

Extracting Data From RDS Intranet Database

I) Introduction

Prior to an RDS Intranet installation, a customer requested means of starting work on code to extract test data from the Reedholm database. To that end, an example database was created and e-mailed to them.

This application note describes the example database and how to use it along with brief direction in writing SQL wafer lot data extraction routines.

A copy of the example database is available by e-mailing support@reedholmssystems.com.

II) Example Database Installation

The Reedholm example database consists of a set of three files:

- RIPRIME.MDF (prime database)
- RIDATA.NDF (main database)
- RITRANS.LDF (transaction log)

While the standard installation places these types of files in the D:\RIWEBSQL directory, they can be placed in any directory on a computer running SQL Server 2000 Personal, Standard, or Developer editions. Service pack 3, or a more current version, must be installed. The database is not designed to work with other SQL database packages.

Once on the target computer, the files are attached to the SQL Server using the SQL Enterprise Manager. The attach command is found by expanding the SQL Server tree and highlighting the “Databases” tree item. The next step is to use the Action→All Tasks→Attach Database menu option, which brings up the dialog box shown in figure 1.

The Browse button is used to select RIPRIME.MDF, and the database should be attached as “RIWEBSQL”. Attaching the database with a different name requires modifying queries written once RDS Intranet is installed.

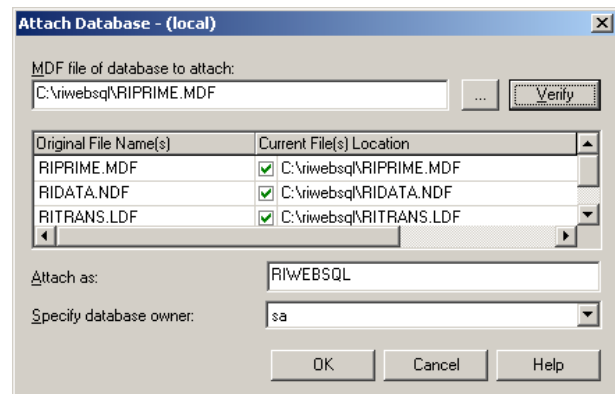


Figure 1 – Attach Database Dialog Box

III) Example Database Contents

The example database is a complete copy of the RDS Intranet database, so it includes:

- Tables plus their relationships and rules
- SQL stored procedures
- Default data for user interface, systems, etc.

The example database was populated with enough user data so that a wafer lot could be executed (test plans, probe patterns, etc.). Using Acquire, two wafer lots were created. However, the test controller was in simulation mode (no instrumentation attached). Thus, while test results do exist with the lot data, the values are meaningless and do not vary. Table 1 describes the user data.

An SQL database diagram named Lot Tables was created that shows the tables used to store the wafer lot data, the name tables, and their relationships. The diagram can be viewed and printed using SQL Enterprise Manager. Because of its size, it was laid out on 11x17. This diagram also contains the name, type, and description of each field associated with wafer lot data.

The database tables are described in the online help located on the RDS Intranet demonstration CD.

Item Name	Description
Meas4TRes	Single point test of 4T resistance measurement
MeasCurrent	Single point test forcing a voltage and measuring a current
Meas I – Sweep T	Sweep test measuring current while stressing voltage for 5 seconds
ExampleTestListA	Test list holding two single point tests in database
ExampleTestListB	Test list holding sweep test in database
ExampleIntraPat	Intradie probe pattern with two intradie: M1 and M2. M1 is assigned ExampleTestListA and M2 is assigned ExampleTestListB
ExampleDiePat	Die probe pattern, shown in figure 2, has 5 die and executes only one intradie pattern: ExampleIntraPat
ExamplePF Setup	Pass-fail setup used to determine wafer pass-fail and inking
Example Probe Setup	Probe setup used to define probe options such as wafer angle for a given device
Example Probe Card	Probe card to be used with device. Used to also track touchdowns
Example Rpt Options	Report option settings that define which reports to run with a device
Example Fixed Comments	Fixed comment attached to the device. Was used in RDS DOS, but is not needed since devices now have description field
Example Device	Device used to create lot test data. This device directly links to the above six items in this table. The rest of the items are linked to the device via the die pattern.
Example Lot A	One of two example wafer lots tested using “Example Device”. Data for each lot was populated identically for the five wafers.
Example Lot B	Second example wafer lot.

Table 1 – User Data in Example Database

A) Die Probe Pattern

A simple die pattern consisting of five die and one intradie was used to create the example lot data, with die names assigned 1 to 5 as shown in figure 2. The reference coordinate for die 1 is 0,0.

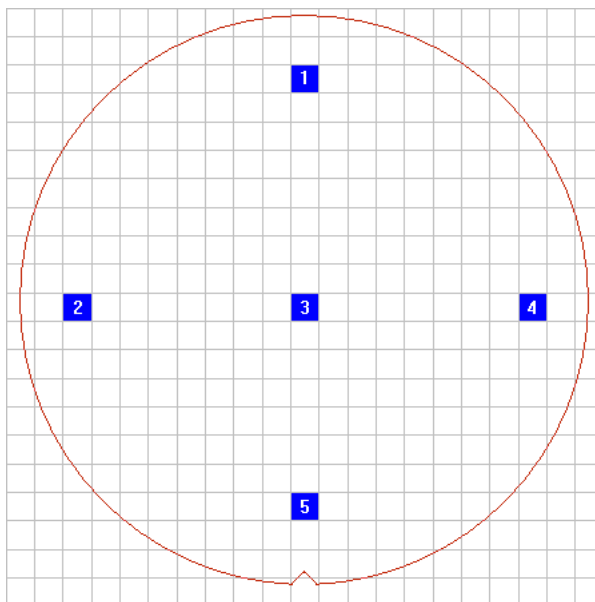


Figure 2 – Example Die Probe Pattern

B) Sweep Test Results

A sweep test of current versus time was executed on the second intradie. The example database includes this plot data for reference. However, extracting plot data requires different SQL code than used to extract single point results. That code is not covered in this application note. Figure 3 is the I/T data generated per die, with 2856 data points taken per sweep.

When single point data is extracted, a sole test result of 0.0 is returned for each sweep test.

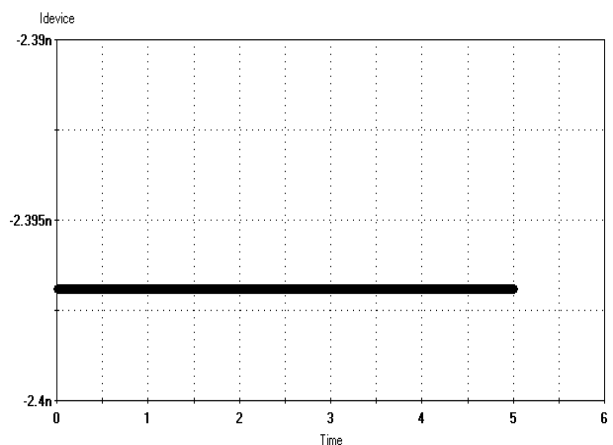


Figure 3 – Current versus Time Data Plot

IV) Extracting Lot Data

As explained in the online help, the best way to create custom extraction code is to start with the SQL stored procedure LotRawDataReport.

Since this procedure is used by and part of the RDS Intranet application, it should not be altered or else the application’s raw data report will fail. Instead, a copy should be made and modified.

The stored procedure uses two temporary tables during its execution. If the custom extraction software created does the same, the temporary table names should be changed to avoid confusion and conflicts.

A) LotRawDataReport Execution

The procedure accepts two input parameters: NumCols and Lot_ID. NumCols is used to breakup the data into die groups for the report and can be eliminated in the extraction code. Lot_ID is the database key that identifies the wafer lot data to be extracted.

Figure 4 shows the record set returned by LotRawDataReport when called using SQL Query Analyzer for “Example Lot A”.

LotRawDataReport returns the following 25 fields:

- Lot_Name, WaferOrder, Wafer_Name
- WaferTemp, DieGroup, DieGroupName
- IntradiePattern, DieOrder, Die_Name
- IntradieOrder, IntradieName, TestOrder
- Test_Name, Test_Version, Result
- ResultStatus, FailCode, SysState, Units
- InnerLow, InnerHigh, OuterLow
- OuterHigh, CenterLow, CenterHigh

B) CSV Export

The Reedholm supplied Visual Basic program UserDataCSV_VB6 (source and DLL) exports the wafer lot data to a CSV file—which is a flat ASCII formatted file. Thus, as explained in the online help, another way to extract data is have this DLL called at the end of each lot. The customer database or application (Excel for example) would then import this file.

V) Summary

Using this SQL code as a starting point, one should be able to write the code needed to extract the data from the Reedholm database and insert it into another SQL compliant database.

	Lot_Name	WaferOrder	Wafer_Name	WaferTemp	DieGroup	DieGroupName	IntradiePattern	DieOrder	Die_Name	IntradieOrder	Intra
1	Example Lot A	1	1	NULL	1	1 - 5	1	1	1	1	M1
2	Example Lot A	1	1	NULL	1	1 - 5	1	1	1	1	M1
3	Example Lot A	1	1	NULL	1	1 - 5	1	1	1	2	M2
4	Example Lot A	1	1	NULL	1	1 - 5	1	2	2	1	M1
5	Example Lot A	1	1	NULL	1	1 - 5	1	2	2	1	M1
6	Example Lot A	1	1	NULL	1	1 - 5	1	2	2	2	M2
7	Example Lot A	1	1	NULL	1	1 - 5	1	3	3	1	M1
8	Example Lot A	1	1	NULL	1	1 - 5	1	3	3	1	M1
9	Example Lot A	1	1	NULL	1	1 - 5	1	3	3	2	M2
10	Example Lot A	1	1	NULL	1	1 - 5	1	4	4	1	M1
11	Example Lot A	1	1	NULL	1	1 - 5	1	4	4	1	M1
12	Example Lot A	1	1	NULL	1	1 - 5	1	4	4	2	M2
13	Example Lot A	1	1	NULL	1	1 - 5	1	5	5	1	M1
14	Example Lot A	1	1	NULL	1	1 - 5	1	5	5	1	M1
15	Example Lot A	1	1	NULL	1	1 - 5	1	5	5	2	M2
16	Example Lot A	2	2	NULL	1	1 - 5	1	1	1	1	M1
17	Example Lot A	2	2	NULL	1	1 - 5	1	1	1	1	M1
18	Example Lot A	2	2	NULL	1	1 - 5	1	1	1	2	M2
19	Example Lot A	2	2	NULL	1	1 - 5	1	2	2	1	M1
20	Example Lot A	2	2	NULL	1	1 - 5	1	2	2	1	M1
21	Example Lot A	2	2	NULL	1	1 - 5	1	2	2	2	M2
22	Example Lot A	2	2	NULL	1	1 - 5	1	3	3	1	M1
23	Example Lot A	2	2	NULL	1	1 - 5	1	3	3	1	M1
24	Example Lot A	2	2	NULL	1	1 - 5	1	3	3	2	M2
25	Example Lot A	2	2	NULL	1	1 - 5	1	4	4	1	M1
26	Example Lot A	2	2	NULL	1	1 - 5	1	4	4	1	M1

Figure 4 – Lot_ID 10001 Records Extracted From Example Database