

TEN STEPS TO SUCCESSFUL DESIGN AND INSTALLATION OF VORTEX[®] PRODUCTS

This quick reference guide provides an overview of the steps required to design, upload, and do final adjustments for a Vortex installation.

Designing and Uploading to the Vortex

- Step 1. Create the Vortex configuration file with *InstantDesigner*. Once *InstantDesigner* has created the design, find the device IDs required for the Vortex devices by looking at the device IDs shown as highlighted in Figure 1. If the design needs to be modified for special applications, save any changes to Preset 16 on all Vortex devices.
- Step 2. Power up the Vortex devices and set the device IDs (using the LCD front panel System Settings menu) to the device IDs specified by *InstantDesigner*. Then bus the Vortex units together, connecting EF Bus In to EF Bus Out. No bus terminators are required.
- Step 3. Ensure the audio amplifiers are turned off and cable the input and output connections of the Vortex devices as shown in the description window of Figure 1.
- Step 4. Upload the Conference Composer configuration file into the Vortex devices as follows: if using serial port COM1 on your computer, simply click the 'Send to Device' button. Otherwise, left click on the Comm #1 field below the project name on the left of the screen and change the transport from Comm #1 to match the serial port or TCP/IP port you are using on your PC. Finally, click the project name field on the left, and click the 'Send to Device' button as shown in Figure 1.

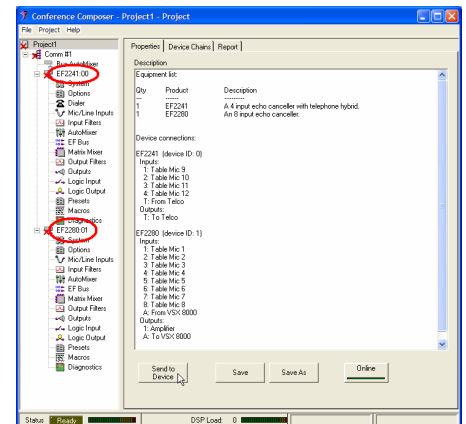


Figure 1. The device IDs for the EF2241 (device ID 00) and EF2280 (device ID 01) are highlighted.

If any communication error messages are received, check that the device IDs on the units and the style of Vortex units (EF2280, EF2241, etc.) match the device IDs and style of units specified in the Conference Composer file created by *InstantDesigner* and make the necessary changes and click the 'Send to Device' button on the project page.

Once the file is uploaded successfully, turn the audio amplifiers back on. The system is ready for testing and any final adjustment that may be required.

Validation and Final Adjustment

- Step 5. For each Vortex in the design, click the 'Levels' button on the Diagnostics tab to review and adjust, if necessary, the input signal levels (microphone inputs, telephone interface, video codec audio, and program audio). The goal is to get one or two yellow lights flickering during normal speech / audio levels and peaking above that. Too few LEDs and the gain should be adjusted up, too many LEDs on consistently and the gain should be adjusted down as shown in Figure 2.

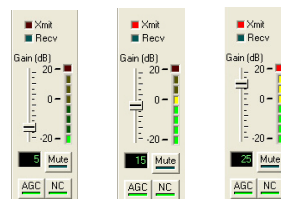


Figure 2. Examples of microphone levels that are too low (left), just right (center), and too high (right) during normal speech.

- Step 6. Review and adjust, if necessary, the output signal levels (amplifiers, video codec, and telephone interface). The signal levels should appear similar to the levels in the center of Figure 2 during normal audio levels. As with the input levels the goal is to have one or two yellow lights flickering during normal speech / audio levels and peaking above that. Too few LEDs and the gain should be adjusted up, too many LEDs on consistently and the gain should be adjusted down. If the Vortex output is connected to a consumer level input device (with an RCA-style connector on the input), set the output gain 10dB lower than you would normally set it in order to not overdrive the input of the consumer device. Play audio (the signal generator, program audio, telephony, or codec audio) into the room to make sure amplifier and loudspeakers are connected and the amplifier level is appropriate.

Step 7. Check the room gain on each microphone when only the *remote* people are speaking if the room gain is above +5dB as shown in Figure 3, adjust the amplifier volume knob lower, increase remote input levels such as telephone and video codec, and check the room gain so that the room gain looks more like Figure 4 for each microphone. To facilitate measuring the room gain, a recording of a remote talker may be heard by dialing the PSTN phone number +770 350 4120.

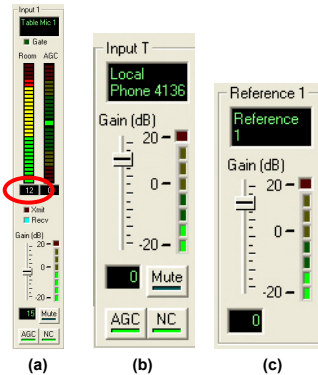


Figure 3. This figure shows an example of +12dB of room gain for Table Mic 1 (a) and the remote audio levels on the telephone input (b) and the AEC reference (c).

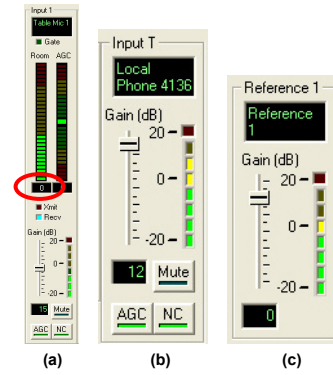


Figure 4. The resulting room gain is reduced to 0dB for Table Mic 1 (a) when the local amplifier has been decreased by 12dB and the remote telephone signal level has been increased by 12dB. The in-room sound levels are the same as the settings of Figure 3.

Step 8. Check that the control system volume control is both increasing and decreasing the output to the amplifier(s) and the reference level to keep room gain constant. The preferred way to control volume is to have a Vortex macro that can be executed for volume up and volume down as shown in Figure 5. *InstantDesigner* creates these volume control macros automatically. In this example, the control system should execute macro 6 to increase the gain by 1 dB and macro 7 to reduce the gain by 1 dB. If using an external volume control such as an AMX volume control card, limit the maximum amount of gain to less than 10dB to keep the room gain reasonable.

Macro	Name	Item	Command
6	Amplifier Up	1	Output 1 ("Amplifier") Gain = + 1 dB
		2	Output R1 ("Reference 1") Gain = + 1 dB
7	Amplifier Dn	1	Output 1 ("Amplifier") Gain = - 1 dB
		2	Output R1 ("Reference 1") Gain = - 1 dB

Figure 5. Macros can be used to increase and decrease the volume and the gain on the AEC reference. These macros will keep the room gain constant as volume is adjusted.

Step 9. Test the system with either a telephone and/or a video call to ensure all microphones can be heard as a local talker speaks while moving around the room and that the remote talkers are heard throughout the room. Adjust the in-room volume to the maximum user setting and do a final test of the room gain to ensure the system is robust with low room gain (< 5dB) even at maximum volume.

Step 10. Adjust the amplifier output signal equalization as necessary to maximize the quality of the remote speech in the local room.

The Vortex products have now been installed properly.

Additional Tips and Information

- The Conference Composer Help File contains the RS-232 Programming Guide, an expanded Echo Troubleshooting Guide, Video Codec installation tips, Wiring tips, and more.
- Mute and unmute crosspoints in the matrix by right clicking on the crosspoint.
- Bold crosspoints are unmuted and their values are in dB – 0dB is the same as unity gain.
- If the remote site hears acoustic echo of their voices from the local room try muting the local microphones. If the echo is removed, unmute one microphone and check the AEC – is it enabled? Check the reference – is the remote audio unmuted in the reference? what is the room gain on that microphone?
- Wiring balanced and unbalanced equipment to Vortex should be connected as shown in Figure 6.



Figure 6. Balanced microphone input to balanced input on Vortex (top) and unbalanced to balanced recommended wiring (bottom).

