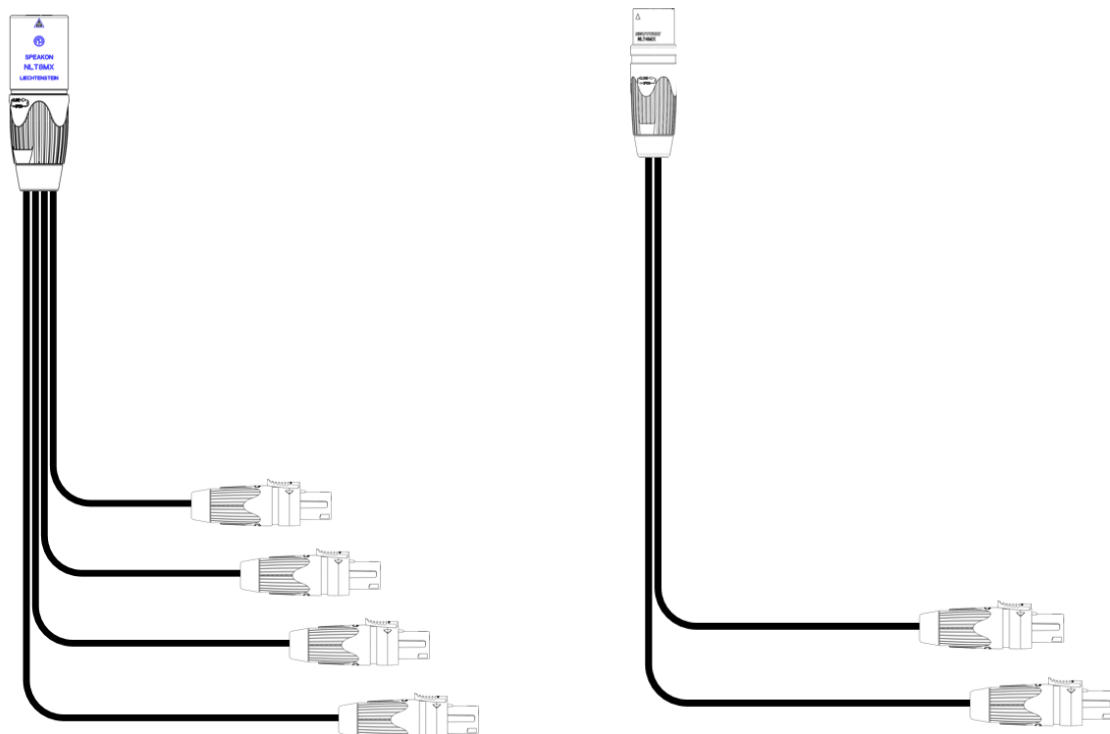




VTX SERIES

VTX Subwoofer Wiring Guide



General Information:

VTX Subwoofer Wiring Guide

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Introduction

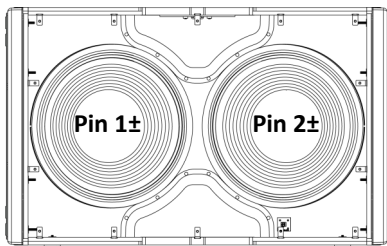
JBL VTX Series subwoofers come equipped with Neutrik STX Series speakON-type connectors for connectivity to amplifiers. Depending on the application and available cables, a number of wiring schemes can be used to achieve the desired flexibility while using the least amount of cables.

This document outlines wiring techniques used for powering JBL VTX Series subwoofer products with Crown I-Tech HD Series amplifiers.

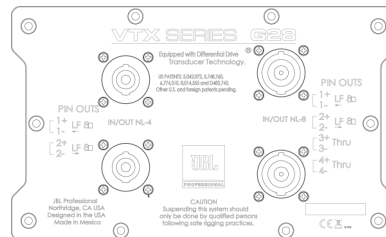
Internal VTX Subwoofer Wiring

All VTX Series subwoofers (with the exception of the VTX F18S) have the two woofer components independently wired to the input panel NL connectors. One woofer is connected to Pin 1 ± and the other to Pin 2 ±. The same pin configuration is used for NL4 and NL8 connectors, giving the user the choice to use either type of cable. When using NL8 connectors, Pin 3 ± and Pin 4 ± are wired as pass-through connections (straight from one connector to the other) and are not used to drive the subwoofer components.

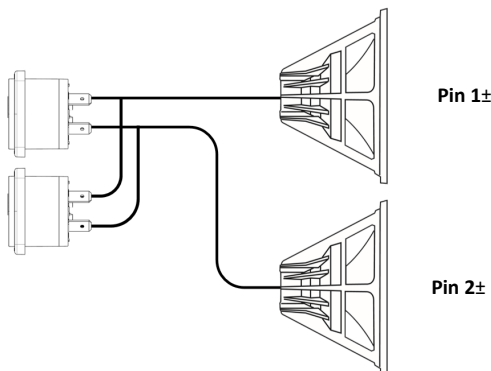
VTX Subwoofer



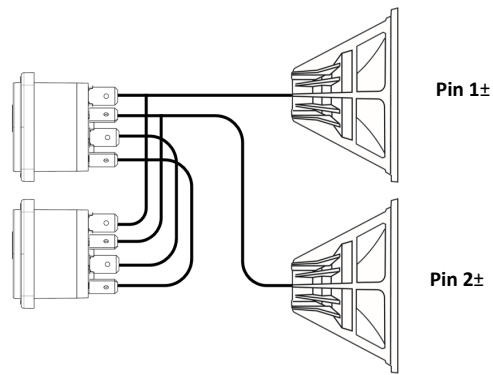
VTX Subwoofer input panel



NL4 Wiring for VTX Subwoofers



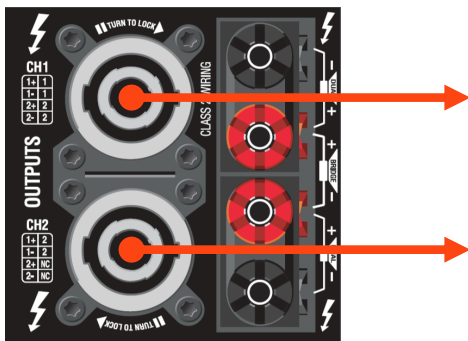
NL8 Wiring for VTX Subwoofers



Crown Audio I-Tech 12000HD Wiring



Crown Audio 2-channel I-Tech HD amplifiers come with both channels 1 and 2 wired to the upper (CH1) NL4 connector. This wiring method is typically used when powering 2-way (bi-amplified) loudspeakers and has Channel 1 wired to Pin 1 ± and Channel 2 wired to Pin 2 ±. The lower (CH2) NL4 connector is dedicated to Channel 2 and uses Pin 1 ± (note: Pin 2 ± is not connected). The wiring configuration for the output connectors is shown below:



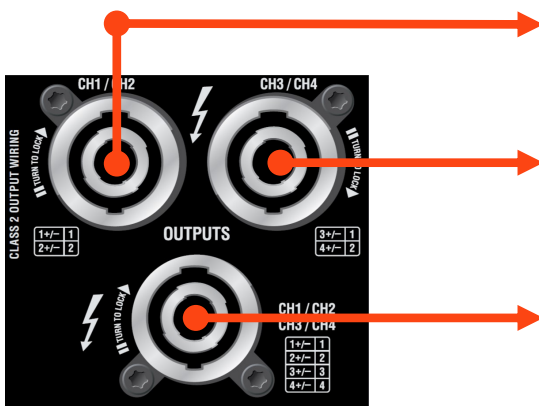
NL4 Wiring	
Pin 1 ±	Channel 1
Pin 2 ±	Channel 2

NL4 Wiring	
Pin 1 ±	Channel 2
Pin 2 ±	Not Connected

Crown Audio I-Tech 4x3500HD Wiring



The 4-channel Crown Audio I-Tech 4x3500HD includes 2 x NL4 connectors and has Channels 1 & 2 wired to the left NL4 and Channels 3 & 4 wired to the right NL4. An NL8 output connector is also available that contains all 4 amplifier channels on Pins 1 ± through 4 ± respectively. Output connector wiring configurations are shown below:



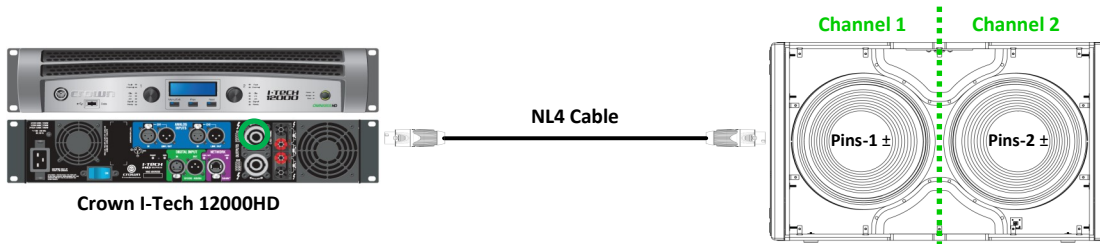
NL4 Wiring CH1/2	
Pin 1 ±	Channel 1
Pin 2 ±	Channel 2

NL4 Wiring CH3/4	
Pin 1 ±	Channel 3
Pin 2 ±	Channel 4

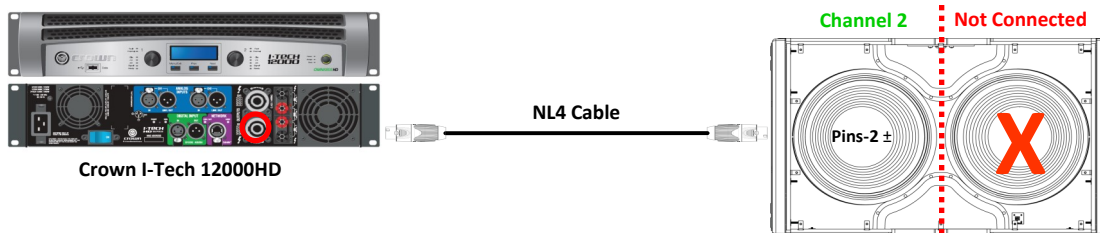
NL8 Wiring CH1-4	
Pin 1 ±	Channel 1
Pin 2 ±	Channel 2
Pin 3 ±	Channel 3
Pin 4 ±	Channel 4

I-Tech 12000HD Standard Wiring (Discrete Mode)

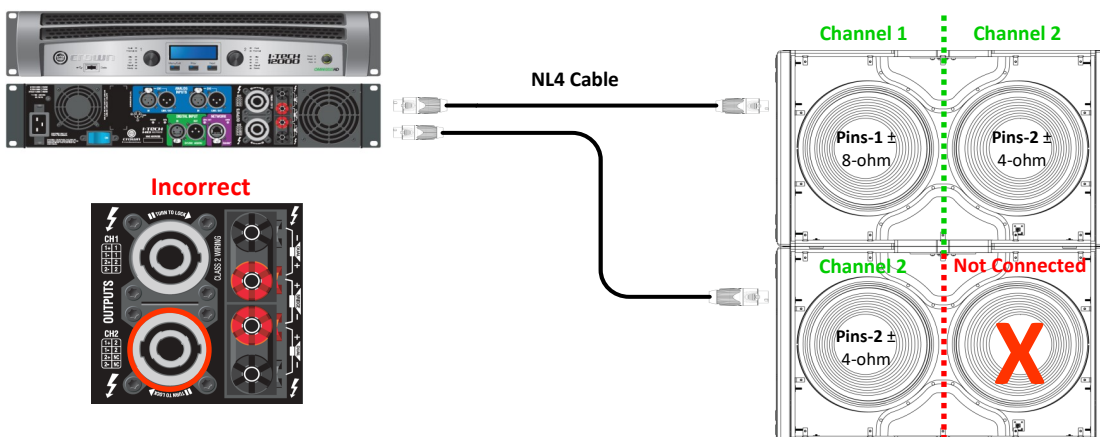
Standard 4-conductor NL4 cables can be used to connect VTX subwoofers to Crown I-Tech HD amplifiers. Using standard cables, each component within a VTX subwoofer enclosure is connected to an independent amplifier channel as shown in the drawing below. This wiring method is referred to as discrete wiring since each transducer within the enclosure is discretely wired to an individual amplifier channel.



For this configuration, only the Channel 1 (Top) NL4 connector should be used since it contains both Channel 1 and Channel 2 of the I-Tech HD amplifier. If the Channel 2 connector is used, one of the transducers will be left disconnected as shown in the example below.



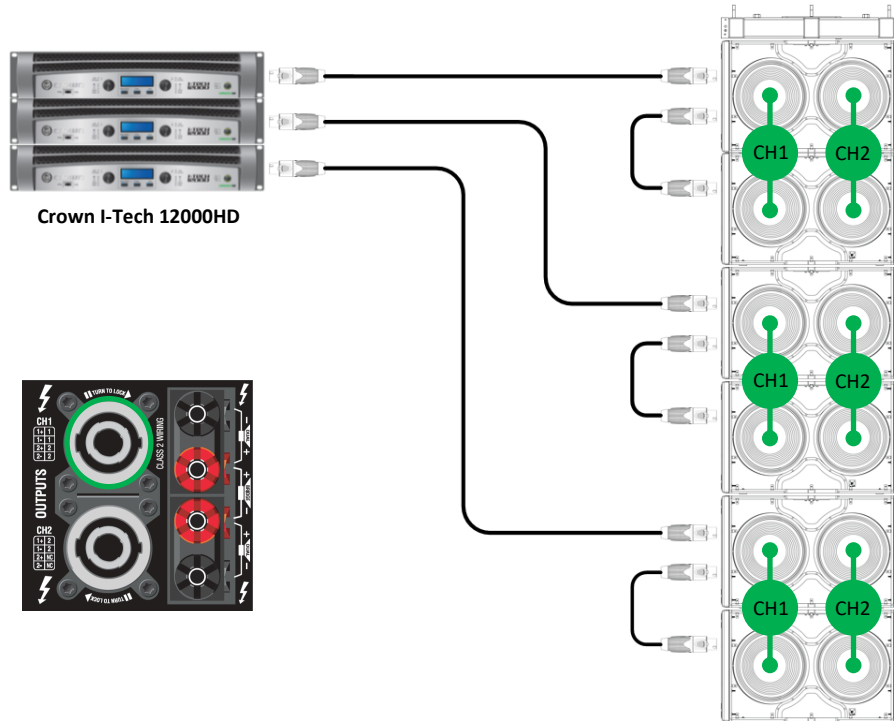
Similarly, using the two NL amplifier connectors for connecting multiple VTX subwoofer enclosures should be avoided. This wiring will only power 3 of the 4 subwoofer components, creating an 8-ohm load for Channel 1 and a 4-ohm load for channel 2.



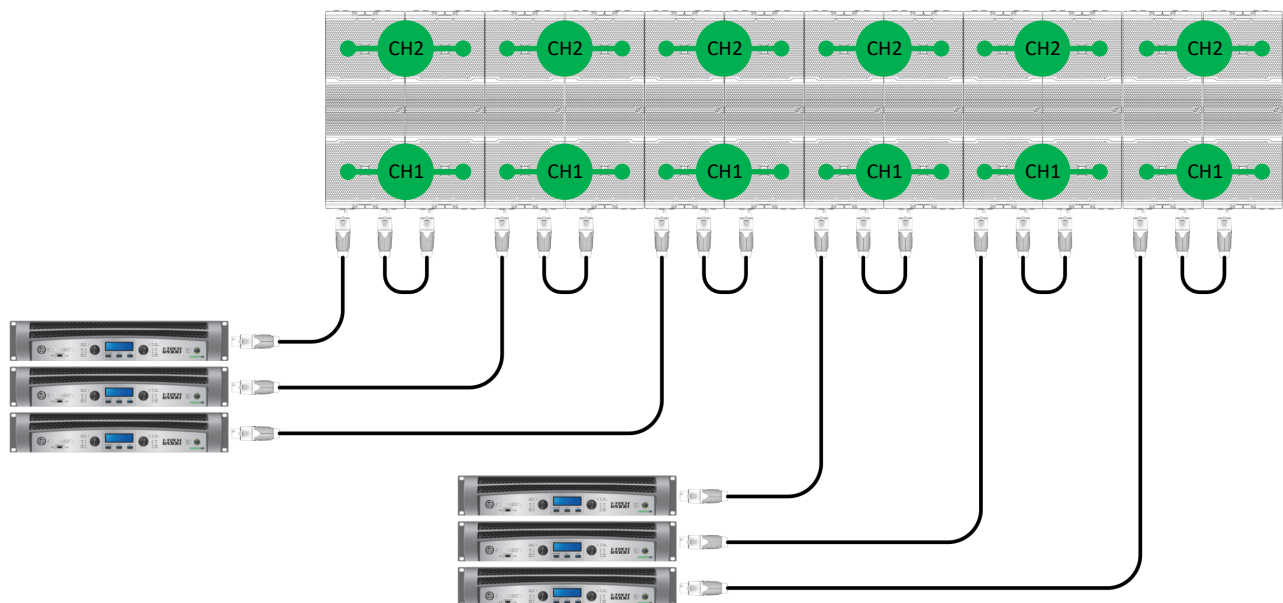
I-Tech 12000HD Standard Wiring Examples

Standard NL4 jumper cables can be used to connect multiple subwoofer enclosures together in a daisy chain wiring scheme. When connecting VTX subwoofers in this manner, each amplifier channel powers half of the subwoofer group.

Below are some examples using VTX subwoofers and discrete wiring:



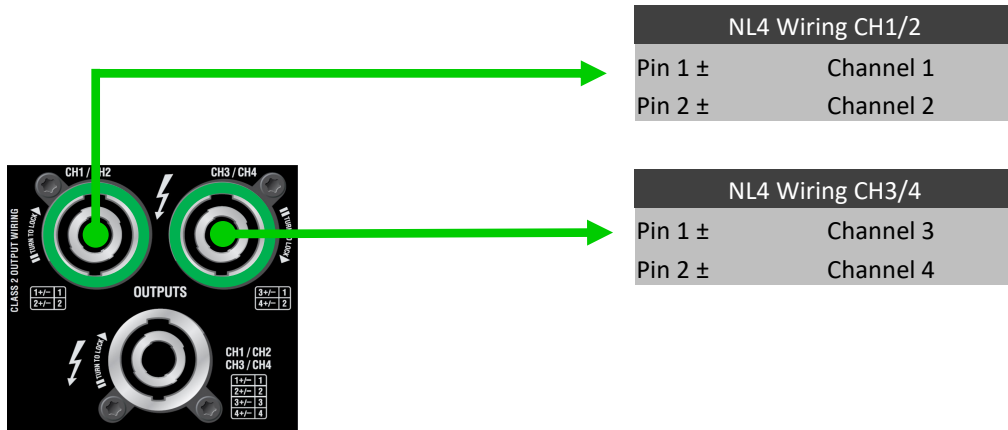
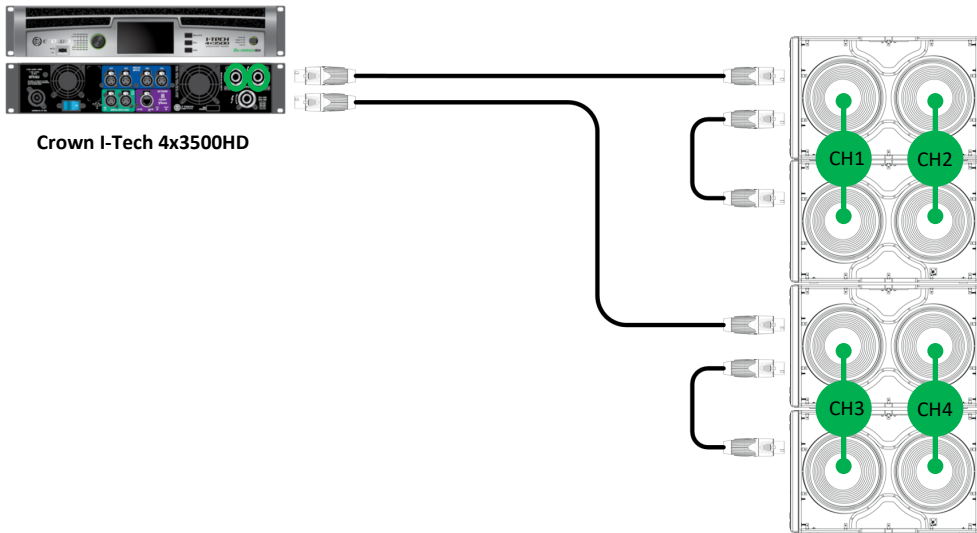
Example: 6x VTX S25 enclosures powered by I-Tech 12000HD amplifiers



Example: 12x VTX S28 enclosures powered by I-Tech 12000HD amplifiers

I-Tech 4x3500HD Standard Wiring (Discrete Mode)

The same wiring configuration can be achieved with the Crown 4x3500HD amplifier by using 2 x NL4 cables and 2 x NL4 jumpers as shown below:



The discrete wiring mode reduces the number of cables required to wire a subwoofer system to a minimum, however, this is at the expense of flexibility. Since multiple enclosures are powered and processed by the same pair of amplifier channels, DSP parameters such as presets or delay can only be applied to groups of subwoofers, not individual subwoofers. For optimum flexibility, one subwoofer per amplifier channel (parallel wiring mode) is recommended since it is more convenient to implement cardioid subwoofer configurations and Electronic Delay Steering (EDS). Parallel mode operation and adapter cable accessories are discussed in the following sections.

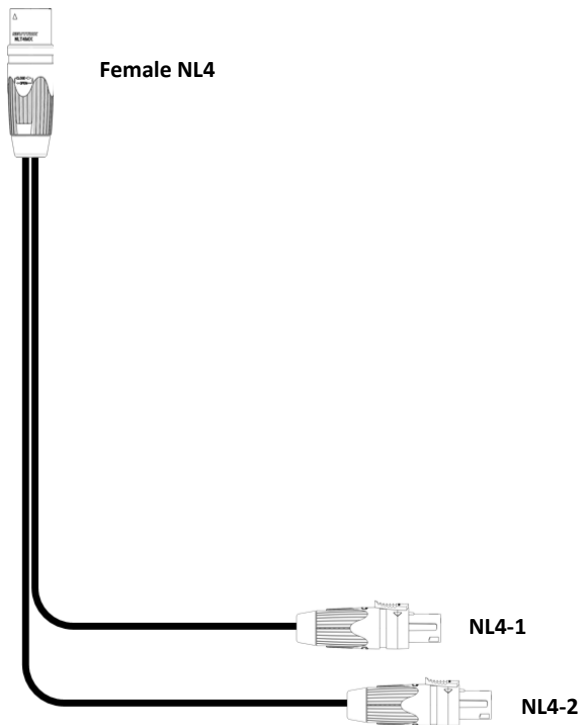
Parallel Wiring Mode

Powering subwoofers in parallel mode with one subwoofer per amplifier channel provides optimum flexibility for implementing cardioid subwoofer configurations and Electronic Delay Steering (EDS) as well as an optimum 4-ohm load for power amplifier channels. This wiring method allows for greater design and control flexibility since each VTX enclosure is connected to its own amplifier and DSP channel. Parallel wiring also makes testing easier since each subwoofer can be tested independently.

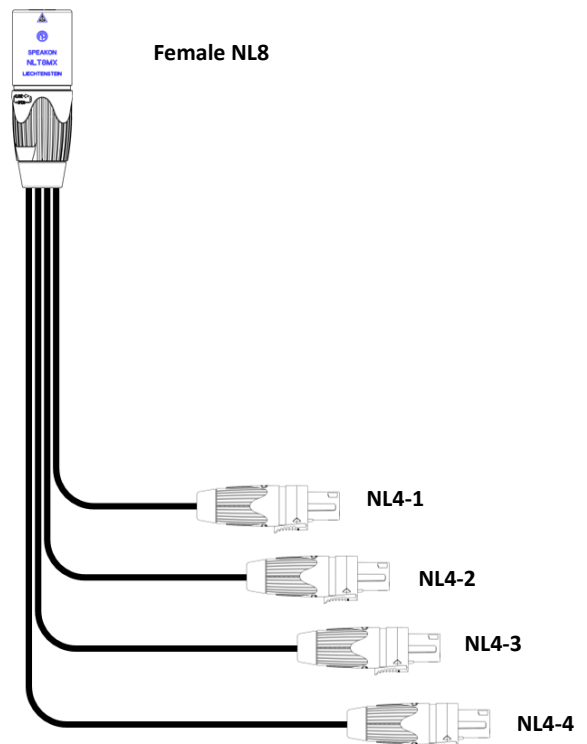
In this configuration a breakout cable or a rack I/O panel is necessary to wire the two subwoofer transducers to one amplifier channel. These adapter cables are easy to construct out of stock connectors and cables. The pin configuration is provided later in this document.

JBL Professional has partnered with cable manufacturer **Link** to offer these adapter cables as finished goods that can be ordered internationally directly from **Link**. Below are the part numbers for these products. To purchase, please contact Link at: sales@linkusa-inc.com

LK VTX-NL-424
For use with 2-Channel I-Tech HD amplifiers

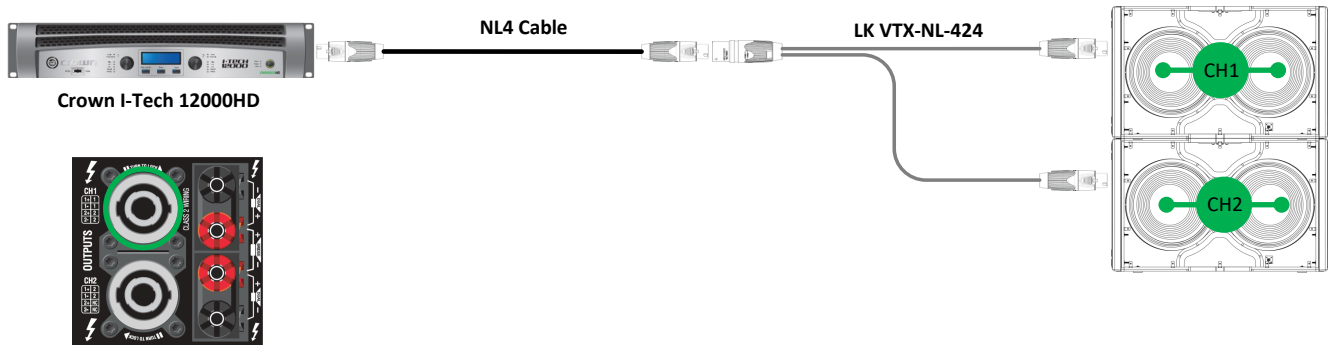


LK VTX-NL-844
For use with 4-Channel I-Tech HD amplifier



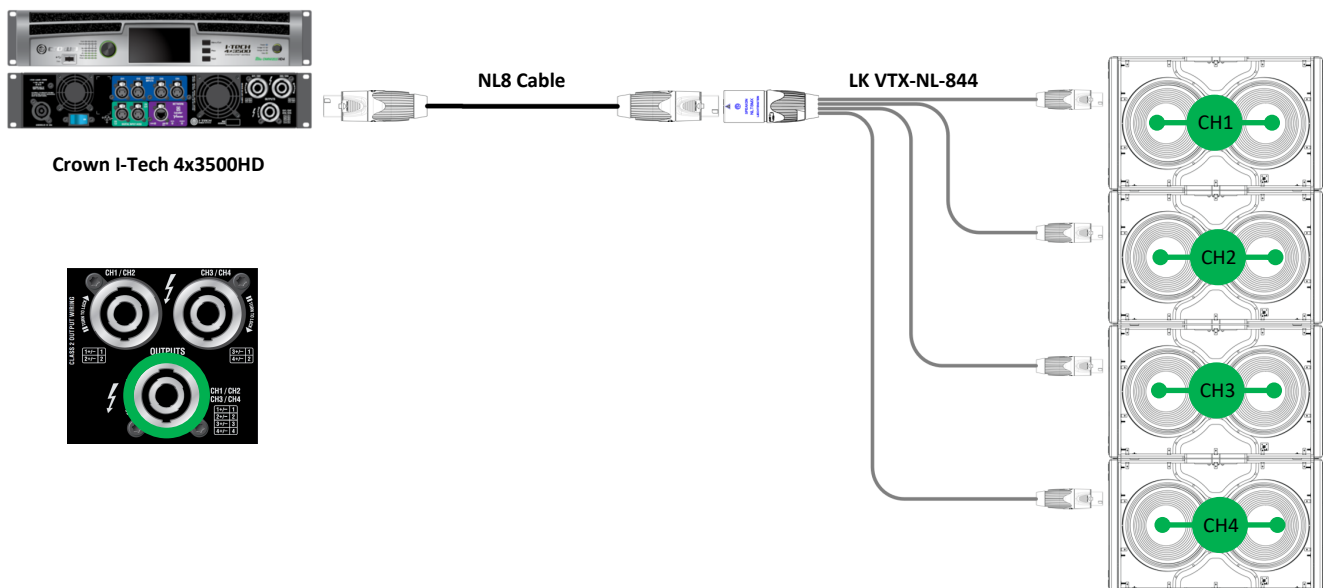
I-Tech 12000HD Parallel Mode Example

Using the **LK VTX-NL-424** breakout cable, two subwoofer enclosures can be connected to a single 2-Channel I-Tech HD amplifier. The breakout cable allows each subwoofer to be connected to an independent amplifier channel as illustrated in the example below. The breakout cable should always be connected to the CH1 (TOP) NL4 connector which contains both Channel 1 and Channel 2.



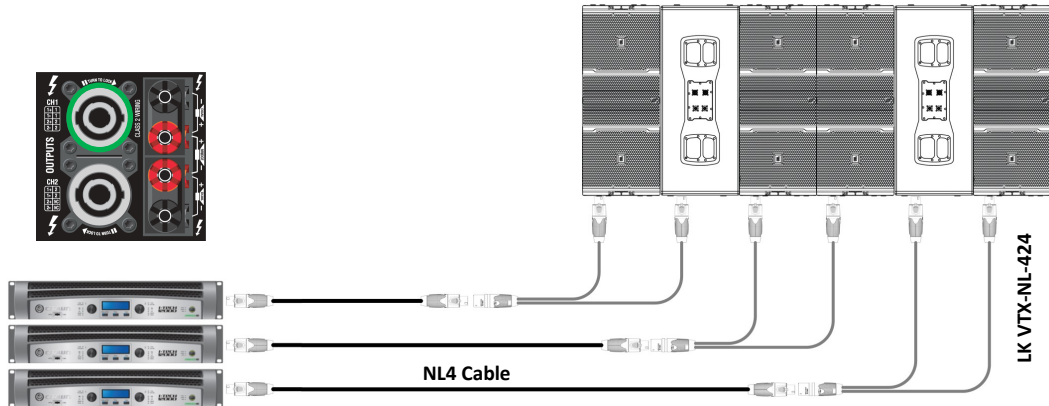
I-Tech 4x3500HD Parallel Mode Example

To implement parallel mode wiring on I-Tech 4x3500HD amplifiers, a pair of LK VTX-NL-424 adapters can be used in conjunction with 2 x NL4 cables that are directly connected to the amplifier's NL4 outputs. Alternatively, a single NL8 cable can be used in conjunction with the recommended 3rd party accessory shown below (Link USA LK VTX-NL-844). In this case the cable is connected to the NL8 connector which contains all 4 channels. This makes for an easy and convenient wiring scheme since a single NL8 cable can be used to independently power 4x VTX subwoofer enclosures, and this significantly reduces the number of cables needed.

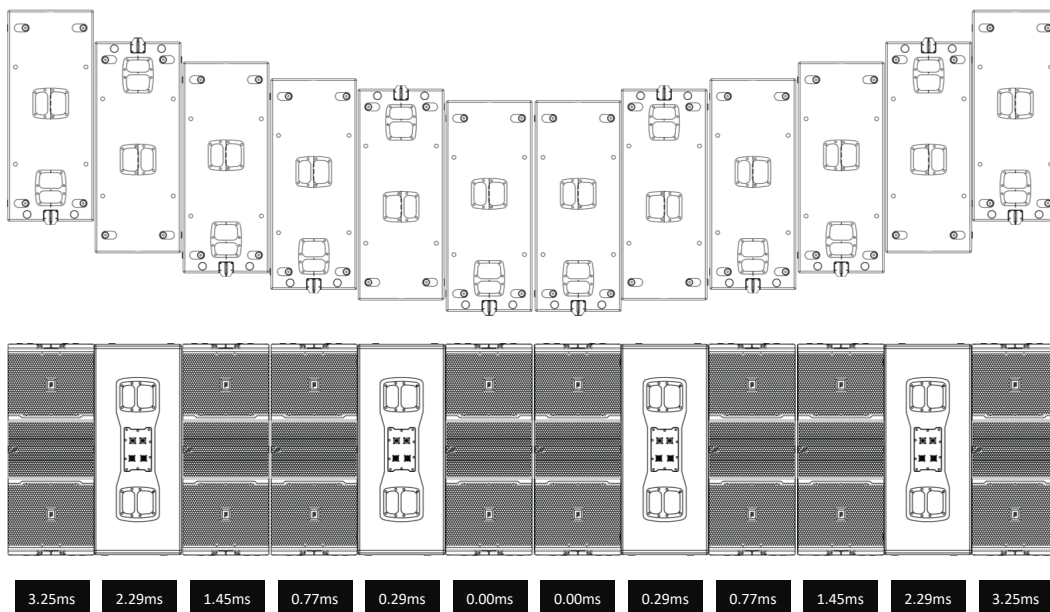


Breakout Cable Examples | 2-Channel Amplifiers

The example below shows an array of 6x VTX G28 enclosures wired using **LK VTX-NL-424** breakout cables. In this configuration each VTX subwoofer enclosure is driven by an independent amplifier channel, allowing for flexible cardioid subwoofer circuiting and a unique EDS delay value for each enclosure.

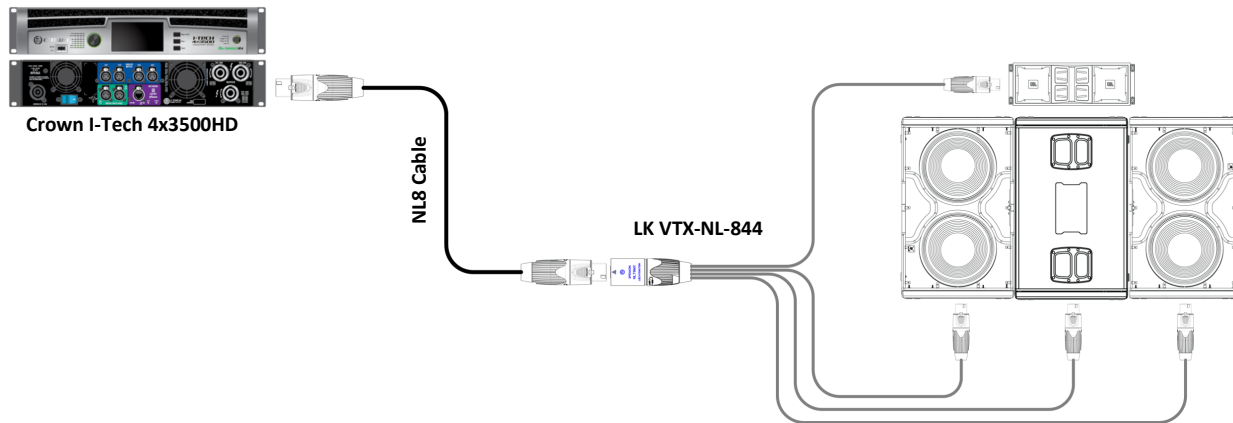


When constructing large horizontal subwoofer arrays, the overall size of an array can have a negative impact on the subwoofer coverage. The longer the array, the narrower the coverage. **Electronic Delay Steering (EDS)** is a technique used to alter the coverage angle of a given subwoofer array by applying a specific, pre-calculated delay value to each subwoofer enclosure. The goal of EDS is to electronically alter the shape of a subwoofer array and widen the coverage pattern by creating a virtual arc. The radius of the arc controls the radiating pattern of the array and each delay value is carefully calculated to align all subwoofers to the virtual arc. Hybrid cardioid EDS subwoofer arrays provide even horizontal coverage with 15–25 dB broadband SPL rejection behind the array. Below is an example of a 12x G28 cardioid subwoofer array and the appropriate delay values for a 90-degree coverage pattern.

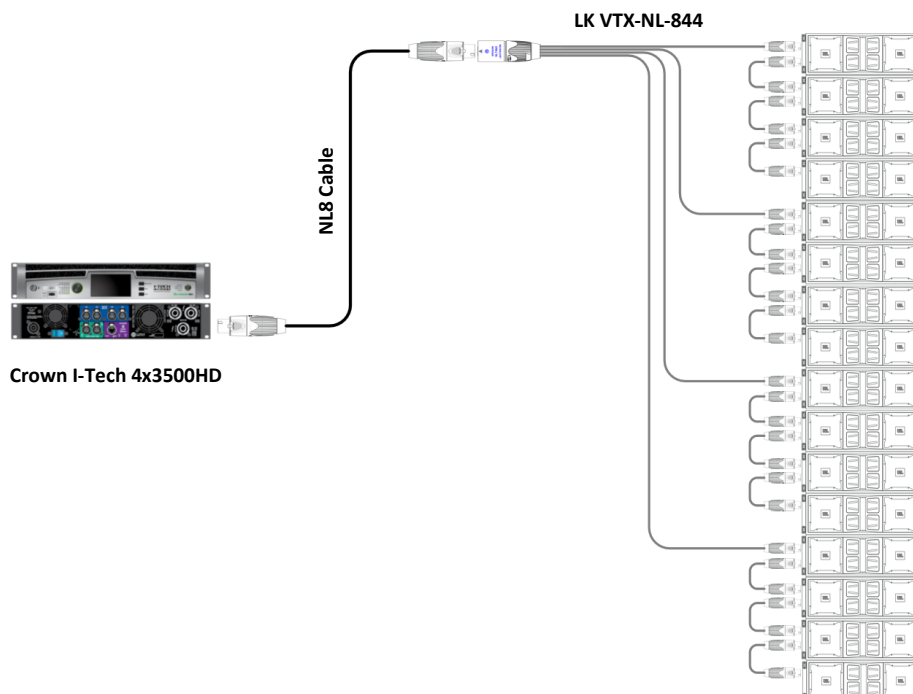


Breakout Cable Examples | 4-Channel Amplifiers

The example below shows an array of 3x VTX S25 enclosures and a Vertec 4886 used as a front fill enclosure. The array is wired using the LK VTX-NL-844 breakout cable to a single Crown I-Tech 4x3500HD amplifier. In this configuration the breakout cable provides independent DSP for each speaker enclosure, allowing for a cardioid configuration for the subwoofers and a separate preset for the VT4886 front fill. Multiples of this configuration can be used for larger system configurations.



Another interesting use case for the LK VTX-NL-844 breakout cable (unrelated to subwoofers) is when used with the Vertec VT4886 line array system. The VT4886 is a 12-ohm passive line array element that can be driven and processed by Crown I-Tech HD amplifiers. Up to 4x VT4886 cabinets can be driven by each amplifier channel, and up to 16x cabinets per Crown I-Tech 4x3500HD amplifier. An entire array of 16x elements can be powered using a single NL8 cable and the LK VTX-NL-844 breakout cable as illustrated in the example below.

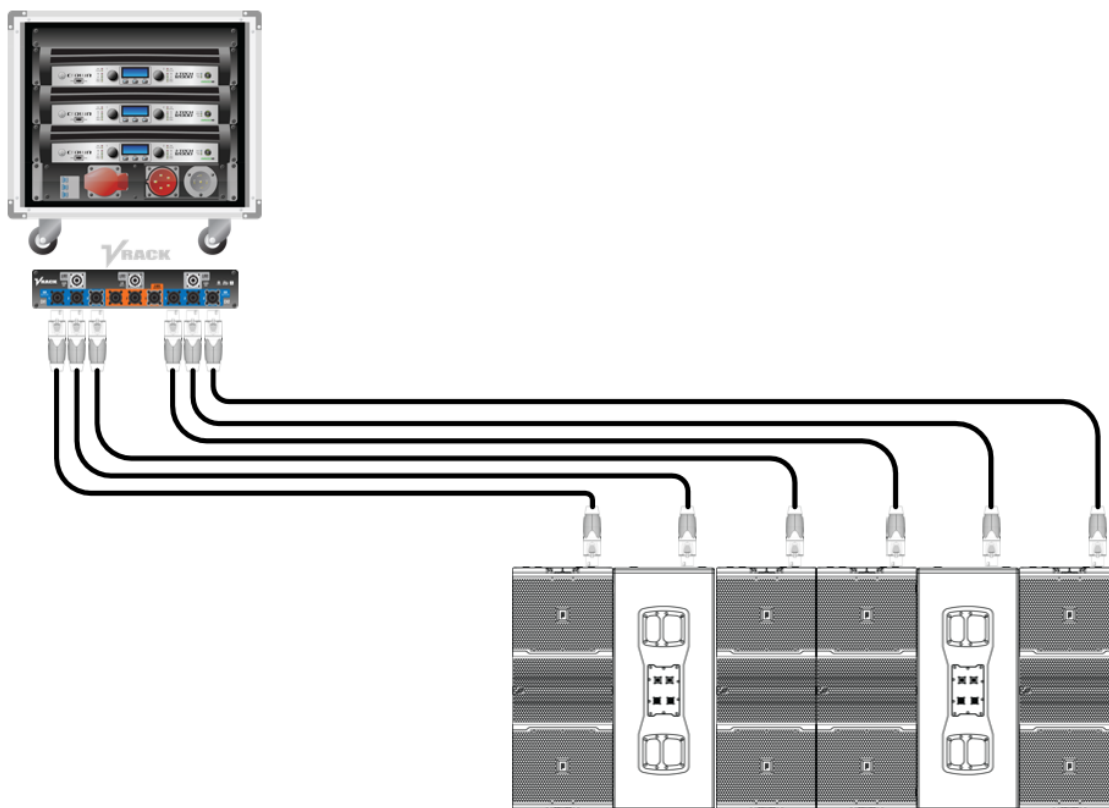


Crown Audio VRack 12000HD

Crown Audio VRack 12000HD output panels have been specifically wired to facilitate convenient operation of VTX subwoofers in parallel mode (6 subwoofers per VRack, 1 subwoofer per amplifier channel in parallel mode):



The NL4 connectors in the Blue group are all wired to individual amplifier channels with Pin 1 ± and Pin 2 ± connected in parallel at the VRack panel. This allows one VTX subwoofer to be connected per amplifier channel while taking advantage of all parallel wiring benefits, without the need for additional breakout cables. The wiring example below shows one VRack 12000HD powering a 6x G28 array.

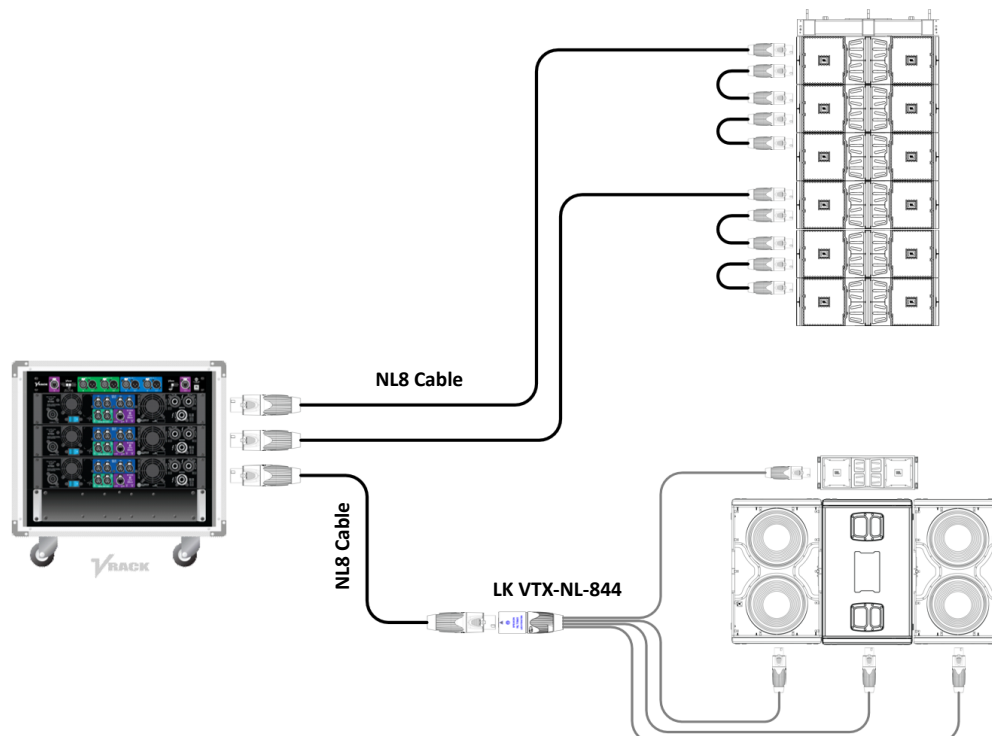


Crown Audio VRack 4x3500HD

Unlike the VRack 12000HD, the Crown Audio VRack 4x3500HD does not contain a speaker output panel, due to its high channel density, and all connections are made directly to the amplifier's NL4 and NL8 connectors. As seen previously, to implement parallel mode wiring on I-Tech 4x3500HD amplifiers, a pair of LK VTX-NL-424 adapters can be used in conjunction with 2 x NL4 cables that are directly connected to the amplifier's NL4 outputs. Alternatively, a single NL8 cable can be used in conjunction with an LK VTX-NL-844 adapter. Therefore, one VRack 4x3500HD is able to power 12x VTX subwoofers with either 6x NL4 + 6x VTX-NL-424 adapters or 3x NL8 + 3x VTX-NL-844 adapters.

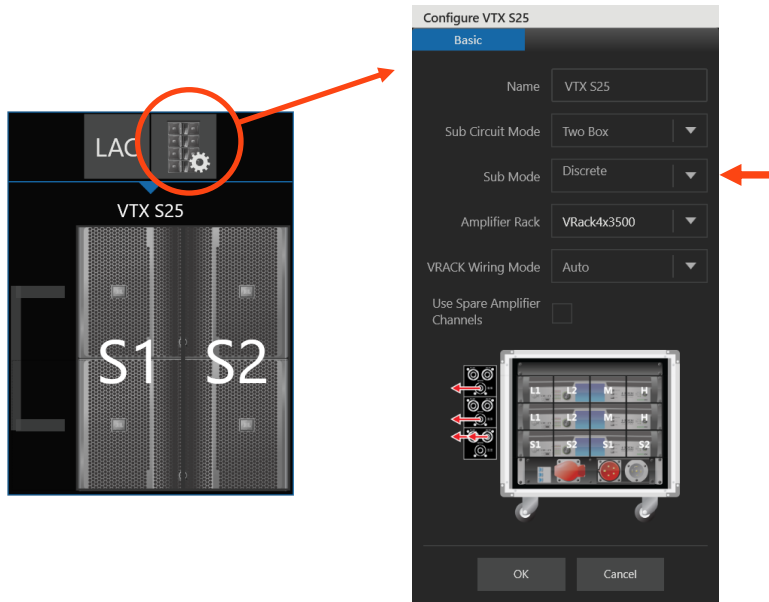


Example: 6x VTX V20, 3x VTX S25, 1x VT4886 powered by 1x VRack 4x3500HD

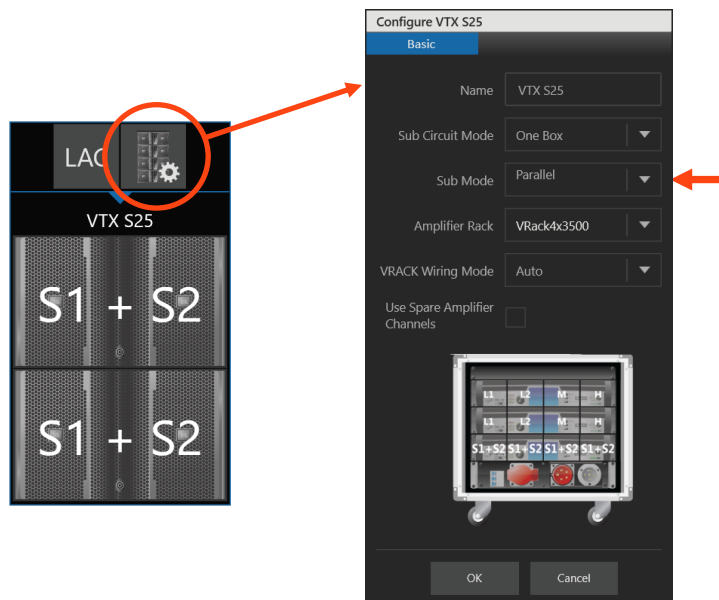


JBL Performance Manager 2

Performance Manger can facilitate both **Discrete** and **Parallel** wiring modes for VTX subwoofer products. The correct wiring mode can be selected from the Array Configuration menu under the Sub Mode drop-down menu. The Sub Mode and amplifier-to-speaker wiring connection should be set correctly so that Performance Manager accurately represents the physical arrays and actual cabling.



Example: Discrete wiring selection in Performance Manager



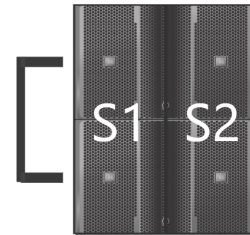
Example: Parallel wiring selection in Performance Manager

Based on the selected mode, Performance Manager adjusts the labels found on the speakers and amplifier channels to reflect the type of wiring. For example, the subwoofer label **S1 + S2** indicates parallel wiring mode has been selected and that both woofers are driven by one amplifier channel. When the label shows **S1 | S2**, this indicates discrete wiring mode has been selected and that each woofer is powered by a different amplifier channel.

Parallel Mode



Discrete Mode

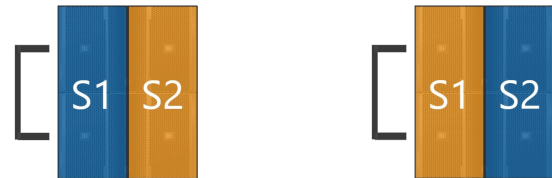


For a valid connection assignment to be made between an amplifier channel and a speaker, both must display the same label type (e.g. S1 and S1). If the two are not the same, a connection between the amplifier and channel will not be established.

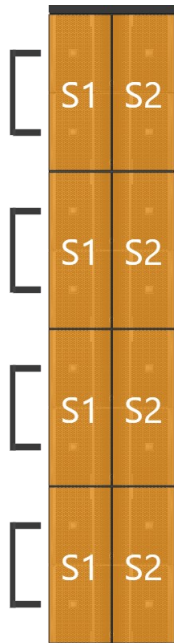
Parallel Mode



Discrete Mode

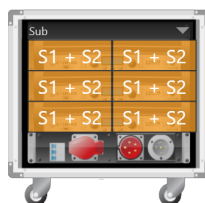
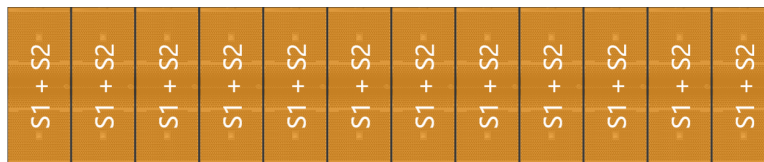


Performance Manager Array Examples



Example: 8x cabinet VTX S25 Array in Discrete Mode,
2x Box Circuits

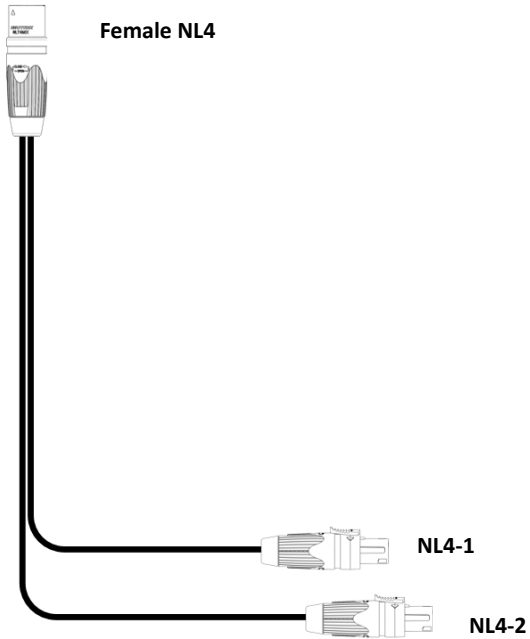
Example: 8x cabinet VTX S25 Array in Parallel Mode,
Single Box Circuits



Example: 12x cabinet VTX G28 Array in Discrete mode, Single Box Circuits

Breakout Cable Pin Assignments

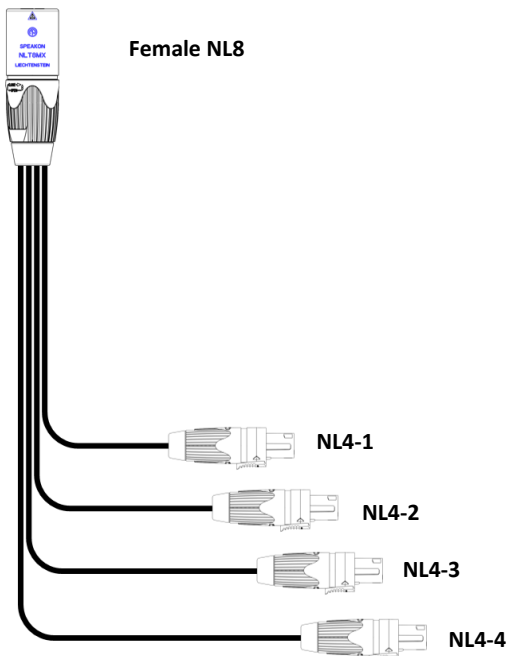
LK VTX-NL-424



Wiring:

NL4	NL4 - 1	NL4 - 2
Pin 1+	Pin 1+ Pin 2+	
Pin 1-	Pin 1- Pin 2-	
Pin 2+		Pin 1+ Pin 2+
Pin 2-		Pin 1- Pin 2-

LK VTX-NL-844



Wiring:

NL8	NL4 - 1	NL4 - 2	NL4 - 3	NL4 - 4
Pin 1+	Pin 1+ Pin 2+			
Pin 1-	Pin 1- Pin 2-			
Pin 2+		Pin 1+ Pin 2+		
Pin 2-		Pin 1- Pin 2-		
Pin 3+			Pin 1+ Pin 2+	
Pin 3-			Pin 1- Pin 2-	
Pin 4+				Pin 1+ Pin 2+
Pin 4-				Pin 1- Pin 2-

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