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ES-IX Setup Guide

Automatically Configure Your Current Setup Files to Work with ES-IX

Included in Cascade is a tool that will convert your standard electrical stimulator protocols to setup files that utilize the ES-IX. The tool is called the EsixStimConverter.exe, and is located in C:\Cadwell\Cascade\. Double left-click on EsixStimConverter.exe to start the tool.

The tool main menu comes up.

You can select and convert a single file, or select and convert an entire directory of procedure setup files. If your folder of setup files includes sub-folders (sub-directories), you will need to convert each directory separately. When the Stim Converter is finished processing your files, it will create copies of the setup files in the directory with the prefix "ES-IX". The files with this prefix are the converted setup files. The original files remain unchanged in the directory. Close the tool after you are finished converting your files.

ES-IX Configuration Options

The ES-IX stimulator has its own Stim Type in the Mode setup window. The ES-IX has the same capabilities as previous electrical stim splitters (ES 5-100, ES-16, etc.), and the options are accessed through the Setup Stimulator button in the Mode Controls, the same as for the electrical stim splitters. **However, the ES-IX includes several new capabilities that were not available with the stim splitters.**

Stimulation Outputs Available

The ES-IX has eight 100 mA constant-current output pairs and a single low output that can be configured to 5 mA, 20 mA, 5 V, and 20 V modes. Two ES-IXs can be daisy-chained, doubling the number of channels available.

Daisy-chaining ES-IXs

ES-IX Standard Cable to Base

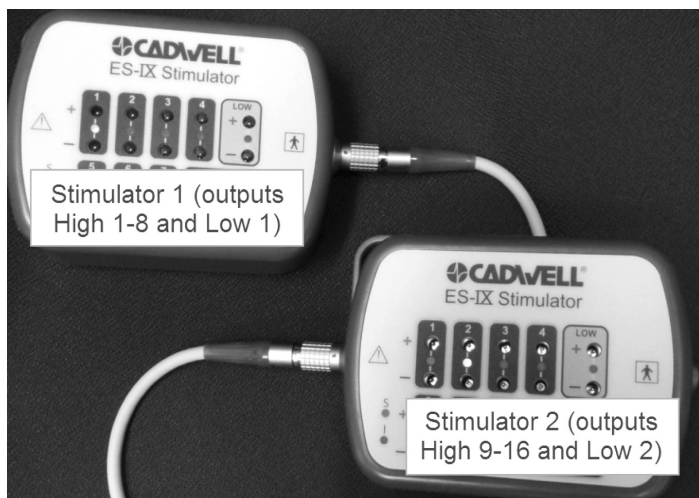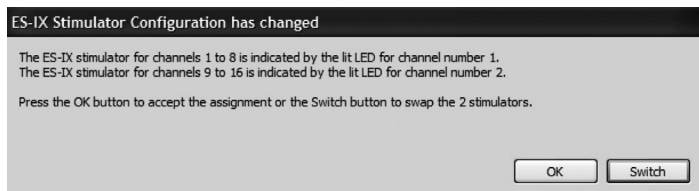ES-IX Daisy Chain Cable
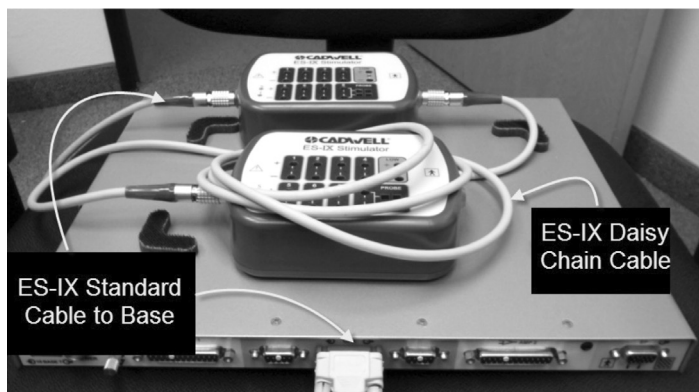
When ES-IXs are daisy-chained, one stimulator becomes outputs High 1-8 and Low 1, while the other becomes High 9-16 and Low 2. When you start a procedure with two ES-IXs connected, you will be presented with the following popup. This message will also appear when you disconnect and reconnect the ES-IXs.

ES-IX Stimulator Configuration has changed

The ES-IX stimulator for channels 1 to 8 is indicated by the lit LED for channel number 1.
The ES-IX stimulator for channels 9 to 16 is indicated by the lit LED for channel number 2.

Press the OK button to accept the assignment or the Switch button to swap the 2 stimulators.

| OK | Switch |

Stimulator 1 (outputs High 1-8 and Low 1)

Stimulator 2 (outputs High 9-16 and Low 2)

Choose OK to accept the ES-IX stim output assignments or Switch to swap which ES-IX is assigned channels 1-8 and which is assigned channels 9-16.

Biphasic Stimulation

The ES-IX can produce biphasic stimulation pulses.
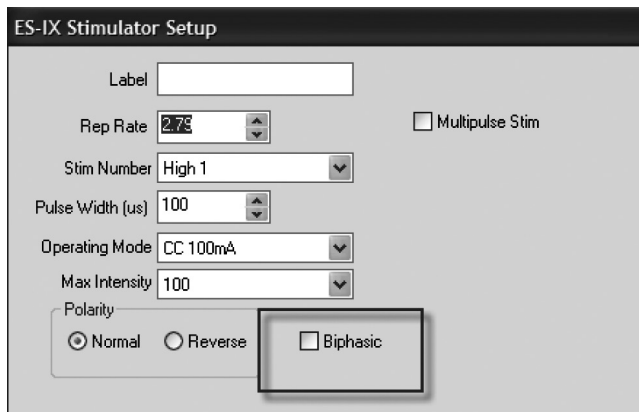
In Cascade, selecting biphasic stimulation, causes the stimulating waveform to change such that the waveform looks like the one below. Both phases of the stimulus pulse have the same amplitude and pulse width. The pulse width specified in the stimulator setup is the pulse width for each phase, not the summed pulse width of both phases.
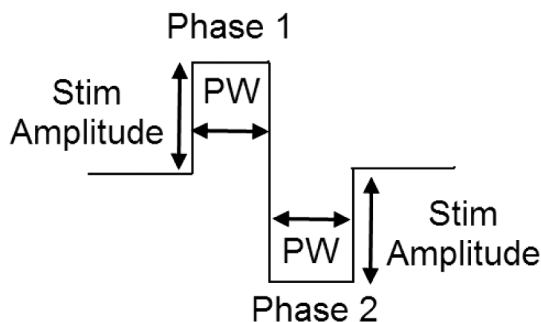
Multipulse Stimulation

In addition to standard single-pulse reprate stimulation and EMG train stimulation, the ES-IX can perform repetitive multipulse stimulation.
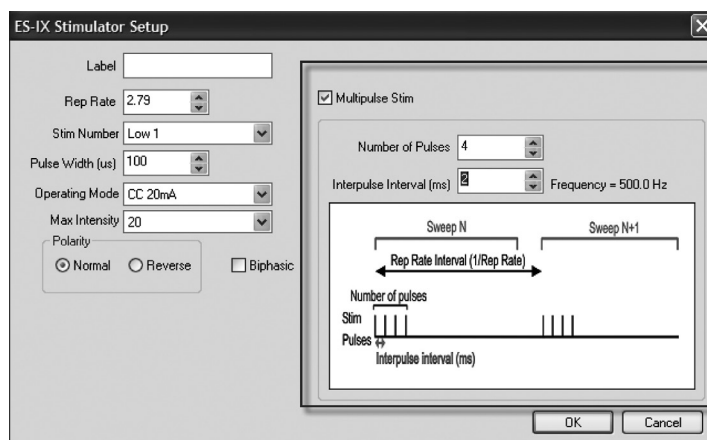
When the Multipulse Stim box is checked, the multipulse options become available. You can create multipulse trains up to 10 pulses with interpulse intervals from 0.5 to 10 ms. These short trains will be repeated at the Rep Rate specified in the Rep Rate box on the left side of the ES-IX Stimulator Setup dialogue.

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