

IBSurgeon FirstAID 4.0 Recovery Guide

ver. 4.0.15

- IBSurgeon FirstAID 4.0 Recovery Guide..... 1
- What is IBSurgeon FirstAID? 2
 - FirstAID Modules 2
- For those who don't want to read this guide 3
- How to view data in corrupted Firebird/InterBase database with FirstAID Extractor..... 4
- How to get a full version of FirstAID..... 8
- Recovery with FirstAID Direct 9
- Recovery with FirstAID Extractor..... 12
 - Overview of data extraction process 12
 - Export to the empty database with the same metadata 13
 - UDFs! 14
 - What if I don't have empty good copy of a database? 15
 - Export process 16
 - Registration 16
 - Export to the new empty database without metadata..... 20
 - Final steps with empty database export 24
- Some important information you may need during recovery..... 24
 - “Quote names” setting 24
 - Offline registration 26
 - Export the single table 27
 - External Metadata 28
- Support 30

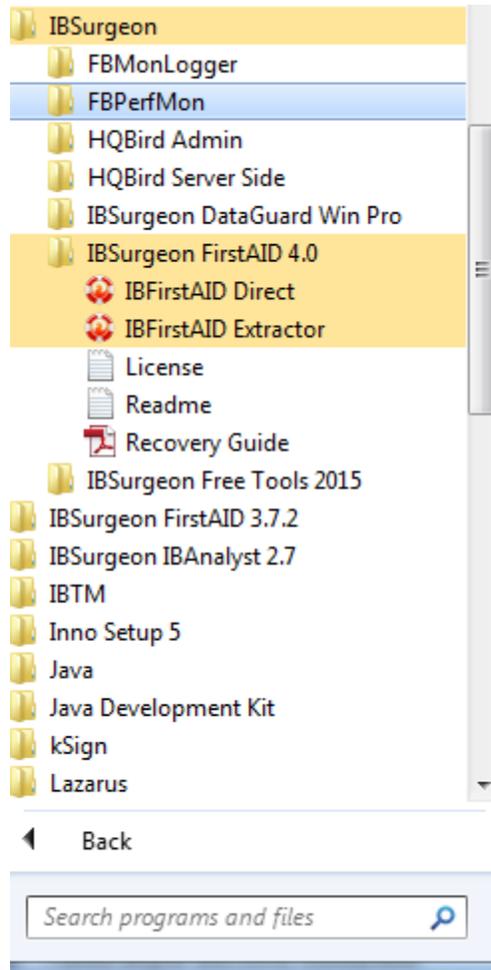


Figure 1. IBSurgeon FirstAID in Start Menu

What is IBSurgeon FirstAID?

IBSurgeon FirstAID is the tool that can automatically diagnose and repair corrupted InterBase or Firebird databases - it can repair corruptions that neither gbak nor gfix can handle. It uses its own layer for low-level database access without using the InterBase or Firebird engine, so it can perform real "surgical" operations and repair your database when all other standard mechanisms cannot.

FirstAID 4.0 supports the following versions of Firebird and InterBase:

- Firebird 1.0
- Firebird 1.5
- Firebird 2.0
- Firebird 2.1
- Firebird 2.5
- InterBase 4.x
- InterBase 6.x
- InterBase 7.0
- InterBase 7.1
- InterBase 7.5
- InterBase 2007
- InterBase 2009
- InterBase XE/XE3

Attention: Firebird 3 is not supported, since there is no release at the moment. There will be the special free update for FirstAID 4.0 to support Firebird 3.0. If you have corrupted Firebird 3.0, contact our support: support@ib-aid.com.

If you have problems with the InterBase 5.x database or earlier version of InterBase, please send email to support@ib-aid.com, we will help you.

FirstAID Modules

IBSurgeon FirstAID contains 2 modules: **FirstAID Direct** and **FirstAID Extractor**. The Direct module is intended to fix original corrupted database in place. The Extractor module is designed to view and export data from the corrupted database to the good new database (usually it should be empty).

After installation of IBFirstAID you can find both modules in the Start menu (or in the installation folder of FirstAID, if you use Windows version without Start menu).

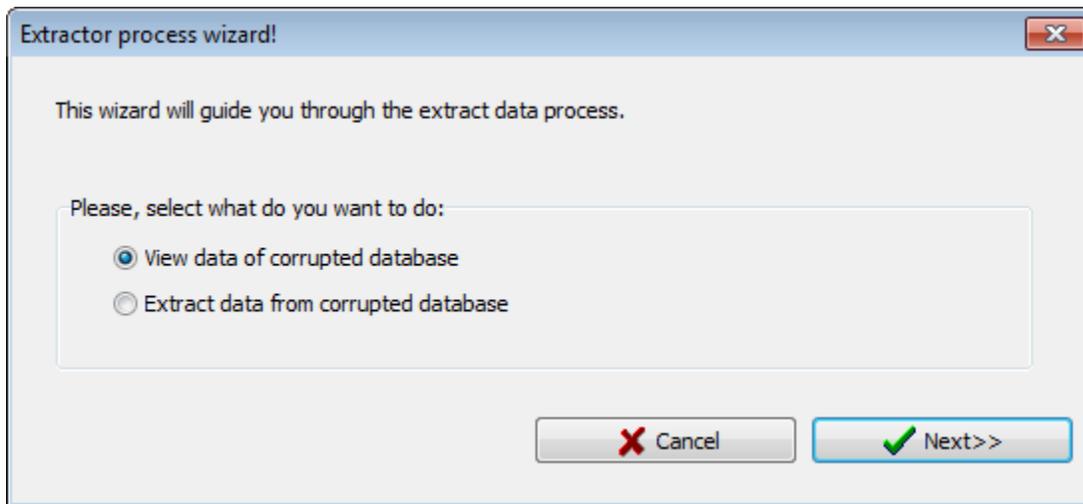
If you have corrupted database and need to check it and see if there are good enough data inside, use IBFirstAID Extractor (this function is available in a free version).

If you can see data you are looking for, and decide to recover database, we recommend performing recovery with FirstAID Direct first, and only if there will be problems, use Extractor to export data to the new database.

Let's consider these operations and available options in details.

For those who don't want to read this guide

Click "Wizard" – it is the first button on the FirstAID Extractor toolbar, and then follow the next steps:



Please remember – if you don't want to read the guide, you must read wizard's screens thoroughly.

However, if you will not be able to achieve a desired result with Wizard, please read the rest of this Guide.

How to view data in corrupted Firebird/InterBase database with FirstAID Extractor

If you need to view data in the corrupted database, you can do it with **free version** of FirstAID Extractor. For this you need to run FirstAID Extractor, click “Open Single-file Database” (if you have multi-volume database, choose from menu File\Open multi-file database).

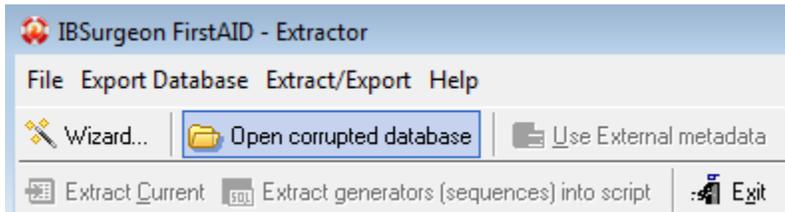


Figure 2 Open corrupted database

After that it can ask you to confirm ODS version (2 variants of dialog are shown, to demonstrate options):

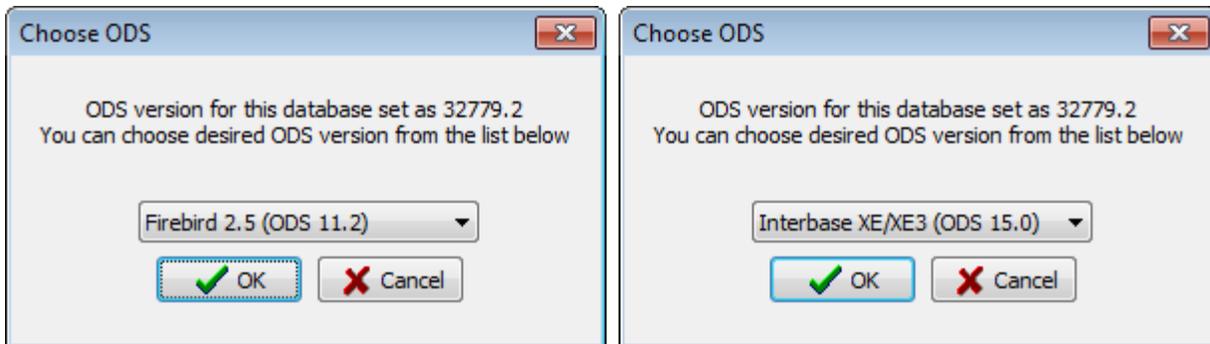


Figure 3 Confirm choice of On-Disk Structure version (optional dialog)

There is the only exception when FirstAID cannot show you ODS – if header page is corrupted. In this case it will show you empty line, and you must select correct version of your database in the drop-down list. We assume you know it, otherwise you should contact us at support@ib-aid.com.

Click “Ok”.

Then it asks to confirm page size:

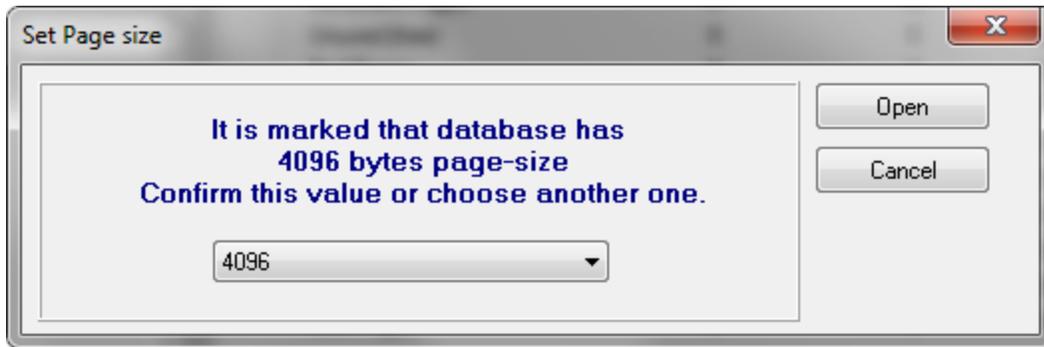


Figure 4 Confirm page size choice (optional dialog)

If the header of database is corrupted, FirstAID will show you empty line and you need to select correct page size from the drop-down box. Most often it is 4096 for Firebird 2.x and 1024 for InterBase and Firebird 1.x. If you will select wrong page size you will see a big percent in "Bad pages" line of "Pages Summary" tab . If you don't know page size and 4096 looks incorrect, try to open database with different page sizes, in order to find correct value.

Click "Open".

After that database will be opened and you will see list of the tables at the left and summary view of database pages at the right:

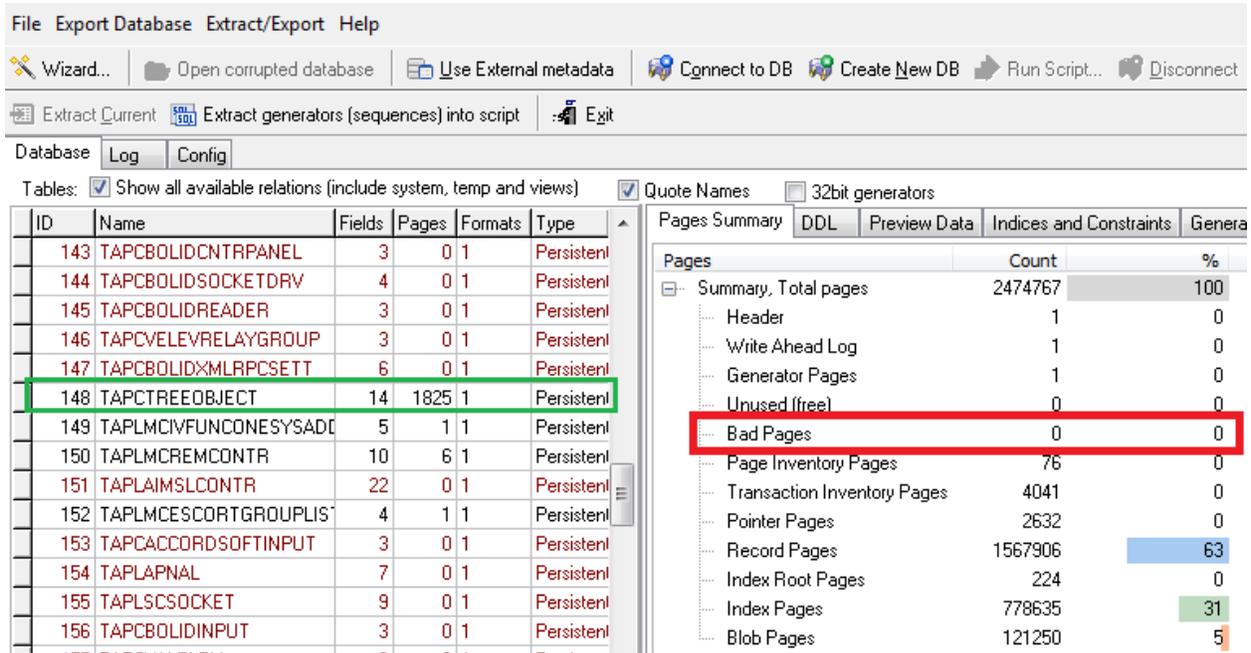


Figure 5 Pages Summary

The most important information on this tab is percent of "Bad pages" - it gives an idea of how many data pages cannot be read and, therefore, what are losses.

If you see 0% of bad pages, it (most likely) means that problems are on the records level or in the system area, and there are not so many problems. If you see 1-2%, it slightly corresponds to losses in the database. If you see something like 50% or 75%, it usually means that you have selected wrong page size (in case of wrong header). Of course, there are cases of corruptions when nearly the whole database is damaged.

You can see that FirstAID Extractor highlights empty tables by light red, and tables with data inside have a black color of the font.

Double click on table name and you will see data from the first data page of this table:

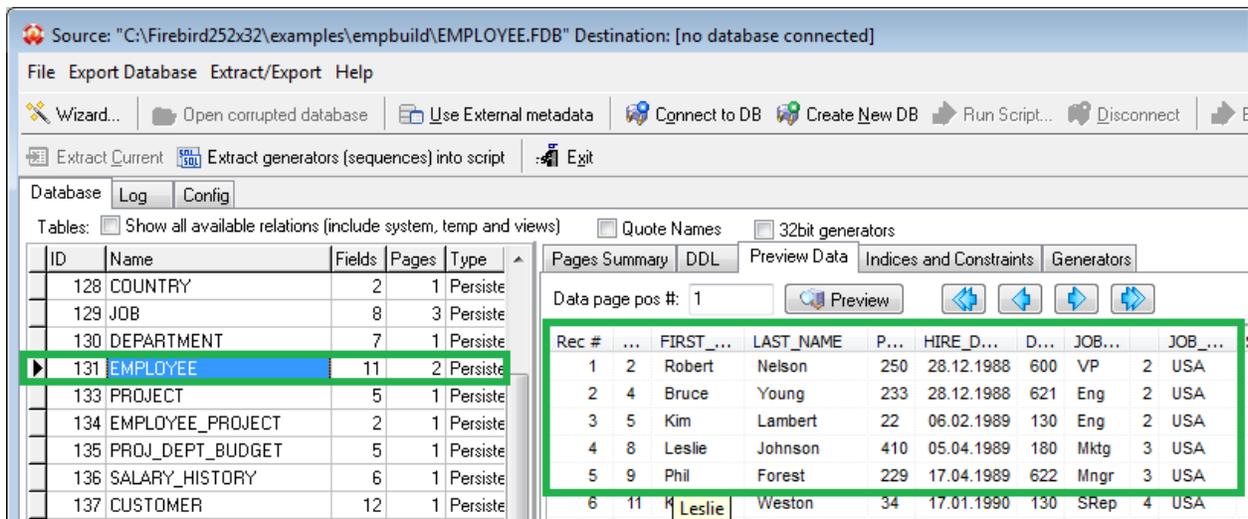
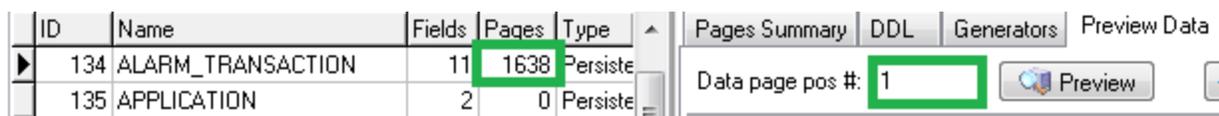
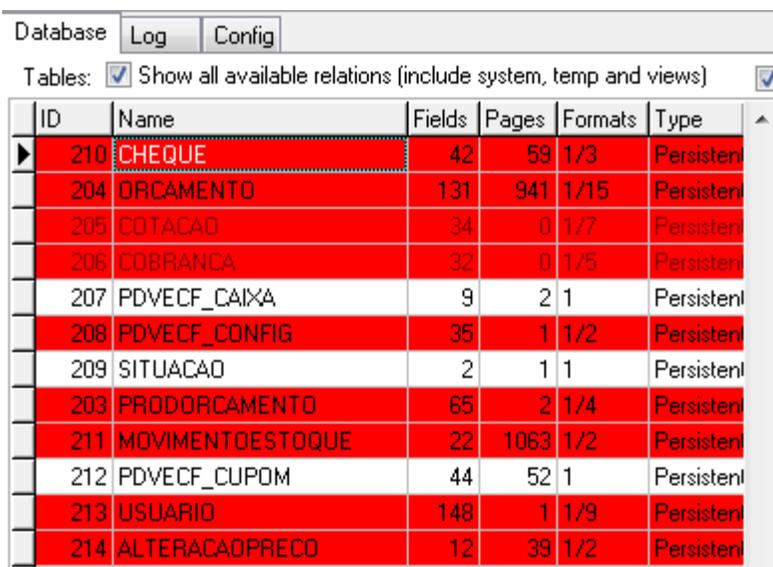


Figure 6 Data preview in corrupted databases

In the tables' list you can see number of data pages found for this table in the database, and there is a navigator to browse data pages on the "Preview" tab of FirstAID Extractor:



Browse data pages for the important tables and decide, do you need to recover this database. If you decided to recover database, read next section.



In case of a heavy corruption of system tables FirstAID Extractor will highlight by bright red all tables with problems. In the column «Formats» it shows a number of expected record formats and number of existing formats.

In this case, and also if you don't see normal tables' names or data in them, read "External metadata" section in the end of this guide!

How to get a full version of FirstAID

To recover database you need to purchase appropriate license of FBFirstAID and wait for its deployment - you should get automatic email from activate@ib-aid.com about it. **Usually it takes around 10-15 minutes.**

FirstAID is licensed on “per database” basis, so you can buy license for 1-3 databases or for 50 databases:

- From 1 to 3 databases:
<https://secure.payproglobal.com/orderpage.aspx?products=185816>
- Up to 50 databases:
<https://secure.payproglobal.com/orderpage.aspx?products=185819>

If you have any old version of FirstAID, or you have exhausted number of databases to be recovery, you can buy an upgrade:

<https://secure.payproglobal.com/orderpage.aspx?products=177656>

Usually order is processed during several minutes, and then you will get automatic email from ShareIt online shop.

After that we will send you necessary information (essentially, it is password) to enter it in FirstAID and perform recovery (see details below in section “Registration”).

If you did not receive the password in 3-4 hours, please check your antispam folder (and settings), and write email to support@ib-aid.com with your order number, to speed up delivery.

You don't need to reinstall FirstAID from Download section of Deploy Center – just enter email and password when requested. Reinstall FirstAID only if you have an older version installed.

Try to recover database with FirstAID Direct module before trying to export all data with FirstAID Extractor – in-place recovery can be faster than export process.

Recovery with FirstAID Direct

To recover Firebird database with FirstAID Direct please do the following:

- 1) Please stop Firebird server and make a copy of the original database file! This is important to have intact copy of the corrupted database for possible future use.
- 2) Run "FirstAID Direct".
- 3) Open corrupted database. Please wait – it can take some time (duration depends on computer's speed).
- 4) After opening it will show you the following message in the main window:

```
18.02.2014 18:35:14 INFO: ===== DATABASE IS READY FOR DIAGNOSING AND REPAIRING. =====
18.02.2014 18:35:14 INFO: ===== Now choose "Diagnose" or "Repair". =====
```

- 5) Click "Diagnose". FirstAID will start to walk through database pages and check them. It can be a long process, which depends on the database size, computer speed and data density (i.e., how many records are on data pages).
- 6) Look into FirstAID log: there will be information messages and errors:

Example of information message:

```
18.02.2014 18:45:29 INFO: Relation MODEL_F (159) is OK
```

Example of error message:

```
18.02.2014 18:45:31 ERROR: Found 1 record errors on datapage#2069
18.02.2014 18:45:31 ERROR: Error on data page #2069
18.02.2014 18:45:32 INFO: Pointer page #243 checking: found 177 errors.
18.02.2014 18:45:32 ERROR: Error in checking relation #160 Found 1 errors.
18.02.2014 18:45:32 ERROR: Relation MOVIMENTA1 (160) is CORRUPT
```

The most unpleasant are data pages and records-levels errors: if there are many errors, it can be a sign that you need to use FirstAID Extractor instead.

- 7) Please save diagnostics log for possible future use. If you will see alerts that more than 30% of database lost, probably it is better to stop recovery with FirstAID Direct and run FirstAID Extractor (see below).
- 8) After "Diagnose" please click "Repair". The following dialog (see Figure 7) will appear (it will appear only if you have Internet connection at the computer where you run FirstAID, otherwise read about "Offline registration").

Enter here your email (which was used for license purchase) and password (from the email from activate@ib-aid.com). Click "Recover database (generate UNLK online)".

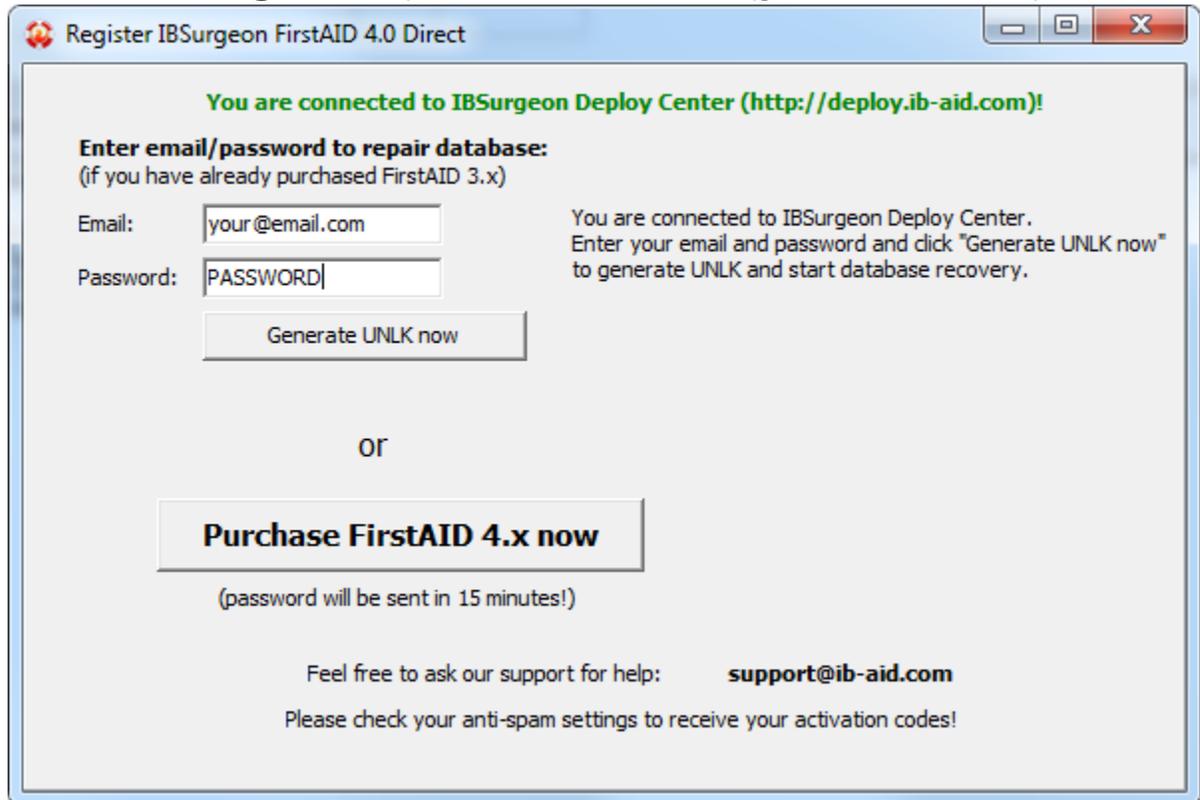


Figure 7 Enter email and password to repair database

Please note that FirstAID will save UNLK file for this database in the folder C:\ProgramData\FBFirstAID3\Unlocks, so next time when you will open this database file at the same computer, FirstAID (both Direct and Extractor) will not ask you for the registration.

- 9) Repair process will take approximately the same time as diagnostics.
- 10) After Repair you will see this message in the FirstAID log:



Click on "Final Steps" to see this instruction:

FINAL STEPS

After IBSurgeon FirstAID Direct repair procedure you need to run standard means to complete recovery. Please keep results of each step for possible future use.
Even if gfix steps fail, try to run gbak steps (3 and 4) anyway!

1) Run gfix.exe (it is located in "Bin" directory of InterBase/Firebird installation) using the following command line:

```
gfix.exe -v -full -user SYSDBA -password <your_sysdba_password>  
Disk:\Path\your_database.gdb
```

2) After that run gfix.exe with another switches combination:

```
gfix.exe -mend -ig -user SYSDBA -password <your_sysdba_password>  
Disk:\Path\your_database.gdb
```

3) Gfix fixes minor corruptions and prepares database for backup. Then you need to backup database using gbak.exe (in the same directory with gfix.exe). Run backup with the following command:

```
gbak.exe -b -g -ig -user SYSDBA -password <your_sysdba_password>  
Disk:\Path\your_database.gdb Disk:\Path\backup.gbk
```

4) Restore database from backup. Run command:

```
gbak -c -user SYSDBA -password <your_sysdba_password> Disk:\Path\backup.gbk  
Disk:\Path\your_database.gdb
```

That's all - now database is repaired.

If you encounter problems during these steps, please use FirstAID Extractor module to export data from the corrupted database to the new one.

Recovery with FirstAID Extractor

If you already tried to fix database with FirstAID Direct and it was not possible to create backup of the database with final steps, proceed with extraction.

We assume that you have an untouched file copy of the original corrupted database which you have created before FirstAID Direct step. If so, please make a copy of it again and perform all further operations with it.

It's important to run FirstAID Extractor on the intact original (before FirstAID Direct) copy of the corrupted database!

Overview of data extraction process

The idea of data extraction process is very simple: FirstAID Extractor reads database on the low-level (it uses its own data access level, not using Firebird engine), and exports all good records into the new good database.

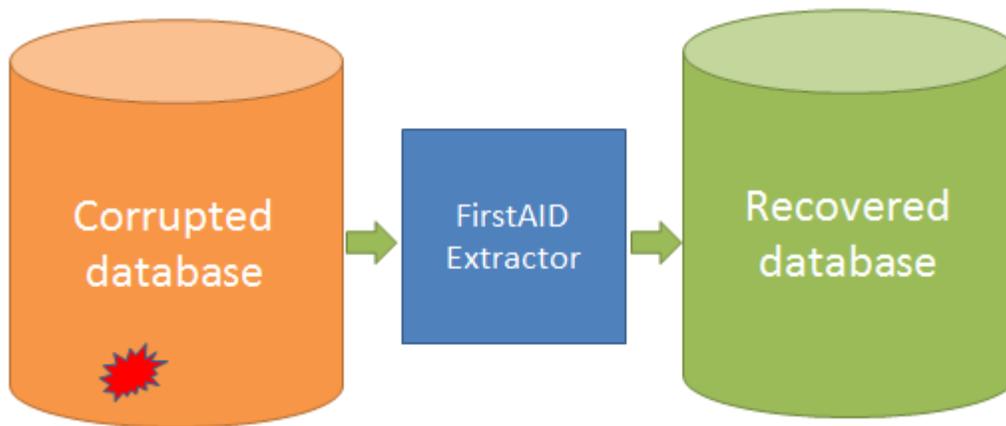


Figure 8 How FirstAID extractor works

There are several important options to be considered:

- 1) Recovered database. You need to have target database where saved data will be pumped to.
 - a. Connect to empty database *with the same structure* (metadata) as a corrupted database. **This is a preferred option.**
 - b. Create new empty database *without metadata*. FirstAID Extractor can create new empty database for you, but since metadata in the source database can be corrupted, it could be incomplete, and you will need extra steps to create missing metadata manually.
- 2) More data VS More consistency. In the corrupted database some primary keys could be missing and some database constraints (like NOT NULL, CHECK, FOREIGN KEY, etc.) could be violated, so there is a choice – turn off violated constraints and let potentially inconsistent data to be inserted to the database, or enforce all rules.
 - a. *More data*. This is a **preferred option**, because after export you will be able to review results and enforce database constraints manually. It is common that some non-relevant constraints exist in the damaged database, so it's better to save as much data as possible.

- b. More integrity. If you don't see many errors, you can try this option. All constraints and Foreign keys will be enforced, and those records which do not correspond database constraints will be skipped.
- c. Manual mode. You have options to tune export process manually. We assume you know what you are doing if you choose manual mode and set parameters by yourself.

Export to the empty database with the same metadata

So, let's consider the recommended option: export to the empty database with the same metadata as corrupted database has.

Open corrupted database in FirstAID Extractor and then choose "Connect to DB":

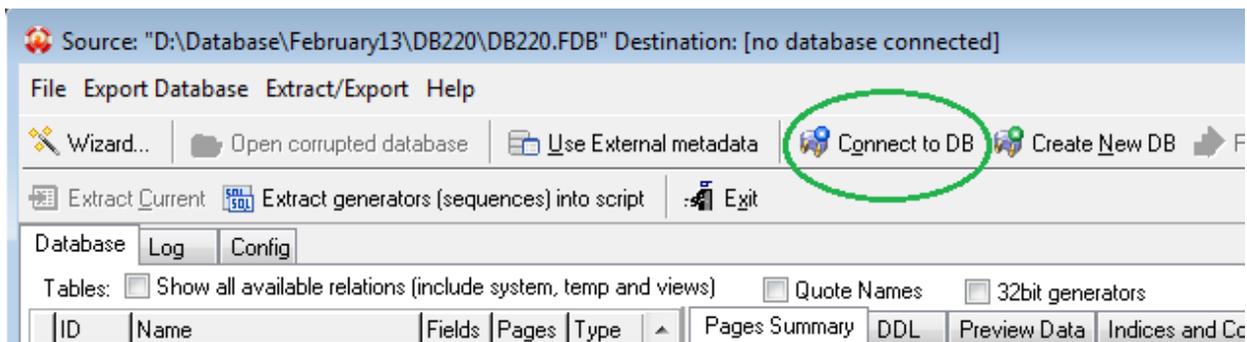


Figure 9 Connect to the empty database with the same metadata

After that the following dialog will appear:

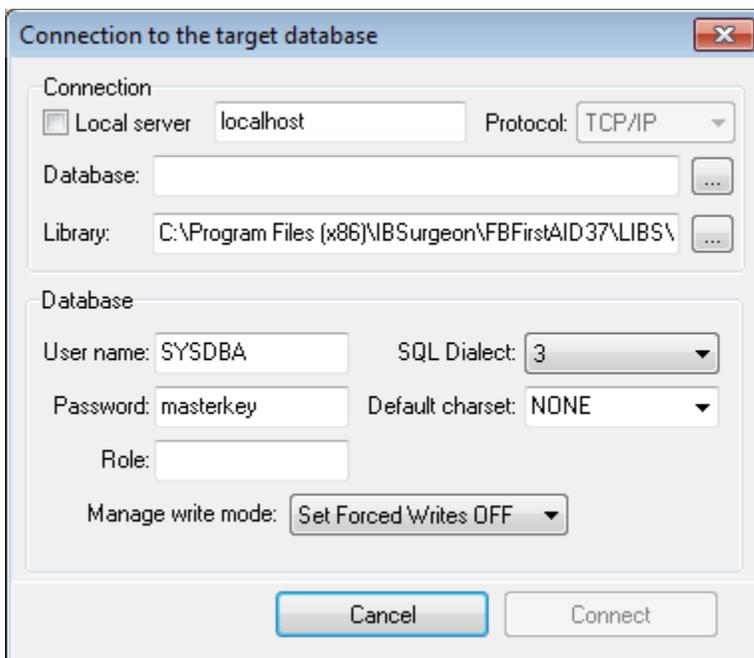


Figure 10 Connect dialog

Click on “...” near “Database” text field and select destination database for the export. Path to client library (fbclient.dll or gds32.dll) is set automatically; it depends on the version of the source database file (necessary client libraries are shipped with FirstAID).

If you prefer to export data with another server version than the original corrupted database, you need to choose the correct client library from that server.

FirstAID extractor will adjust SQL Dialect and Default charset parameters automatically, if detect that header page of corrupted database is not damaged, otherwise you need to set these parameters by yourself.

By default FirstAID Extractor will set target database in Forced Writes OFF mode, in order to speed up export process. You can change to Forced Writes ON after recovery complete, before going to production, with command `gfix -write sync <database> -user SYSDBA -pass <your_password>`.

Make sure that Firebird (or InterBase) server is running at this moment!

Click “Connect”.

UDFs!

After establishing connection with the destination database FirstAID Extractor checks the metadata for UDFs. At this moment you may see the following (or similar) message:



Figure 11 UDFs warning

It means that there are UDF functions in the destination database, and you **must** provide UDFs dll file(s) to ensure correct extraction. FirstAID Extractor shows you the name(s) of UDF libraries; in this case it is “ib_udf2.dll”.

An absence of UDF dll may prevent the proper export process!

You need to go to UDF folder of your Firebird/InterBase installation and check that this file is in this folder. If not, copy it from the server where originally your corrupted database was located.

What if I don't have empty good copy of a database?

If you don't have an empty good copy of the corrupted database, you need to create it with the following process:

- 1) Find any good copy (probably it will be old good copy) of the corrupted database. If you have good old backup (gbk or fbk), skip step 2.
- 2) Make backup with metadata only option:
gbak -b -g -m -user SYSDBA -pass masterkey Disk:\Path_to_good_db.fdb
Disk:\backup.fbk
- 3) Restore backup with metadata-only option:
Gbak -c -m Disk:\backup.fbk Disk:\path_to_empty_metadata_db.fdb

Use new empty metadata-only database as a target for export.

Export process

After that the following dialog will appear:

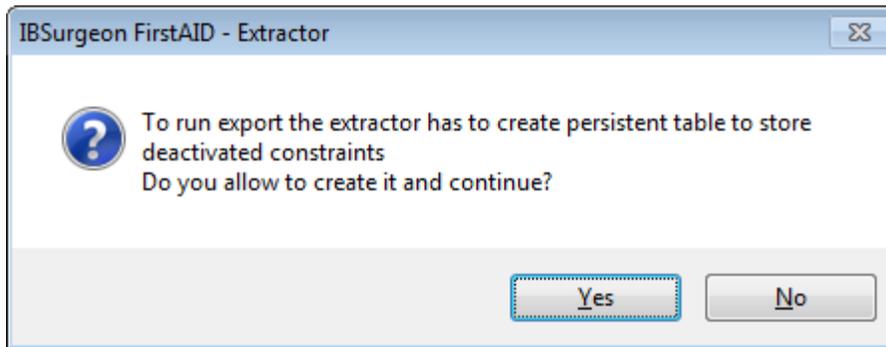


Figure 12 Permission to create service table

FirstAID needs to create service table to store necessary export information. This table will contain information about database constraints, triggers, indices, etc.

Click “Yes”.

After that FirstAID will open new tab “Destination database”:

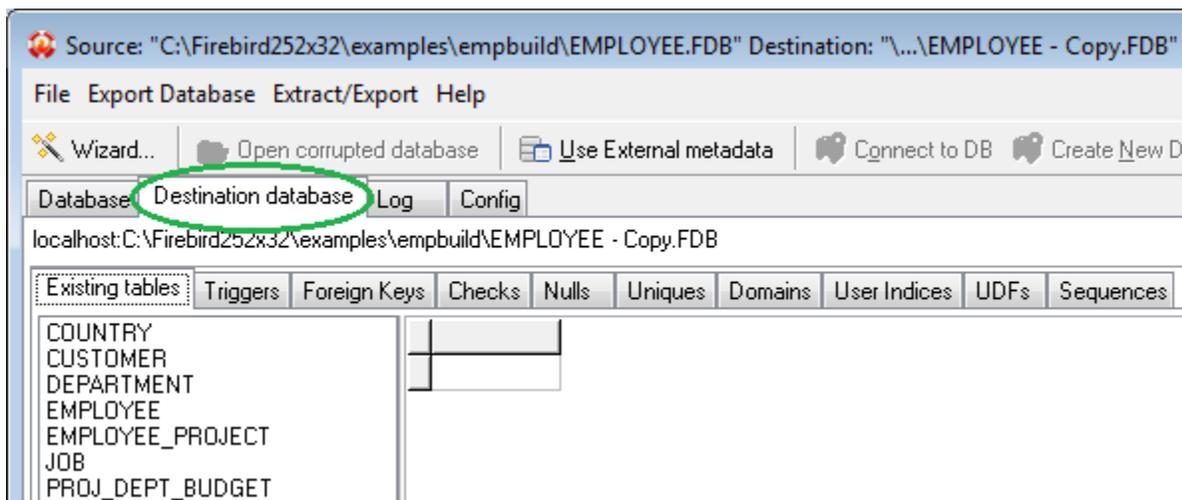


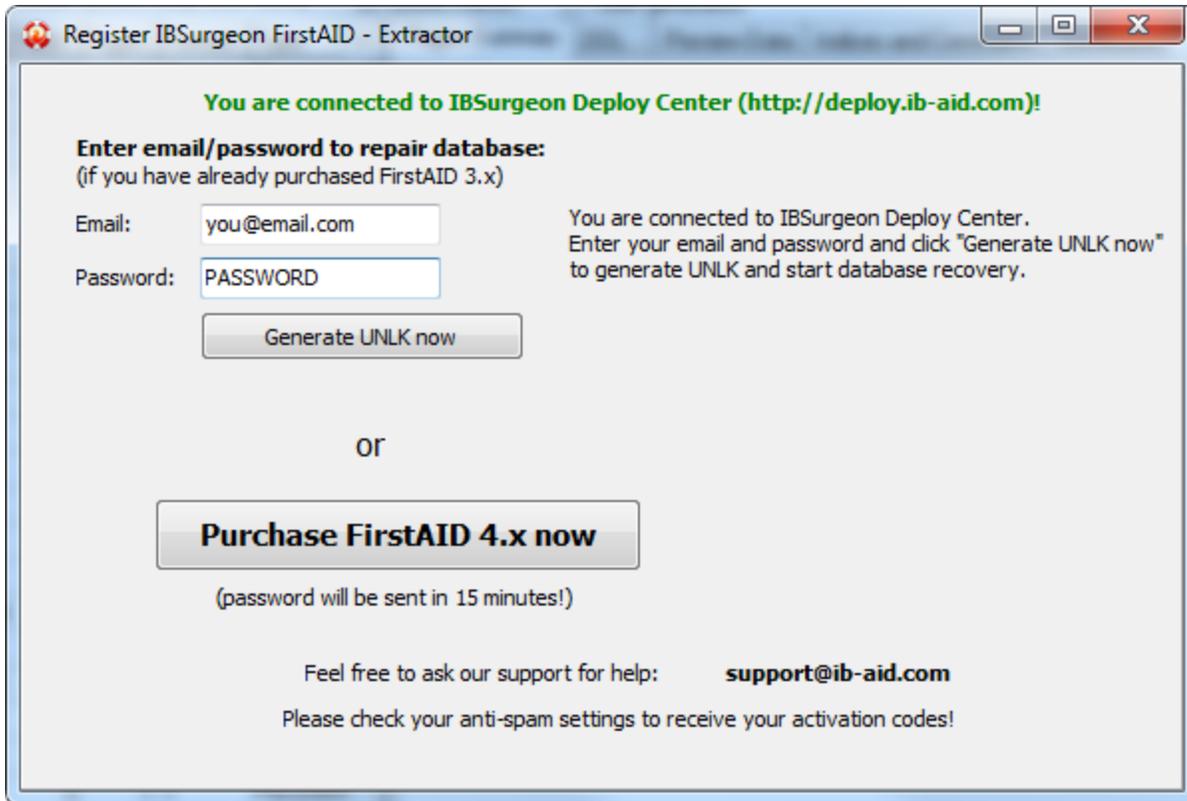
Figure 13 Tab "Destination database"

At this tab you can see the list of tables of target database, as well as triggers, foreign keys, checks and NOT NULL constraints, unique keys, domains, UDFs and generators (sequences).

Click “Extract All Tables”

Registration

The following dialog will appear (if you have Internet connection at the computer where you run FirstAID Extractor, otherwise read section "Offline registration"):



Enter here your email (**which was used for license purchase**) and password (from the email from activate@ib-aid.com).

Click "Generate UNLK now".

If you already registered this corrupted database on the same computer, registration dialog will not appear!

Then this dialog will appear:

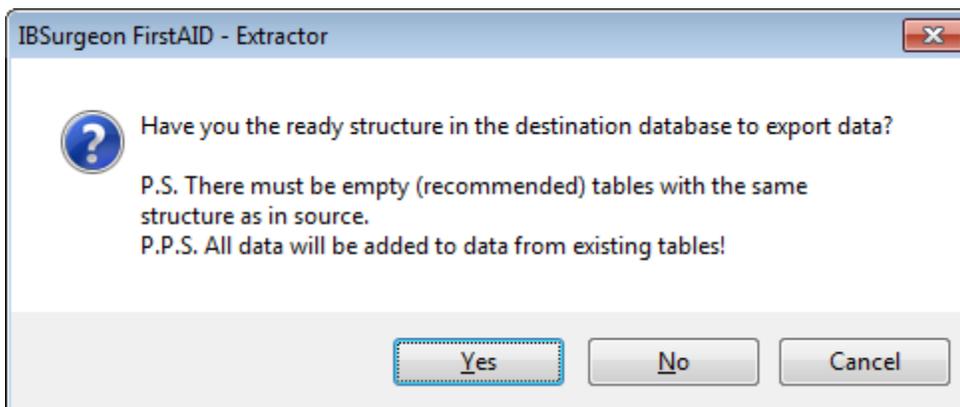


Figure 14 Confirmation of a destination database

It's the confirmation that you are agree to export data from corrupted database to the selected one, and it also informs you that data will be added to the existing tables (if there were already records, they will be not deleted automatically!)

Click "Yes".

If you click "No", FirstAID Extractor will try to create structure using corrupted database metadata as template. "Cancel" will cancel the operation.

After that there will be one more dialog with the final confirmation and reminder about the structure:

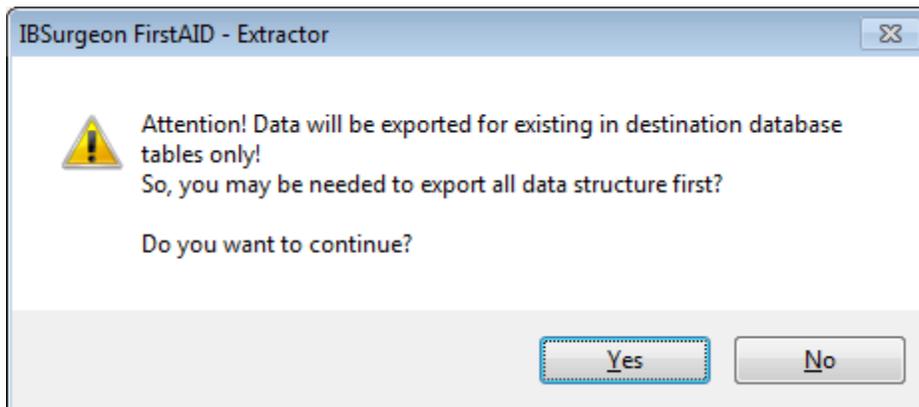


Figure 15 Reminder about structure

Click "Yes".

Then you will see very important dialog with export options (see Figure 16). We recommend option "More restored data", it will switch off all database constraints (except primary keys) and extractor will try to export all available data.

After export all constraints will be switched on again (for those data that allow it). At the tab "Destination database" you can review result and correct or drop all data that you decided to be odd or unwanted.

"More data integrity" mode will restore all constraints after export and will drop all exported data that will not correspond to database constraints.

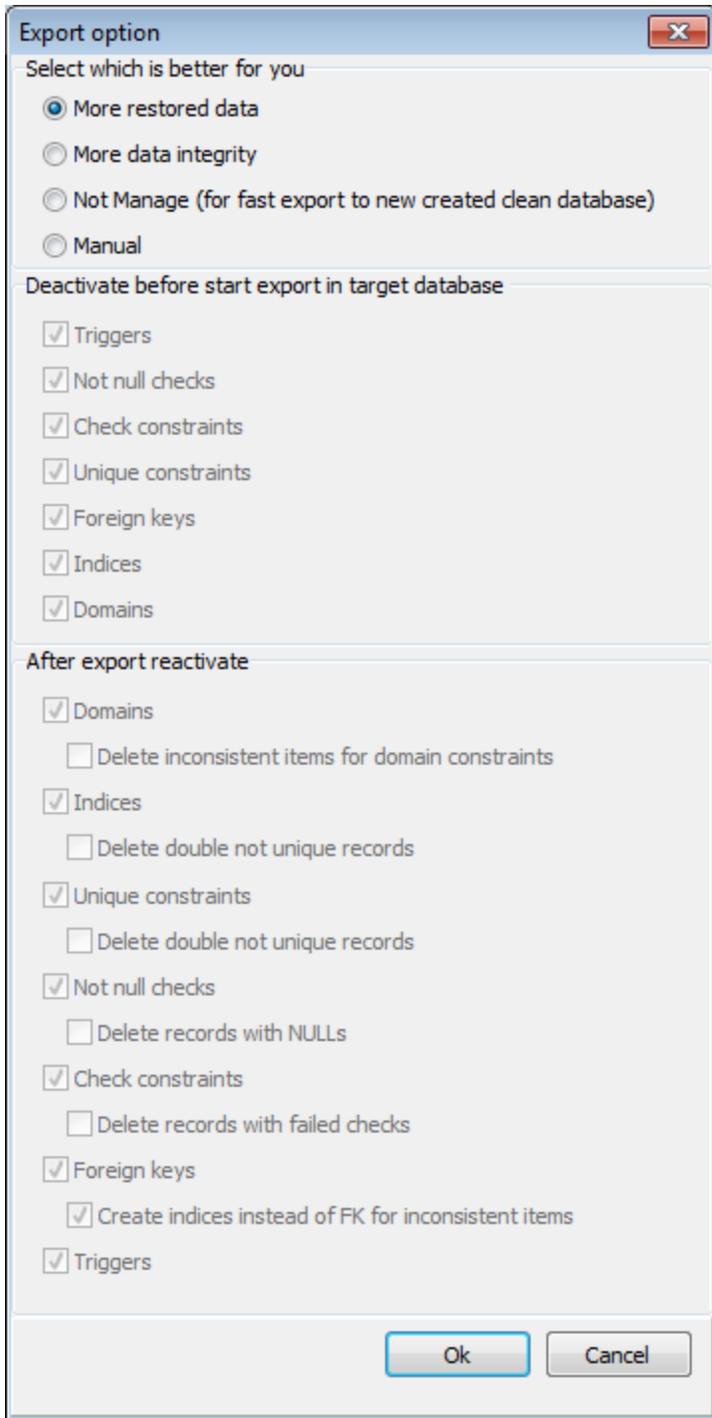


Figure 16 Export options

Click "Ok".

Export to the new empty database without metadata

Open database in FirstAID Extractor and then click "Create New DB":

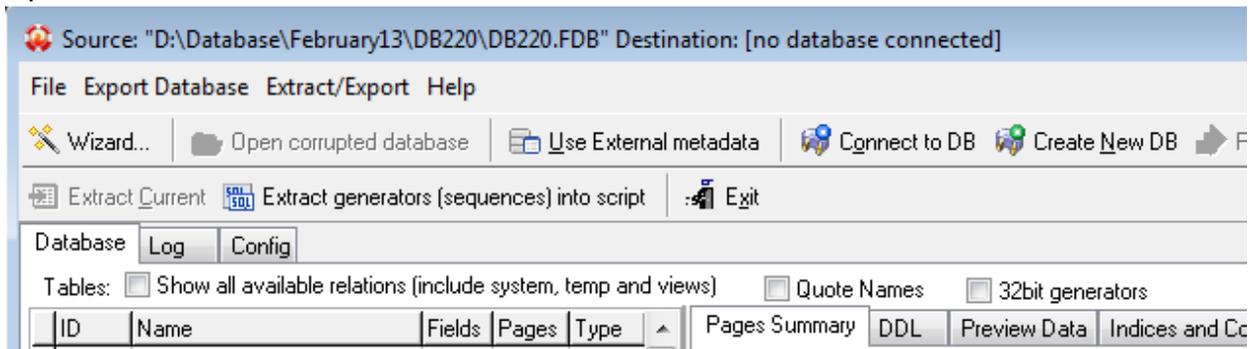


Figure 17 Open database

First you will see this message (see Figure 18):

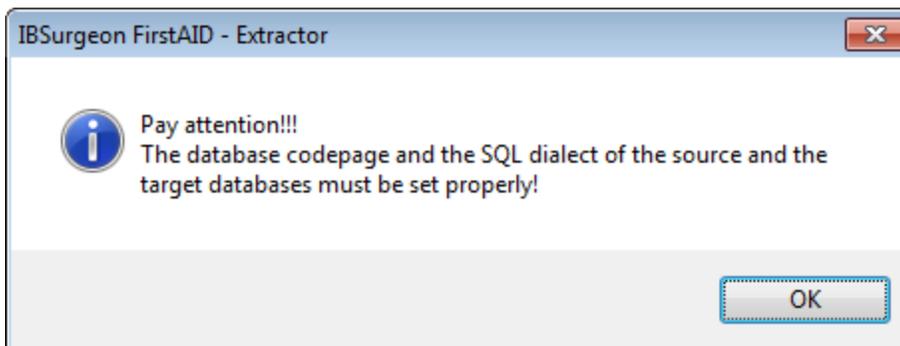


Figure 18 Attention message

It warns you to pay attention to dialect and codepage properties of the next dialog – this is important if you have corrupted header page, otherwise it will be adjusted automatically.

Click “OK”.

Then you will see dialog “Create new database and login” (Figure 19).

It will create the new empty database where data from corrupted database will be pumped to.

You will see the following dialog, where you need to specify path to new database for export.

Path to client library (fbclient.dll or gds32.dll) is specified automatically (it is shipped with FirstAID).

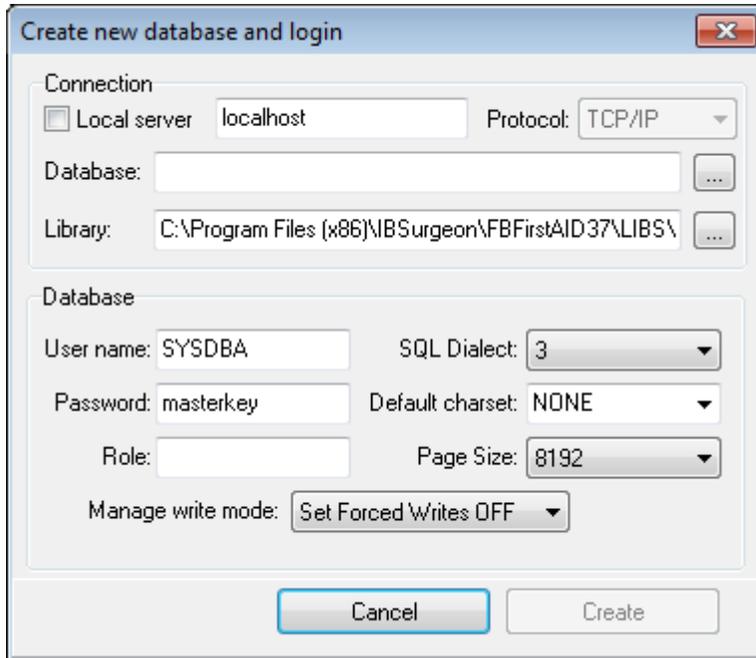


Figure 19. Create new database

Choose where you need to create new database and click “Create”.

When the database will be created, you will see the following dialog:

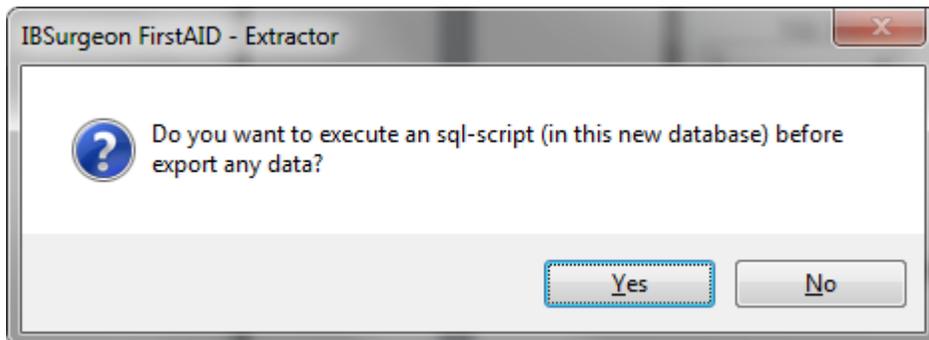


Figure 20 Dialog: do you need additional script?

Click "No".

After that click the button "Export Structure" on the main toolbar and wait for the finish of database metadata export:

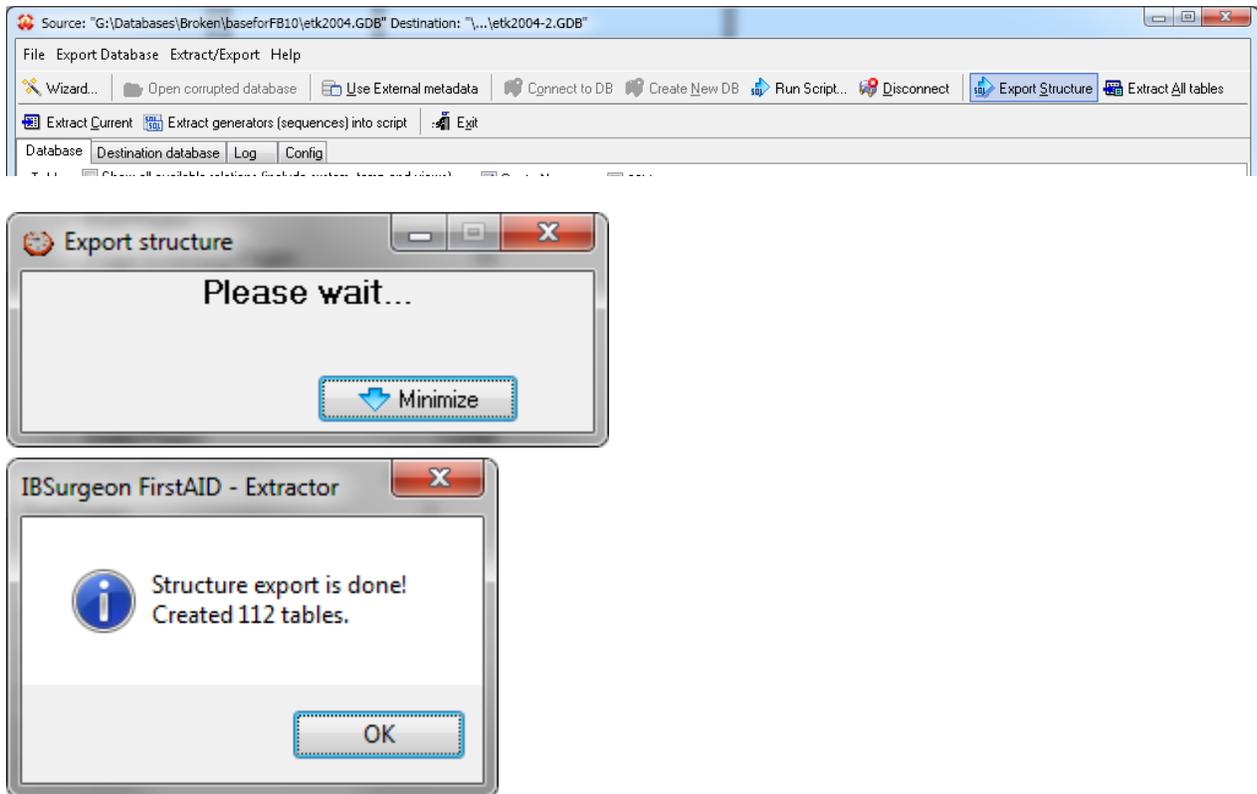


Figure 21 Export structure result

If you will see that number of create databases is 0, go to section "Quote names" of this guide!

Then we need to obtain license to perform export of data from the corrupted database – you already know about it from section "Export to the empty database with the same metadata".

After successful registration the following dialog will appear:

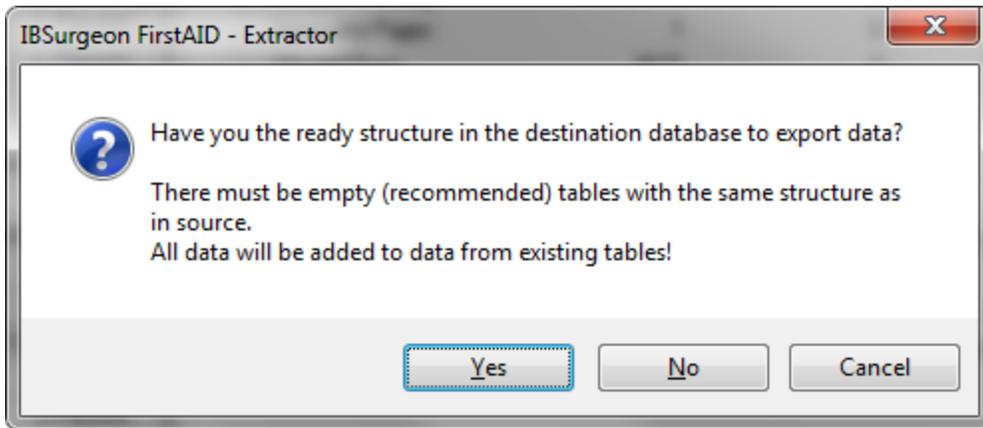


Figure 22 Confirmation dialog

Click "Yes"

and "Yes" again here:

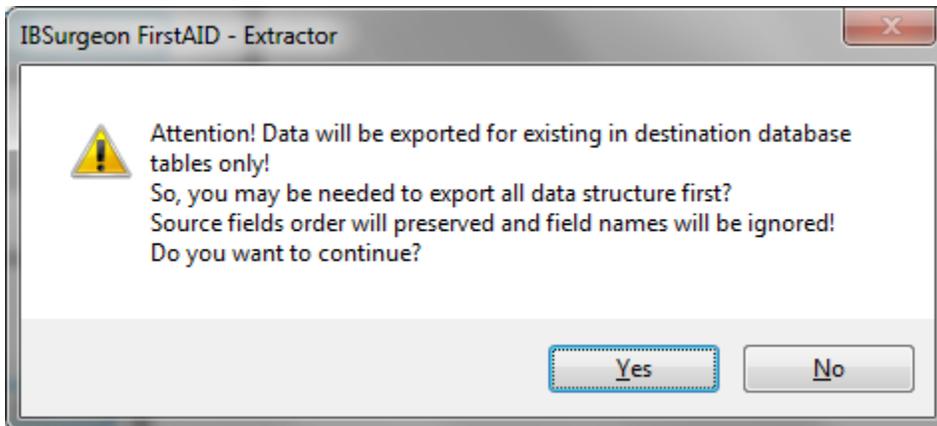


Figure 23. Confirmation dialog 2

Export process will start; you need to wait till its finish:

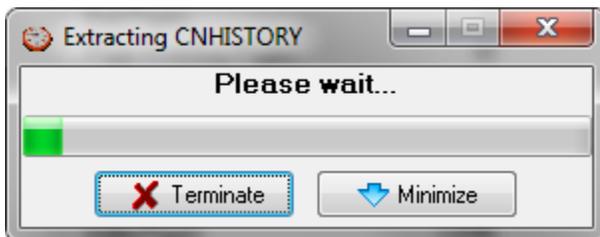


Figure 24 Export is in progress

Export time depends on the size of the database and performance of the computer, it can be several minutes for small databases and several hours for very big database. At the good hardware export speed is approximately 1Gb per 5 minutes.

Please note that FirstAID Extractor by default extracts only records from the users tables, and it does not extract primary and foreign keys indices, triggers and stored procedures.

Generators values will be exported if you choose export all tables (you will be asked about it) or if you can extract them manually:

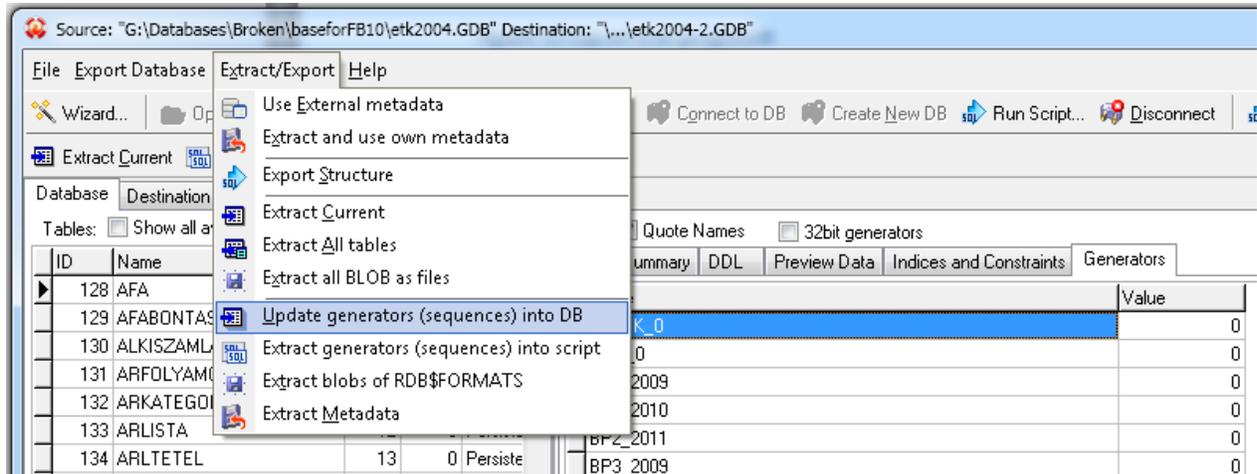


Figure 25. Manual update of generators values

Final steps with empty database export

For destination database you can find generators values and SQL definitions for its primary and foreign keys and indices on tabs "Generators" and "Indices and Constraints", so it is possible to create these objects in export database - you need to run these scripts in your database (with isql.exe from Firebird's Bin folder, for example).

However, there is easier way to complete recovery - just pump exported data to the new empty database with all necessary metadata using free tool IBDataPump.

You can download [IBDataPump](#), run it and set exported database as source and new empty database with the same structure as target, then pump data.

However, if you have reached this point and decided to use IBDataPump, probably it would be better to choose export to the empty database with ready metadata (the same as in the corrupted database).

Some important information you may need during recovery

“Quote names” setting

At the tab “Database” of FirstAID Extractor you can see checkbox “Quote Names”. This checkbox determines should FirstAID Extractor quote tables and metadata names during the export, i.e. is database in Dialect 1 or in Dialect 3.

Usually it is set ON/OFF automatically, using information from the header page of the corrupted database (not destination!).

If header page is corrupted or if you are trying to export data to the database with another dialect, you may need to check or uncheck "Quote names".

One of the good indications that you need to change "Quote Names" setting is 0 tables as a result of "Export Structure" command.

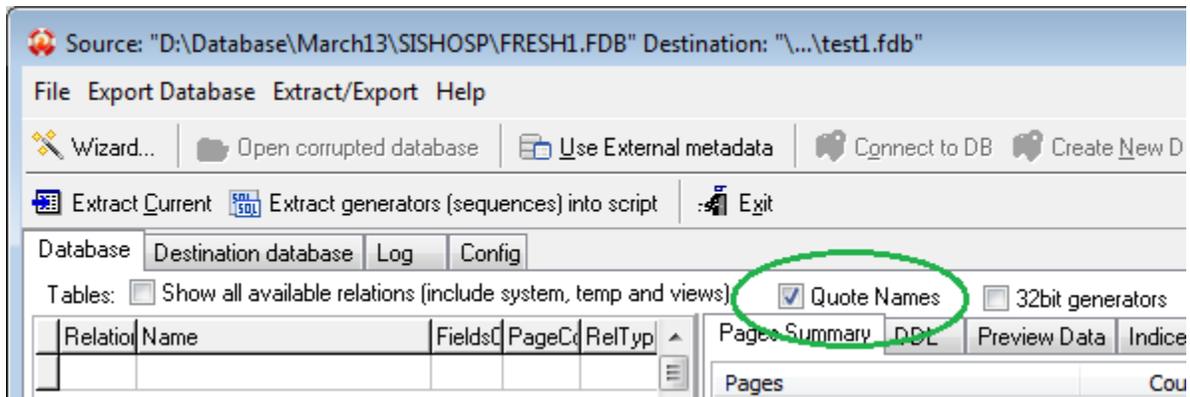


Figure 26 "Quote Names" checkbox

Offline registration

If you run FirstAID on the computer without Internet access, you will need to perform "Offline registration" of the database:

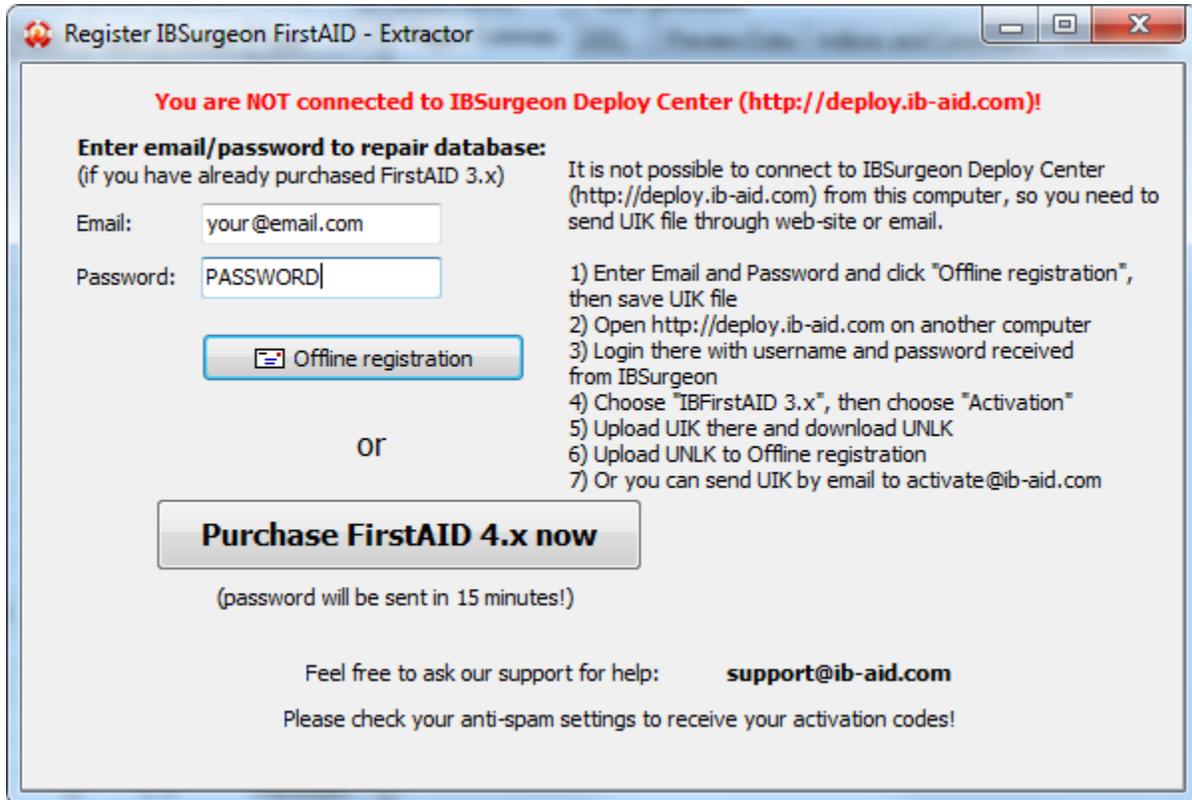


Figure 27 Offline registration process

It is not possible to connect to IBSurgeon Deploy Center (<http://deploy.ib-aid.com>) from this computer, so you need to send UIK file through web-site or email.

- 1) Enter Email and Password and click "Offline registration", then save UIK file
- 2) Open <http://deploy.ib-aid.com> on another computer
- 3) Login there with username and password received from IBSurgeon
- 4) Choose "IBFirstAID 3.x", then choose "Activation"
- 5) Upload UIK there and download UNLK
- 6) Upload UNLK to Offline registration
- 7) Or you can send UIK by email to activate@ib-aid.com (it will take some time due to manual processing of such requests)

Export the single table

FirstAID Extractor gives you an ability to export only needed relations. For this you need to select table in the list, right-click and select “Export current relation”:

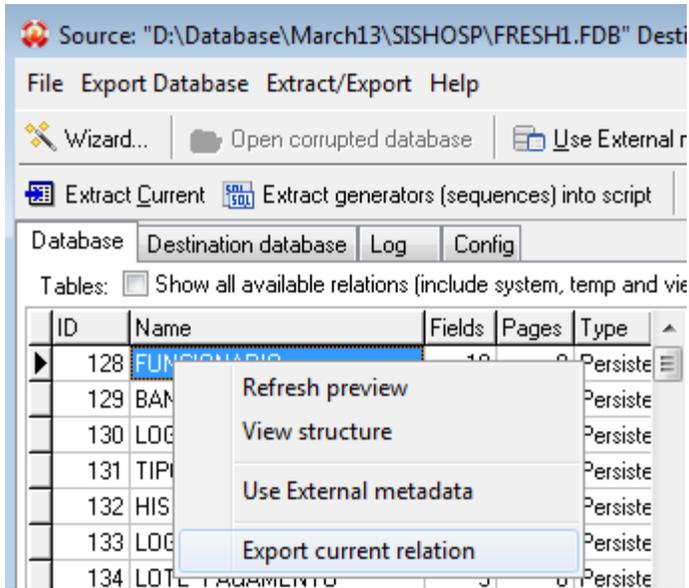


Figure 28 Export the single table

All steps for export are similar to export to the new created database.

External Metadata

Sometime corruption kills important system information in the database and even FirstAID cannot see its contents due to lack of metadata.

In this case you can try to borrow metadata from the good database with the same structure (old good copy), or you can get them from the FBDataGuard metadata repository.

It's necessary that this donor database will be good file copy of the corrupted database (usually it is old file copy).

In order to use "External Metadata" please open your corrupted database and then choose "Extract/Export"/"Use External metadata":

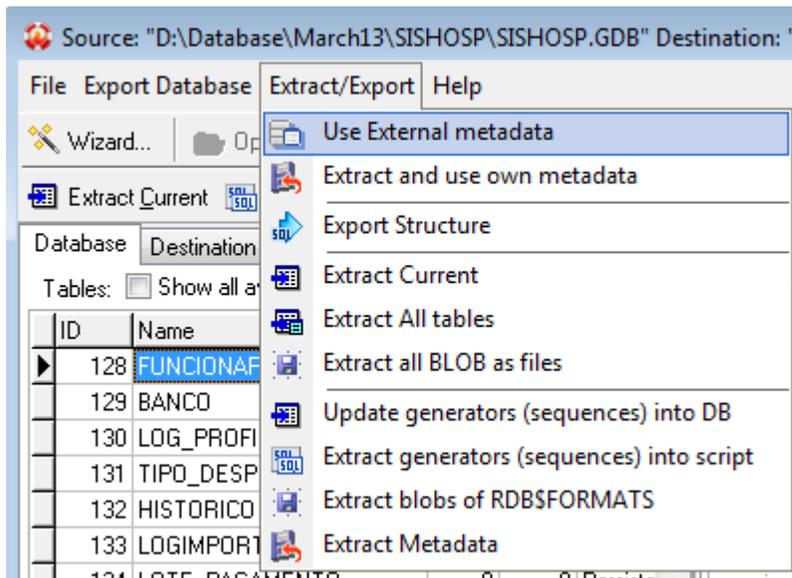


Figure 29 Use External Metadata

The following warning will appear:

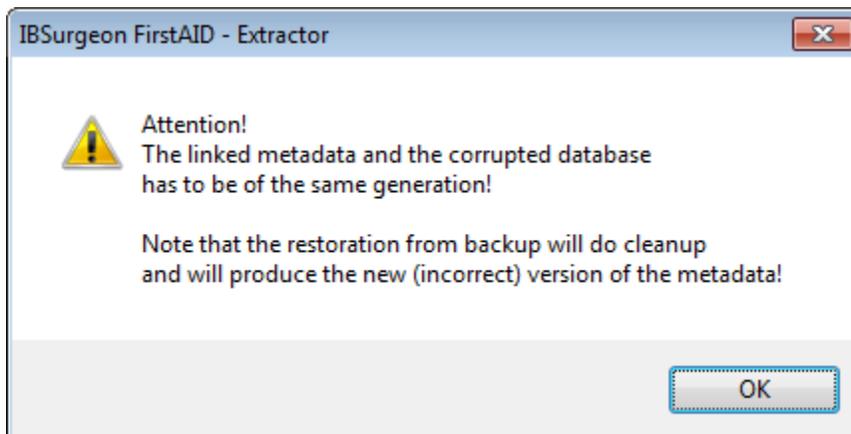


Figure 30 Warning: the database where you borrow metadata should have the same metadata as corrupted one

Click “OK”.

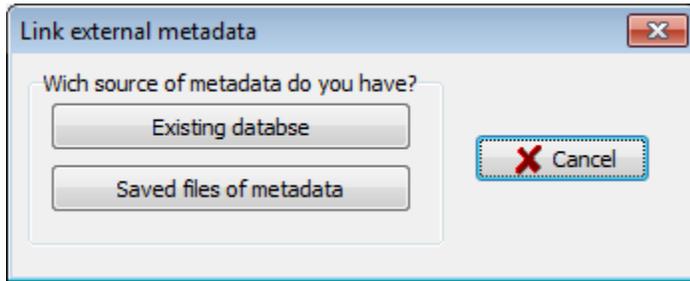


Figure 31 Choose how to get external metadata

If you need to get metadata from the live database (old good copy), click “Existing database”:

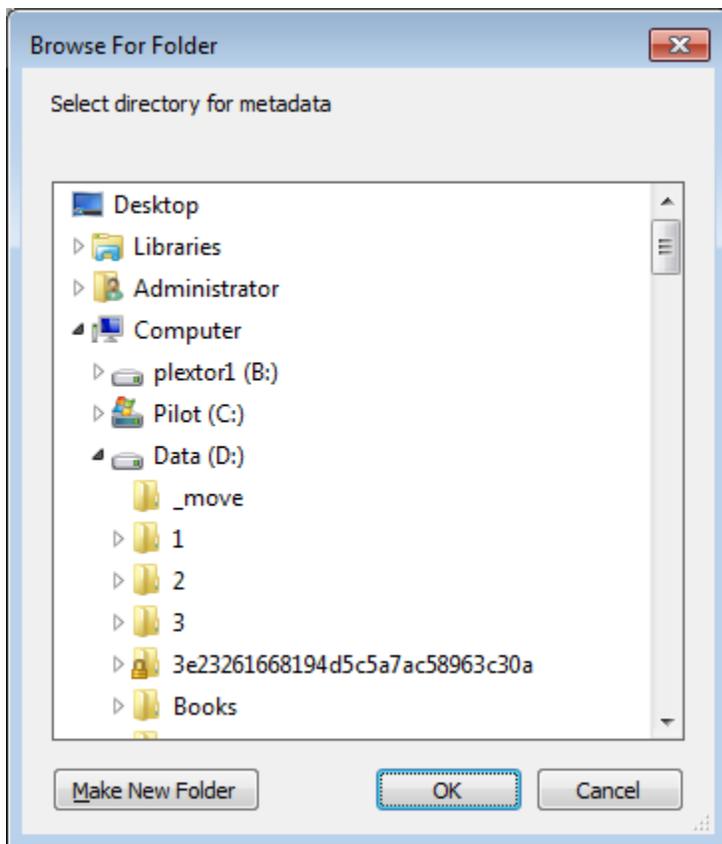


Figure 32 Choose old good copy of the corrupted database as source of metadata

Firebird server must be running at this moment!

After that FirstAID will extract metadata from the good database and reload corrupted database in order to apply new metadata. Hopefully you will be able to see data to recover. If so, proceed with export of the data (see “Recovery with FirstAID Extractor” section.)

Support

If you have any questions please feel free to contact us: support@ib-aid.com