes the current record. Upon a successful **InsertRecord** Action, an integer value of zero (0) is placed in the DBEngine's **Reaction** property. In the event of an error, a non-zero integer error value is placed in the **Reaction** property.

See Also

AppendRecord, UpdateRecord, DeleteRecord.

26-IsFieldBlank

Description

Tests to see if a field is blank.

Remarks

This Action tests to see if the field specified in **DBEngine.FieldNumber** is blank. If the field value is blank the **FieldBlank** property is set to 1-True. If the field value is not blank, the **FieldBlank** property is set to 0-False. Upon a successful **IsFieldBlank** Action, an integer value of zero (0) is placed in the DBEngine's **Reaction** property. In the event of an error, a non-zero integer error value is placed in the **Reaction** property.

See Also

PutBlank and the FieldBlank property.

27-IsRecordLocked

Description

Tests to see if the current database record is locked.

Remarks

This Action tests to see if the current record is locked. If the current record is locked the

RecordLocked property is set to 1-True. If the current record is not locked, the **RecordLocked** property is set to 0-False. Upon a successful **IsRecordLocked** Action, an integer value of zero (0) is placed in the DBEngine's **Reaction** property. In the event of an error, a non-zero integer error value is placed in the **Reaction** property.

See Also

LockRecord and **UnlockRecord**.

28-IsTableProtected

Description

Tests to see if a table is encrypted.

Remarks

This Action tests to see if a table is encrypted. If the table specified in **DBEngine.TableName** is encrypted, the **TableProtected** property is set to 1-True. Otherwise the **TableProtected** property is set to 0-False. Upon a successful **IsTableProtected** Action, an integer value of zero (0) is placed in the DBEngine's **Reaction** property. In the event of an error, a non-zero integer error value is placed in the **Reaction** property.

See Also

EncryptTable and **DecryptTable**.

29-LastRecord

Description

Moves to the last record in the database table.

Remarks

This Action moves to the last record in the database table and makes that record the current record. Upon a successful **LastRecord** Action, an integer value of zero (0) is placed in the DBEngine's **Reaction** property. In the event of an error, a non-zero integer error value is placed in the **Reaction** property.

See Also

FirstRecord, **NextRecord** and **PreviousRecord**

30-LockRecord

Description

Locks the current database record.

Remarks

This Action locks the current record. The database table and it's current record are specified in the DBEngine control. Once the record is successfully locked, no other users are able to delete, or otherwise write to the record until the record is unlocked with an **UnlockRecord** Action. Upon a successfull **LockRecord** Action, an integer value of zero (0) is placed in the DBEngine's **Reaction** property. In the event of an error, a non-zero integer error value is placed in the **Reaction** property.

See Also

UnlockRecord

31-LockTable

Description

Locks a database table.

Remarks

This Action locks the database table specified in **DBEngine.TableName**. The type of lock applied to the table is specified in **DBEngine.TableLockType**. Upon a successfull **LockTable** Action, an integer value of zero (0) is placed in the DBEngine's **Reaction** property. In the event of an error, a non-zero integer error value is placed in the **Reaction** property.

See Also

UnlockTable and **TableLockType** property.

32-NextRecord

Description

Moves to the next record in the database table.

Remarks

This Action moves to the next record in the database table and makes that record the current

record. The database table is specified in the DBEngine control. Upon a successful **NextRecord** Action, an integer value of zero (0) is placed in the DBEngine's **Reaction** property. In the event of an error, a non-zero integer error value is placed in the **Reaction** property.

See Also

FirstRecord, LastRecord, and PreviousRecord.

33-NFields

Description

Gets the number of fields in the database record structure.

Remarks

This Action gets the total number of fields present in the database table's record structure. The database table is specified in **DBEngine.TableName**. The number of fields present in the record structure is placed in the **DBEngine.NFields** property. Upon a successful **NFields** Action, an integer value of zero (0) is placed in the DBEngine's **Reaction** property. In the event of an error, a non-zero integer error value is placed in the **Reaction** property.

See Also

NKeyFields.

34-NKeyFields

Description

Gets the number of key fields in the database record structure.

Remarks

This Action gets the total number of key fields present in the database table's record structure. The database table is specified in **DBEngine.TableName**. The number of key fields present in the record structure is placed in the **DBEngine.NKeyFields** property. Upon a successful **NKeyFields** Action, an integer value of zero (0) is placed in the DBEngine's **Reaction** property. In the event of an error, a non-zero integer error value is placed in the **Reaction** property.

See Also

NFields.

35-NRecords

Description

Gets the number of records present in the database table.

Remarks

This Action gets the total number of records present in the database table specified in the DBEngine control. The number of records is placed in the **DBEngine.NRecords** property. Upon a successful **NRecords** Action, an integer value of zero (0) is placed in the DBEngine's **Reaction** property. In the event of an error, a non-zero integer error value is placed in the **Reaction** property.

36-OpenTable

Description

Opens a database table file for subsequent processing.

Remarks

Before you can process information in a database table file, you must first open that file for processing. You open database table files by performing the **OpenTable** Action. To successfully open a database table you will need to specify three other DBEngine properties:

DBEngine.TableName
DBEngine.IndexID
DBEngine.SaveEveryChange

DBEngine.TableName should hold the name of the database table file including any MSDOS PATH specifier. Do not include the file extension.

DBEngine.IndexID should specify the index you wish to use for table operations.

MASTERINDEX (0) - should be used to open the table with all of its associated indexes. For a specific index, specify the field number of the associated index.

DBEngine.SaveEveryChange should specify whether you wish to save every change to disk or whether you wish to buffer changes to disk. Buffering is faster, but you may lose data if the power goes out (see **FlushBuffers** for information on writing buffered data to disk). To buffer changes set this parameter to FALSE.

Once these three DBEngine properties have been appropriately set, perform an **OpenTable** Action to open the database table. Upon a successful **OpenTable** Action, an integer value of zero (0) is placed in the DBEngine's **Reaction** property. In the event of an error, a non-zero integer error value is placed in the **Reaction** property.

See Also

CloseTable, FlushBuffers.

37-PreviousRecord

Description

Moves to the previous record in the database table.

Remarks

This Action moves to the previous record in the database table and makes that record the current record. The database table is specified in the DBEngine control. Upon a successful **PreviousRecord** Action, an integer value of zero (0) is placed in the DBEngine's **Reaction** property. In the event of an error, a non-zero integer error value is placed in the **Reaction** property.

See Also

FirstRecord, LastRecord, and NextRecord.

38-PutBlank

Description

Places a blank value into the specified field in the database record.

Remarks

This Action places a blank value into the field specified in the **DBEngine.FieldName** property. The field value is not written to the database table until the record is written to disk using either **InsertRecord, AppendRecord, or UpdateRecord** Actions. A blank value of the appropriate data type is placed in the field automatically. A blank value is a valid value which represents the fact that the value has yet to be entered (a blank value is not zero.) Upon a successful **PutBlank** Action, an integer value of zero (0) is placed in the DBEngine's **Reaction** property. In the event of an error, a non-zero integer error value is placed in the **Reaction** property.

39-PutField

Description

Places a field value into the specified field in the database record.

Remarks

This Action places the value found in **DBEngine.FieldValue** for the field **DBEngine.FieldName** into the database record. The record in the database table file is not actually modified until an **InsertRecord**, **AppendRecord**, or **UpdateRecord** Action is performed. The table and record for the operation is specified by the DBEngine control. All field values to be written to a database field are placed in **DBEngine.FieldValue** and are of type String regardless of the actual data type of the field in the database table itself. The **PutField** Action automatically converts the value to the appropriate type before placing it in the database record. Upon a successful **PutField** Action, an integer value of zero (0) is placed in the DBEngine's **Reaction** property. In the event of an error, a non-zero integer error value is placed in the **Reaction** property.

See Also

GetField, **PutBlank**.

40-RefreshTable

Description

Refreshes or updates a table image to reveal up-to-the minute changes.

Remarks

This Action updates the table image to reflect any changes to data that other users may have made since your last table refresh. The following Actions automatically refresh a table image **RecordLock**, **UpdateRecord**, **InsertRecord**, **AppendRecord**, and **DeleteRecord**. Upon a successful **RefreshTable** Action, an integer value of zero (0) is placed in the DBEngine's **Reaction** property. In the event of an error, a non-zero integer error value is placed in the **Reaction** property.

41-RemovePassword

Description

Removes a previously entered password from the system.

Remarks

This Action removes a previously entered password (entered via **AddPassword** Action) from the

system. The password to be removed should be present in **DBEngine.Password**. Upon a successful **RemovePassword** Action, an integer value of zero (0) is placed in the DBEngine's **Reaction** property. In the event of an error, a non-zero integer error value is placed in the **Reaction** property.

See Also

AddPassword, EncryptTable, DecryptTable and IsTableProtected.

42-RemoveRecords

Description

Removes all the records from a database table.

Remarks

This Action removes all records from the database table specified in **DBEngine.TableName**. Upon a successful **RemoveRecords** Action, an integer value of zero (0) is placed in the DBEngine's **Reaction** property. In the event of an error, a non-zero integer error value is placed in the **Reaction** property.

43-RenameTable

Description

Renames a database table.

Remarks

This Action renames a database table (and table family members if any.) The table is specified in **DBEngine.TableName**. The new name for the table is specified in **DBEngine.OtherTable**. Upon a successful **RenameTable** Action, an integer value of zero (0) is placed in the DBEngine's **Reaction** property. In the event of an error, a non-zero integer error value is placed in the **Reaction** property.

44-SearchField

Description

Searches a database table file on a specified field.

Remarks

This Action searches through the database table for a value in a field. The database field

searched on is specified by **DBEngine.FieldName** the field value to search for is specified by **DBEngine.FieldValue**. You need to set these two properties and then perform the **PutField** Action. After that you need to specify your search mode preference by setting **DBEngine.SearchMode** to one of three values:

- **SEARCHFIRST**
- **SEARCHNEXT**
- **CLOSESTRECORD**

SEARCHFIRST begins the search at the first record in the database, the record position of the current record is not changed if a search attempt fails to find a match.

SEARCHNEXT begins with the record following the current record in the database, the record position of the current record is not changed if a search attempt fails to find a match.

CLOSESTRECORD begins to search at the first record in the database, if a record is not found (search attempt fails), one of two possibilities exist:

-If there is no exact match, there happens to be a record which has a value lexically greater than the search value. The current record in the database will be the record with the first such instance and a record not found error (89) returned.

- There is no record in the database that has a value greater or equal to the search value. The current record will be the last record in the database and a record not found error (89) returned.

A search can then be started with a call to the **SearchField** function.

The available search modes rely on the index on which the table is currently using. **SearchField** always searches for the first record which fullfills the search criteria. On non-indexed database tables **SearchField** searches via a sequential scan. The order of the records searched through the sequential scan is that of the physical order of the records in the table itself. In non-indexed tables **CLOSESTRECORD** is not supported. Upon a successfull **SearchField** Action, an integer value of zero (0) is placed in the DBEngine's **Reaction** property. In the event of an error, a non-zero integer error value is placed in the **Reaction** property.

See Also

SearchKey

45-SearchKey

Description

Searches a database table for a key match.

Remarks

This Action searches the table specified in **DBEngine.TableName** on the Primary index. A search match is sought on the key field(s) of the table specified by **DBEngine.SearchKey**. The key to be matched must be the primary key or a subset of the primary key. The fields to be matched are the fields which have been placed into the database engine's record buffer via **PutField** Actions.

If there are five key fields and you are only interested in finding records which have specific values in the first two key fields lets say "Date" and "Customer Name", you want to search for records in the database that have 12/12/92 for the "Date" value and "Robert Smith" for the "Customer Name" you would set the criteria for those fields and place them in the database engine via **PutField** Actions. Your KeySearch would be set up as **DBEngine.KeySearch = 2**.

You need to specify your search mode preference by setting **DBEngine.SearchMode** to one of three values:

- **SEARCHFIRST**
- **SEARCHNEXT**
- **CLOSESTRECORD**

SEARCHFIRST begins the search at the first record in the database, the record position of the current record is not changed if a search attempt fails to find a match.

SEARCHNEXT begins with the record following the current record in the database, the record position of the current record is not changed if a search attempt fails to find a match.

CLOSESTRECORD begins to search at the first record in the database, if a record is not found (search attempt fails), one of two possibilities exist:

-If there is no exact match, there happens to be a record which has a value lexically greater than the search value. The current record in the database will be the record with the first such instance and a record not found error (89) returned.

- There is no record in the database that has a value greater or equal to the search value. The current record will be the last record in the database and a record not found error (101) returned.

The available search modes rely on the index on which the table is currently using. **SearchKey** always searches for the first record that fullfills the search criteria. Once the desired key fields have been set-up and submitted via **PutField** Actions, the desired search mode specified, along with the keysearch specification, you can then do a **SearchKey** Action. Upon a successfull **SearchKey** Action, an integer value of zero (0) is placed in the DBEngine's **Reaction** property. In the event of an error, a non-zero integer error value is placed in the **Reaction** property.

See Also

SearchField.

46-TableChanged

Description

Indicates if table image has been changed by other users.

Remarks

This Action indicates whether a database table image has been significantly changed by other users (enough to warrant a **RefreshTable** Action.) The table is specified in **DBEngine.TableName**. If the table image has been changed the **DBEngine.TableChanged** property is set to 1-True, otherwise it is set to 0-False.

Upon a successful **TableChanged** Action, an integer value of zero (0) is placed in the DBEngine's **Reaction** property. In the event of an error, a non-zero integer error value is placed in the **Reaction** property.

See Also

RefreshTable

47-UnlockRecord

Description

Unlocks a previously locked record.

Remarks

This Action unlocks a previously locked record. You are only able to unlock records that you have previously locked. You can not unlock records locked by other users. A locked record can also be unlocked under the following conditions:

- You delete the record by performing a **DeleteRecord** Action.
- You do a **CloseTable** Action which unlocks all the records in that table before closing the table.

Upon a successful **UnlockRecord** Action, an integer value of zero (0) is placed in the DBEngine's **Reaction** property. In the event of an error, a non-zero integer error value is placed in the **Reaction** property.

See Also

LockRecord

48-UnlockTable

Description

Unlocks a previously locked database table.

Remarks

This Action unlocks a previously locked database table. The table is specified in **DBEngine.TableName**. The table lock type must be specified in **DBEngine.TableLockType**. Upon a successful **UnlockTable** Action, an integer value of zero (0) is placed in the DBEngine's **Reaction** property. In the event of an error, a non-zero integer error value is placed in the **Reaction** property.

See Also

LockTable

49-UpdateRecord

Description

Updates a record in a database table.

Remarks

This Action updates the record specified in the DBEngine control to the database file. There must be a current database record to update. Upon a successful **UpdateRecord** Action, an integer value of zero (0) is placed in the DBEngine's **Reaction** property. In the event of an error, a non-zero integer error value is placed in the **Reaction** property.

See Also

AppendRecord, InsertRecord, DeleteRecord.

FieldBlank

Description

This property is an integer value which represents whether or not a database field is blank.

This property is not automatically managed for reasons of performance. You should only consider this property's value valid directly after performing an **IsFieldBlank** Action.

This property may have the following values:

Setting	Description
0	False

DataType

Integer (Enumerated)

FieldName**Description**

This property is an ASCII string with a maximum length of 25 characters. This string holds the name of the target database field.

DataType

String

FieldNumber**Description**

This property is an integer value which represents the field's position in the table's record structure.

This property is not automatically managed for reasons of performance. You should only consider this property's value valid directly after entering it manually or after performing a **GetFieldNumber** Action.

DataType

Integer

FieldType**Description**

This property is an ASCII string with a maximum length of 5 characters. This property holds the data type of the target database field.

Database Field Types

Each field in a database has a corresponding data type. The available field types in the DBEngine (version 2.0) release are listed below:

Alphanumeric (A) field type permits the full ASCII character set (except ASCII 0) and is used for entry of string data types. Fields of this type are specified as **Axxx**, where the **xxx** represents the maximum length of the field in characters. For example, if you were to create a field in a table which is intended to hold a maximum of 50 characters you would specify the field as an **A50**.

Number (N) and **currency (\$)** field types permit up to 15 significant digits (including the decimal point) in the range of real numbers from $\pm 10^{-307}$ to $\pm 10^{307}$. Number field values which are greater than 15 significant digits are rounded and stored in scientific notation. Currency field values are stored in a default predefined format.

Short Number (S) field types permit values in the range of signed integers. (-32,767 to 32,767).

Date (D) field types permit any valid dates between January 1, 100 A.D. to December 31, 9999. Date values are stored as long integers which represent the number of days since January 1, A.D.

Data Type

String

FieldValue

Description

This property is an ASCII string with a maximum length of 255 characters. This property holds the value of the target database field.

Remarks

DBEngine programming involves handling database field values as strings only! Regardless of the actual data type in the database file. This is mandated by the DBEngine's internal data structures. DBEngine programmers receive field values from data table files as String values and write database field values as String values regardless of the actual field value type present in the database table file. The DBEngine automatically performs data type conversions based on the data type of the field in the database table file. This data type conversion process is transparent to the Visual Basic/Visual C++ programmer and provides a much simpler interface to database programming.

Data Type

String

IndexID

Description

This property is an integer which holds the identification of the index to be used with the database table (specified in the **DBEngine.TableName** property).

Remarks

This property should be zero (0) to open the database table with all associated indexes.

DataType

Integer

IndexNFields

Description

This property is an integer which holds the number of key fields present in an index. This property is not automatically maintained.

DataType

Integer

IndexType

Description

This property is an integer (enumerated) which is used to specify the type of index.

This property may have the following values:

Setting	Description
0	Primary
1	NonMaintainedSecondary
2	MaintainedSecondary

DataType

Integer (Enumerated)

KeySearch

Description

This property is an integer data member which specifies what portion of the databases primary

index to use for index based searches.

Remarks

All database **key** fields must be contiguous fields starting with the first field in the database table. All database searches performed with the **SearchKey** Action must specify the portion of the **PRIMARY** index to search on. For example:

If there are five key fields in your database table and you are only interested in finding records which have specific values in the first two key fields lets say "Date" and "Customer Name", you want to search for records in the database that have 12/12/92 for the "Date" value and "Robert Smith" for the "Customer Name" you would set the criteria for those fields and place them in the database engine via **PutField** Actions. Your KeySearch would be set up as **DBEngine.KeySearch = 2**.

An example of how to use **key** fields and database searches using the **SearchKey** Action is provided in the **DBEngine Example Programs** section of this document. (Extensive examples of using **key** fields and database searches using full and partial keys are provided in the DBEngine User's Manual.)

DataType

Integer

NFields

Description

This property is an integer value which indicates the number of fields present in the database table's record structure.

Remarks

This property is not automatically managed by the DBEngine control due to performance reasons. Therefore to insure that the value present in this property is as accurate as possible read the value immediately after performing a **NFields** Action on the table.

DataType

Integer

NKeyFields

Description

This property is an integer value which indicates the number of key fields present in the database table's record structure.

Remarks

This property is not automatically managed by the DBEngine control due to performance reasons. Therefore to insure that the value present in this property is as accurate as possible read the value immediately after performing a **NKeyFields** Action on the table.

DataType

Integer

NRecords

Description

This property is a long value which indicates the number of records present in the database table.

Remarks

This property is not automatically managed by the DBEngine control due to performance reasons and complications related to network concurrency. Therefore to insure that the value present in this property is as accurate as possible read the value immediately after performing a **NRecords** Action on the table.

DataType

long

OtherTable

Description

This property is an ASCII string used to hold the name of a database table (path may be specified.) This property is used in DBEngine actions that reference another table such as **AddRecords**, **RenameTable**, **CopyTable**, etc.

DataType

string

Password

Description

This property is an ASCII string used to hold a password for DBEngine Actions such as **AddPassword** and **RemovePassword**. Passwords may have no more than 15 characters.

DataType

string

Reaction

Description

This property is an integer value which indicates whether or not a DBEngine Action was performed successfully or not.

Remarks

Its purpose is to report any errors encountered when performing any DBEngine Actions. For a listing of the possible errors reported after performing DBEngine Actions see the DBEngine / PARADOX ENGINE ERROR CODES section at the end of this document.

DataType

Integer (Enumerated)

RecordLocked

Description

This property is an integer (enumerated) which is used to indicate whether or not the current record is locked.

This property is not automatically managed, so it should only be considered accurate directly after performing a **IsRecordLocked** Action.

This property may have the following values:

Setting	Description
0	False
1	True

DataType

Integer (Enumerated)

RecordNumber

Description

This property is a long value which indicates the record number of the current record in the database table.

Remarks

This property is not automatically managed by the DBEngine control due to performance reasons and complications related to network concurrency. Therefore to insure that the value present in this property is as accurate as possible read the value immediately after performing a **GetRecordNumber** Action on the table.

DataType

long

SaveEveryChange

Description

This property is an integer value which indicates whether changes to database tables are done immediately or buffered to disk.

Remarks

This property is available to programmers basically for performance reasons. The possible values of this property are:

Setting	Description
0	False (changes are buffered to disk)
1	True (changes are made immediately)

DataType

Integer (Enumerated)

SearchMode

Description

This property is an integer value which indicates the search mode used in database searches.

Remarks

The possible values of this property are:

Setting	Description
37	

0	SEARCHFIRST
1	SEARCHNEXT
2	CLOSESTRECORD

SEARCHFIRST begins the search at the first record in the database, the record position of the current record is not changed if a search attempt fails to find a match.

SEARCHNEXT begins with the record following the current record in the database, the record position of the current record is not changed if a search attempt fails to find a match.

CLOSESTRECORD begins to search at the first record in the database, if a record is not found (search attempt fails), one of two possibilities exist:

-If there is no exact match, there happens to be a record which has a value lexically greater than the search value. The current record in the database will be the record with the first such instance and a record not found error (89) returned.

- There is no record in the database that has a value greater or equal to the search value. The current record will be the last record in the database and a record not found error (101) returned.

DataType

Integer (Enumerated)

TableChanged

Description

This property is an integer (enumerated) which is used to indicate whether or not the current table image is still valid.

This property is not automatically managed, so it should only be considered accurate directly after performing a **TableChanged** Action.

This property may have the following values:

Setting	Description
0	False
1	True

DataType

Integer (Enumerated)

TableFieldNames

Description

This property is an ASCII string which is used to hold the names of fields in a database table. Individual field names must be separated by a comma. The last field name in this list must **not** be followed by a comma.

This property is used primarily with the **CreateTable** Action.

DataType

String

TableFieldTypes

Description

This property is an ASCII string which is used to hold the field types of the fields listed in the **TableFieldNames** property. The field types listed must be on a one-to-one correspondence with the field names in the **TableFieldNames** property. Individual field names must be separated by a comma. The last field name in this list must **not** be followed by a comma.

This property is used primarily with the **CreateTable** Action.

DataType

String

TableFound

Description

This property is an integer (enumerated) which is used to indicate whether or not a table exists. It is used only with the **FindTable** Action.

This property is not automatically managed, so it should only be considered accurate directly after performing a **FindTable** Action.

This property may have the following values:

Setting	Description
0	False
1	True

DataType

Integer (Enumerated)

TableLockType

Description

This property is an integer (enumerated) which is used to specify the table lock type for the **LockTable** and **UnlockTable** Actions.

This property may have the following values:

Setting	Description
0	None
1	FullLock
2	WriteLock
3	PreventWriteLock
4	PreventFullLock

DataType

Integer (Enumerated)

TableName

Description

This property is an ASCII string with a maximum length of 255 characters. This string holds the name of a database table, including any MSDOS PATH specifier. Database file names placed in this property must not include a file extension.

DataType

String

TableProtected

Description

This property is an integer (enumerated) which is used to indicate whether or not a table is encrypted. It is used only with the **IsTableProtected** Action.

This property is not automatically managed, so it should only be considered accurate directly

after performing a **IsTableProtected** Action.

This property may have the following values:

Setting	Description
0	False
1	True

DataType

Integer (Enumerated)

APPENDIX

DBEngine Custom Control / PARADOX ENGINE ERROR CODES

Error Code	Description
1	Drive not ready
2	Directory not found
3	File is busy
4	File is locked
5	File not found
6	Table damaged
7	Primary index damaged
8	Primary index is out of date
9	Record is locked
10	Sharing violation - directory busy
11	Sharing violation - directory locked
12	No access to directory
13	Sort for index different from table
14	Single user but directory is shared
15	Multiple PARADOX.NET files found
21	Insufficient password rights
22	Table is write-protected
30	Data type mismatch
31	Argument is out of range
33	Invalid argument
40	Not enough memory to complete operation
41	Not enough disk space to complete operation
50	Another user deleted record
70	No more file handles available
41	

72	No more table handles available
73	Invalid date given
74	Invalid field name
75	Invalid field handle
76	Invalid table handle
78	Engine not initialized
79	Previous fatal error, cannot proceed
81	Table structures are different
82	Engine already initialized
83	Unable to perform operation on open table
86	No more temporary names available
89	Record was not found
94	Table is indexed
95	Table is not indexed
96	Secondary index is out of date
97	Key violation
98	Could not login on network
99	Invalid table name
101	End of table
102	Start of table
103	No more record handles available
104	Invalid record handle
105	Operation on empty table
106	Invalid lock code
107	Engine not initialized
108	Invalid file name
109	Invalid lock
110	Invalid lock handle
111	Too many locks on table
112	Invalid sort-order table
113	Invalid net type
114	Invalid directory name
115	Too many passwords specified
116	Invalid password
117	Buffer too small for result
118	Table is busy
119	Table is locked
120	Table was not found
121	Secondary index was not found
122	Secondary index is damaged
123	Secondary index is already open
124	Disk is write-protected
125	Record is too big for index
126	General hardware error
127	Not enough stack space to complete operation
128	Table is full
129	Not enough swap buffer space to complete operation
130	Table is SQL replica
131	Too many clients for Engine DLL
132	Exceeds limits specified in WIN.INI
133	Too many files open simultaneously (includes all clients)
134	Can't lock PARADOX.NET - is SHARE.EXE loaded
135	Can't run Engine in Windows real mode
136	Can't modify unkeyed table with non-maintained secondary index