



KRAMER ELECTRONICS LTD.

DGKat Installation Guide

MODELS:

Kramer DGKat™ Cable Recommendations for Usage and Termination Guidelines

For the latest information on our products and a list of Kramer distributors, visit our Web site where updates to these cable installation instructions may be found.

We welcome your questions, comments, and feedback.

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1 Introduction

This document contains successful cable installation guidelines and is intended for Kramer technical personnel or external system integrators.

To check that you have the latest version, go to the DOWNLOADS section of our Web site at:

http://www.kramerelectronics.com/support/product_downloads.asp

To check our suggested cables listing, per product, go to <http://www.kramerelectronics.com>

HDMI and DVI digital signals have limited transmission distance capabilities. To overcome these limitations, AV professionals use twisted pair systems. However, distance is still limited by the construction and quality found in twisted pair cables that are optimized for high speed data in typical network applications.

Category cables from other manufacturers may have unpredictable and often reduced performance (depending on cable brand and type). It is important to choose a cable with a proven track record of performing at long distances and high resolutions.

Category cable designed for use with analog signals does not perform well with digital signals. Low-skew or skew-free cables do not perform well with digital signals.

To achieve maximum distance and ensure the highest quality performance, it is necessary to use cables designed specifically for use with HDMI & DVI digital signals.

Kramer's DGKat Series Shielded Twisted Pair Category Cable is specifically designed to deliver pristine digital video signals over the longest possible distances, ensuring optimum results.

Kramer twisted pair category cables include high quality cables for passing digital signals via transmitter–receiver sets to provide optimum range and performance:

- **BC-DGKat623** – a 4-pair CAT 6 U/FTP (unshielded around foiled twisted pair) bulk cable (23AWG). The cable construction is based on unique insulation foam materials and shielding materials usually not used in conventional IT CAT cables. As a result Kramer BC-DGKat623 cables maintain much better signal integrity on longer cable runs and provide less crosstalk between the twisted pairs inside the cable for modern high-frequency digital video signals. Using Kramer's BC-DGKat623 cable adds much needed "invisible power reserve" to your installation to make them hassle-free and ensuring piece of mind in demanding AV applications
- **BC-DGKat7a23** – a 4-pair CAT 7A S/FTP (braided shield around foiled twisted pair) bulk cable (23AWG). The cable is optimized for the new 10GBase-T applications as defined in IEEE 802.3an and for PoE+. Four individually aluminum–foil shielded twisted pairs (S/FTP), are cabled with a drain conductor and overall braid–shielded, providing the best available shield
- **BC-DGKat524** – a 4-pair CAT 5e F/UTP (foil around unshielded twisted pair) bulk cable (24AWG), designed as the ideal companion to Kramer's twisted pair digital transmitter–receiver sets to provide optimum range and performance. Four non–shielded (F/UTP) twisted pairs of 24AWG solid copper conductors are cabled together and shielded with a polyester–aluminum tape and outer jacket

These cables are available in pull boxes of 100/305m (328/1000ft).

Before installing a particular cable, be sure to check that you are using the appropriate cable best suited to your installation. Take into account the distances involved, as well as the expected performance of the connected devices (for example, consider the expected resolutions of display devices).

2 General Guidelines and Recommendations

It is essential that you keep away as far as possible from EMI (Electro-Magnetic Interference) environments, and in particular:

- **EMI sources:** Keep the cable away from electromagnetic interference environments such as high-voltage electrical cables, electric motors (such as elevators or refrigerators), fluorescent, light-fixtures and so on
- **AC power cables:** Keep the cable at a distance of at least 12" from AC power cables
- **AC power canals:** Do not use electrical conduits to deploy the cable
- **Patch cords:** For better results do not use patch cords

Proper cable termination is crucial; otherwise installation failure may occur (see [Section 3](#)):

- Make sure that the drain wire is well soldered to the metal casing of the RJ-45 connectors on both cable ends. Note that the Drain wire **MUST** be firmly attached because it is used as a 9th conductor
- Always use the recommended Kramer RJ-45 connector:
For BC-DGKat623 use CCR-RJ45-TP6
For BC-DGKat7a23 use CCR-RJ45-TP7
For BC-DGKat524 use a shielded RJ-45 connector
- Keep the pairs twisted as close to the termination point as possible and make sure that the strain relief is pulled over the jacket of the cable

2.1 General Rules

The following are general rules to follow during the installation.

We recommend that you:

- Make only gradual bends in the cable when necessary to maintain the minimum bend radius of 4 times the cable diameter or approximately 3cm radius
- Use low-to-moderate force when pulling cable. The standard calls for a maximum of 25 lbf (pounds of force)

Never:

- Bend, twist, or kink the cable at any time. Doing so may result in permanent damage to the geometry of the cable and cause transmission failures
- Over-tighten cable ties or use plastic ties
- Splice or bridge Category cable at any point
- Use excessive force when pulling the cable
- Tie cables to electrical conduits, or lay cables on electrical fixtures
- Install taut cables (cables should be loose, but not sagging)
- Use staples on CAT cable that crimp the cable tightly

2.2 Patch Cables and Connectors

Ideally, the signal from the transmitter to the receiver should be transmitted using a single cable; however, often patch cables are used to connect the device to the deployed cable. Considering that patch cables tend to be the weakest link in the installation, they should only be used if absolutely necessary (at the transmitter or receiver), and these cables should be kept as short as possible.

Be sure to verify that the patch cord connector is terminated using the same wiring scheme as the category cable.

3 DGKat Twisted Pair Cable Termination

The following sections describe how to properly terminate Kramer DGKat Twisted Pair cables.

3.1 BC-DGKat623 Cable Termination

This procedure describes how to terminate the **BC-DGKat623** Twisted Pair cable.

Tools

You will need these tools at hand: a **razor knife**, **wire cutters**, a **pair of pliers** and a **standard RJ-45 Crimp Tool**.

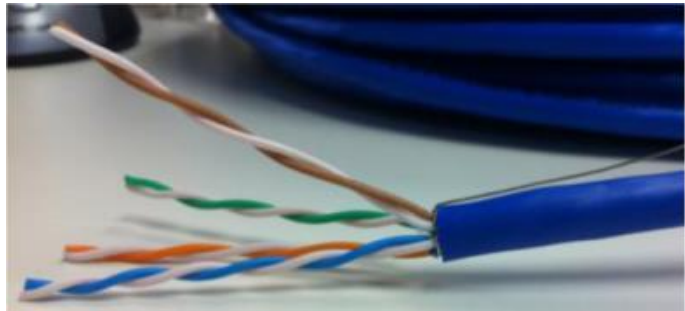
Step 1: Remove part of the blue jacket

Remove approximately 2.5" of the blue jacket using the razor knife exposing the 4 shielded pairs and drain wire. Fold the drain wire over onto the cable for future use.



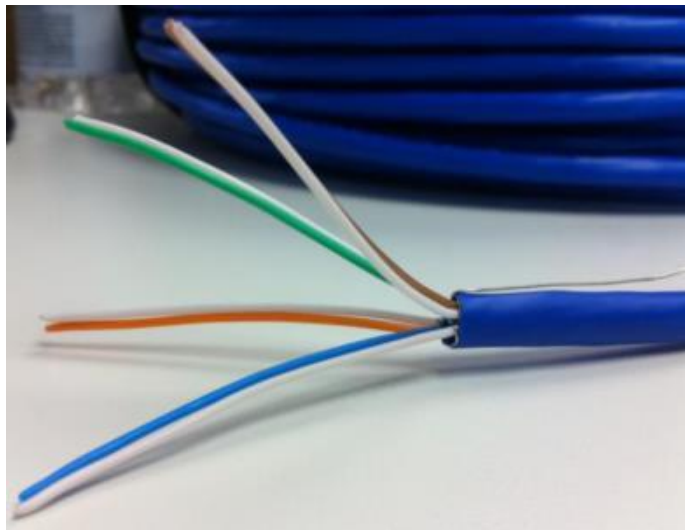
Step 2: Separate the 4 pairs

Separate the 4 Pairs. Use the razor knife to carefully remove the shielding without scoring the wires beneath it. Repeat for all 4 pairs.



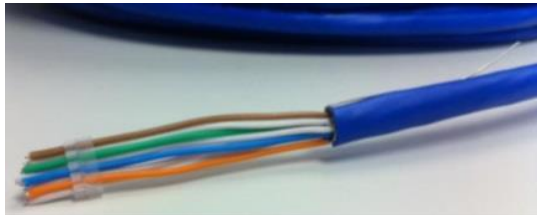
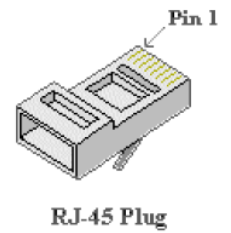
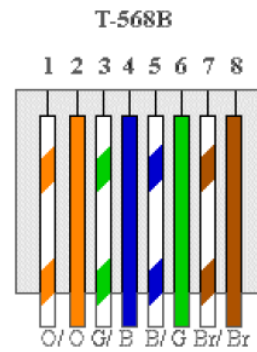
Step 3: Untwist each pair

Untwist each pair and straighten the individual conductors. Be sure to keep each pair together so it can be identified.



Step 4: Insert conductors into the plastic loader

Using the standard wiring scheme shown here (T-568B), insert the conductors into the plastic loader piece of the RJ-45 (CCR-RJ45-TP6) connector. The plastic loader is necessary because the thickness of CAT 6 cable does not allow it to sit flat in an RJ-45 connector like in normal CAT 5. Note how the loader staggers the cables:



Step 5: Slide the plastic loader down the cable

Slide the plastic loader down the cable as close to the base as possible. Keep pressure on the top and bottom of the loader so the cables stay in place while sliding down.



Step 6: Cut all conductors

Using the wire cutters, cut all conductors leaving approximately 0.5" remaining.



Step 7: Insert the cable into the RJ-45 connector

With the orange pair on the left and the clip of the RJ-45 connector facing downwards, insert the cable into the RJ-45 connector, pushing the cable all the way in until the exposed pairs contact the back of the connector.

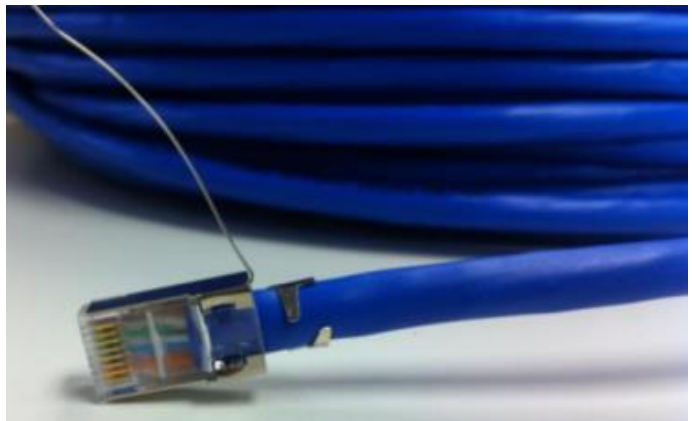
Step 8: Crimp the RJ-45 connector

Using the Standard Crimp Tool, crimp the RJ-45 connector.



Step 9: Flip the drain wire up onto the RJ-45 connector

Flip the drain wire up onto the RJ-45 connector. Clamp the strain relief down on the blue jacket of the BC-DGKat623 cable using the pair of pliers.



Step 10: Solder the drain wire to the metal casing of the RJ-45 connector

Solder the drain wire to the metal casing of the RJ-45 connector and cut off the excess using the wire cutters.

Verify the continuity of the conductors and the shield using a cable tester.



3.2 BC-DGKat7a23 Cable Termination

This procedure describes how to terminate the **BC-DGKat7a23** Twisted Pair cable.

Tools

You will need these tools at hand: a **razor knife**, **wire cutters**, a **pair of pliers** and a **standard RJ-45 Crimp Tool**.

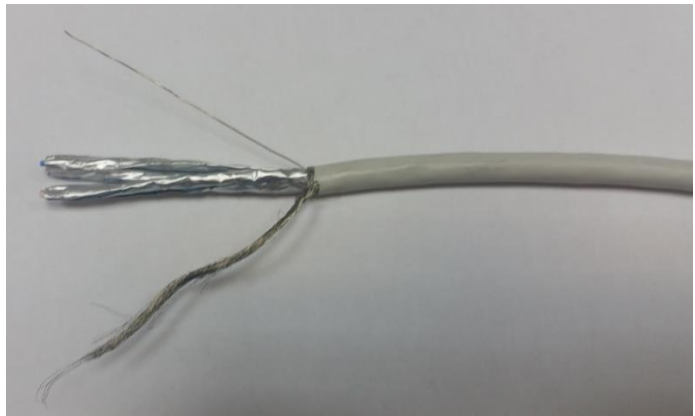
Step 1: Remove part of the jacket

Remove approximately 2.5" of the jacket using the razor knife exposing the 4 shielded pairs and drain wire surrounded by the braided shield.



Step 2: remove the braided shield

Neatly remove the braided shield aside.



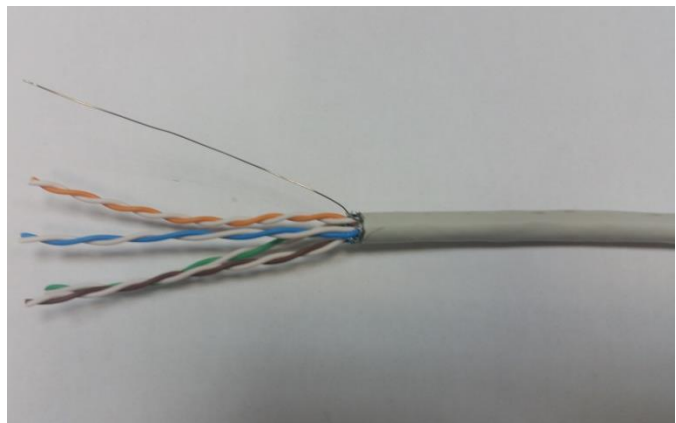
Step 3: Cut the braided shield

Carefully remove the braided shield using the razor knife.



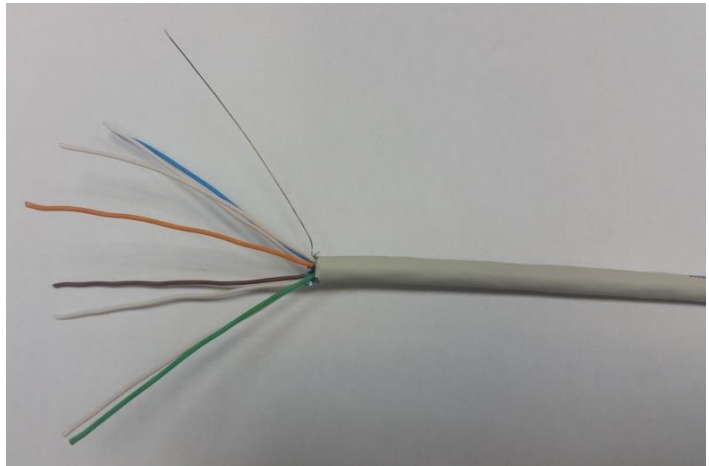
Step 4: Separate the 4 pairs

Separate the 4 Pairs. Use the razor knife to carefully remove the shielding without scoring the wires beneath it. Repeat for all 4 pairs.



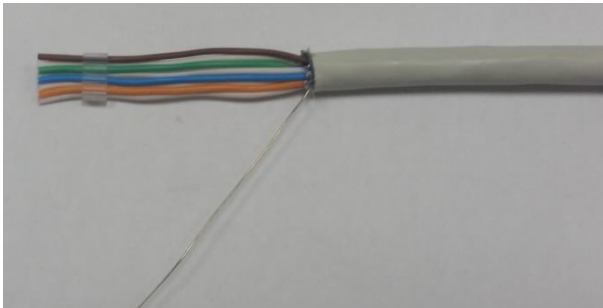
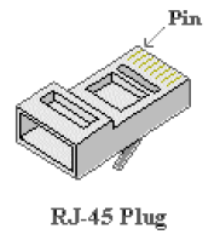
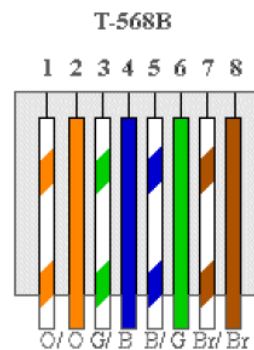
Step 5: Untwist each pair

Untwist each pair and straighten the individual conductors. Be sure to keep each pair together so it can be identified.



Step 6: Insert conductors into the plastic loader

Using the standard wiring scheme shown here (T-568B), insert the conductors into the plastic loader piece of the RJ-45 (CCR-RJ45-TP7) connector. The plastic loader is necessary because the thickness of CAT 7a cable does not allow it to sit flat in an RJ-45 connector like in normal CAT 5. Note how the loader staggers the cables:

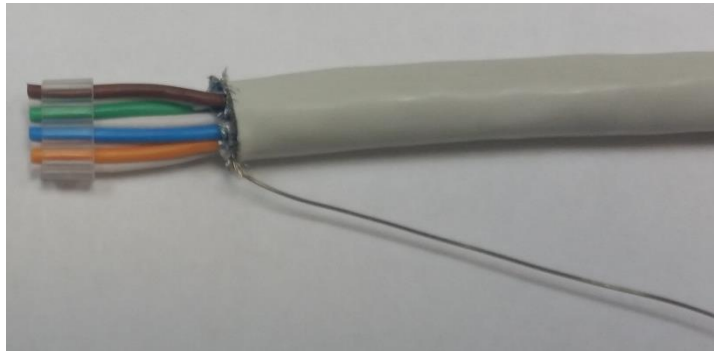


Step 7: Slide the plastic loader down the cable

Slide the plastic loader down the cable as close to the base as possible. Keep pressure on the top and bottom of the loader so the cables stay in place while sliding down.

Step 8: Cut all conductors

Using the wire cutters, cut all conductors leaving approximately 0.5" remaining.



Step 9: Insert the cable into the RJ-45 connector

With the orange pair on the left and the clip of the RJ-45 connector facing downwards, insert the cable into the RJ-45 connector, pushing the cable all the way in until the exposed pairs contact the back of the connector.

Step 10: Crimp the RJ-45 connector

Using the Standard Crimp Tool, crimp the RJ-45 connector.



Step 11: Clamp the drain relief

Clamp the strain relief down on the jacket of the BC-DGKat7a23 cable using the pair of pliers.



Step 12: Solder the drain wire to the metal casing of the RJ-45 connector

Flip the drain wire up onto the RJ-45 connector and solder the drain wire to the metal casing of the RJ-45 connector and cut off the excess using the wire cutters.

Verify the continuity of the conductors and the shield using a cable tester.



3.3 BC-DGKat524 Cable Termination

This procedure describes how to terminate the **BC-DGKat524** Twisted Pair cable.

Tools

You will need these tools at hand: a **razor knife**, **wire cutters**, a **pair of pliers** and a **standard RJ-45 Crimp Tool**.

Step 1: Remove part of the jacket

Remove approximately 2.5" of the jacket using the razor knife exposing the 4 shielded pairs and drain wire.



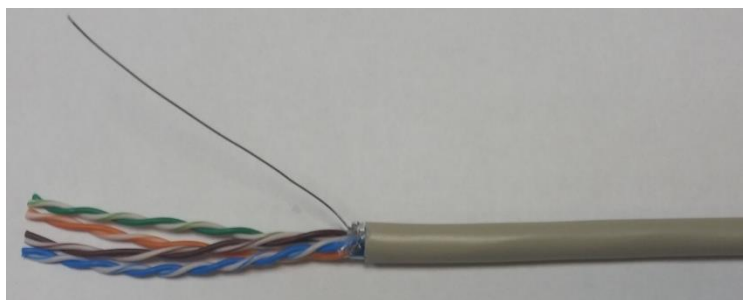
Step 2: Remove the Polyester foil

Remove the polyester foil and carefully cut it out.



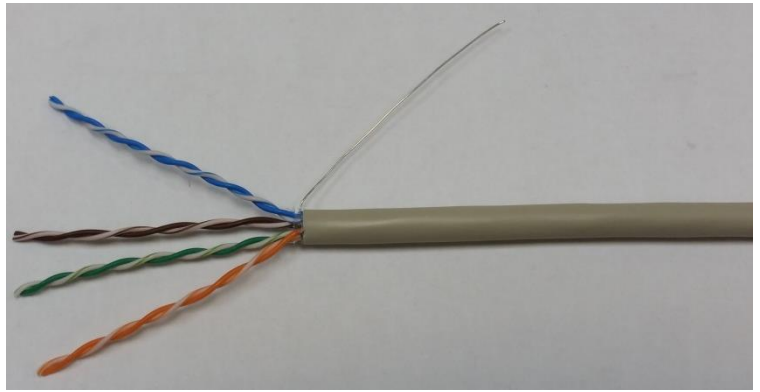
Step 3: Remove the shielding foil

Remove the shielding foil using the razor knife exposing the 4 pairs and drain wire.



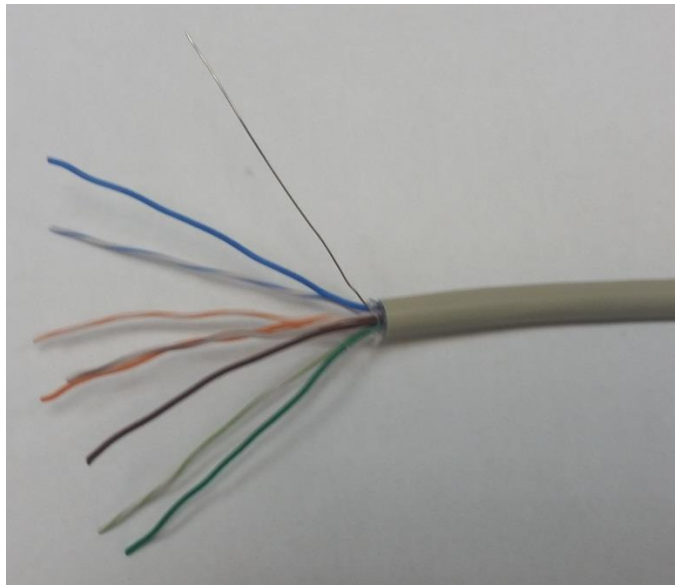
Step 4: Separate the 4 pairs

Separate the 4 Pairs.



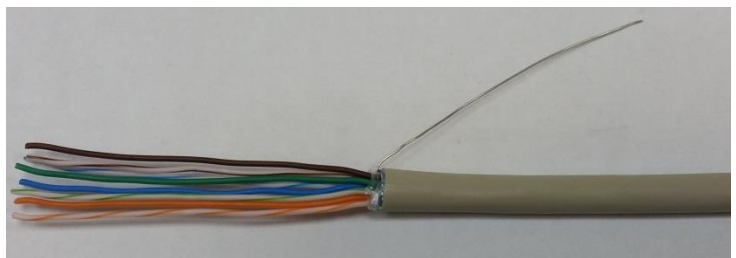
Step 5: Untwist each pair

Untwist each pair and straighten the individual conductors. Be sure to keep each pair together so it can be identified.



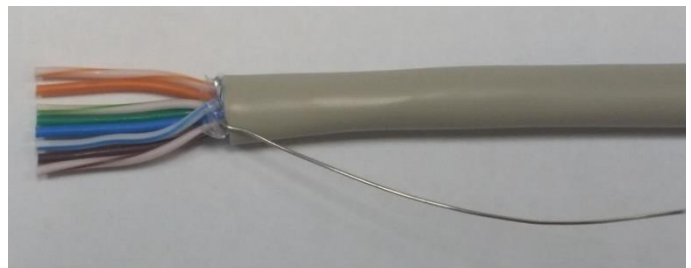
Step 6: Place wires in order

Place the wire in order



Step 7: Cut all conductors

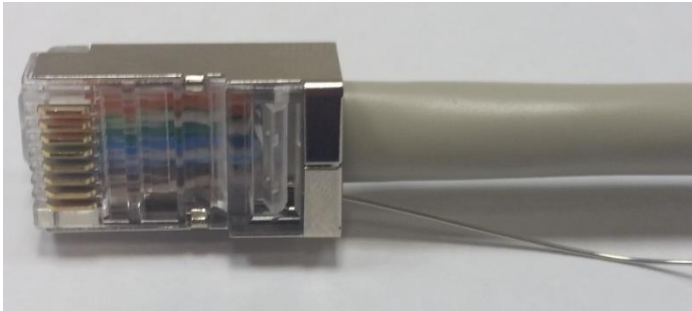
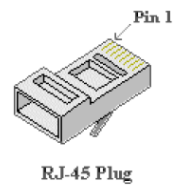
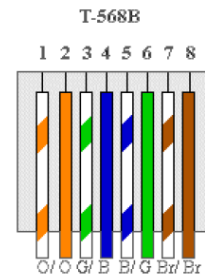
Using the wire cutters, cut all conductors leaving approximately 0.5" remaining.



Step 8: Insert conductors into the RJ-45 connector

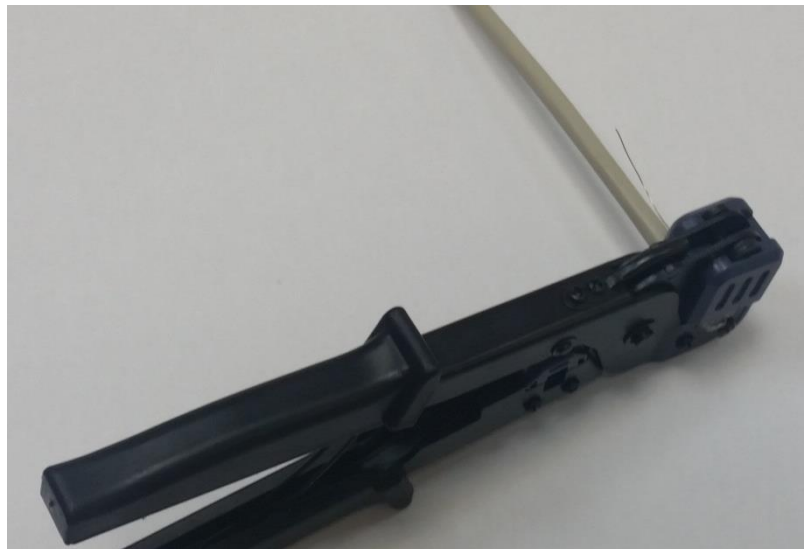
Using the standard wiring scheme shown here (T-568B), insert the conductors into the shielded RJ-45 connector:

With the orange pair on the left and the clip of the shielded RJ-45 connector facing downwards, insert the cable into the RJ-45 connector, pushing the cable all the way in until the exposed pairs contact the back of the connector



Step 9: Crimp the RJ-45 connector

Using the Standard Crimp Tool, crimp the RJ-45 connector.



Step 10: Solder the drain wire to the metal casing of the RJ-45 connector

Flip the drain wire up onto the RJ-45 connector and solder the drain wire to the metal casing of the RJ-45 connector and cut off the excess using the wire cutters.

Verify the continuity of the conductors and the shield using a cable tester.

