

## INTEGRATING EPI SUITE WITH THIRD-PARTY PRODUCTS

### PURPOSE

This document is intended to serve as a guide for the integration of EPI Suite 6.0 and third-party products, such as access control, time-and-attendance, or point-of-sale systems.

### ASSUMPTIONS

ImageWare Systems, Inc. assumes that you have sufficient expertise and resources to integrate EPI Suite, and to support the integrated solution. ImageWare Systems, Inc. only warrants the EPI Suite portion of the integrated solution, according to the terms and conditions of its Software License Agreement. Any claims or guarantees for fitness of use of the third-party solutions are with the respective manufacturers or integrators.

Due to the complexity of the integration, it is also assumed that appropriate quality assurance testing is performed before the integrated solution is implemented in a live environment.

### DEFINITIONS, ACRONYMS AND ABBREVIATIONS

Integrator	The company that sells the two integrated products.
ODBC	Open Database Connectivity. A Microsoft® standard that provides a way to generically connect to relational databases.
PMK	Primary Key. A field in a database table that uniquely identifies each record.
FK	Foreign Key. A field in a database table that is a copy of a PMK from another table, thus establishing a relationship between the two tables' records.
JET	(Joint Engine Technology) The database engine used in Microsoft Access.
MDAC	(Microsoft Data Access Components) A collection of software modules from Microsoft that provide access to databases. MDAC includes ODBC.
DAO	(Data Access Objects) A programming interface for data access from Microsoft. DAO/Jet provides access to the Jet database.
ISAM	Indexed Sequential Access Method.
Version	A release of a product that contains new features, enhancements, and bug fixes. Provided with an upgrade policy to existing customers.
Revision	A bug fix release of the product. Provided free of charge to existing customers.

### ODBC DRIVERS

EPI Suite is an ODBC-compliant product. This means that it can potentially connect to any ODBC-compliant database, so long as a compatible ODBC driver is provided. Microsoft provides some ODBC drivers in its MDAC package. Most database vendors also provide ODBC drivers. ODBC drivers can also be purchased from third party organizations like Data Direct. You can download trial versions of the drivers from Data Direct's web site at [www.datadirect.com](http://www.datadirect.com)

### THE CONNECTION

EPI Suite can connect to only one ODBC data source or JET connection at a time. For integration to work, the database schema must contain both the EPI Suite and integrator proprietary tables.

This method is usually problem-free. But if you encounter difficulties, another solution is to use the Microsoft Access 2000 relational database management system (RDBMS) to attach the necessary integrator tables to the EPI Suite database.

Please note that ImageWare Systems, Inc. does not recommend the use of ISAM databases, since they do not support UNIQUE, NOT NULL, or PRIMARY constraints. In addition, some ISAM databases maintain deleted rows until they are “packed.”

### **TABLE AND FIELD NAMES**

EPI Suite uses a database schema that contains proprietary tables and fields. These are given names that all EPI Suite component applications recognize. Starting with EPI Suite 5.0, the default short names are no longer supported.

### **THE CARDHOLDER TABLE**

In EPI Suite 6.0, the cardholder table is named EPI\_PERSON. By default, this table contains preset fields that will accommodate the needs of most organizations that intend to use the product as a standalone badging system. When connecting to an existing badging or other solution, clients will most likely want to use their current data rather than to reenter it. You can avoid redundant data entry by replacing the default EPI Suite cardholder table with one that already resides in another database. To do so, follow these rules:

1. The table or tables that are to be shared with EPI Suite must contain a non-composite primary key. In EPI Suite, this is a mandatory field called PERSON\_ID. The primary key is controlled by EPI Suite’s component applications; the user cannot make changes to it through the UI.
2. You must remove the EPI\_PERSON table, and all of its indexes, from the EPI Suite database schema. The integrator’s proprietary cardholder table will replace it.
3. You must provide access to cardholder data using one of the following methods (we recommend the first):

#### **Method One (Not supported by all database engines)**

The standard—and most efficient—way to provide access to EPI Suite cardholder information is to:

- Create a standard SQL table, MS Access query or SQL view;
- Name it EPI\_PERSON;
- Include the cardholder primary key, and use the SQL “AS” keyword to rename it to PERSON\_ID.

This method can also be used to join data from multiple tables (using a view), and return it as data from one table. It is important to note, however, that certain databases cannot update joined records that are returned by views.

Ideally, you would customize the existing database to accommodate EPI Suite’s proprietary tables and views, and then establish an ODBC or JET connection between EPI Suite and the database. Under these circumstances, no other modifications are necessary.

#### **Method Two**

A second method is to rename the cardholder table through the GuardTool Database Utility. You can find information on that subject in the EPI Suite *Administrator’s Guide*.

By default, the PERSON\_ID PMK field is a variable-length string of 10 characters (maximum). If you intend to use a longer field, you will need to modify the scripts so that all FK fields refer to the PERSON\_ID replacement. For example:

**EPI\_CARD.CARD\_PERSON\_ID**  
**GA\_IMAGE.IMAGE\_KEY**  
**GA\_LOG.PERSON\_ID**

Please note that when using an existing field as the cardholder primary key, EPI Suite users should not be creating new cardholder records. To prevent this, remove the GuardCard option “User can add and delete person records”. If you wish to prevent users from modifying the cardholder information, remove the GuardCard option “User can edit person records” or add all the required cardholder fields as “read only text box” using the “Data Field Setup” menu option.

### **DATABASE SCHEMA SCRIPTS**

Schema scripts are available for download from ImageWare Systems, Inc.’s web site. You may use them to create schema objects in the EPI Suite database. Visit [www.iwsinc.com/support.cfm](http://www.iwsinc.com/support.cfm) to determine how the different script files will perform.

Before executing any of the scripts, you should do the following:

1. Remove all undesired fields from the EPI\_PERSON table definition. This will decrease the size of the database, and ensure that the EPI Suite field list is not cluttered with unused fields.
2. Determine how much disk space the EPI Suite database tables will require, and allocate that space using database clauses. This is important, since it affects the database’s overall performance, as well as disk usage.

Tables that require predefined disk allocation include EPI\_PERSON, EPI\_CARD, GA\_LOG, and GA\_IMAGE. GA\_IMAGE is particularly important, since it stores the cardholder images. Under typical system conditions, you should allocate 1.5Kb per cardholder record; .2Kb per card record; 1Kb per log record; 30Kb per photograph (with an additional 4Kb for each photograph thumbnail); 50Kb per fingerprint; and 40Kb per signature. These are, of course, average values and do not necessarily represent the storage requirements you should expect from your system.

For best results, select an image compression method (via the Image Setup command in GuardCard’s View Options menu), and capture a few sample images. Next, determine the average amount of disk space that is used by the captured images. This will allow you to assess how much allocation to perform.

The images may optionally be stored outside the database in a folder identified by a mapped drive letter or using the universal naming convention ( [\\myserver\mydrive\myfolder](#)). This may help in keeping the database to a convenient size. Note that using the file system for storing images outside of the database also has drawbacks as directory operations and fragmentation can severely slow down the applications when dealing with thousand of images.

3. Replace the EPI\_PERSON CREATE TABLE command from the schema scripts with the appropriate CREATE VIEW command—but only if you intend to use your own proprietary cardholder table. As is indicated in **The Card Holder Table** section below, the view should be named EPI\_PERSON and return proper field names. You will also need to remove the referential integrity constraints between

the EPI\_PERSON table (which is now a view), and the EPI\_CARD and GA\_IMAGE tables, since referential integrity cannot be enforced between views and actual tables.

### Notes

ImageWare Systems, Inc. does not provide schema scripts for, or support, file-based databases. If you need to connect to this type of database, use the Microsoft Access Attach Table method described above.

Although ImageWare Systems, Inc. provides schema scripts for some of the most popular databases, you may find that yours is not included in the list. If this is the case, you may develop your own schema script by using TEMPLATE.mdb (EPI Suite's supplied default database) as a guide. Simply export the database definition from TEMPLATE.mdb using Microsoft Access. You will need to recreate the indexes and primary keys, since Access does not export them. The documents EPI Suite Database Structure.PDF and EPI Suite Database Description.PDF describes the database structure in details. These documents can be found in the \Doc\Database Description directory of your installation CD.

### TROUBLESHOOTING

Below, you will find a list of commonly encountered integration problems and their solutions. This is not an exhaustive list, but it provides adequate reference material that should save you time during the integration.

#### Operating System

The following operating systems are supported:

Windows NT 4.0 SP3,  
Windows 98 SE,  
Windows 2000 Professional,  
Windows XP Professional

#### Database compatibility\*

\* Currently tested with Beta versions of EPI SUITE 6. Test results are subject to change upon release of the final product to QA.

#### Microsoft SQL Server 2000 (8.00.760)

Tested with Microsoft ODBC driver version 2000.81.9031.38 (Source: MDAC 2.7 SP1)

Client OS: Windows 98SE, 2000 SP3 and XP SP1a.

No compatibility issues found.

#### Oracle 9i (9.2.0.1)

Tested with Oracle ODBC driver version 9.02.04.00 (Source: ora9204.exe)

Client OS: Windows NT 4 SP6a, 98SE, 2000 SP3 and XP SP1a.

Compatibility issues: Performance is adequate when the database owner option in Guard Card is set.

Installing the ODBC driver produced the message "Error occurred" at the end of the installation but it did not affect the proper operation of the ODBC driver.

#### Oracle 9i (9.2.0.1)

Tested with Microsoft ODBC driver version 2.573.9030.00 (Source: MDAC 2.7 SP1)

Client OS: Windows NT 4 SP6a, 98SE, 2000 SP3 and XP SP1a.

Compatibility issues: Functional, but this driver is NOT recommended due to severe performance issues with Guard Card.

#### **Oracle 8i (8.1.5.0.0)**

Tested with Oracle ODBC driver version 8.01.55.00.

Client OS: Windows 98SE, 2000 SP3 and XP SP1a.

Compatibility issues: Performance is adequate when the database owner option in Guard Card is set. Their required Net 8 is not certified for Windows XP by Oracle.

#### **Microsoft Access 2002 and Access 2003 beta.**

Tested with native JET connection. Client OS: Windows 98SE, 2000 SP3 and XP SP1a.

No compatibility issues found.

#### **IBM DB2 UDB v8.1**

EPI SUITE 6.0 was found to be compatible with DB2 UDB v8.1 with the following restrictions:

ODBC Driver from DataDirect must be used instead of the IBM native drivers.

Images storage as database BLOB's is not supported by EPI SUITE in this release. Images can be stored on the file system as an alternative.

Batch Update, Batch Add Card and Batch Delete may cause a fatal ODBC error which requires restarting EPI SUITE.

The tests were conducted with Windows XP as the client computer. Other OS's will be tested at a later date. DataDirect ODBC DB2 Wire Protocol Driver version 04.20.007 was used for the duration of the tests.

#### **EPI SUITE 5.0 & 5.5 Database Compatibility Notes**

##### **Oracle 8i (8.1.55)**

Tested with Oracle ODBC driver version 8.01.55.00. Operating systems used: Windows NT, 98, 2000.

**Note:** Oracle 8i client cannot be installed on a Windows ME (Millennium) workstation.

##### **Oracle 8.0**

Not tested.

##### **Oracle 7.3**

EPI SUITE 5.x can connect to Oracle 7.3 with the Intersolv ODBC driver for Oracle v. 3.11 with the option "Enable scrollable cursors" selected. Tested on Windows 98. Contact Technical Support for the Oracle 7.3 scripts for EPI SUITE 5.x.

##### **Microsoft SQLServer 7.0**

Tested with Microsoft ODBC driver 3.70.08.30.9.2. Operating systems: Windows NT, 98, 2000.

##### **Microsoft SQL Server 6.5**

EPI SUITE 5.x cannot be used with SQL Server 6.5. There is a problem importing images and cards. Tested on Windows 98 and NT.

## **MDAC**

Microsoft provides the MDAC libraries necessary to establish your ODBC connections.

## **SHARED DLLs**

- Windows shares certain DLLs between multiple products. This can sometimes generate incompatibility issues when installing different products. Whenever possible, the workstation should be used exclusively for the integrated EPI Suite solution for both stability and security issues.
- Please keep in mind that newer versions of DLLs do not necessarily guarantee the continued satisfactory operation of a software product. **EPI Suite installs DLLs that are certified to work with its component applications.**
- There should only be one shared DLL of its kind in the system path; otherwise, it is impossible to determine which one EPI Suite will load. Specifically, ODBC DLLs should all be located in the System directory, and not in the Windows directory.

## **The Database Engine**

- EPI Suite uses field types that some older database engines do not support. In particular, the integration database must define data types that can store images, as well as up-to-the-second dates and times in single fields.
- EPI Suite supports fixed-length character strings. But these are cumbersome for the user, since they must enter all of the data, including spaces, when querying certain fields—an absolute necessity, since the database performs a direct match of the field contents.
- Some database engines do not enforce UNIQUE/NOT NULL integrity. Although they may offer keywords like “UNIQUE” or “NOT NULL,” these engines do not use indexes to ensure field contents are indeed unique and not null. Our tests indicate that Paradox 5.0, FoxPro 2.6, DBase 3.0 are among these databases.

## **Temporary Files**

Some ODBC drivers may create temporary files in the Windows TEMP directory. These files are used by database cursors to keep track of record movements. The number of records a query will return affects the file size. If you expect to return large numbers of records with a query, it is important to ensure that there is enough temporary disk space.

## **Export/Import Connectivity**

When it is impossible to establish an ODBC link between the two products, you can export records to a text-delimited (CSV) or fixed-length file, and then import them back into EPI Suite. To do this, you will have to write your own customized export function. To import data from a text file, or any other ODBC source, use the GuardTool Importer. Importer allows you to create an import definition that can be saved to file for later use. Once the definition is created and saved to disk, the import sequence can then be automated.

The automated import sequence can be performed as a background process by using GuardTool Importer's command line arguments, which are noted on page 2-22 of the *EPI Suite User*

*Manual*. Once the import procedure is complete, GuardCard can be automatically opened to the last imported cardholder record, see the section entitled **Application Communication** (below) for further details.

**Note:** The GuardTool Importer not only imports records, but also updates them if they already exist.

### **UI Configuration**

GuardCard's data entry forms can be customized to display whatever fields are present in the EPI Suite database, including those available in the integrated cardholder table. For complete information on how to customize the GuardCard data entry forms, refer to "Adding Data Fields to the Workspace" of the *EPI Suite User Manual*.

### **Application Communication**

An OLE Automation Interface is supplied with EPI Suite. This allows the integrated solution to automatically open GuardCard to a specific cardholder record. To work, the integrated solution must call one function and pass it to the cardholder PMK. It can also pass standard GuardCard command line arguments like /User and /Password, thus bypassing GuardCard's manual sign in protocol. The document EPI Suite OLE Automation.pdf describes the Automation Interface in details. This document can be found in the Doc\OLE Automation directory of your installation CD.

### **Dates and Times**

EPI Suite stores dates and times in the database as universal time. The "Save all Date/Time as GMT" checkbox under View/Options/Database in GuardCard can disable this processing for the current database.

### **Reports**

EPI Suite comes with a standard set of Microsoft Access 2000 static reports, which can be generated through the GuardTool Reports utility. GuardTool Reports provides a method for the user to connect to the EPI Suite ODBC data source, which operates reliably when the data source contains all of the EPI Suite tables in their native forms. In other words, all tables must be located in the same database, and not exist as attachments from other databases. If you intend to use Microsoft Access 2000 to attach external tables to the supplied TEMPLATE.mdb database, then you must also perform the same attachments to the GuardTool Reports database (GuardToolReports.mdb). This is necessary because Microsoft Access 2000 does not support an attachment to another attachment. **We do not recommend that you modify the supplied Reports database by adding new reports, or by modifying existing reports. Rather, you should build a new Access 2000 database to accommodate your needs.**

## **REDISTRIBUTION OF THE INTEGRATED PRODUCT**

In general, the EPI Suite database schema should be incorporated into, and redistributed with, the integrated solution. You should write a procedure that describes, in detail, how to install and integrate the products. Pay special attention to the ODBC connection, to avoid problems. Your procedure should also indicate which EPI Suite edition, version, and revision to install. Since third-party software and hardware is involved in the integration, you should avoid further changes after testing.

## **LIMITATIONS**

Currently, EPI Suite is available in three editions: Pro, Classic, and Lite. Only Pro and Classic can be reliably integrated. Both flavors feature:

- Connection to any ODBC-compliant database, so long as an appropriate driver is installed.

- Connection to Access databases via a JET connection.
- An option to apply read-only privileges to the integrated cardholder database table. This means that GuardCard operators cannot add, modify, or delete cardholder records.
- An option that disables the GuardCard operator's ability to add or remove cardholder database records. Operators may nevertheless modify cardholder records.
- An option that limits to one the number of card records that can be created for each cardholder.
- The ability to rename tables and fields through the GuardTool Database Utility.

## **CONCLUSION**

EPI Suite has been successfully integrated to several different third-party products. Fully tested connections to Microsoft Access 2000, Oracle, SQLServer and other databases have already been established. Although the integration process can sometimes present its share of obstacles, the end result should always be fruitful.