

## **TECHNICAL BULLETIN # 13**

## March 31, 2016

## To: All Far-Field Application users with EMxpert

## **Re: How to use the Far-Field Application**

- 1. Place the large absorber pad on the EMxpert scanner: EMX, EHX, EHX+ or ERX+.
- 2. Run a Spectral/Spatial from 30 MHz to 1 GHz with Probe Compensation unselected; which is the case by default in the Preferences settings.

references			×
Analyzer Display Options			
Display Letter For Scanner			
Color Spectrum: Pseudo Color 🗸			
Probe Compensation			
O Peak Only  Threshold	5.00	🔾 All Data	
	OK	Cancel	Apply

3. Export data by right clicking on the spatial scan and select Export Spatial Scan. You will end up with a text file.







4. Modify the data.

N2FConvert is a small program that corrects, decimates and converts the exported near-field data into the Far-Field Application format. This is where an offset is applied to account for the absorber pad loss and where the data is compensated for probe response, air loss, switch loss and path loss.

a. Run "N2FConvert.exe" and you will see the following screen:

e	- • ×
Decimation   Correct   Combine	EN SCAN real-time results
Use Compensation EMX EHX/EHX+/ERX+	
Convert Now 🔁	
	te Decimation   Correct   Combine Use Compensation ENX ENX ENX ENX Convert Now €

- b. Select *Single Input File* if you only have scanned one side of the PCB or exported only the data set of one side. Click on *Input Lower* and select the Spectral/Spatial data file you exported in text format. P.S.: You will notice that the *Out Lower* path and file name has been created automatically.
- c. Select *Use Compensation*. It is selected by default. If for some reason, you selected Probe Compensation in Preferences as shown in Item 1 above when you ran the Spectral/Spatial scan, then deselect *Use Compensation*.
- d. Select whether you used an EMX scanner or an EHX/EHX+/ERX+ scanner when running the Spectral/Spatial scan. The hardware design and thus the probe compensation factor is different between the two families of products. The probes are oriented differently and the switches are from different suppliers.
- e. If the Input file is much bigger than 10 MB, reduce the file size by entering 10, 100, 1000 etc. in the Decimation field to cut the number of points by approximately 10, 100, 1000 or more. Enter 1 if the file is the file is less than 10 MB.

**VERY IMPORTANT:** The Far-Field Application can only process ten thousand data points (10,000). The number of data points left after the conversion will be shown on the lower left once you click on *Convert Now*. There are two parameters to reduce the number of points: *Decimation and Threshold*.

- f. Click on *Out Lower* (and/or *Out Upper* as required) to select a new Destination File and name if the default path and name needs to be changed.
- g. Click on *Convert Now*. The number of data points will only show up while the conversion takes place.

Once it says Conversion Completed Successfully at the bottom left, move to the next step.





- 5. Transform to Far-Field
  - a. Open the Far-Field Application named DVTPCBNF-FF.



b. Click on Data Input.

tupParameter Vear Field Far Field Proc	ram		
PCB Length (mm)         140 0C           PCB Width (mm)         170 0C           Cell Length (mm)         250           Cell Width (mm)         250           Cell Width (mm)         200           Start (MHz)         20 00           Stop (MHz)         1000 00           No. of Points         50	Maximum Roves 45 (-) Maximum Columns 57 (-) Length (mm) 145.00 Wridth (mm) 15.00 Gap to PCB (mm) 5 (-) Bectronic Scanner	Printed Circuit Board Ceil	de 9 Scan Plane
<ul> <li>H-Field</li> </ul>	Near Field Graph Display Save		
Input File and Directory In       Directory Path       C:\Users       PCB Pri File	ormation \Stephane Attal\Documents\EMSC. III	AN/Sales/EMopert Demo/Release Jul 18-2012/	Dem Specify Specify
FF Reference File NF Reference File			Specify Specify
Reading Near F	eld Data from file. It may take few s	ecconds to minitues due to file size Ok	Cancel

- c. Click on *Specify* next to the Directory Path box to point to the folder where all the Destination Files created in step 4 above have been stored.
- d. Click on *Specify* next to the PCB Pri File box to select one of "Destination Files" as the PCB primary data file to transform.
- e. Click on the Far-Field tab.

Model Architecture         Optional Parameters           ASC/C         PCB Image Plane           Loop         Prove Site           Trace         Stat           Bapolytic         Prime Field	Vear Field Far Field Program		
Output File and Directory Information Directory Fall C_DUTSOLBORINE/PCENF.FP/2p18\ C_DUTSOLBORIN	Model Architecture ASIC/IC Loop Trace Sist PlaneSplt PlaneSplt PlaneSplt Class A Class B ✓ FCC CISPR	Octional Persenters PCB Image Plane Program Field	
Directory Path Spectry Co.	Output File and Directory Informa	tion onsinc\PCBNF-FFV2p18\	
	Output Elea Partia TC-2		> Specity





i. Model your PCB in the Model Architecture section.

Model A	rchitecture	
ASIC/	1C 5 🗢	
Loop		
Trace		
Slot 🗹	2 🗘	
Plane:	Split	
A5,L ,T ,S2	2,P 7	

- ii. Select your standards' limit lines and distance (1, 3 or 10 meters) in the Regulatory Compliance Limits section.
  - Regulatory Compliance Limits

     Display Limits

     Class A
     Class B

     FCC
     FCC

     CISPR
     CISPR

     IC
     IC

     Limit1
     Limit2

     OATS
- iii. In the Output File and Directory Information section, specify the path where you want the JPG and csv copy of the far-field results to be saved.

Output File and Dir	ectory Information	
Directory Path	C:\Users\Owner\Desktop\ < >	Specify
Output Files Prefix	TC-2-	Specify

- f. Click on Program tab.
  - i. Select Log instead of Lin (Linear) for a logarithmic scale display as used in chamber results.



- g. Click OK.
  - i. The near-field data peaks will be displayed.







- h. Click on Transform button.
  - i. The far-field data will be calculated and overlaid with the limit lines.



