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Terminate HDMI Cables in the Field! AudioQuest Solves HDMI's Biggest Challenge

Field-terminated HDMI cables? They said it couldn't be done, but AudioQuest's solution lets installers run cable now, terminate later, and maintain the integrity of HDMI.

Jan. 26, 2009 — by [Julie Jacobson](#)

AudioQuest appears to have the first HDMI cables and connectors that can be terminated in the field ... and work.

Field-terminated HDMI cables? They said it couldn't be done, but AudioQuest claims its solution lets installers run cable now, terminate later, and still maintain the integrity of HDMI.

With the AudioQuest solution, installers split the HDMI wires into two groups, and then terminate them separately.

"There are 19 wires in an HDMI cable," says Xiaozheng Lu, senior VP product development for AudioQuest. "If you try to crimp all 19, it's impossible."

With the AudioQuest solution, the integrator crimps 10 wires and 9 wires at a time, and the two bundles come together at termination.

"Everyone is already doing eight wires for Cat 5 termination in the field, and it's proven to be very reliable and easy to master," Lu says. "We group 10 wires so it's just like one more Cat 5."

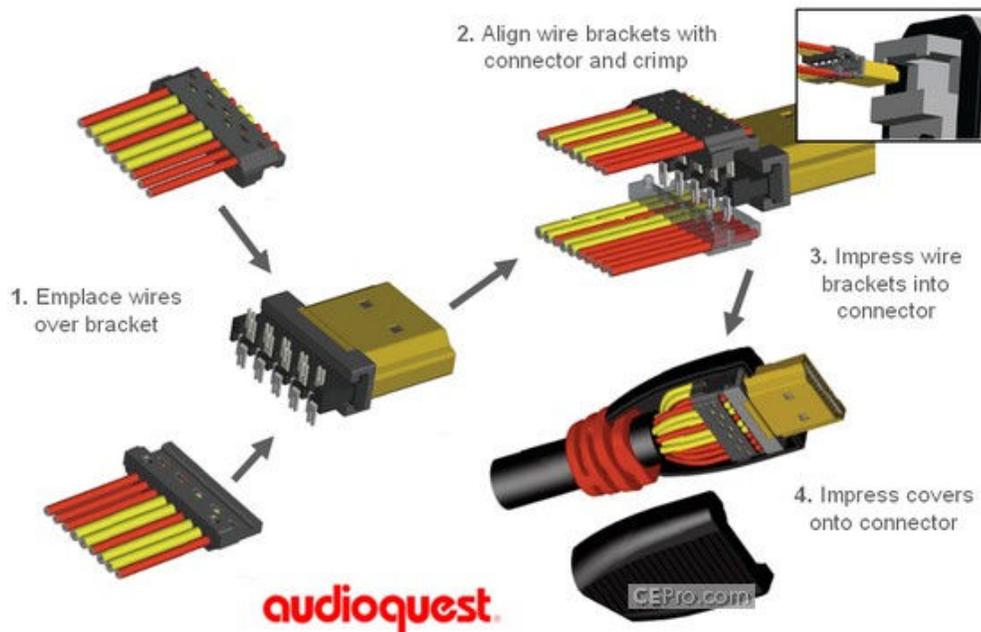
In fact, Lu suggests, terminating AudioQuest's HDMI cables is even easier than most Cat 5 terminations because you don't need to strip or trim the individual wires. Instead, the integrator simply slides the wires through the holes in the connector, using the color maps provided.

"When you crimp, the tool will trim the wire for you," Lu says.



The inability to terminate HDMI cable in the field has been the number-one pain point among A/V installers. AudioQuest comes to the rescue.

Field Termination of HDMI Connectors



Straight Wires Make all the Difference

Key to its field-termination design is AudioQuest's use of solid conductors instead of stranded wires in its HDMI cables.

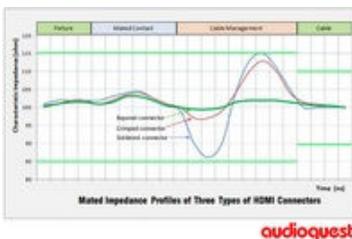
"That's one of the four AudioQuest design principles," Lu says.

Many manufacturers use stranded wire because it is more flexible than straight wire at any given wire gauge.

But, says Lu, "The disadvantages of the stranded wire are signal integrity and geometry stability."

Stranded conductors can induce electromagnetic radiation (EMR) interference among the strands. More importantly, however, stranded wires make poor candidates for field termination because the strands can shift when compressed.

"Thus they won't create reliable contact when the V-shaped pins in the field termination connectors try to make a good contact to the strands," Lu says.



AudioQuest's single-conductor design gives the company an advantage when it comes to field termination.

But that's not all. The company invented a connector – code-named Bayonet – utilizing V pins that cut *cleanly* through the wire insulation. There is no need to strip off any vital insulation.

Do You Still Get Full HDMI Transmission?

After testing the field terminated cables, AudioQuest engineers were surprised to find that the HDMI signal was actually better than with traditional HDMI cables, including its own soldered varieties.

[Click on image to see TDR results of AudioQuest's Bayonet connector versus traditional soldered and crimped connectors.](#)

Because the termination does not require insulation removal, the impedance on the new AudioQuest cables is maintained at the optimal 100 Ohms throughout the connector. [AudioQuest performed TDR \(time domain reflectometry\) tests](#) on its own Bayonet connector, as well as the more traditional soldered and crimped connectors.

While impedance throughout the AudioQuest connectors (shown in green) hovered around 100 Ohms from the tip to the cable, impedance on standard crimped connectors (red) fluctuated between 93 and 113 Ohms. Soldered connectors (blue) fared even worse.

"We just wanted to make sure it would be simple to terminate in the field," says Lu of the new connector. "We were surprised it would be even better than soldering."

With that discovery, AudioQuest has decided to implement the new termination techniques across its full line of HDMI cables.

"When you do soldering [in the factory], quality is very hard to control," Lu says. "With us, you just pull the wires through and the integrity is maintained by the mechanical design. The only problem is if you feed the wrong color wire through."

Lest installation technicians make such a silly mistake in the field, new testing tools from AudioQuest will diagnose the error.

Field Termination and HDMI Certification

HDMI Licensing, LLC, the organization that certifies cables for HDMI compliance, has some soul-searching to do.

Lu says that HDMI execs are intrigued by the AudioQuest product but skeptical about certification. The integrity of a cable, after all, is contingent on the quality of the field termination, right?

Lu doesn't buy that argument. Most dealers already run HDMI over field-terminated Cat 5 cables, he explains.

He says that AudioQuest is working with HDMI Licensing to figure out a way to certify field-terminated cables.

Hallelujah for Field Terminated Cable!

The inability to terminate HDMI cable in the field is probably the number-one pain point of A/V professionals. The benefits of field terminated HDMI cable are so obvious they hardly bear mentioning.

Still ...

- Pull bundles of HDMI cable through the wall without having to worry about the huge connector heads.
- Futureproof homes by pulling the cable now, and terminating later if necessary.
- Buy just what you need. If you need a 1.6m cable, you don't have to pay for a 2m product.
- Keep your racks tidy by eliminating the ugly excess from pre-cut cables.
- And the number one biggest benefit of all: You can repair HDMI in the field! If a cable or connector gets mangled in the field (darn those electrical contractors), you can repair it simply, without having to rewire the home.

Lu says the field terminated HDMI cables and connectors will ship in the second quarter. Pricing will be similar to the company's pre-terminated products.



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