

## Proper Termination of Element™ CANBus with Axia Accessory Panels and Element Button Modules

November 1, 2007

Axia Element consoles use CANBus technology (short for Controller Area Network Bus) to connect fader modules and accessory panels with the Element CPU. CAN is a broadcast, differential serial bus standard (ISO 11898-1, 2003), originally developed by Robert Bosch GmbH, designed specifically to be robust in electromagnetically noisy environments (as broadcast facilities can sometimes be).

One of the benefits of CANBus is that it allows connected devices to be daisy-chained — the bus connection looping through one module to the next, and so on.

Like similar serial bus connection methods, CANBus must be terminated at the furthest point in the chain (users with SCSI device experience will understand this immediately). Early Element consoles have terminators built-in to the Power Distribution Board located in the console overbridge; new consoles incorporate running changes and use outboard RJ-45 Termination Blocks. The procedures that follow assume that your console is equipped with these blocks; if you have earlier consoles without these blocks and with hard-terminated Power Distribution Boards, please contact Axia Customer Support for special instructions.



The RJ-45 Terminator Block used on Element consoles is shown at left. They are installed on the Element Power Distribution Board as illustrated below (Terminator Blocks are circled in orange for clarity).

As of 1 November 2007, single-frame consoles shipped from the factory have two of these Terminator Blocks installed, either both on the Power Distribution board (as shown here) or one on the power board and one at the end of the longest fader module daisy-chain. Dual-frame consoles will have one Block installed in each frame (or in the longest daisy-chain in each frame) as appropriate.

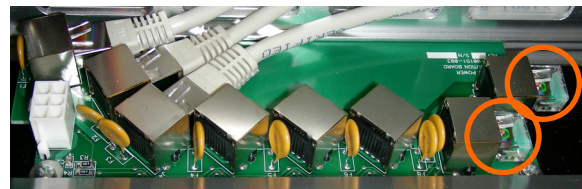


Figure 1: Power Distribution Board

This document details proper termination procedures for consoles when CANBus studio accessory panels and switch modules are installed, and applies whenever the following modules or accessory user panels are field-installed by the owner:

### Console Modules

- #2001-xx189 5-Button SmartSwitch Module
- #2001-xx190 10-Button SmartSwitch Module
- #2001-xx187 5-Button Film Cap Switch Module
- #2001-xx188 10-Button Film Cap Switch Module

### Studio Accessory Control Panels

- #2001-20198 4-Button SmartSwitch Accessory Panel
- #2001-20199 Mic Control/Headphone Selector Panel
- #2001-20200 Headphone Selector Panel

**Note:** This document is not a complete reference to module or accessory panel installation; it covers only proper CANBus termination procedures. For full details on module installation, please refer to the Element User's Guide, "Appendix C: Installing a New Module" or "Appendix E: Accessory User Panels".

## **Termination Instructions for Single-Frame Consoles**

### **Adding Studio Accessory Control Panels**

1. Remove one of the RJ-45 Termination Blocks from the Power Distribution Board and set it aside.
2. Connect another CAT-5 cable to the empty RJ-45 jack on the Power Distribution Board and route it out of the console frame to the location of your new Studio Control Panel. Connect it to one of the RJ-45 jacks on the Panel.
3. If you are done adding Control Panels, skip to Step 5.
4. If you need to add another Studio Control Panel, connect its CAT-5 cable to the empty jack on the previously installed Panel. Repeat this until you are finished.
5. When you have installed all of your Studio Control Panels, insert the RJ-45 Termination Block that you removed in Step 1 into the empty RJ-45 Jack on the final Panel.
6. Refer to the Element User's Guide, Appendix C for instructions on properly setting the rotary ID switch on the back of each panel.

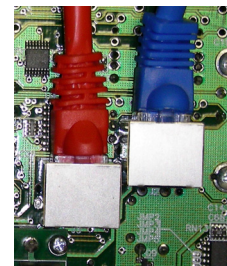


Figure 2: Module RJ-45 Jacks

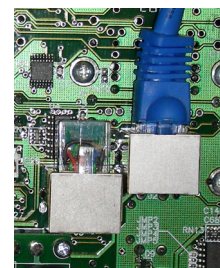


Figure 3: Final Accessory Panel with RJ-45 Termination Block installed.

If you have a large console with lots of modules, it's possible that all positions on the Power Distribution Board are already filled. In this case, examine the module connections and determine on which module the RJ-45 Termination Block is installed. Remove it, and add your Accessory Panel connections to this daisy-chain, remembering to re-install the Termination Block on the last Panel when you are through.

## **Adding 5- and 10-Button SmartSwitch Modules**

***Note that these SmartSwitch modules do not feature a second RJ-45 connector; they cannot be used at the end of a module daisy-chain and must be connected directly to the Power Distribution Board.***

1. Locate an unused RJ-45 jack on your console's Power Distribution board.
2. Take the CAT-5 cable that shipped with your SmartSwitch Module and connect one end to the empty RJ jack; connect the other end of the CAT-5 cable to your new SmartSwitch Module.
3. No changes to the locations of the RJ-45 Termination Blocks are necessary.
4. Refer to the Element User's Guide, Appendix C for instructions on properly setting the rotary ID switch on the back of each panel.

If you have a large console with lots of modules, it's possible that all positions on the Power Distribution Board are already filled. In this case, examine the module connections and determine on which module the RJ-45 Termination Block is installed. Remove it, and transfer another module's connection cable from the Power Distribution Board to this daisy-chain, remembering to re-install the Termination Block on the last Module when you are through.

## ***Termination Instructions for Dual-Frame Consoles***

When Element is ordered in a dual-frame configuration (two frames linked to a single Element CPU and functioning as a single console), one RJ-45 Terminator Block should be installed in the Power Distribution Board of each frame. Any accessory Studio Control Panels should be added to just one of the frames (it doesn't matter which) in the daisy-chain configuration described above, and that frame's RJ-45 Terminator Block transferred to the Panel at the end of the chain.

If you find there are more than two RJ-45 Terminator Blocks installed on your split-frame system, remove the unneeded Blocks so that there a total of two Blocks are installed — one in each frame.

As shown in Figure 4, each frame is connected to the Element CPU via a 6-conductor CANBus cable. To add new Studio Accessory Panels:

1. Remove the RJ-45 Termination Block from the Power Distribution Board of one of the Element frames, and set it aside.
2. Undo the setscrews that hold in one of the modules installed in your Element.
3. Turn the module over and find the two RJ-45 jacks on the back; one is occupied by the CAT-5 cable that connects it to the Power Distribution Board.

4. Connect another CAT-5 cable to the empty RJ-45 jack and route it out of the console frame to the location of your new Studio Control Panel. Connect it to one of the RJ-45 jacks on the Panel.
5. To add another Studio Control Panel, connect its CAT-5 cable to the empty jack on the previously installed Panel.
6. When you are finished installing Studio Control Panels, insert the RJ-45 Termination Block that you removed in Step 1 into the empty RJ-45 Jack on the final Panel.

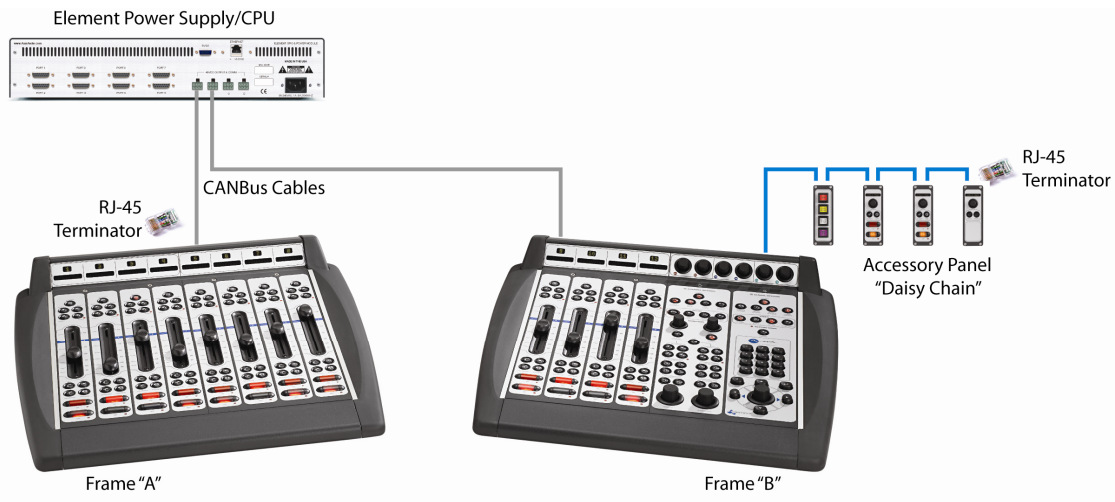


Figure 4: Installing Studio Control Panels in a split-frame Element console

If you require more assistance or have questions about this procedure, please contact Axia Support at [inquiry@AxiaAudio.com](mailto:inquiry@AxiaAudio.com).