

## EPFD Static

### Technical Annex and Guide

#### Description of the main features of the EPFD Static software

##### A. Calculation methods

Specific very large earth station (under certain conditions) requires coordination under RR No. **9.7A** with respect to any existing non-GSO satellite systems using the coordination triggers in RR Appendix 5.

Also, FSS non-GSO satellite systems requires coordination under RR No. **9.7B** with respect to any large earth station (under certain conditions) using the coordination triggers in RR Appendix 5.

Coordination thresholds under Nos. **9.7A** and **9.7B** are using EPFD (equivalent-power flux density) levels produced by non-GSO FSS system to measure whether coordination between specific very large earth stations and non-GSO FSS is required.

In general, Recommendation ITU-R S.1503 is used to calculate EPFD produced by non-GSO FSS. However, this recommendation assumes inclination of GSO space station operating with very large earth stations to be equal to 0 degrees. Many VLES are operating with GSO space stations having orbit inclination of 5 and 8 degrees. Therefore, Recommendation ITU-R S.1503 may not correctly identify these earth stations as affected.

Another calculation methodology used specifically to address calculation of EPFD levels from non-GSO FSS into VLES is provided in Recommendation ITU-R S.1714-1. This recommendation is using static interference geometry (i.e., assuming stationary worst-case position of non-GSO satellite) and consider notified orbital inclination of GSO space station associated with victim VLES.

**EPFD Static** software is implementing Recommendation ITU-R S.1714-1 to assess whether any VLES maybe potentially affected by a non-GSO FSS system.

##### B. Input data

The software is using the same data required for examination under Article **22** using EPFD validation software. This data comprises of two databases:

- PFD/EIRP mask data stored in MS-Access MDB format.
- Examination SRS-Data

Same steps used to prepare the data for EPFD validation are applicable to prepare the data for EPFD Static software.

These steps are detailed in EPFD User Guide. **EPFD Prepare** software could be used to prepare required databases.

In addition to these two databases **EPFD Static** software may need access to BR IFIC SRS database.

This is required for already published network since examination SRS database does not contain all the groups of frequency assignments of subject non-GSO FSS network and instead it only containing several groups representing complete set of different assignments in frequency bands subject to No. **9.7B**.

BR IFIC SRS database is used to provide all actual frequency assignment groups subject to No. **9.7B**.

Another reason for using BR IFIC SRS database is to provide most recent list of published VLES to be used in No. **9.7A** or **9.7B** analysis.

### C. Results database

To facilitate analyses of the results, the program generates upon each run a new database containing the calculations results.

Results of are stored in output folder defined in the software or folder containing input databases under filename [NoticeID]\_97B.mdb

These results databases contain the following information:

- List of affected administrations (*prov*n table)
- List of affected VLES (*tr\_aff\_ntw* table)

### D. Report file

In addition to the information provided in the results, a report is also produced to give detailed calculation results in the format described in Recommendation ITU-R S.1714-1.

Report file is stored in output folder defined in the software or folder containing input databases under filename [NoticeID]\_97B(Calc).xlsx

## System requirements and installation

### A. System requirements

**EPFD Static** software should run on most newer PCs, but the following table represents what is considered to be the minimum and recommended system specifications.

	<b>Minimum</b>	<b>Recommended</b>
<b>CPU</b>	2.0+ GHz Intel Core i3	Intel Core i7+
<b>RAM</b>	4 GB	8+ GB
<b>Operating System</b>	Microsoft Windows 10/11	Microsoft Windows 10/11 64 Bit
<b>Hard Disk Space</b>	Microsoft Office with Access 2 GB	Microsoft Office with Access 2+ GB

### B. Installing and launching the software

Once downloaded the software can be installed by running **EPFDStaticSetup.exe**. No administrative rights are required both to install and to run the software.

The software is installed in user folder:

`C:\Users\[USER]\AppData\Local\EPFD Static`

Software can be launched using shortcuts on desktop.

There are two versions of executables:

**EPFD Static** is using 32-bit architecture.

**EPFD Static x64** is using 64-bit architecture.

**EPFD Static** is to be used on system where Microsoft Office 32-bit version is installed. This is also a recommended option for systems where BR Space Applications are already installed.

**EPFD Static x64** is to be used on systems where Microsoft Office 64-bit version with MS Access is installed. **EPFD Static x64** is also able to examine EPFD data containing very large PFD-masks.

#### Additional step for systems without Microsoft Office installed

In systems without Microsoft Office installed it is also possible to use **EPFD Static** software by downloading and installing Microsoft Database Access Engine drivers.

It is recommended to install Microsoft Access Database Engine 2010 drivers which can be downloaded from <https://www.microsoft.com/en-US/download/details.aspx?id=13255>

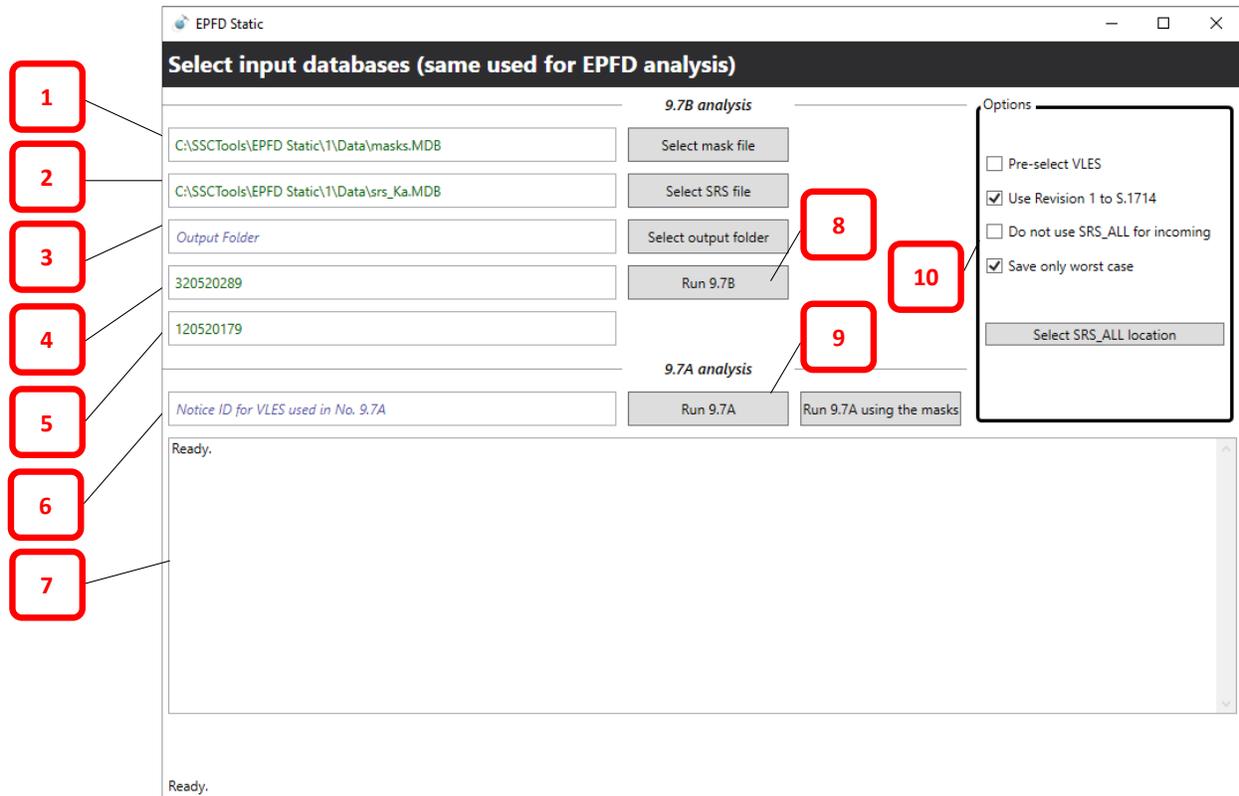
Please make sure to install drivers corresponding to intended use of **EPFD Static**:

AccessDatabaseEngine.exe for **EPFD Static** 32-bit

AccessDatabaseEngine\_X64.exe for **EPFD Static** 64-bit

Installing both versions of drivers in the same system is not recommended and may results in problems running different software.

## Brief overview of the interface



- (1) Input for mask database. Mask database can be selected by clicking **Select mask file**.
- (2) Input for examination SRS database. Examination SRS database can be selected by clicking **Select SRS file**.
- (3) Output folder for results. Can be selected by clicking **Select output folder**. If no selection is made, output files are saved in the same folder where input files are contained.
- (4) Notice ID of non-GSO FSS as contained Examination SRS Database
- (5) Notice ID of non-GSO FSS as contained BR IFIC SRS Database
- (6) Notice ID of VLES as contained BR IFIC SRS Database
- (7) Status window
- (8) Click to run 9.7B analysis.
- (9) Click to run 9.7A analysis.
- (10) Different optional settings

Software offers two run scenarios.

- 1) After specifying input databases, No. **9.7B** analysis can be conducted by clicking **Run 9.7B**.

!!! It should be noted that notice Id of non-GSO FSS system specified in Examination SRS database (4) may be different from actual non-GSO FSS system if the system is already recorded and published in BR IFIC. In such case user need to specify actual notice ID in field (5).

- 2) No. **9.7A** can be conducted by clicking **Run 9.7A**. No input databases except BR IFIC SRS ALL is required for this analysis. Only frequency overlap is used in the analysis.

There are several options available:

- 1) Pre-select VLES. When checked, before running No. 9.7B analysis, the software will ask which VLES to be used in the analysis.
- 2) Use Revision 1 to S.1714. Checked by default and methodology described in Recommendation ITU-R S.1714-1 is used for calculations. If unchecked, the software will use the methodology presented in Recommendation ITU-R S.1714-0.
- 3) Do not use SRS\_ALL for incoming. If checked BR IFIC SRS\_ALL will not be used to extract incoming assignments.
- 4) Save only worst case. For each potentially affected VLES, the resulting Excel report would contain only the worst calculation pair and Recommendation ITU-R S.1714-1 Case. If unchecked, Excel report will include each applicable Case calculation and incoming assignment overlapping VLES frequency band.
- 5) Select SRS\_ALL location – is used to specify location of BR IFIC SRS database. If location is not specified, upon running **No. 9.7B** analysis the software will ask for BR IFIC SRS database anyway.