BOSS Database Overview

To support finding data associated with video recordings, a database is provided, implemented using Open Office Base (similar to Microsoft Access)

An empty primary database with predefined tables is located in

C:\Users\bosadmin\Desktop\bos-sys\db

The basic pattern of use is to append data to the primary database using the following procedure

1. Copy and/or filter raw data from Advanced Serial Data Logger (ASDL) is stored in

   C:\Users\bosadmin\Desktop\bos-sys\data

   to a temporary database directory

   C:\Users\bosadmin\Desktop\bos-sys\tmp-db

2. Open the temporary database directory as a text (CSV) data base

3. Import (copy and paste) data from the temporary database to the primary database

4. Use query forms to find data of interest

This workflow is illustrated below.

The remainder of this section provides detailed instructions for the process.

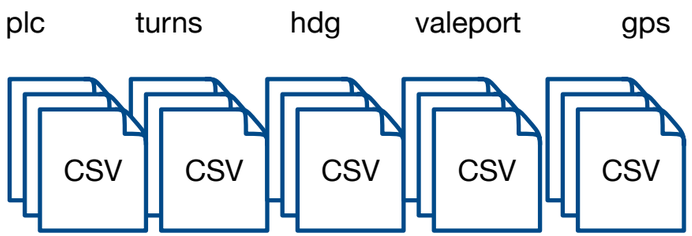
The primary database template provided includes several predefined tables and query forms, which may be extended by users.

A copy of the empty database and headers used to define the tables are included in

C:\Users\bosadmin\Desktop\bos-sys\db

should there be a need to recreate them.

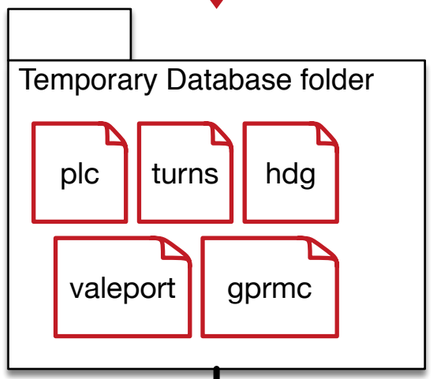
BOSS Database Workflow



1

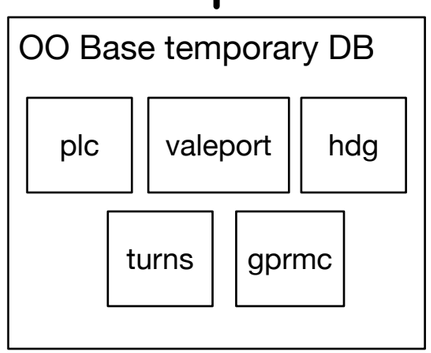
Copy and optionally filter raw CSV data to temporary database (DB) folder

e.g. extract GPRMC messages from gps channel



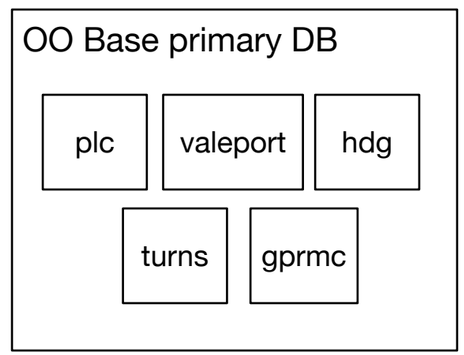
2

Open the temporary DB folder as a text database



3

Import data tables

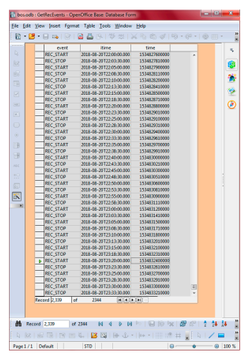


4

Query database

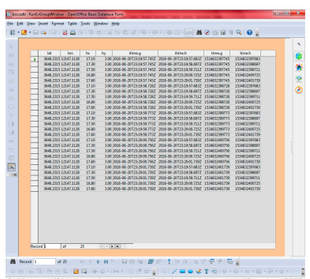
PLC Query

Find camera record events



Device Query

find adjacent device data



BOSS Create temporary DB

Create temporary Source database (read-only CSV file connection)

Open a Cygwin terminal, and navigate to the bos-sys directory

```
$ cd /cygdrive/c/Users/bosadmin/Desktop/bos-sys
```

Create a temporary database directory if it doesn't exist

```
$ mkdir tmp-db
```

Empty temporary database directory

```
$ rm tmp-db /*
```

Use mktable.sh script to copy raw csv files to database directory, adding headers and ID column

```
$ sort -k1,14 <file-set> | ./mktable.sh -H <header-string> -I -1 > tmp-db/<table-file>.csv
```

Where

<file set> is an expression or list of individual files, e.g. data/hmr201808[0-9][0-9].CSV

<table-file> is the name of the file to combine the data from <file-set>, e.g.

<header-string> is a quoted string that will be included at the top of the table file to define the data field names

- Each temporary database table file should include data with a single source and record type.
- The -H option to mktable.sh should include ID,time, and itime fields; additional fields should match the source-specific data fields
- The -I option to mktable.sh should generally be set to -1, which will leave the field blank and enable the database to automatically set this field during import

Example: creating temporary source table for compass data with three fields (x,y,z) in addition to the time fields:

```
$ sort -k 1,14 /cygdrive/c/Users/bosadmin/Desktop/bos-sys/hmr20180829* | mktable.sh -H "ID,etime,itime,x,y,z" -I -1 > tmp-db/hmr-20180829.csv
```

Input

```
1535588147.237,2018-08-29T17:15:47.237Z,222.7,2.5,-0.4
…
```

Output (hmr-20180829.csv)

```
ID,etime,itime,x,y,z
,1535583987.295,2018-08-29T16:06:27.295Z,247.7,2.7,-0.4
…
```

Some data channels may contain multiple record types in the same file, i.e. records containing fields with different data types. For example, the GPS data from ASDL may contain multiple NMEA messages (e.g. GPGGA, GPRMC).

Each database table may only contain only one record type (format), requiring that each unique record format have it's own data table.

This separation may be done using a variety of methods; BOSS includes Cygwin, which provides implementations of utilities like grep, sed, awk along with several shells and scripting languages, which may be used to filter data into appropriate tables.

Here, the previous example is extended to use grep to select only GPRMC records for the temporary database table:

```
1534481660001,2018-08-16T21:54:20.001Z,$GPGGA,215533,3648.2315,N,12147.1128,W,0,00,,,M,,M,,*4B
1534481660890,2018-08-16T21:54:20.890Z,$GPRMC,215534,V,3648.2315,N,12147.1128,W,,,160818,013.2,E*76
1534481660968,2018-08-16T21:54:20.968Z,$GPGGA,215534,3648.2315,N,12147.1128,W,0,00,,,M,,M,,*4C
1534481661873,2018-08-16T21:54:21.873Z,$GPRMC,215535,V,3648.2315,N,12147.1128,W,,,160818,013.2,E*77
```

garmin19x20180816.CSV

```
$ HDR="ID,etime,itime,ID,time,itime,msg,gtime,val,lat,ns,lon,ew,sog,course,gdate,var,vew_chk”
$ GPS_IN=“/cygdrive/c/Users/bosadmin/Desktop/bos-sys/garmin19x20180816.CSV”
$ cat $GPS_IN|grep GPRMC|sort -k 1,14 |../mktable.sh -H $GPS_HDR -I -1 > tmp-db/gprmc.csv
```

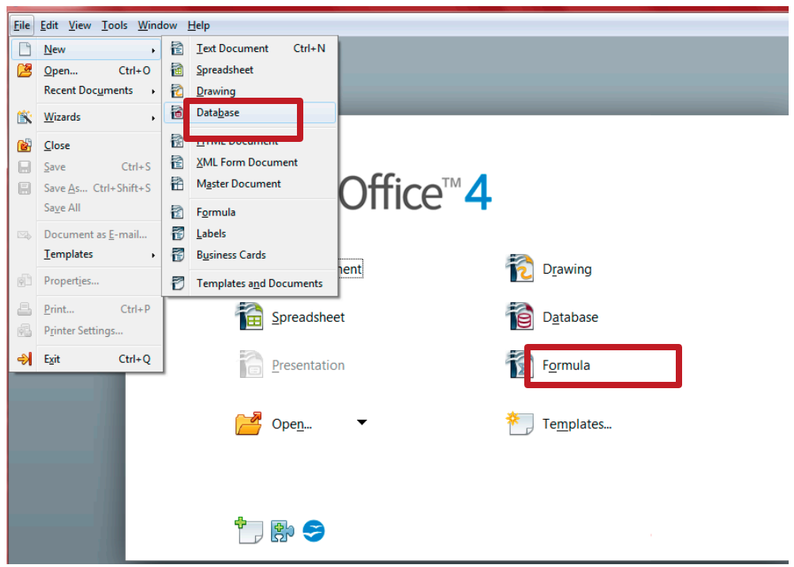
extract GPRMC messages from raw CSV

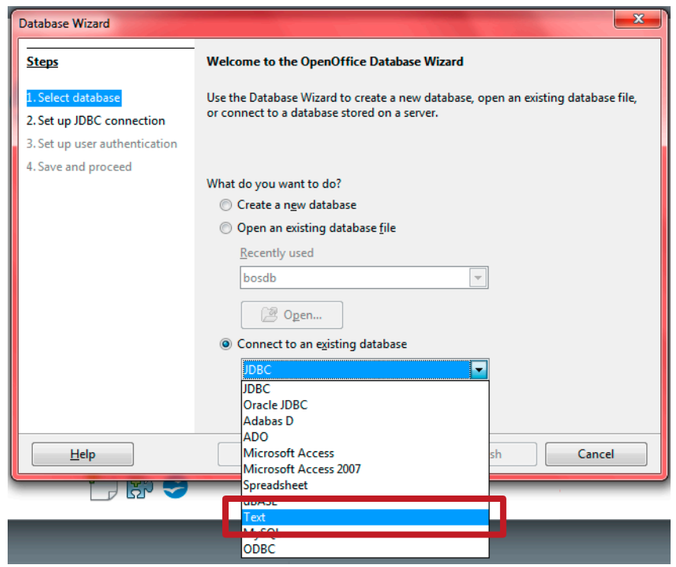
```
ID,etime,itime,ID,time,itime,msg,gtime,val,lat,ns,lon,ew,sog,course,gdate,var,vew_chk”
1534481650017,2018-08-16T21:54:10.017Z,$GPRMC,215523,V,3648.2315,N,12147.1128,W,,,160818,013.2,E*70
1534481650969,2018-08-16T21:54:10.969Z,$GPRMC,215524,V,3648.2315,N,12147.1128,W,,,160818,013.2,E*77
1534481651858,2018-08-16T21:54:11.858Z,$GPRMC,215525,V,3648.2315,N,12147.1128,W,,,160818,013.2,E*76
1534481652841,2018-08-16T21:54:12.841Z,$GPRMC,215526,V,3648.2315,N,12147.1128,W,,,160818,013.2,E*75
```

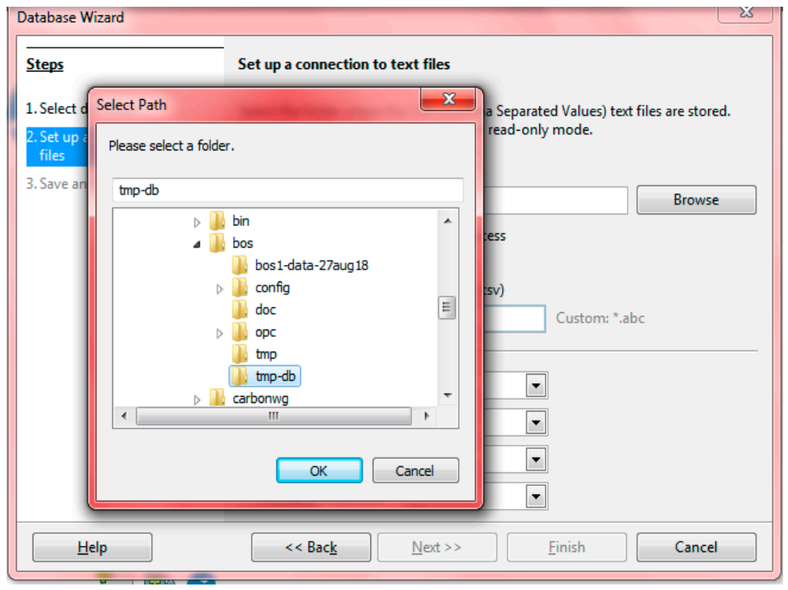
gprmc20180816.csv

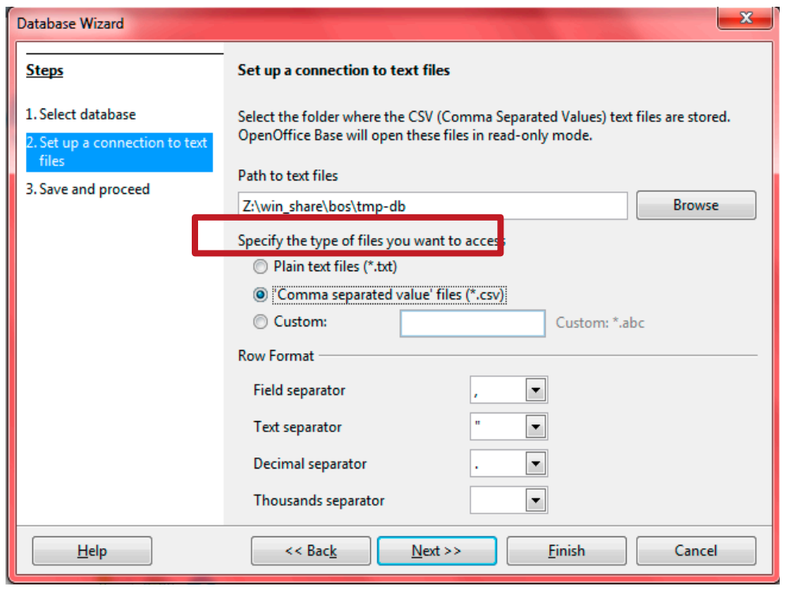
BOSS Create temporary DB

Use Open Office to open the temporary database directory as a new text database









BOSS Create temporary DB

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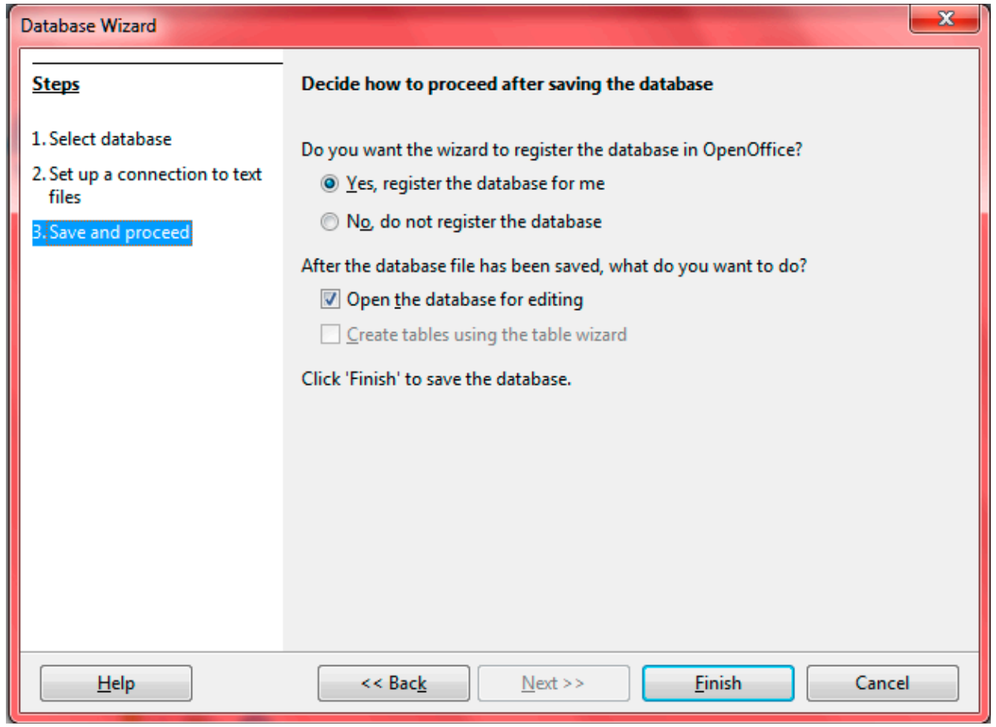
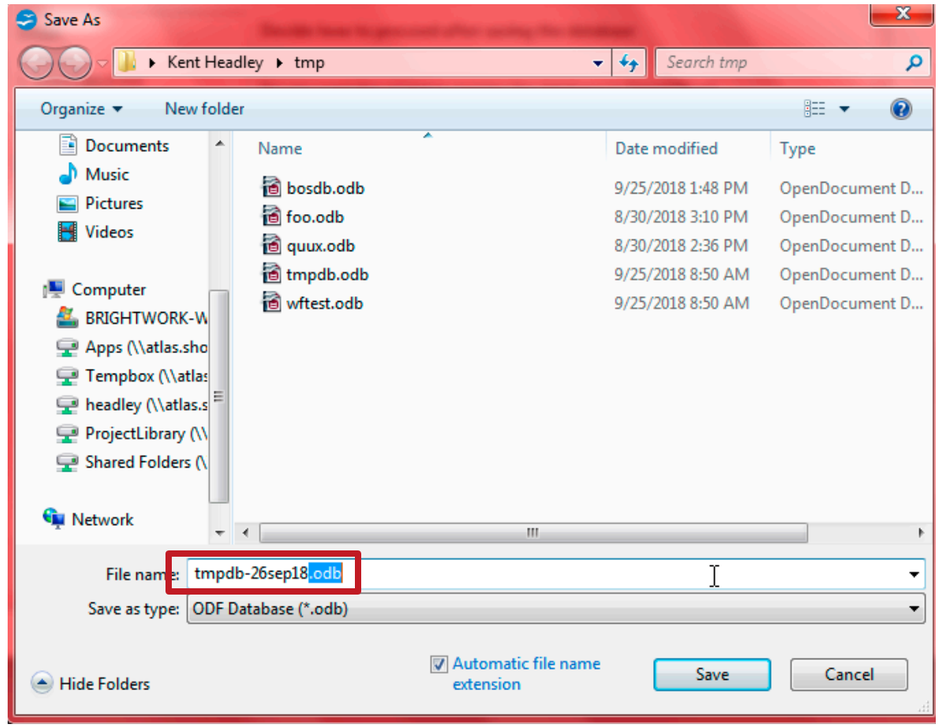
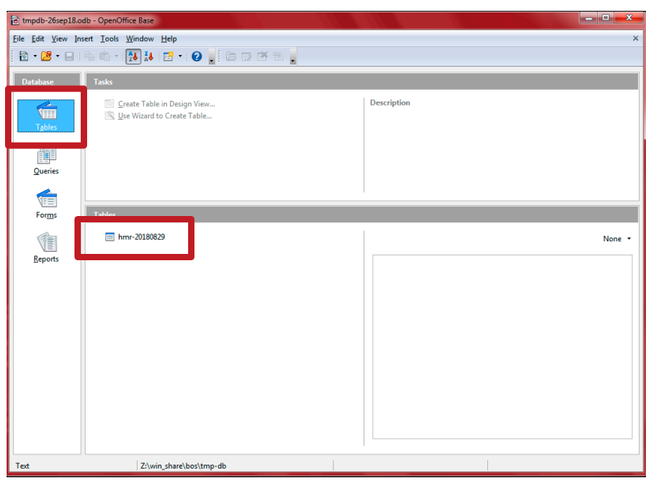


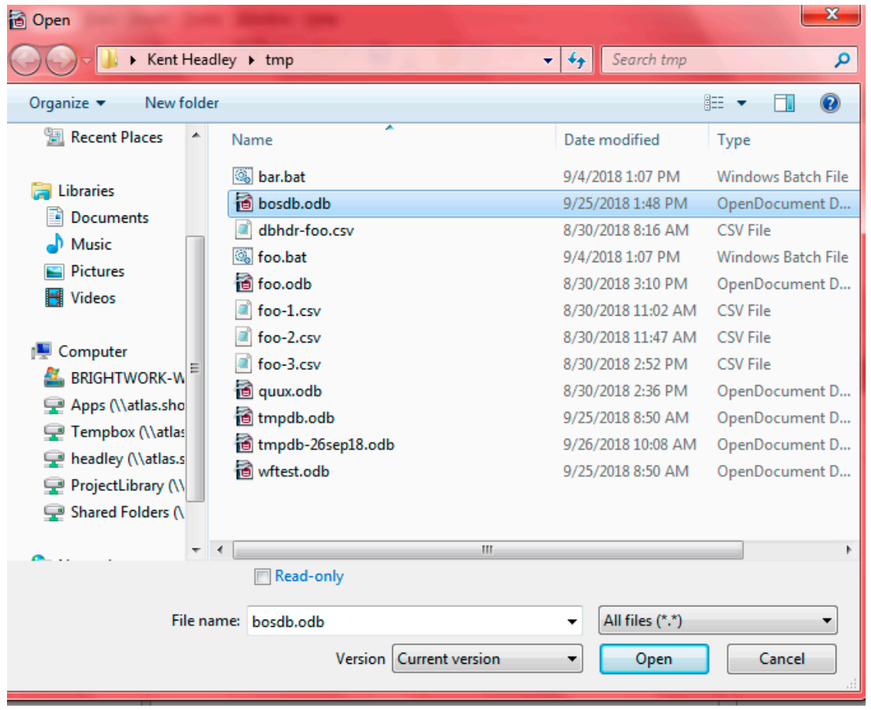


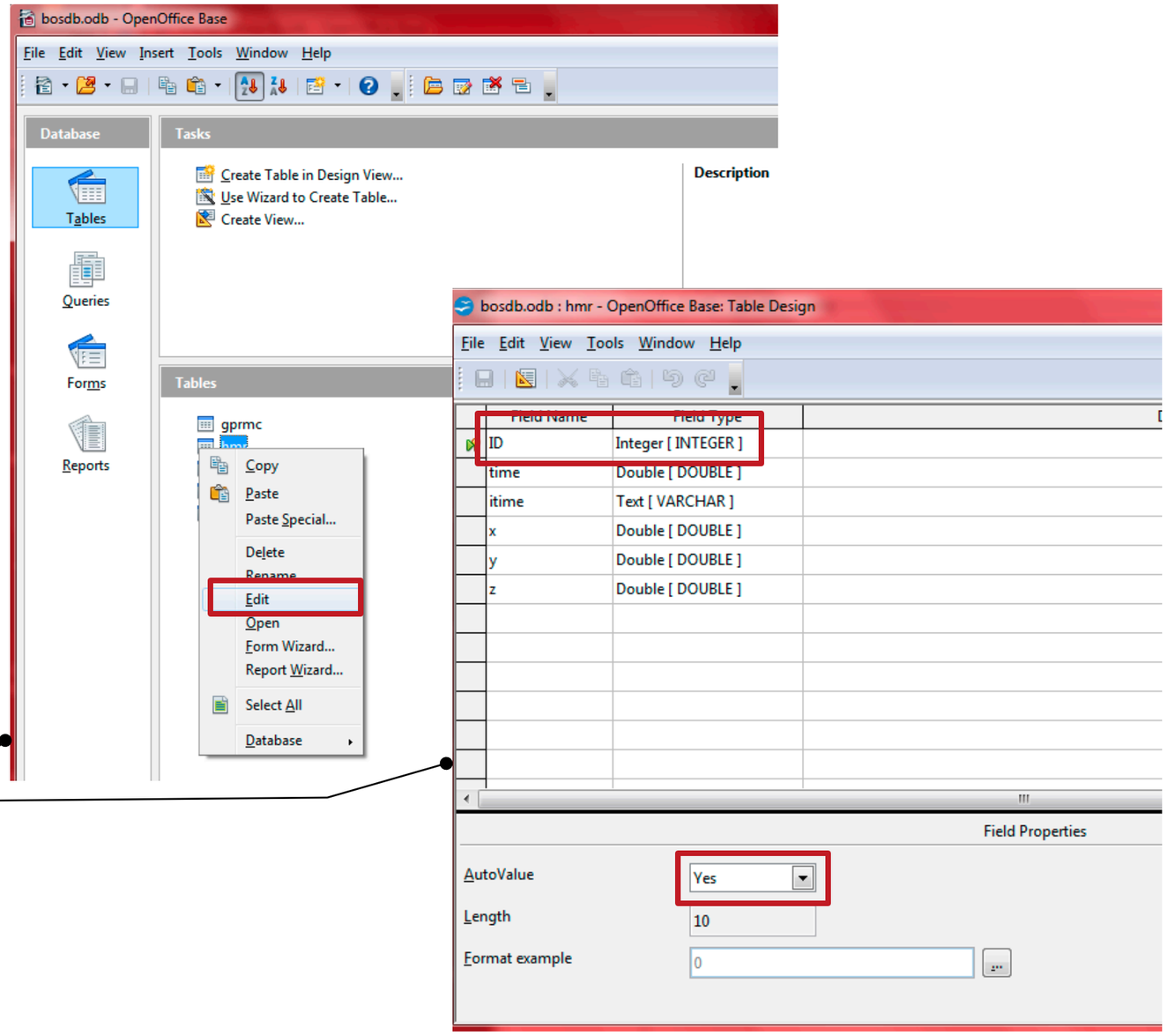
Each csv file in the temporary database directory is a table
Here, only one is shown



BOSS Create temporary DB

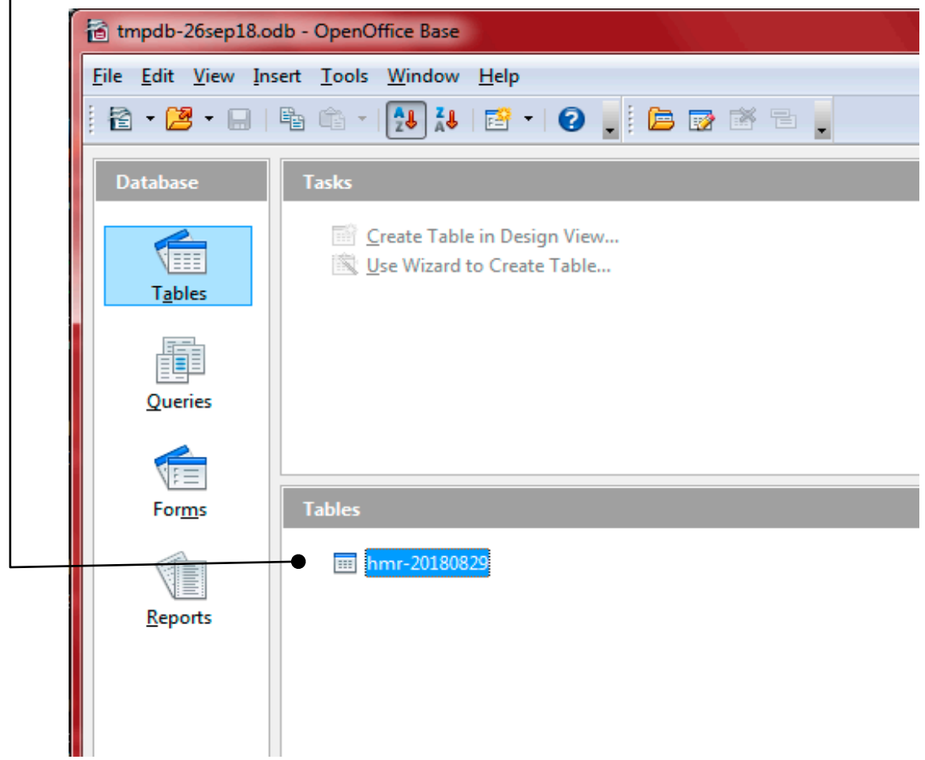
Use OO Base to open the destination database (i.e. primary database)



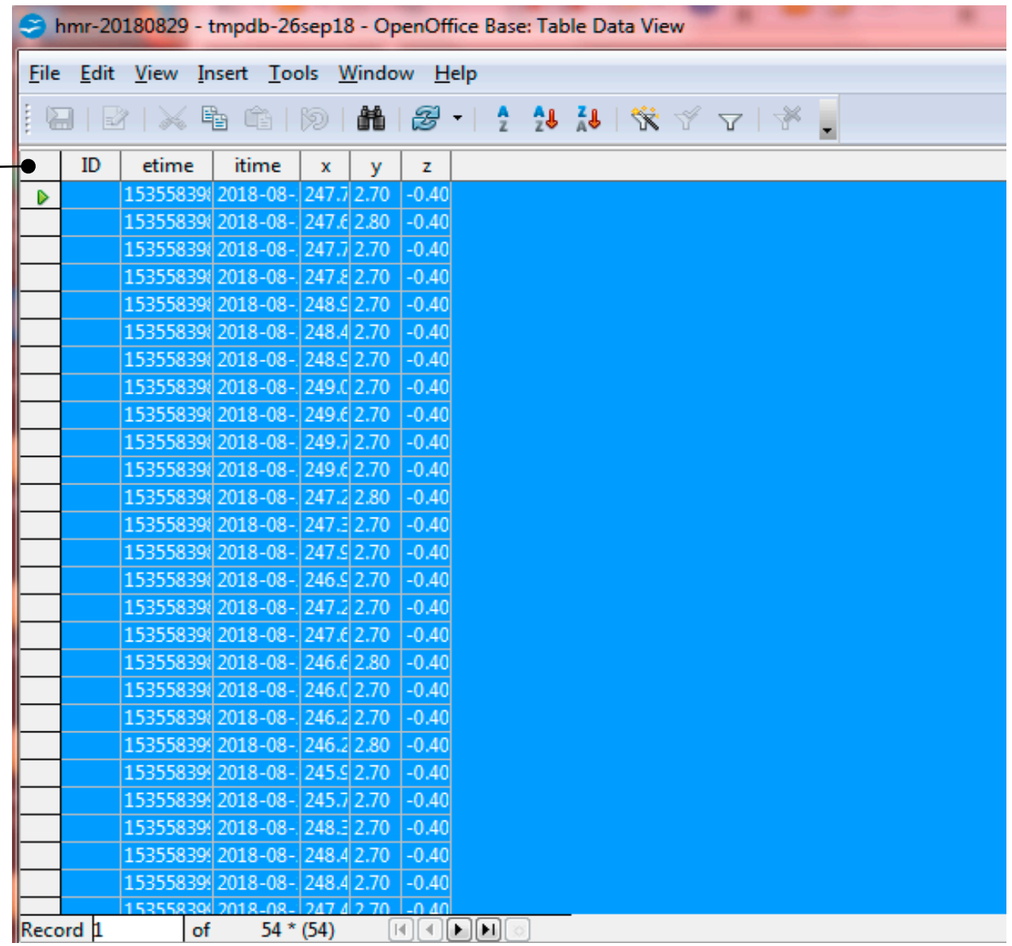


In Destination database
Destination table ID field must be type INTEGER and auto increment must be enabled
Right click the table > Edit
To check/set

Right click on table > Edit…

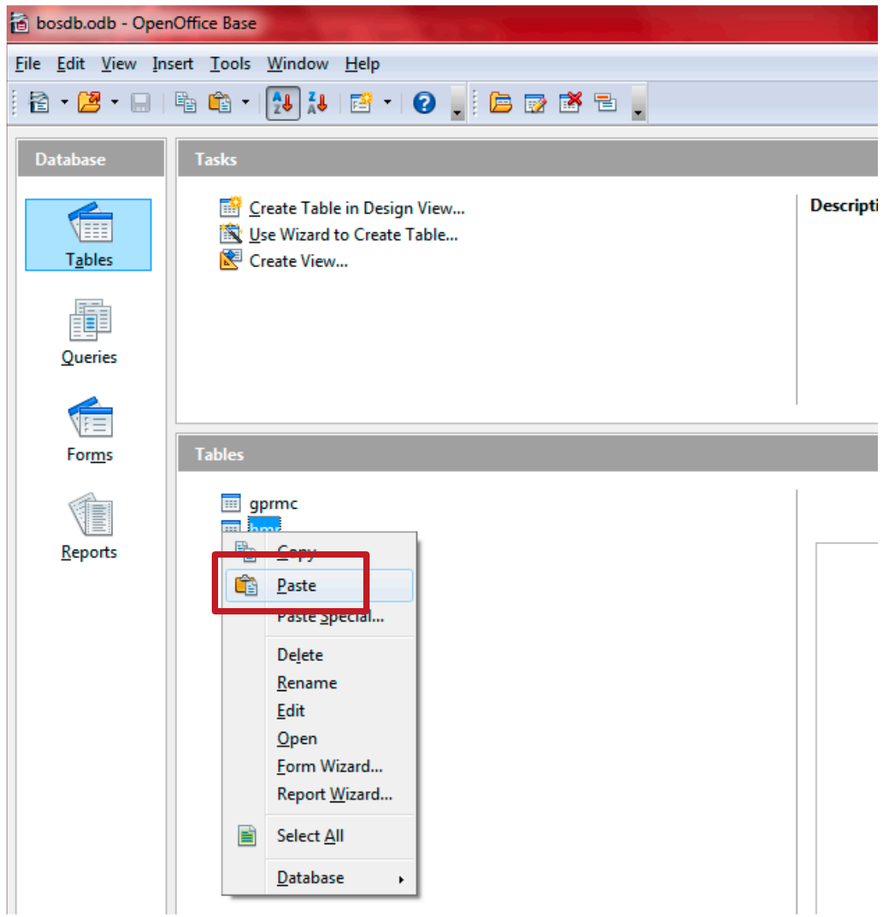


Click upper corner to select all
Then
Right click > Copy
or
CTRL-C
or
Edit > Copy

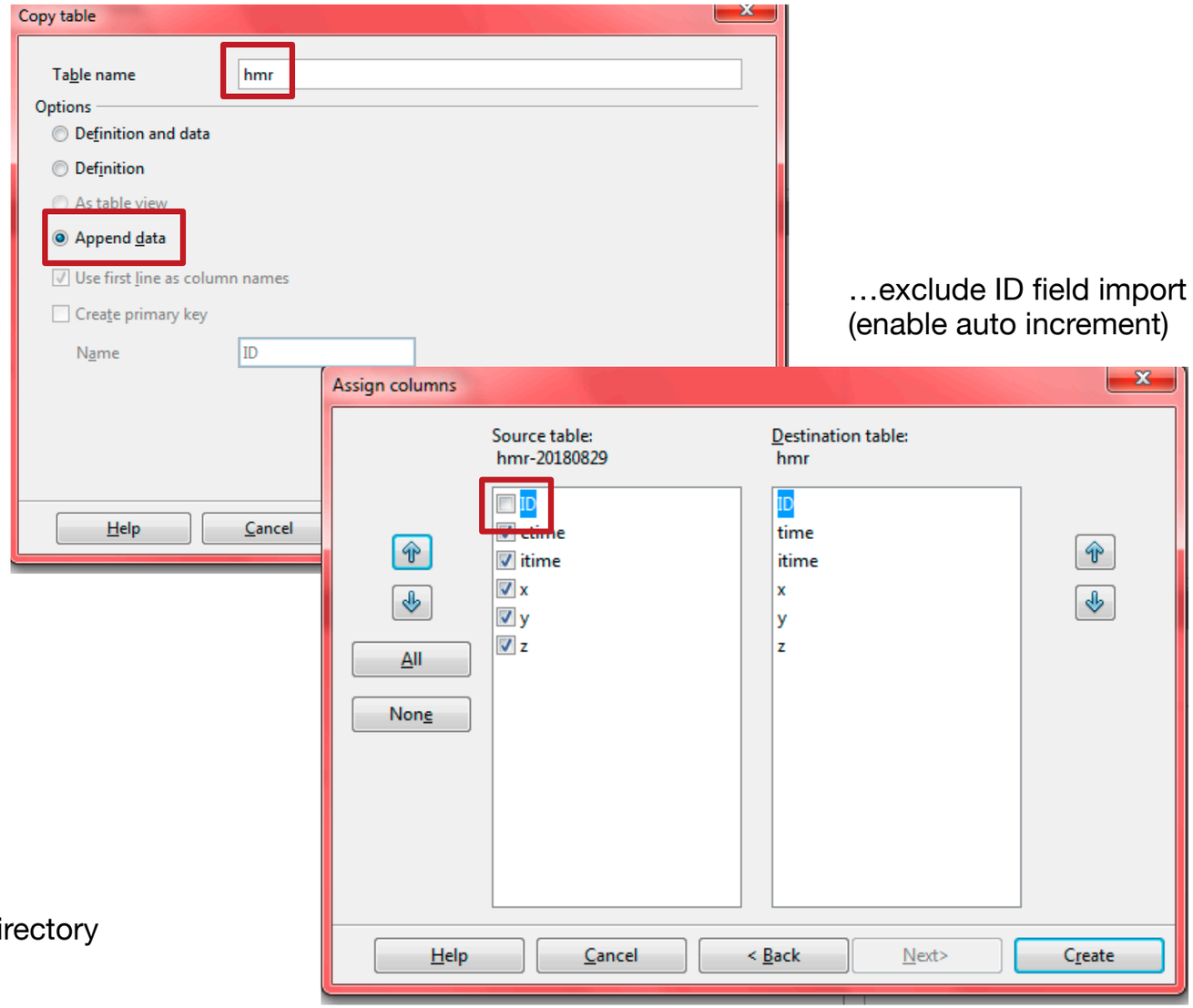


BOSS Import data from temporary DB tables to primary DB tables

Right click destination table, then click Paste



Follow prompts…name the table and select Append data



…exclude ID field import (enable auto increment)

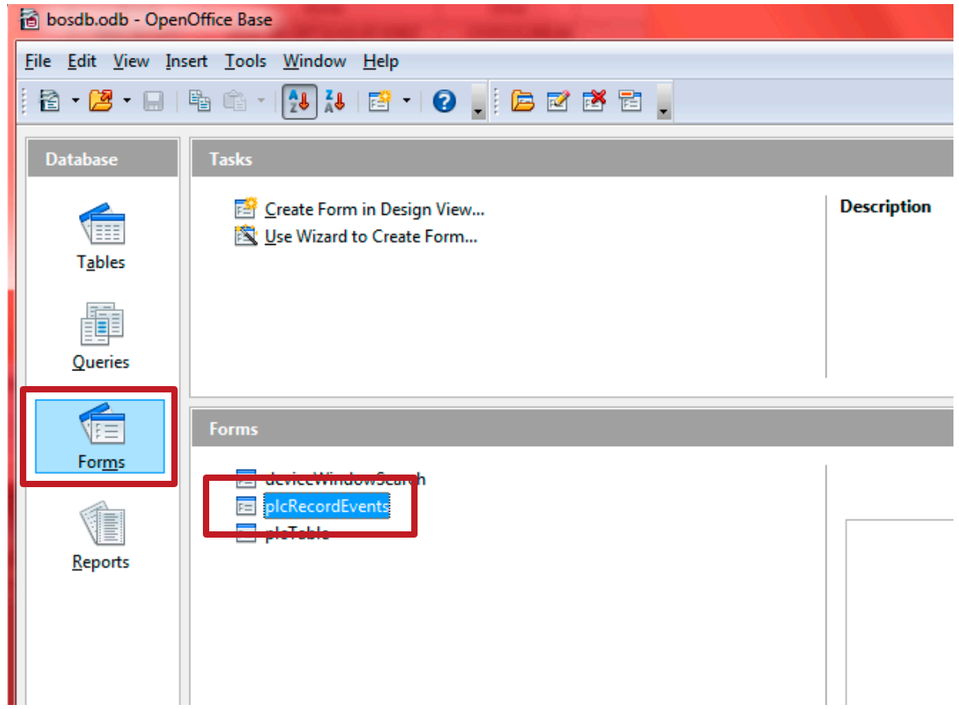
Repeat for each table

Close temporary DB and remove or empty temporary database directory (using Cygwin or Windows explorer)

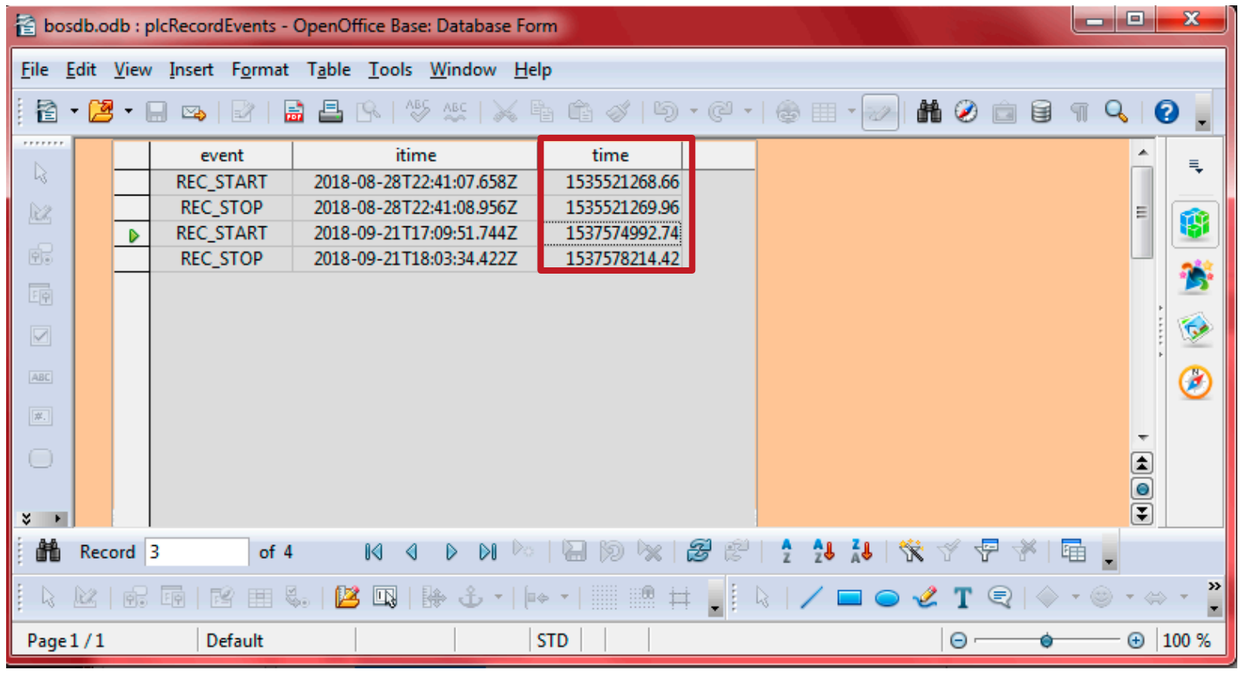
```
$ rm tmp-db /*
```

BOSS plcRecordEvents Query

To find camera record events start and stop events, run a plcRecordEvents query by double clicking its form



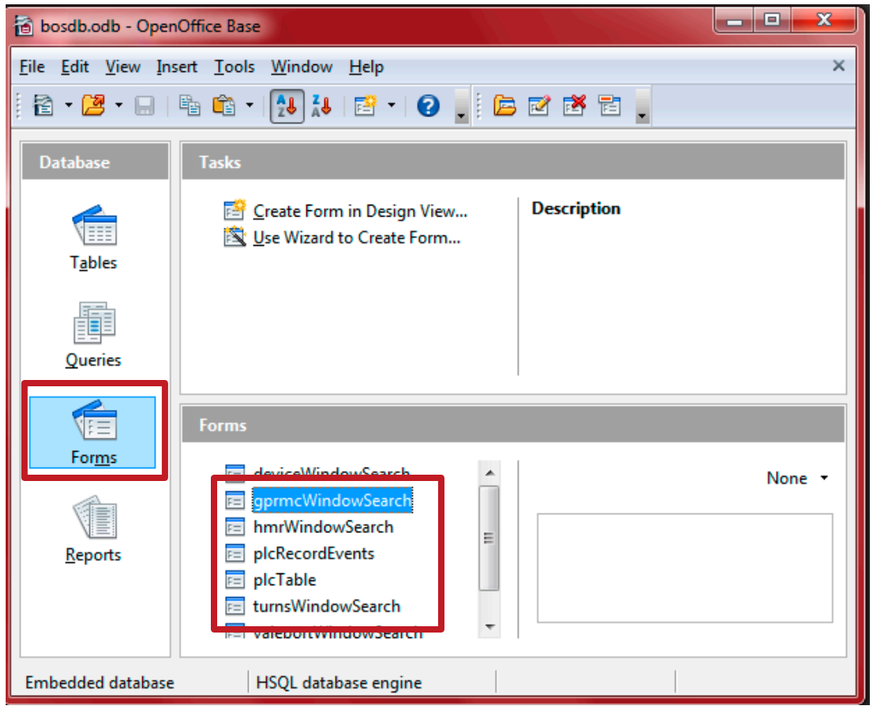
The results include REC_START and REC_STOP events form the plc table

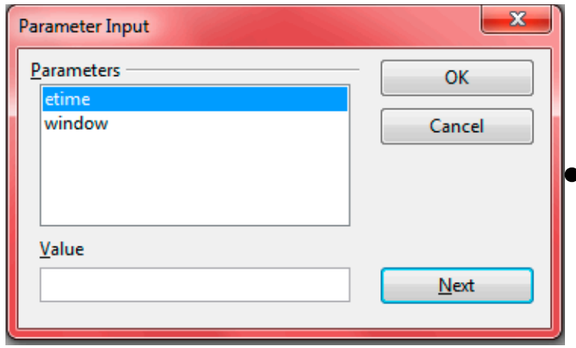


Passing one of the time values together with a search window width to a WindowSearch query will access data records near the specified record event

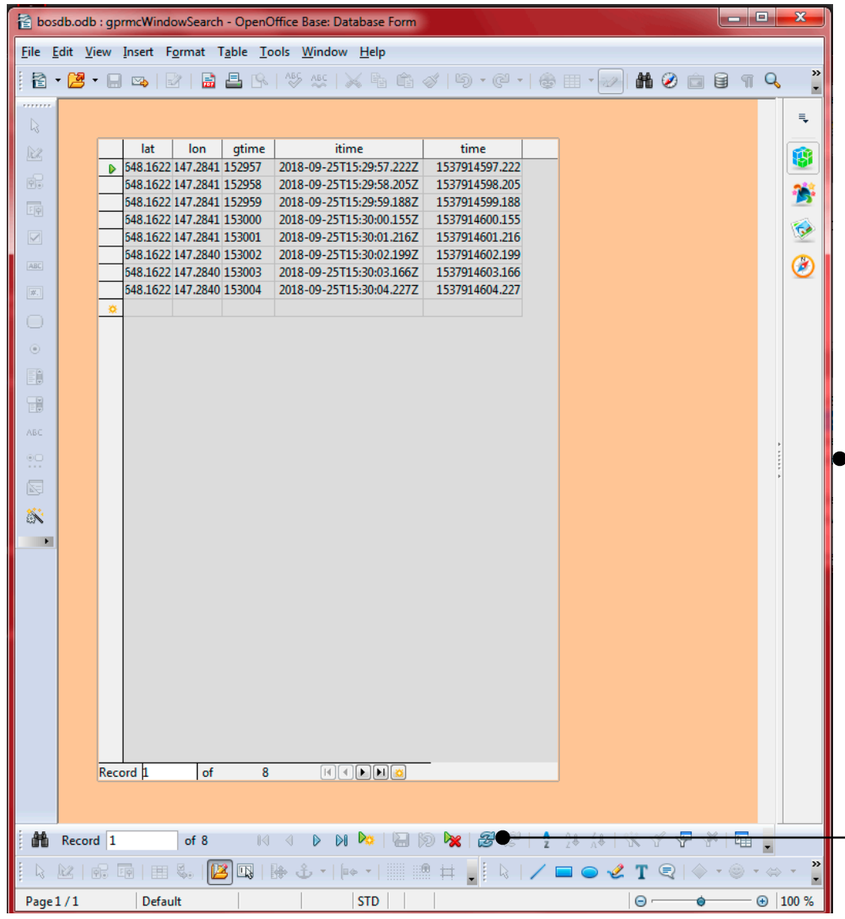
BOSS WindowSearch Queries

To find device data near a certain time, run one of the WindowSearch queries by double clicking its form





The query will prompt for an epoch time and window (search radius, in seconds)



The results are data values near within the specified search window.

The form refresh button may be used to run the query with new search values

Tip : Queries and forms may be copied and pasted, making it easy to extend or modify them, and to make backup copies before doing so