

AV332: Digital Communication Lab

Lab 0

Familiarization with Emona Datex Kit

Date: 1st and 4th August 2016

1 Familiarization with the Emona Datex kit

The objective of this lab session is to :

1. Read through the user manual for the trainer kit
2. Interact with the lab staff and understand the operation of the kit
3. Explore the kit operation with sample experiments
4. Write a short description of the capabilities of the kit as well as the answers to the sample experiments below.

Task 1: Read through the user manual which details the various components (blocks) on the Emona Datex kit. Pay special attention to the adders, multipliers, filters, master signal blocks. Familiarize yourself with the virtual instruments which can be used along with this kit. Write a short description of the capabilities of this kit.

Task 2: The following experiments are meant to make you familiarize yourself with the capabilities of the kit

Sample experiments:

- Obtain a signal $x(t) = A\cos(2\pi ft) + B\cos(2\pi 2000t)$. Visualize the frequency spectrum of $x(t)$ as a function of the parameters A , B , and f . In your report using a block diagram show how you have obtained $x(t)$. This block diagram should mention which blocks in the kit have been used. Draw the frequency (magnitude) spectrum of $x(t)$ that you have obtained.
- Generate two signals $x(t) = \sin(2\pi 2000t)$ and $y(t) = \sin(2\pi 2000t + \phi)$. Explore the correlation between $x(t)$ and $y(t)$ as a function of the phase ϕ . In your report using a block diagram show how you have obtained the correlation. This block diagram should mention which blocks in the kit have been used. Report the obtained correlation for two different values of ϕ (any two would suffice).
- How will you obtain the magnitude response of the channel BPF and the baseband LPF on your kit board ? As homework check the magnitude response that you have obtained with the one provided in the manual. In your report using a block diagram show how you have obtained the magnitude response.