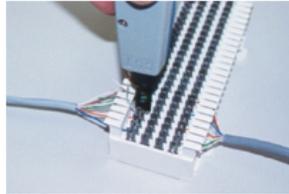


FOA Reference Guide



Virtual Hands-On Premises Cabling - 66 Block Termination



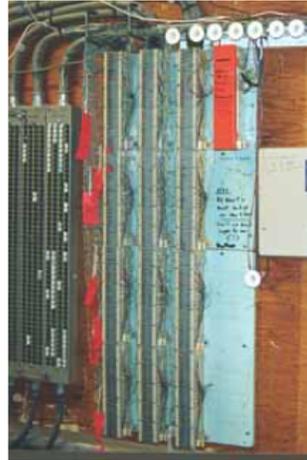
© 2020, The Fiber Optic Association, Inc.

1

This FOA virtual hands-on (VHO) tutorial on fiber optics is intended to help understand the process of punching down UTP cable on a 66 block. It is copyrighted by the FOA and may not be distributed without FOA permission.

Terminating 66 Punchdown Block

- 66 Blocks are generally used for low frequency signals - mostly telephone POTS lines
- Often see hundreds - or thousands - of lines terminated in wiring closets using 66 blocks
- Twisted pair cables for telephones come in high pair counts (25, 50, 100, 200 , etc.) for dense cross connects.



© 2020, The Fiber Optic Association, Inc.

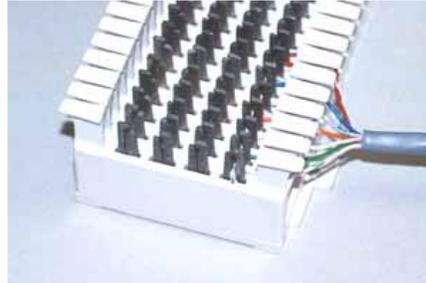
2

66 Blocks are generally used for low frequency signals - mostly telephone POTS lines

Often see hundreds - or thousands - of lines terminated in wiring closets using 66 blocks

66 Punchdown Block

- 50 rows of 4 IDC (insulation displacement) contacts in two pairs
- Connection across center pairs allows cross-connect



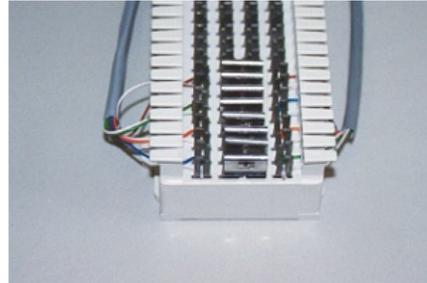
© 2020, The Fiber Optic Association, Inc.

3

The 66 block consists of 50 rows of 4 punchdown contacts, designed for 50 pair backbone cable. The insulation displacement contacts are part of the block. On each row, two contacts on either side are connected, allowing for interconnection flexibility. Incoming cables are punched down in the outer IDC contacts.

66 Block Wiring

- Terminate two four-pair cables across from each other with bridging clip
- Can also punch down a bridging wire between center contacts to cross-connect any pair arrangement



© 2020, The Fiber Optic Association, Inc.

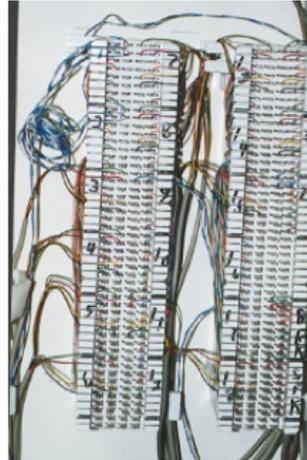
4

The 66 block can be terminated with two cables placed across from each other and the interconnection made by a bridging clip.

If the cables are not opposite, the interconnection can be made by using wires punched down into the corresponding inner IDC contacts.

66 Block Wiring

- Can also cross-connect by connecting one cable to outside contacts and another to next contact which is already connected
- Doubles density of block



© 2020, The Fiber Optic Association, Inc.

5

Another high density way to terminate telephone cables with a 66 block is to terminate one cable on the outside contact and the other cable on the inside contact, using each row for two interconnections.

Strip The Cable Jacket

- Using a jacket stripper, strip off about 2-3 inches of cable jacket
- The stripper should be set to cut almost through the jacket but not so deep it cuts the insulation on the wires which can affect the performance of the cable



© 2020, The Fiber Optic Association, Inc.

6

Strip The Cable Jacket

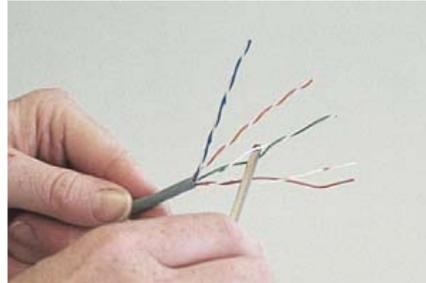
Using a commercial jacket stripper or one of the simple but effective ones given away by cable manufacturers, like this one, strip off about 2-3 inches of cable jacket

The stripper should be set to cut almost through the jacket so you can easily twist it off but not so deep it cuts the insulation on the wires which can affect the performance of the cable

There are many types of jacket strippers on the market, from simple (and usually free from manufacturers of cable) to complex, like the one shown above. The major concern with removing the jacket is to not cut the insulation on the wires, as that may adversely affect the performance of the cable. Some installers take off about 2 inches (50 mm) of jacket and use the ripcord to remove the jacket another 2-3 inches (50-75 mm) to insure no damage has been done to the wires.

Separate The Wires

- Using a sharp tool or screwdriver, separate the wires from each pair
- Leave about 1/2 inch (13mm) outside the jacket twisted



© 2020, The Fiber Optic Association, Inc.

7

Separate The Wires

Begin the process by stripping the jacket from the cable, but, for jack termination, you should only expose 1-1/2 inches (37 mm) of the twisted wires. Untwist the wires to about 1/2 inch from the end of the jacket. Like for the jack, untwist the pairs for placing in the slots of the block. At this point it is important to realize that separating the wires does not follow the same color code convention as a plug or jack. The pairs are left in order- pairs 1 to 4 - on the block.

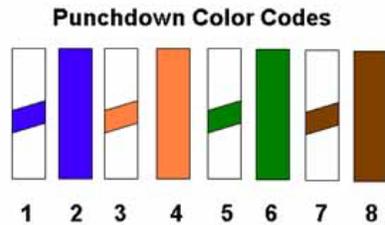
Notice the twists in the pairs of wires. These twists are critical to the Cat 5 performance. They must be maintained to within 1/2 inch (12 mm) of the termination point

.Note the different twist rates of the pairs. The different twist rates help minimize crosstalk, since each pair is an antenna tuned to a different frequency.

Also be aware of the 4 color coded pairs: blue, orange, green, and brown. Each pair consists of the solid color wire and a wire with white and a stripe of color.

Punchdown Color Codes

- All 4 pair cables are terminated on punchdown blocks in pair order:
 - Pair 1 - blue
 - Pair 2 - orange
 - Pair 3 - green
 - Pair 4 - brown
- Remember with the mnemonic BLOG = Blue-Orange-Green-brown



© 2020, The Fiber Optic Association, Inc.

8

Color Codes For Punchdown Blocks

All 4 pair cables are terminated on punchdown blocks in pair order:

Pair 1 - blue

Pair 2 - orange

Pair 3 - green

Pair 4 - brown

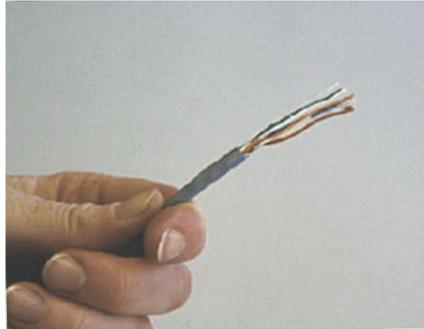
The convention is to remember to order them in this way: BL-O-G, which is BLue, Orange, Green, and brown by default.

It is also standard to terminate the white striped wire of the pair (tip) first then the solid wire of the pair (ring), as in: first, wire white-blue; second, blue; third, white-orange; fourth, orange; etc.

And especially remember that color codes for punchdowns are different from plugs and jacks!

Wires For 66 Blocks

- Strip jacket off cable
- POTS - wires can be as long as you wish
- Cat 3 - keep exposed pairs under 4 inches (100 mm)
- Remember color codes



Begin by stripping off the jacket of the cable.

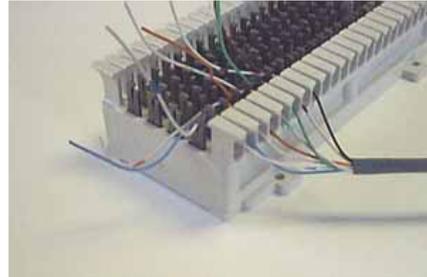
If you are installing for POTS (plain old telephone service), you can strip off as much jacket as you wish.

For Cat 3 structured cabling, keep the length of exposed pairs under 4 inches (100 mm).

Untwist the pairs and put in order by color codes. Note the 4 color coded pairs: blue, orange, green, and brown. Each pair consists of the solid color wire and a wire with white and a stripe of color.

Insert Wires

- Push wires into contacts - use fingers or Spudger
- Insert all wires in same direction for convenience in punchdown process - must cut on side that removes excess wire only!
- Watch color codes



© 2020, The Fiber Optic Association, Inc.

10

Push the wires into the contacts one at a time. The 66 block has a slot for each wire that leads to the contact. Make sure all the wires are inserted in the same direction - the end of the wires should all face either up or down so the punchdown tool can be used with the cut side of the blade in one direction only (and you don't cut the wire before the contact instead of after - making for an "open" connection.)

Punchdown Tool - 66 Blade

- Forces wire into punchdown slot
- Cuts off excess wire if desired
- Use The “66 Blade” CUT end
- Tool has a sharp “CUT” end that will cut wire, other end just punches down and leaves wire for further connections



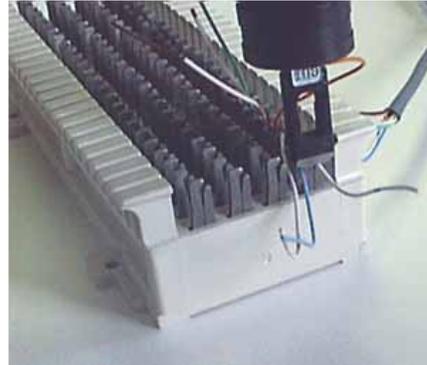
© 2020, The Fiber Optic Association, Inc.

11

Here is the punchdown tool. It does two things: it forces the wire strand into the slot, and it cuts off the end. One side of the blade is clearly labeled "CUT" or "CUTTER". This is the side you must have pointed toward the wire ends as you begin punching down the wires.

Punchdown Wires

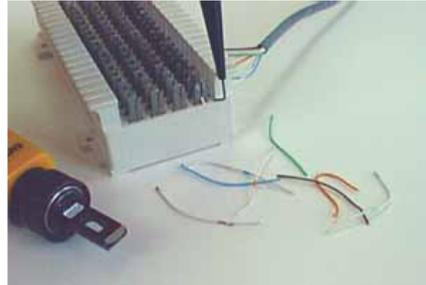
- Use the punchdown tool to fully insert the wires and cut off excess wire
- Be sure you cut the right side to remove the excess wire not cut the wire before the contact



Use the punchdown tool to insert the wire firmly in the IDC contact and cut the excess wire off.

Remove Scrap Wires

- Remove all excess wire scraps carefully
- Use a Spudger to get between the contacts to remove scraps



© 2020, The Fiber Optic Association, Inc.

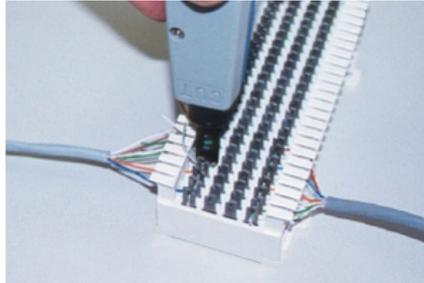
13

Make certain you remove all the wires cut off in the termination - they are a major source of shorts if not removed!

A "Spudger" is a pencil-like plastic tool with a wire hook on one end and a molded punchdown on the other end. They are indispensable for inserting, removing wires in either a 66 or 110 block.

Repeat For Second Cable

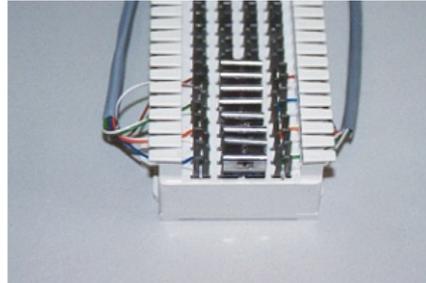
- Repeat the process with the second cable
- Watch color codes
- If using 4-pair cables, is more convenient to place cables to be connected across from each other



Repeat the process on the other cable opposite the first. Color codes should match side to side.

Complete Connection By Bridging

- You can complete the connection with “bridging clips” if the cables are across from each other
- Or use bridging wire on center contacts to make connections



Complete the connection by connecting the two cables with bridging clips. Alternatively, they can be connected by bridging wires punched down into the center two contacts.

FOA Guide - Virtual Hands-On

By

The Fiber Optic Association, Inc.

1-760-451-3655 Fax 1-781-207-2421
Email: info@foa.org <http://www.foa.org>



© 2020, The Fiber Optic Association, Inc.

16