COMMSCOPE®

Design Guide

SYSTIMAX® GigaSPEED® X10D Solution Design and Installation Guidelines

June 2015

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Contents

Figures

Tables

Overview

The purpose of this guide is to help customers to design and install a SYSTIMAX GigaSPEED X10D cabling system using:

- MGS600
- 1100 GS6
- 91B Series Cable
- 360GS10E and 360GS10E117 cords
- Various panels, boxes and faceplates supporting the MGS600

This set of guidelines supports copper cabling solutions that conform to existing architectures, as defined by telecommunications cabling standards. Registered SYSTIMAX installations that conform to this guide and the SYSTIMAX Performance Specifications are covered by the SYSTIMAX 20-year Extended Product Warranty and Application Assurance. These guidelines also include:

- The standards defined architecture for the horizontal channel and permanent link
- Design options for SYSTIMAX components used within the channel

For product information, please visit Product Catalog at commscope.com.

This solution complies with the SYSTIMAX GigaSPEED X10D guaranteed performance specifications and is capable of supporting 10GBASE-T (10 Gigabit Ethernet over twisted pair) LAN over the configurations specified up to a full 100 meter, 4-connection channel. The GigaSPEED X10D solution meets or exceeds all the Category 6A/Class E_A requirements in ANSI/TIA-568-C.2, CENELEC EN 50173 series, and ISO/IEC 11801:2002 including its amendments 1 & 2.

Additional information for design purposes can be found in the following documents:

- SYSTIMAX Performance Specifications
- Telecommunications cabling and associated standards published by organizations such as the American National Standards Institute and Telecommunications Industry Association (e.g., TIA-569-B, TIA-942), International Standardization Organization/International Electrotechnical Commission (e.g., ISO/IEC 11801, ISO/IEC 24764), and Comitee European de Normalisation Electrotechnique (CENELEC; e.g., EN 50173 and EN 50174 series).
- National and local codes such as the National Electrical Code (NEC), Canadian Electrical Code (CEC) or equivalent documents.
- BICSI Telecommunications Distribution Methods Manual

This information as well as support software and application guides can be found by visiting the CommScope web site at www.commscope.com.

Designers and installers should also consider attending Commscope Infrastructure Academy training.

Code Requirements and Power Separation

Refer to the *"Power Separation Guidelines for SYSTIMAX installations"* document for guidance on installation alongside electrical power cabling and equipment.

Always check with applicable codes and standards, and consult with authorities having jurisdiction before submitting final designs. Applicable local or national safety regulations take precedence whenever their required separation distances are larger or other requirements conflict with those specified in this document. For example:

- In the UK, BS 7671
- In the USA, NEC

Bonding and Grounding

Always check with applicable codes and standards, and consult with authorities having jurisdiction before submitting final designs. Applicable local or national safety regulations take precedence whenever their requirements conflict with those specified in this document.

The proper bonding and grounding of the telecommunications cabling, pathways, equipment, and connecting hardware is critical to achieve optimal cabling performance, reduce electromagnetic interference (EMI), protect equipment, and maintain safety for building occupants and maintenance personnel. Refer to the TIA-607-B, the NEC, ISO/IEC 60364, EN 50174-2 and EN 50310 for accepted industry practices.

The primary components of a standardized telecommunications grounding and bonding infrastructure as outlined in TIA-607-B include:

- **Telecommunications Main Grounding Busbar (TMGB)** – located at the telecommunications EF and connected to the electrical EF and building grounding electrode system. At this point, the telecommunications grounding and bonding infrastructure is connected to other building grounding systems (e.g., electrical, water piping, lightning protection) and is also bonded to the metal framework of the building.
- **Telecommunications Bonding Backbone (TBB)** – ties TMGB to TGBs (typically No. 6 AWG).
- **Telecommunications Grounding Busbar (TGB)** – located in the TRs and EFs. These are also connected to the metal framework of the building.
- **Grounding Equalizers (GE)** – tie multiple TBBs together.

Specific documented bonding and grounding instructions should be provided to the installers.

Administration and Labeling

Cabling administration and labeling is an important cabling element that allows for easy maintenance and management of the telecommunications cabling system. Use the labeling inserts supplied with the SYSTIMAX connecting hardware and faceplates to properly label the cabling components. Product labeling Word templates for SYSTIMAX panels are available on www.commscope.com.

An online label set creation tool can also aid in filling out label templates. This will allow automatic generation of labeling sequences for SYSTIMAX cables, connecting hardware, and faceplates. Label sheets for these products include 8-1/2 x 11 inch or A4 format. Color-coded labels for termination fields should be implemented as follows:

TABLE 1: COLOR CODING OF CONNECTING HARDWARE FIELDS

Cabling element	Color Code
Backbone riser	White
Backbone tie	Gray
Backbone campus	Brown
Horizontal	Blue
Equipment	Purple
Network interface (cust. Side)	Green
Network interface (co side)	Orange
Auxilliary circuits, alarms	Yellow
Key telephone systems	Red

Cable should also be identified at both ends with labels suitable for wrapping. The labels should be made of a durable material such as vinyl, use a white printing surface, and wrap around the cable so that a clear label end self-laminates the printed area. If a cabling element contains mixed categories of cabling, such as a horizontal mixed with category 5E, they can be identified using enhanced color-coding such as white stripes on the blue label to differentiate X10D FTP cabling. Refer to the ANSI/TIA/EIA-606-B Administration Standard for the Telecommunications Infrastructure of Commercial Buildings for proper administration and labeling practices.

General Cabling Guidelines

- Follow local regulations and applicable codes of the "authority having jurisdiction".
- Refer to the TIA-568-C series or CENELEC 50174 for planning and installation practices.
- All cables, connecting hardware, interconnecting cords, bonding and grounding, and support structures should be visually inspected for proper installation. Telecommunications cables should be installed with proper pathway support.

They must:

- Not be placed directly on fluorescent light fixtures.
- Not be supported by ceiling grid systems, electrical conduits, gas, or water pipes.

Also:

- The use of cable lubricant is not allowed.
- Avoid water and water splatter, high humidity, and chemical contaminants including lubricants, paint and cleaning solvents.
- Avoid cold temperature bending of cables.

- Operating temperature range for SYSTIMAX copper cable is –4°F to 140°F (-20°C to 60°C)
- Installation temperature for SYSTIMAX copper cables cable is 32°F to 140°F (0°C to 60°C) However, at the extreme temperatures care must be exercised to prevent excessive kinking or increases in pulling tension. If the cable has been stored below 32°F (0°C) for more than 8 hours, the cable must be conditioned at room temperature, 59°F to 86°F (15°C to 30°C) for at least 4 hours before installation.

TABLE 2: CABLE WEIGHTS PER 1000 FT (305 M)

Cable Type	1091B	2091B	3091B
Nominal weight per kft*	16.9 kg (37.3 lbs)	18.5 kg (40.7 lbs)	16.7 kg (36.9 lbs)

** R1000 reels and W1000 boxes hold 305 m (1 kft). R1000 reels have a 35.6 cm (14 in) flange diameter, 17.1 cm (6.75 in) drum diameter, and a 34.3 cm (13.5 in) outside traverse. R3000 reels hold 914 m (3 kft) and have a 53.3 cm (21 in) flange diameter, 25.4 cm (10 in) drum diameter, and a 50.8 cm (20 in) outside traverse. W1000 boxes are 44.8 cm (17-5/8 in) length by 30.5 cm (12 in) width by 46.7 cm (18-3/8 in) height.*

Bundling and Alien Crosstalk

A primary feature of the SYSTIMAX GigaSPEED X10D cabling is its alien crosstalk performance in support of the 10GBASE-T standard. This performance is achieved even under the worst case condition of all cables routed together in the most tightly packed form. This is usually referred to as a "combed and laced" cable bundle where all cables maintain their position within a bundle and the bundle is tie wrapped at regular intervals. The GigaSPEED X10D Solution supports:

- Tie wrapping up to 3 times per meter (once every foot). Tie wraps must not be over-tightened and distort cable jacket.
- Cable tray vertical depths up to 23 cm (9 in) using hardware with sweeping edges and well controlled entry. Check with raceway manufacturer for tray support and design limitations. Note that current standards call for 15 cm (6 in) maximum.
- GigaSPEED X10D GS10E equipment cords may also be bundled by combing to eliminate crossovers and may be tie wrapped, although separate minimum lengths may be required. Bundling is typical for long equipment cords. Cross-connect cords and work area cords are generally not combed and tied. These cord applications are usually randomly placed or routed separately.

Fill Guidelines

The GigaSPEED X10D (1091B/2091B/3091B) cable diameter is 7.24 mm (0.285 in), and rough fill guidelines are as follows:

- 1.7 cables per cm^2 (11 cables per in^2) in trays or other open raceways if the layout is done as follows -
  - cables are laid in place without tying in smaller bundles
  - crossovers are not made in the raceway
  - crossovers are not made where cables enter or exit the raceway
  - entries and exits are wide enough to sweep cables out from the raceway
- 1.2 cables per cm^2 (8 cables per in^2) in trays or other open raceways if cables have crossovers in the raceway and where individual cables randomly enter or exit the raceway. Note that density will be lowered further if tied bundles have crossovers in the raceway and randomly enter or exit the raceway, or if entry or exit openings are constrictive.
- Note that raceway manufacturers guidelines on fill and weight may be more restrictive. Standards generally call for 40% fill limits.
- Table 3 is a reference guide for different conduit sizes. Note that this can be increased where conduit is used for short sleeves and when careful feed and pulling is exercised.

TABLE 3: NOMINAL CONDUIT FILL

Conduit Size	Number of Cables
3/4	3
1	5
1.25	9
2	21
3	55
4	92

Faceplates and Boxes Using the MGS600

The single gang six-plex faceplates (M13FP, M16, M26FP, M26C) and M36CCP and M48CCP Boxes will support all positions loaded with GigaSPEED X10D MGS600 information outlets using the MGS High Density Covers. Packs of 10 and 50 MGS High Density 6A Covers can be ordered. MGS High Density Covers must be used with the M3600 Panel, but must be ordered separately. MGS High Density Covers are included with the M4800 GS Panel and must be installed. Other faceplates, boxes and panels can use the wiring cap included with the MGS600.

SYSTIMAX GigaSPEED X10D Installation Alongside Other Cabling

These solutions may be installed alongside other communications cabling including previous generations of GigaSPEED X10D, GigaSPEED XL7, GigaSPEED XL8 and PowerSUM. Refer to TIA-862 for pathways sharing with BAS applications. Spacing from other communications cable is not required. Conduit sharing and bundling with other communications cable types is also supported. To support future additions and removal of cable, it is recommended to bundle different cable types separately. The MGS600 may be positioned on the same faceplate, M-series patch panel, floor or zone box with other modular connectors without restrictions.

Cable/Cord Distance

Channel guidelines call for no more than 90 meters of 1091/2091/3091 cable and 10 meters of GigaSPEED X10D GS10E cord/cordage length. However, site guidelines may alter this, provided the site guidelines are effectively documented and followed. Often, additional cordage length is called for, with a corresponding decrease in cable distance.

There are several motivations for such a tradeoff. Cordage to a consolidation point is a coordinated design replacement for cable. Additional length of work area cords for multi-user telecom outlet assemblies requires the same coordination. Data center cords might need additional cord length to span large Equipment Distribution Areas.

These changes are coordinated so that strict attenuation limits are preserved. The following formula and table, adopted from TIA-568-C may be used to determine alternate maximum cordage lengths useable with reduced cable length. These may be applied to any of the configurations outlined within this document.

Total Cord Length ≤ (102 – Horizontal)/1.2
Horizontal Length ≤ 102 – 1.2 (Total Cord Length)

TABLE 4: ALTERNATE MAXIMUM LENGTHS FOR CABLE AND CORDAGE

Maximum Length of Horizontal Cable	Maximum Combined Length of all Cordage and Cords
90 m (295 ft)	10 m (33 ft)
85 m (279 ft)	14 m (46 ft)
80 m (262 ft)	18.3 m (60 ft)
75 m (246 ft)	22.5 m (74 ft)
70 m (230 ft)	26.7 m (87 ft)

Cord and Cable Guidelines

Table 5 provides the minimum length and configuration guidelines for the GigaSPEED X10D Solutions that are applicable to the work area and data center channel models shown in Figures 1 to 10.

TABLE 5: GIGASPEED X10D CHANNEL CONFIGURATIONS WITH MINIMUM CORD AND CABLE LENGTHS

Channel Components	2-Connection Channel (figure 1, 6)	3-Connection Channel (figure 2, 7)	3-Connection Channel (figure 3, 8)	4-Connection Channel (figure 4, 9)	4-Connection Channel (figure 10)
Equipment Cord	1m (3.3 ft)	2m (6.6 ft)	2m (6.6 ft)	2m (6.6 ft)	2m (6.6 ft)
Cross-Connect Cord	not applicable	1m (3.3 ft)	not applicable	1m (3.3 ft)	1m (3.3 ft)
Horizontal Cable	3m (9.7 ft)	5m (16.4 ft)	5m (16.4 ft)	5m (16.4 ft)	5m (16.4 ft)
CP Cord	not applicable	not applicable	5m (16.4 ft)	5m (16.4 ft)	not applicable
Remote Cross-Connect Cord	not applicable	not applicable	not applicable	not applicable	1m (3.3 ft)
Remote equipment Cord/ work area Cord	1m (3.3 ft)	1m (3.3 ft)	1m (3.3 ft)	1m (3.3 ft)	2m (6.6 ft)

All channel segments can be combed and fully bundled.

In addition to the conventional channel configurations, the MSG600 and GS6 solutions also support the following configuration that exceeds standards. This configuration is channel performance compliant and may be used for switch, server or workstation support. It may be useful for specific site design or for temporary administration and testing.

Data center cabling can be planned with this centralized cross-connection architecture. This is a useful extension of the two connection model of Figure 6, although the cable lengths must be carefully planned. For this, two cable segments are cross-connected into a single channel. The total cable length must stay within the maximum of Table 4 and the minimum lengths of Table 5B.

TABLE 5B: ADDITIONAL SUPPORTED CHANNEL CONFIGURATION WITH MINIMUM LENGTHS

Channel Components	Central Cross-connect Configuration
Equipment Cord	1m (3.3 ft)
Horizontal Cable	5m (16.4 ft)
Cross-Connect Cord	1m (3.3 ft)
Horizontal Cable	5m (16.4 ft)
Remote Equipment Cord	1m (3.3 ft)

Work Area Channel Models

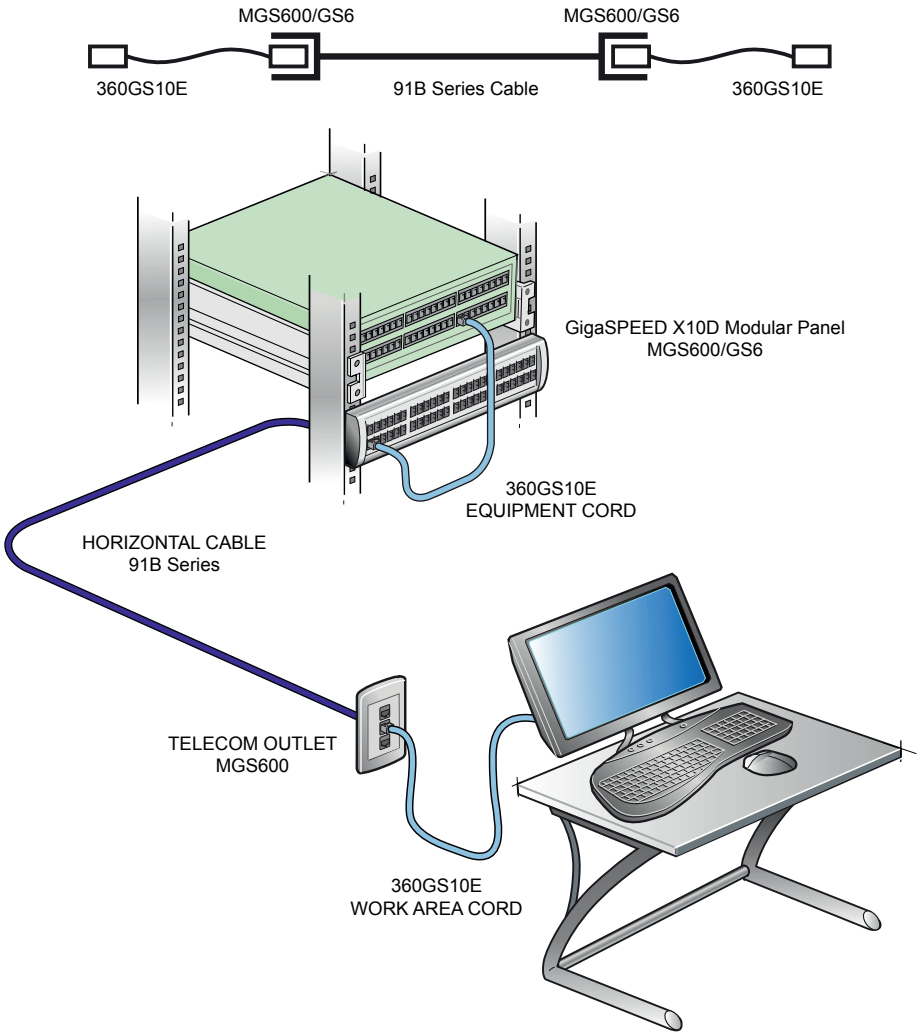
The following illustrations of the various channels identify connections from the central equipment (data switch, BAS controller, etc.) to the work area equipment (workstations, servers, etc.). They show the *TIA-568-C Commercial Building Telecommunications Cabling Standard and ISO/IEC IS 11801 Information Technology-Generic Cabling for Customer Premises* defined configurations containing up to four cabling connections. A connection is where two cabling segments come together.

These models are also commonly applied in backbone cabling subsystems, although the configurations like the Data Center channel models would also be used.

Two Connection Model

The most basic channel model has only 2 connections and is typically referred to and tested (without the cords) as a permanent link. The horizontal with the cords is tested as a channel.

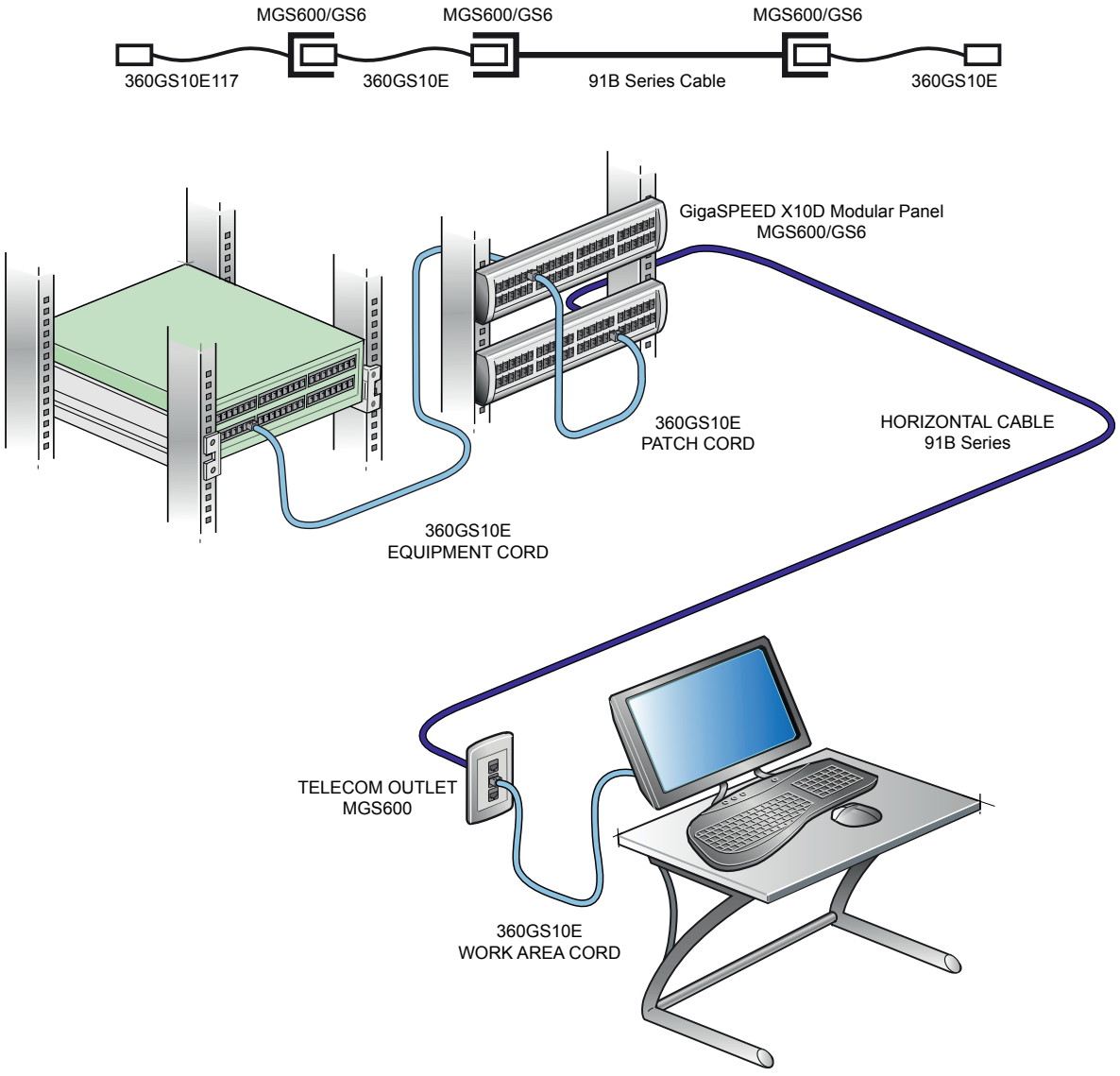
Figure 1. Two Connection Model, Interconnection to Telecommunications Outlet



Three Connection Models

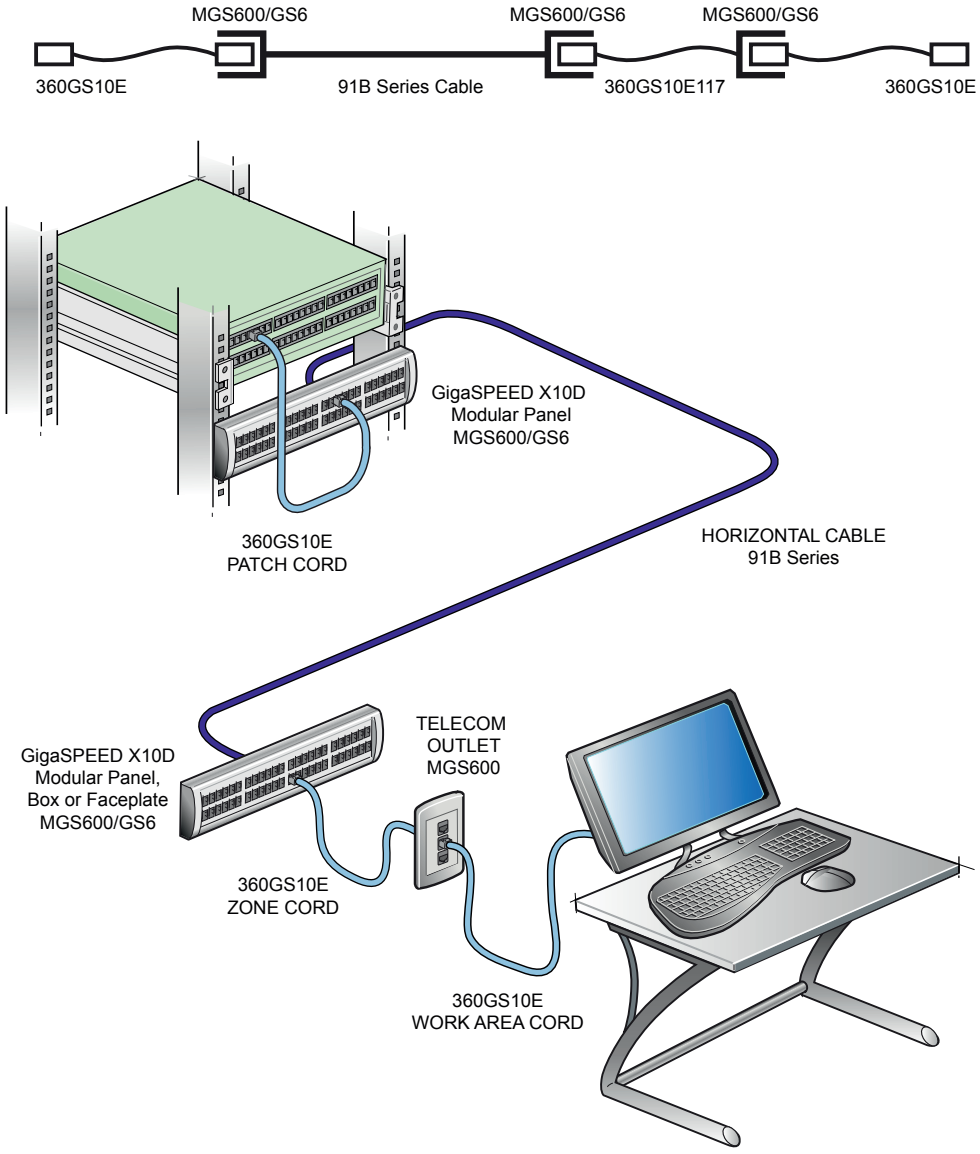
A third connection can support two different channel models, a cross-connection or a consolidation point. At large sites or sites with a high density of switching equipment or where space constraints might otherwise dictate, the Horizontal Distribution Area can be configured with a cross- connection. This configuration is typically referred to and tested (with the cords) as a channel. This configuration can also be applied to backbone cabling with a main cross-connect.

Figure 2. Three Connection Model: Cross-connection to Telecommunications Outlet



Where open office spaces may have a high turnover or where installation may be staged, the horizontal cable can be terminated at a consolidation point. This is often done for supporting modular office designs, allowing easy cabling changes from the consolidation point to the telecom outlet that follow changes made to the open office space. This configuration is typically called a permanent link. It may be tested without the cords as a permanent link, or with the cords as a channel.

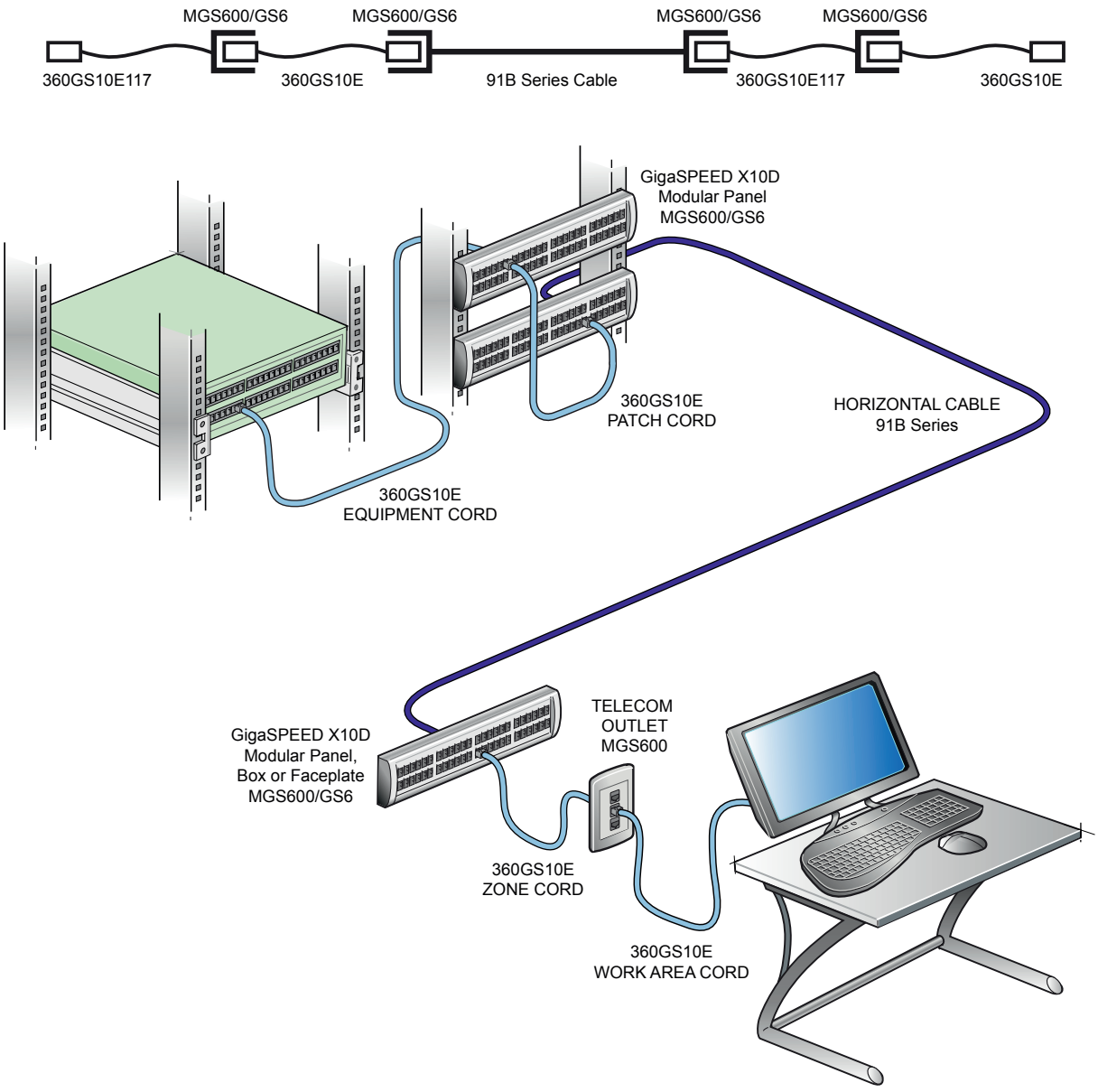
Figure 3. Three Connection Model: Interconnection to a consolidation point



Four Connection Model

At large open office sites where administration flexibility calls for it, four connections are often used in channels. This configuration offers flexibility and protection at both ends of the Horizontal cabling, providing the advantages of cross-connection in the telecommunications room and the flexibility of the consolidation point for modular office design. This configuration is typically referred to and tested (with the cords) as a channel.

Figure 4. Four Connection Model: Cross-connection with a consolidation point

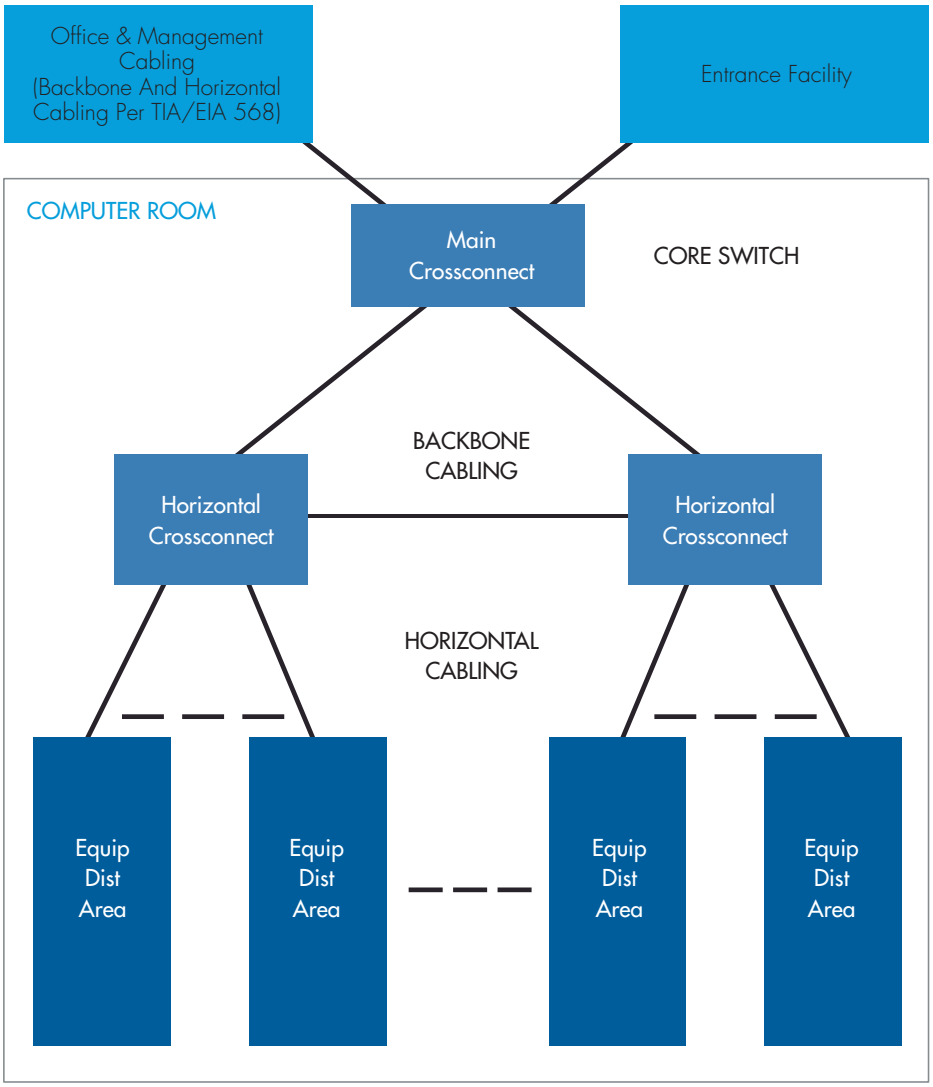


Data Center Computer Rooms

Data Center cabling is an excellent application for SYSTIMAX GigaSPEED X10D, allowing data center operations upgrades when 10GBASE-T equipment is deployed. The following pages show configurations for supporting ANSI/TIA-942-A Telecommunications Infrastructure Standard for Data Centers.

The standardized channel configurations were developed based on those in the TIA-568-C Series Commercial Building Telecommunications Cabling Standard because data centers utilize much of the same LAN equipment that was designed for these channels. However, data center equipment has become specialized and is typically deployed in high density. The cabling design must be tightly coordinated with other system designs, such as the electrical and HVAC. Security and operations also become significant design factors. Consult ANSI/TIA-942-A for additional information and details.

Figure 5. Data Center Computer Room Cabling Architecture



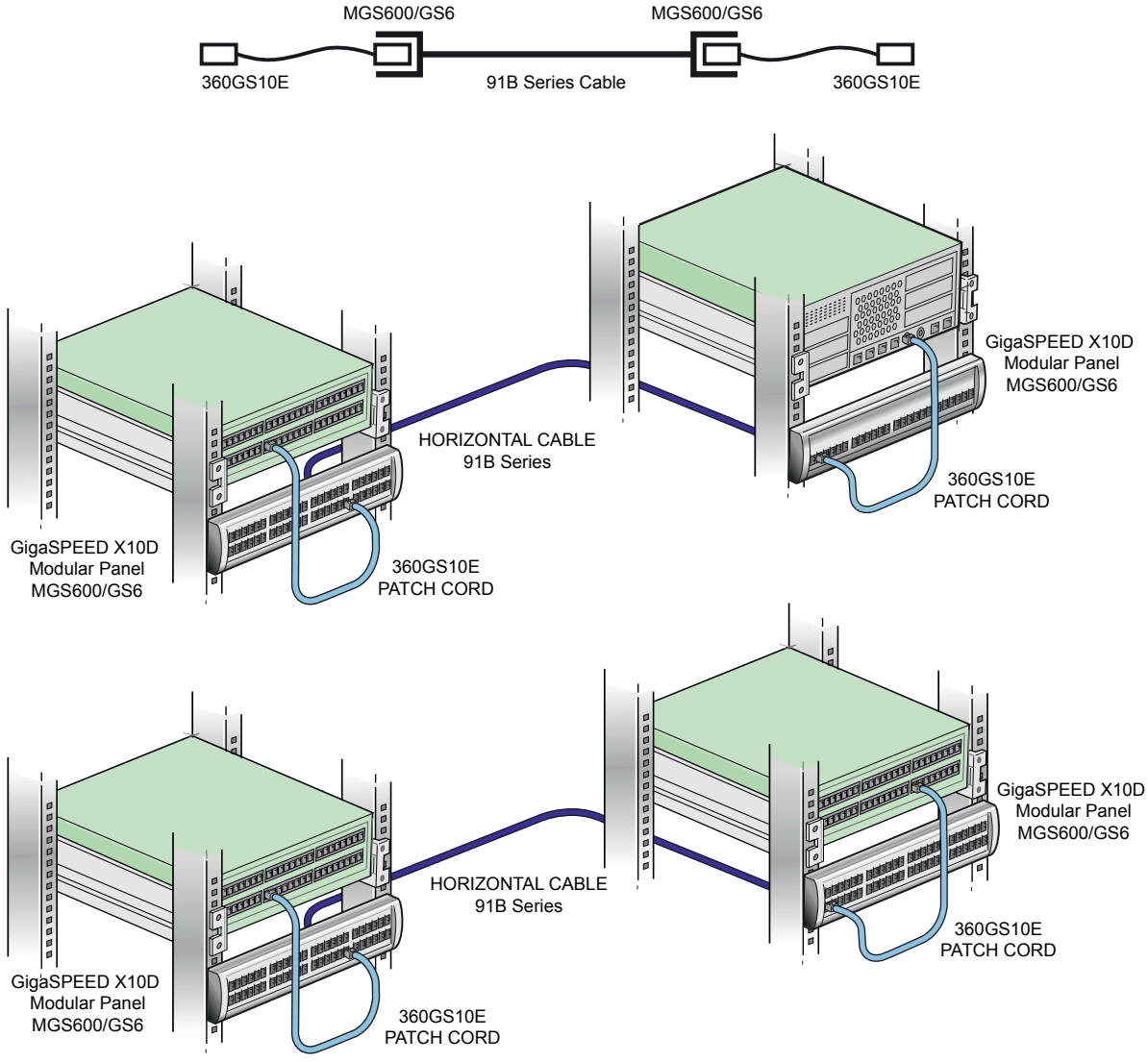
Data Center Channel Models

The following illustrations identify various channels between different areas within a data center's computer room. These configurations contain up to four connections. A connection is where two cabling segments come together, while the connections on the end equipment are not counted in the models.

Two Connection Model

The most basic channel model has only 2 connections and is typically referred to and tested (without the cords) as a permanent link. The Horizontal with the cords may also be tested as a channel.

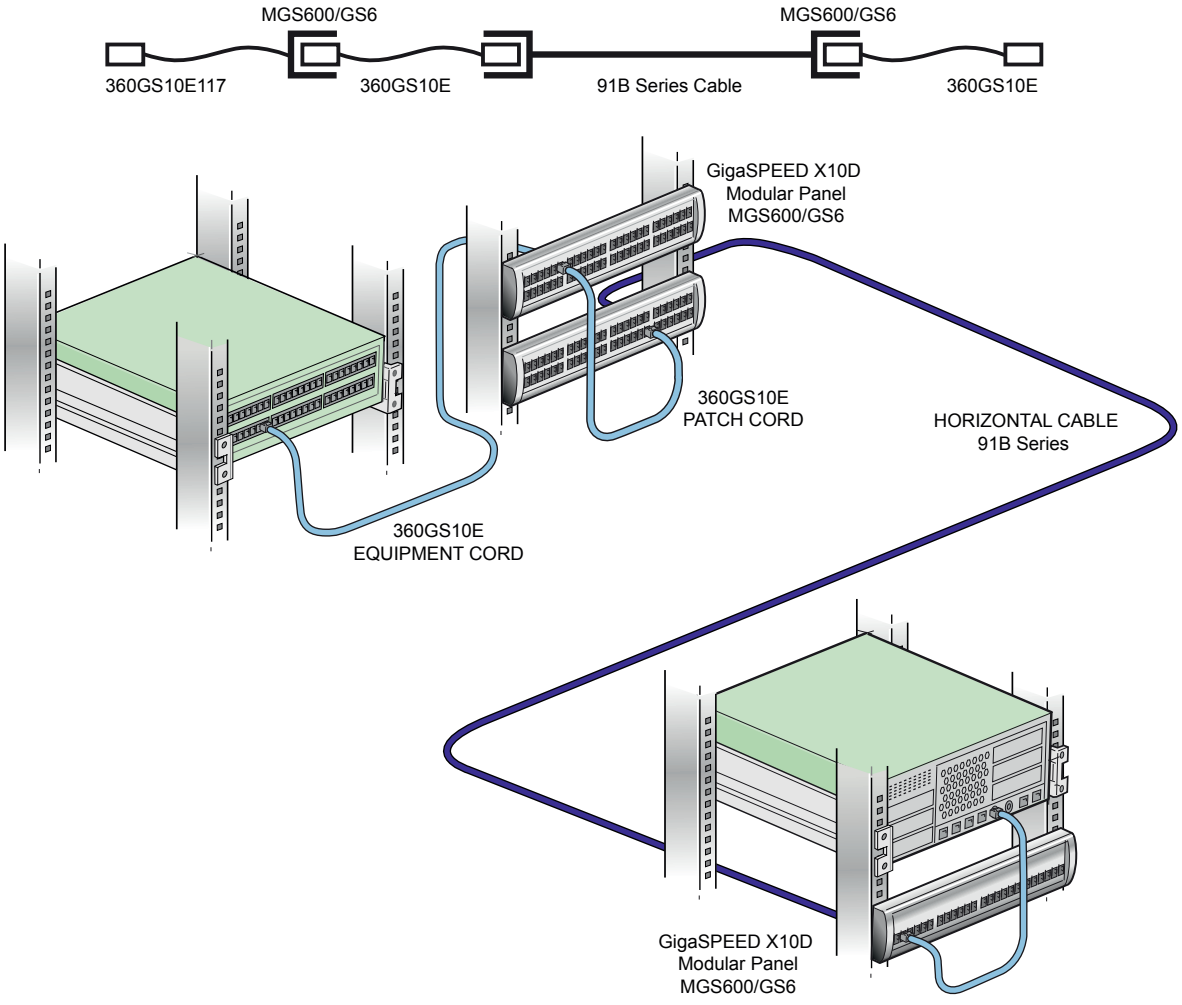
Figure 6. Two Connection Model, Interconnection to Interconnection



Three Connection Model

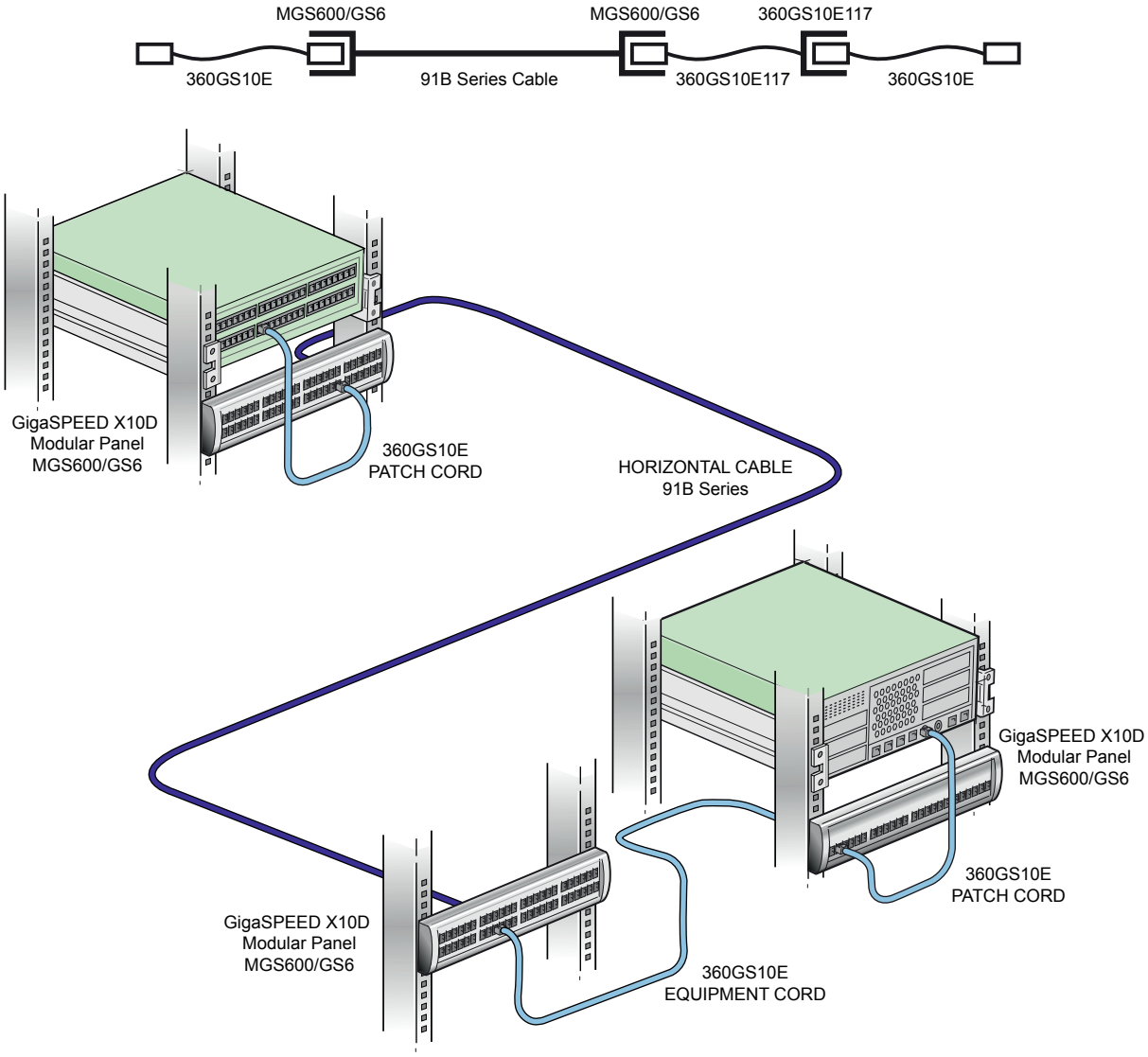
A third connection can support two different channel models, a cross-connection or a consolidation point. At large sites or sites with a high density of switching equipment or where space constraints might otherwise dictate, the horizontal distribution area can be configured with a cross-connection. This configuration is typically referred to and tested (with the cords) as a channel. This configuration can also be applied to backbone cabling with a main cross-connect.

Figure 7. Three Connection Model, Cross-connection to Interconnection



Where a site administrator may need flexibility or where installation may be staged, the horizontal cable can be terminated at a consolation point. It might be used for example to terminate a horizontal bundle at the middle of a row of equipment, and allow the site administrator to apportion horizontal cables between sections of the row as needed. This configuration is typically called a permanent link. It may be tested without the cords as a permanent link, or with the cords as a channel.

Figure 8. Three Connection Model, Interconnection with a consolidation point

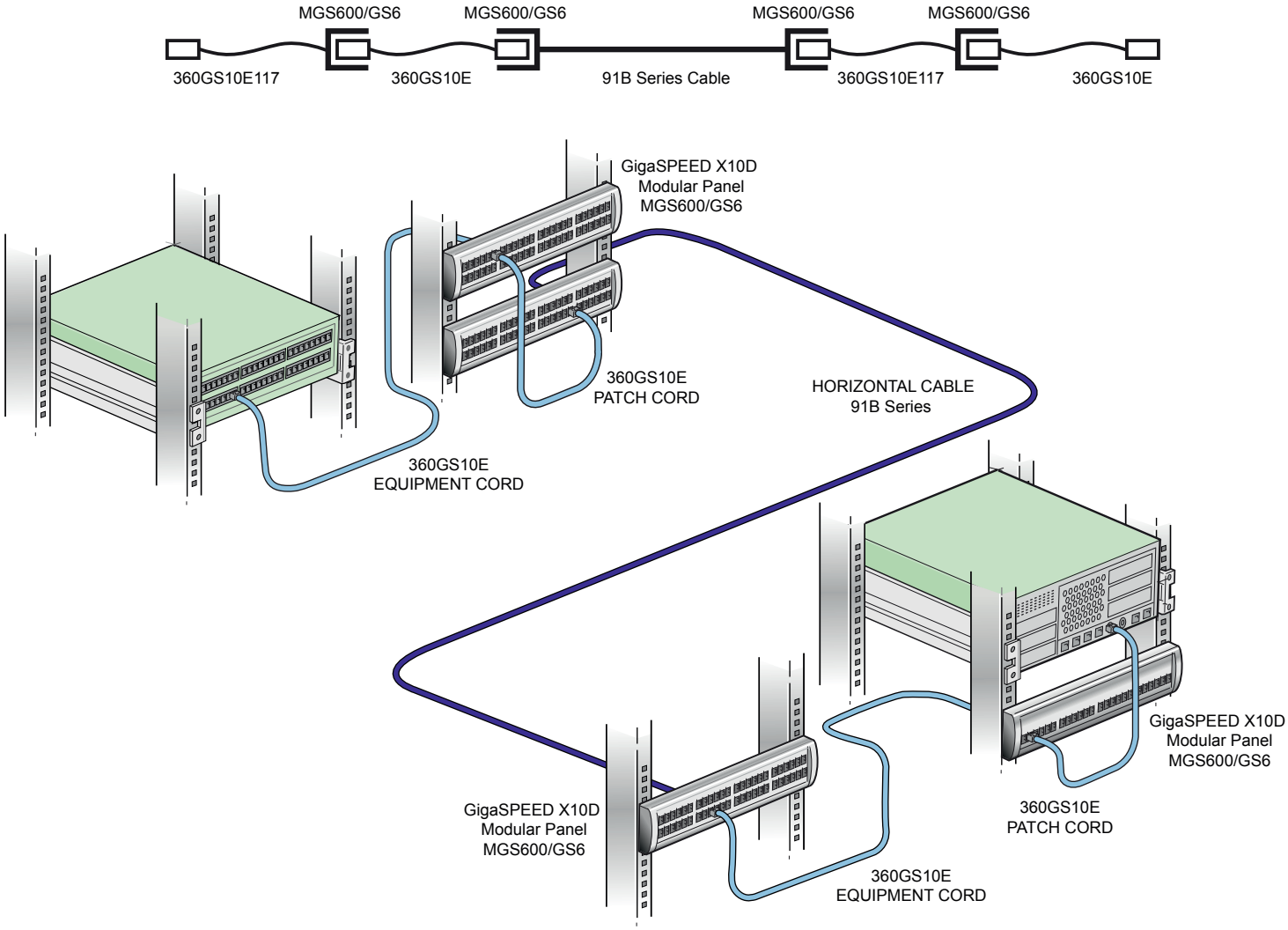


Four Connection Model

In large data centers the cabling administration is typically consolidated at cross-connects, and four connections would be used in channels. These configurations are typically referred to and tested (with the cords) as a channel. There are two configurations, a crossconnection with a consolidation point and a double cross-connect.

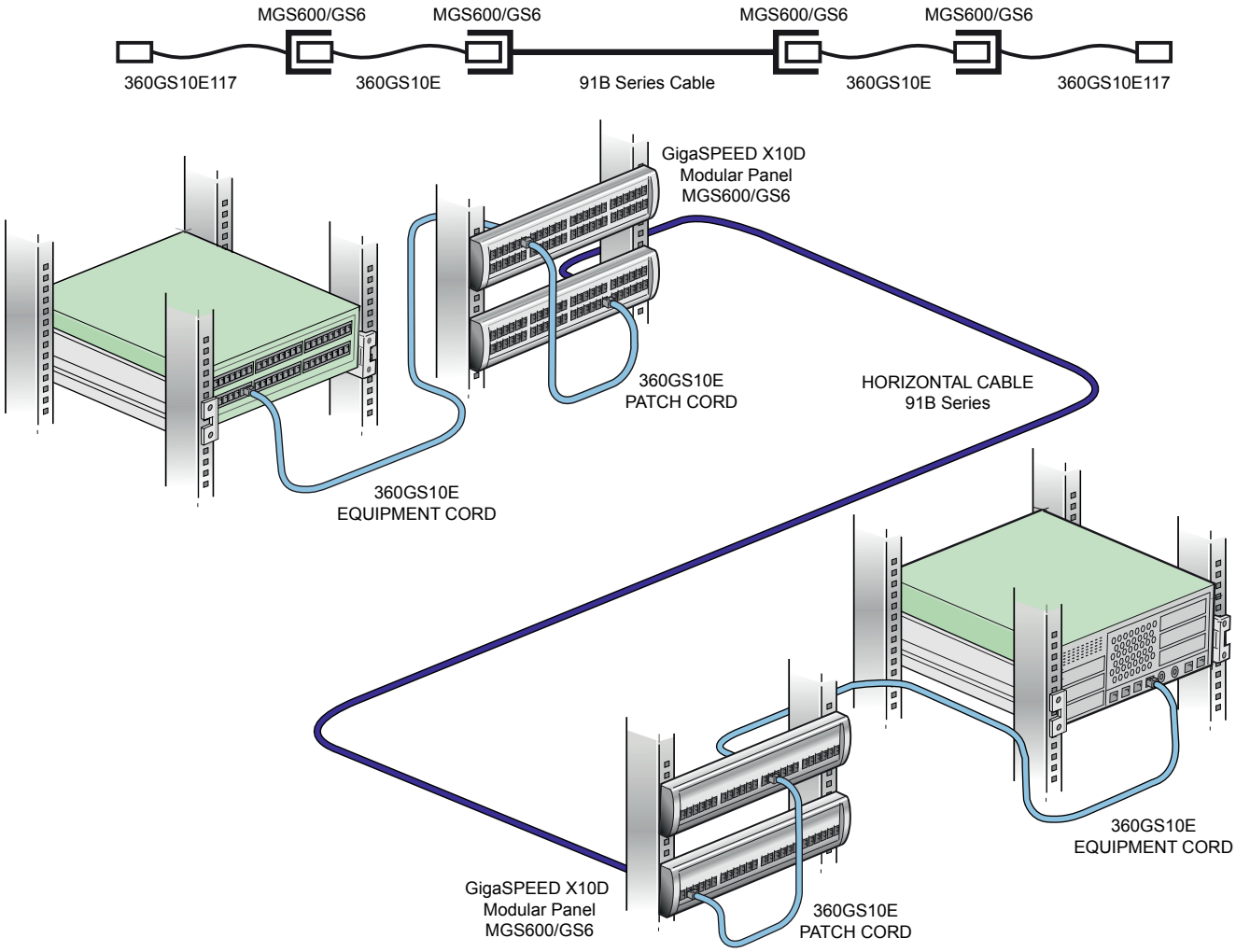
The consolidation point configuration (Figure 9) allows for two levels of administration to the server equipment as in Figure 8 on the previous page, but also provides a cross-connect for the switching equipment. The consolidation point may be useful for flexibility allocating horizontal capacity to many small customers that must be independently maintained.

Figure 9. Four Connection Model, Cross-Connection to consolidation point



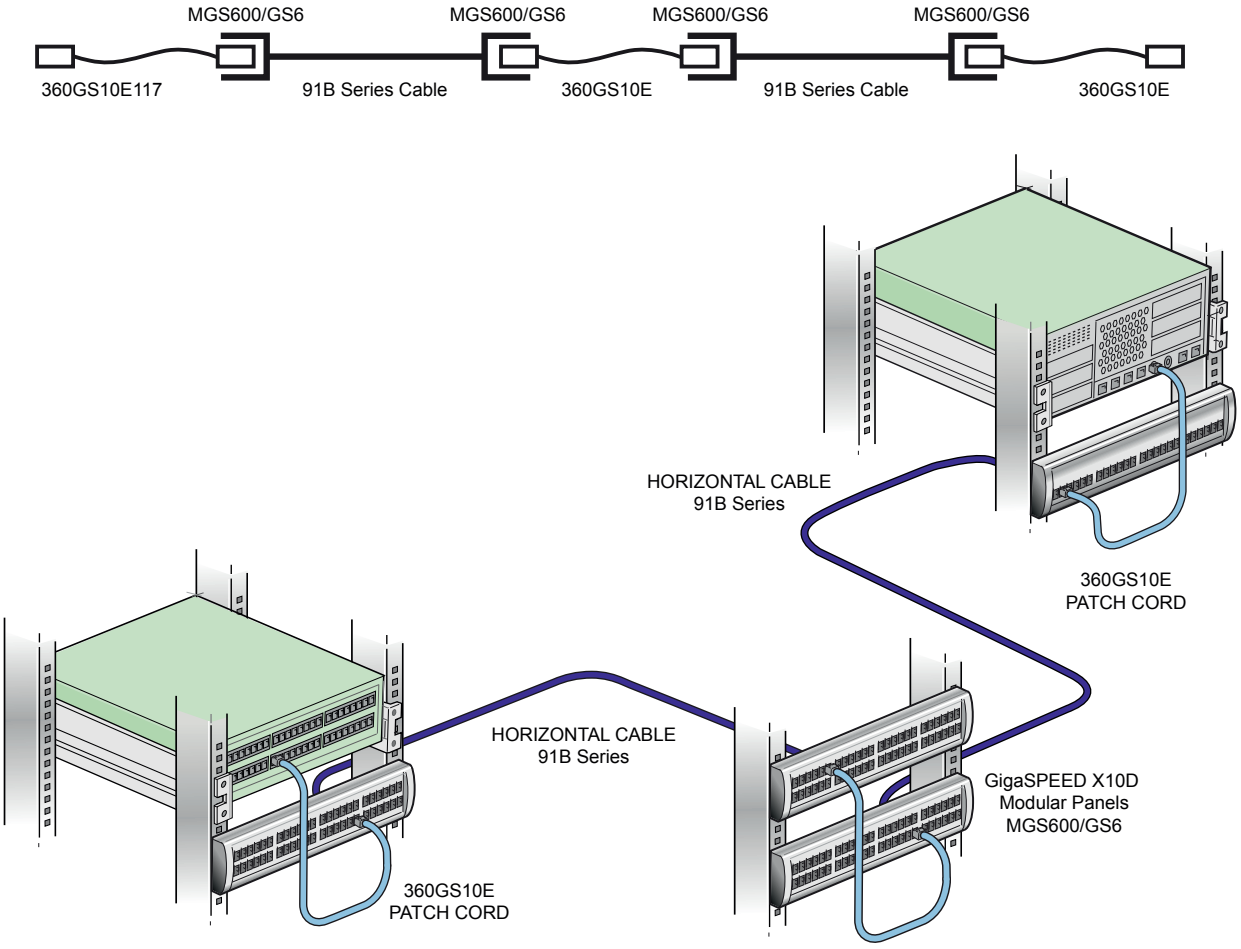
The dual cross-connect configuration is a classic backbone configuration. It provides uniform administration and is suited for large corporate data centers. This configuration is also applicable to backbone cabling from the main distribution area.

Figure 10. Four Connection Model, Cross-Connect to Cross-Connect



Data center cabling can also be planned with a centralized cross-connection architecture. This is a useful extension of the two connection model of Figure 6, although the cable lengths must be carefully planned. For this, two cable segments are cross-connected into a single channel. The total cable length must stay within the maximum of Table 5 and the minimum lengths of Table 6B.

Figure 11. Two Cable Central Cross-connect Configuration



SYSTIMAX GigaSPEEDX10D Installation

Use industry accepted practices and workmanship for installation of SYSTIMAX GigaSPEED X10D. The care and attention to detail can have a direct impact on product performance and reliability. Ensure that instructions are read and understood. Follow the additional details provided below for installation. Consider CommScope Infrastructure Academy training.

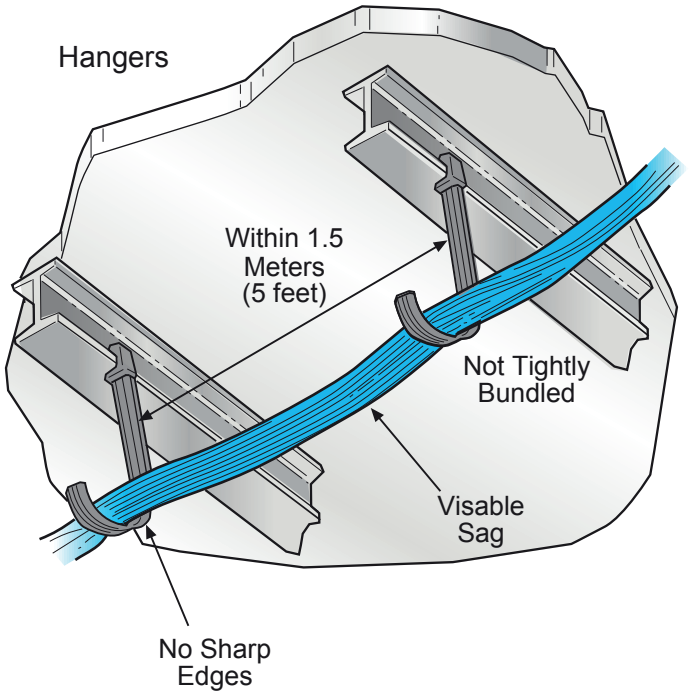
Cable Pathways

The following diagrams provide basic information concerning the primary pathway methods used for proper support, protection, and installation of the telecommunications cabling. Refer to the TIA-569-B Commercial Building Standard for Telecommunications Pathways and Spaces and manufacturer's guidelines for more detailed information.

Using Hangers for the Cable Pathway

1. Avoid more than 144 cables in a single hanger pathway, including crossovers of cables along the pathway.
2. Maintain proper distance between hangers to avoid cable stress caused by tension in the suspended cable run.
3. The cable surface of the hanger should have rounded or flexible edges in order to avoid damaging or deforming the cable sheath.
4. When using cable ties to secure cables be sure to wrap ties loosely and use the appropriate plenum or non-plenum cable tie. Hook and Loop straps may be easier to use and adjust.
5. Do not allow cables to sag onto lighting fixtures or pipes. Follow local and national codes for proper pathway support of cables.

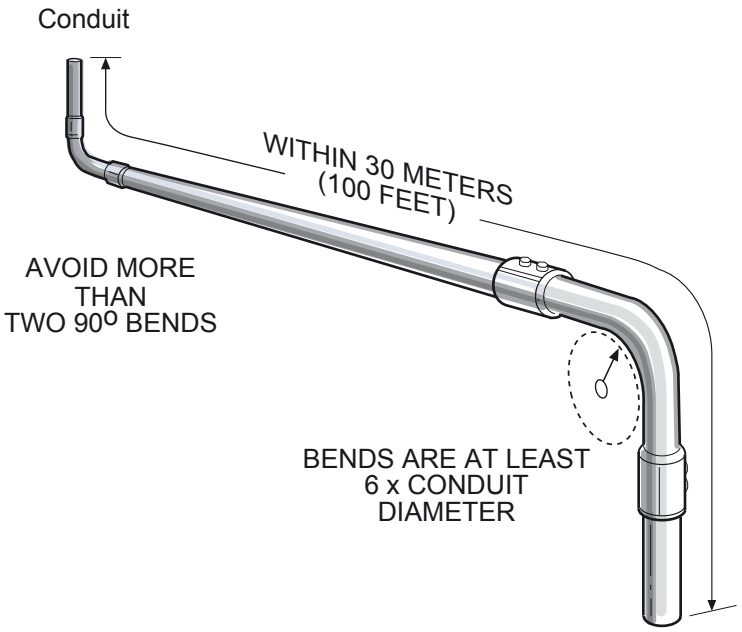
Figure 12. Hangers



Using Conduit for the Cable Pathway

1. Make sure conduits are properly reamed and bushed.
2. Feed cables directly into the conduit end or use a suitable conduit shoe to avoid excessive pulling tension and prevent cable tearing.
3. See the NEC (Chapter 9, Table 4) for identifying different conduit types and sizes.
4. Cable lubricants should not be used because of excessive drying time and water ingress.

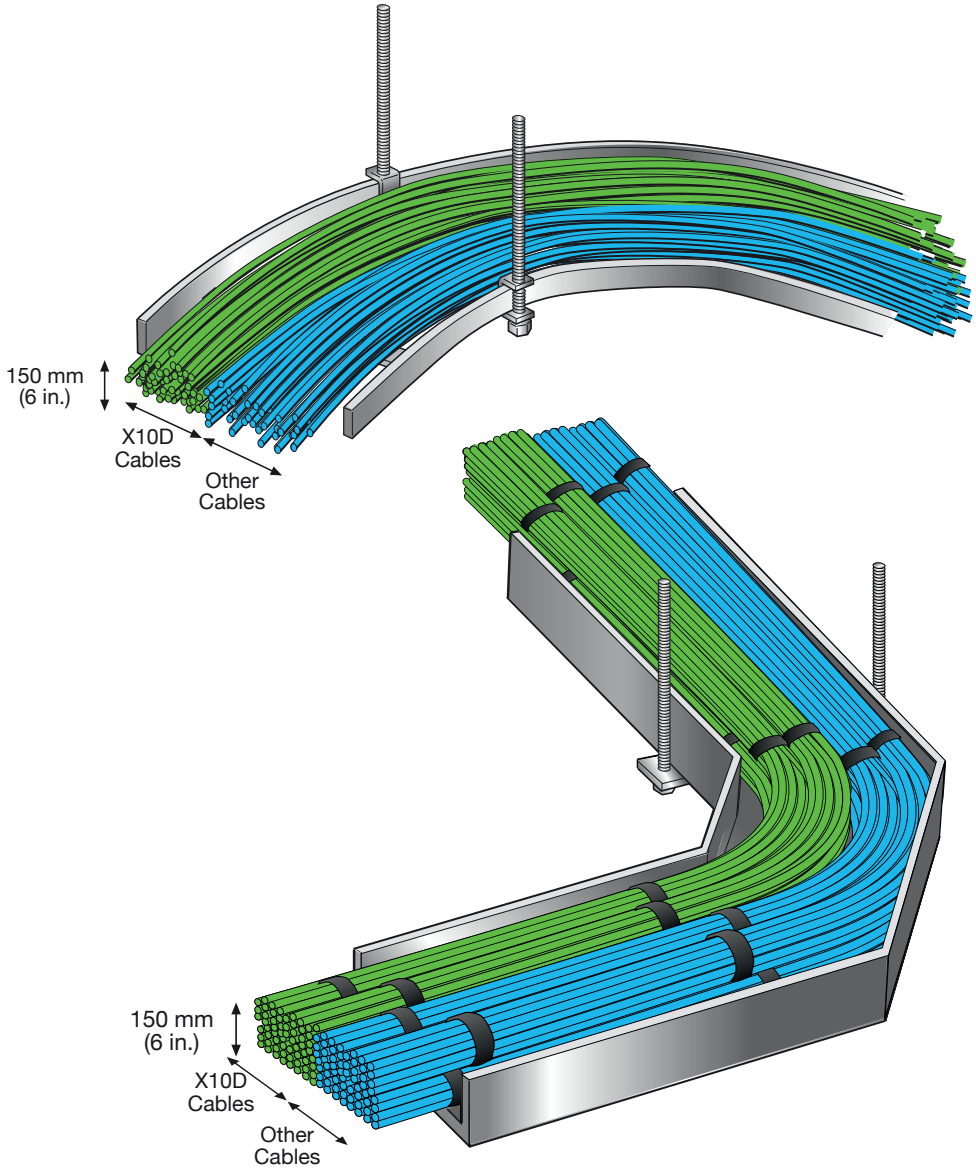
Figure 13. Conduit



Using Raceways and Trays for the Cable Pathway

1. Follow design specifications for loading weight of cable tray or raceway.
2. Standards require a minimum of 300 mm (12 in) access headroom to be provided and maintained above a cable tray system or cable runway.
3. Follow manufacturers specifications for cable fill limits. Cabling must not exceed 23 cm (9 in) depth, or 15 cm (6 in) for standards compliance.
4. Cable routing should be planned to avoid crossovers and entanglement when branching off of the pathway. Plan all runs prior to installation.
5. When using cable ties to secure cables to tray, be sure to wrap ties loosely and use the appropriate plenum or non-plenum cable tie.
6. Telecommunications cabling must be partitioned from power or routed in a separate group when combined in the same tray or raceway (Check Power Separation design specifications).

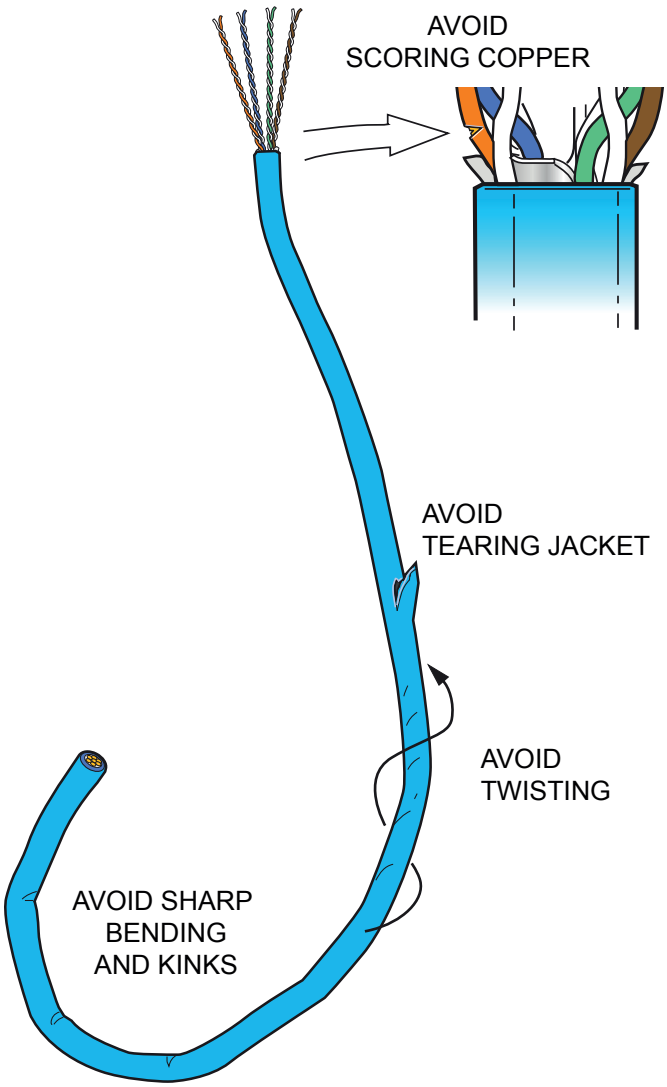
Figure 14. Raceways



Cable Handling

- Check with design specifications and requirements.
- Cable ties should be applied loosely to cable bundles and allow sliding of the cable tie across the cable bundle. Tie wraps must not distort cable jacket.
- Cable installation should not significantly deform the cable jacket.
- Maximum pulling tension of each cable should be kept below 110 N (25 lb).
- Avoid slack loops. Pull back excess cable along "slack runs" for storage of excess cable. Where slack looping is unavoidable, ensure that cable is not twisted while creating loops (this can untwist the cable pairs). Disengage the outlet from the faceplate and form the slack loops without twisting the cable. Unwinding and using the slack must account for the same issues.
- Maintain bend radius and avoid kinks. Minimum bend radius is 4x the cable diameter for cables and 1x the cordage diameter for cords.
- Avoid untwisting and separation of cable pairs. Maintain twists to the point of termination and avoid pair wrapping.

Figure 15. Cable Handling Precautions



MGS600, 1100 GS6, 91B, and 95B Installation

Ensure that instructions are read and understood, and installation technicians are properly trained. Follow the information provided below as well as product instruction sheets.

Figure 16. 91B Series Cable and 95B Series Cordage Termination Preparation

(See SYSTIMAX® GigaSPEED® X10D 91B Series Cable and 95B Series Cordage – Preparation for Termination - Material ID 860 469 402)

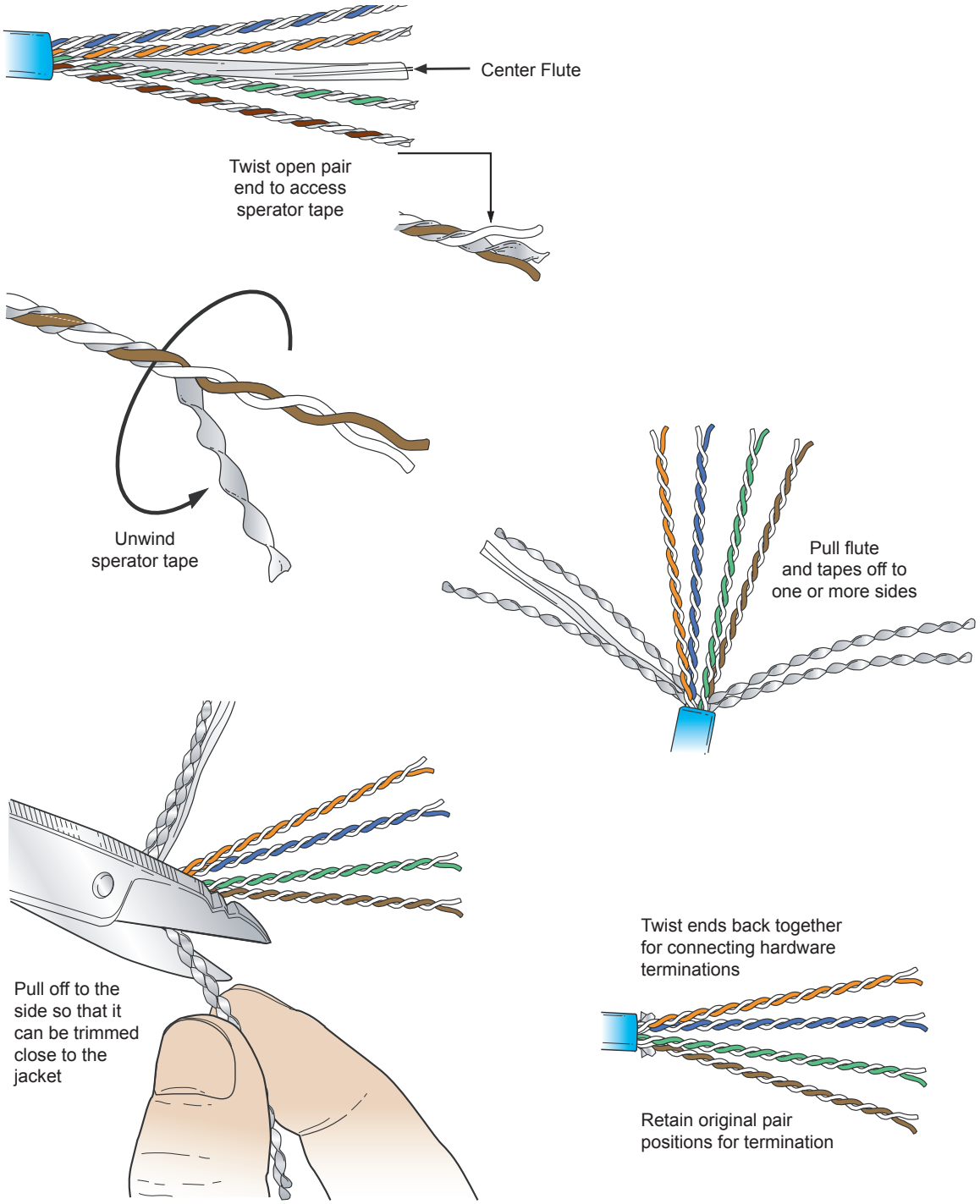
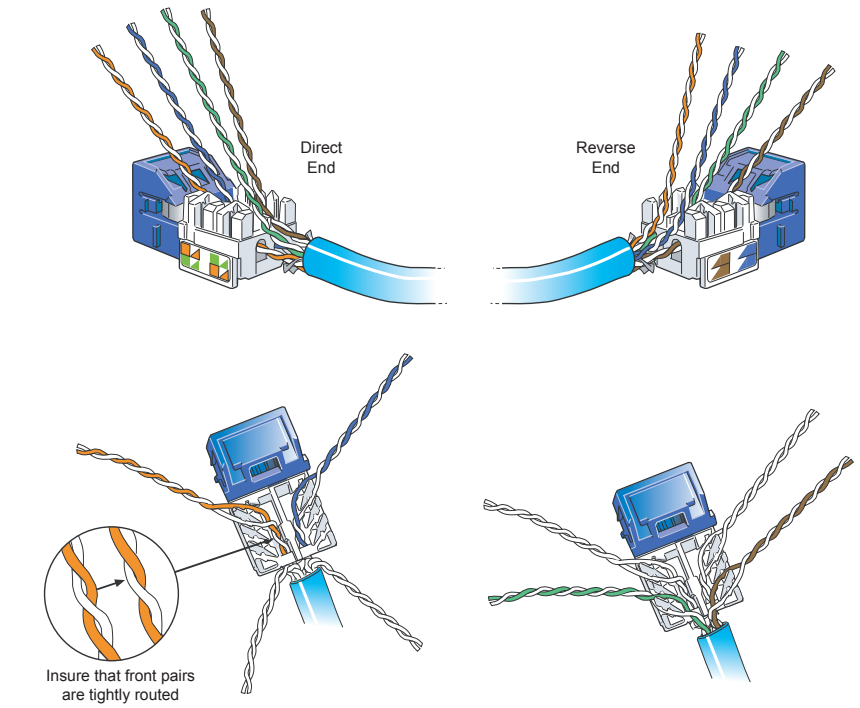
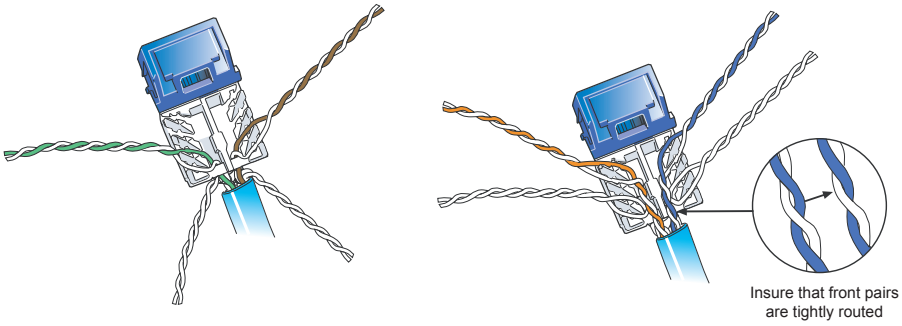


Figure 17. MGS600 Termination

(See SYSTIMAX® MGS Module Termination Instructions Material ID 860 344 274)



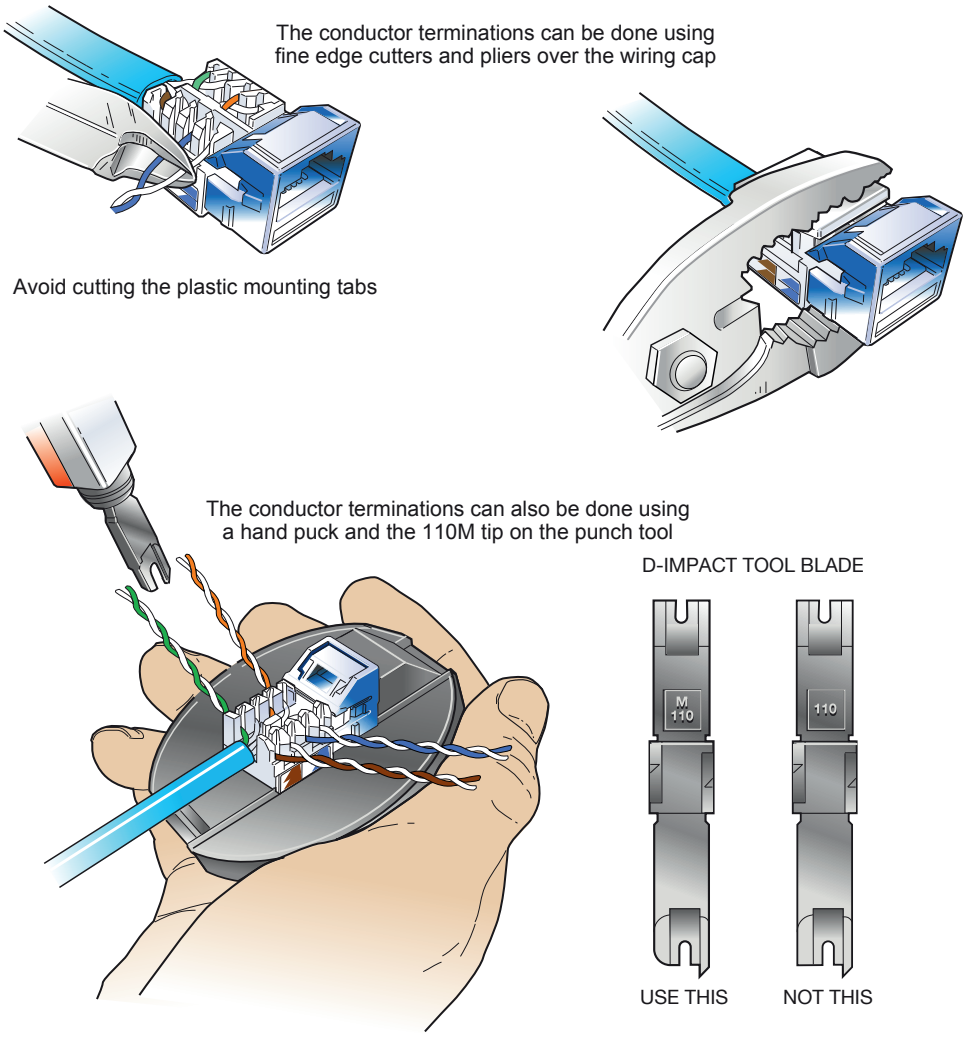
(T568B wiring shown) On the **Direct** cable end, place Orange and Blue pairs first, then place Green and Brown pairs.



(T568B wiring shown) On the **Reverse** cable end, pull Green and Brown pairs back, eliminate the twist, and pull them tightly into place. Then route Orange and Blue pairs to the front positions.

Note: For T568A Wiring - On each cable end, one of the two pairs fed in through the holes is pulled back for the rear positions. Check label color codes.

Figure 18. MGS600 Termination



Once the termination is completed, the MGS600 snaps directly into boxes, faceplates or panels

NOTE:
If cable entry is needed from the side, position the cable and pairs before the conductor placement and termination

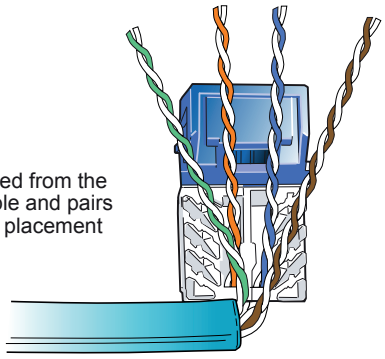
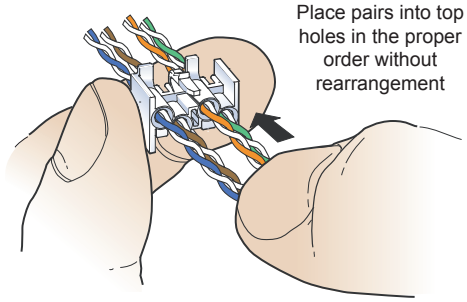


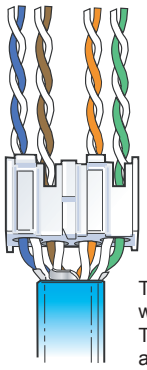
Figure 19. GS6 Panel Termination

(See SYSTIMAX 360™ 1100GS3 and 1100GS6 Evolve Modular Panel Instructions Material ID 860 509 967)

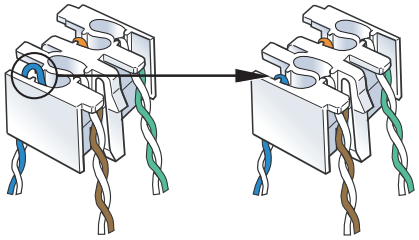


Place pairs into top holes in the proper order without rearrangement

Note: T568B Wiring order is shown.
T568A Wiring order is Blue, Brown, Green, Orange

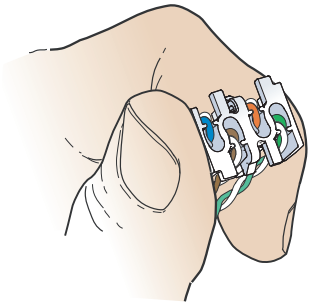


The jacket should end with a gap to the Termination Manager to allow for inspection

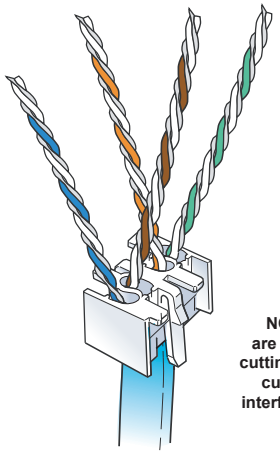


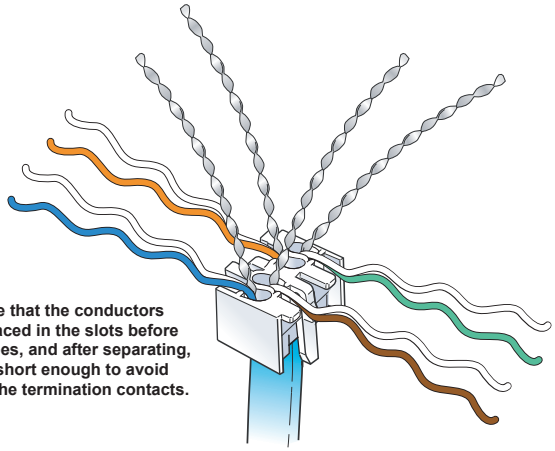
Insure conductors are placed in the slots

Final placement is easier if the bottom pairs have the color conductor facing out - (T568B - Blue and Orange, T568A - Blue and Green)



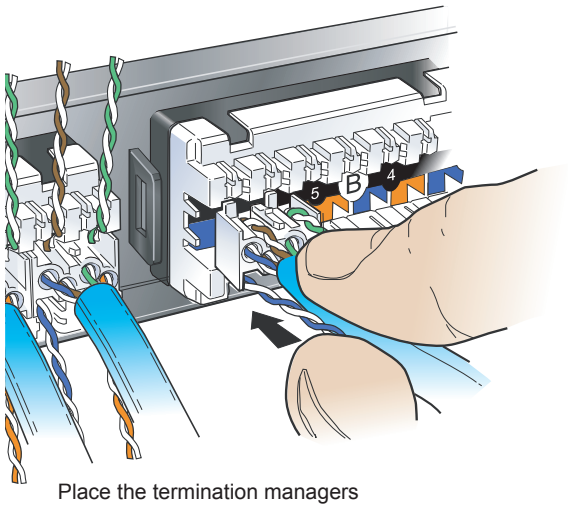
An alternative termination method is shown below





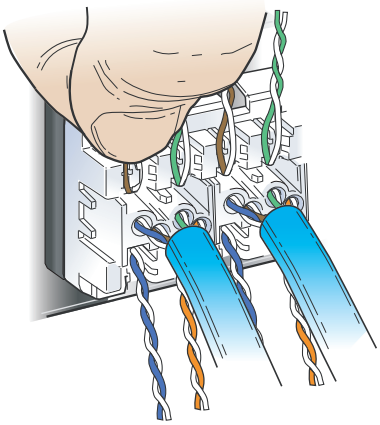
NOTE: Ensure that the conductors are properly placed in the slots before cutting of the tapes, and after separating, cut the tapes short enough to avoid interfering with the termination contacts.

Figure 20. GS6 Panel Termination

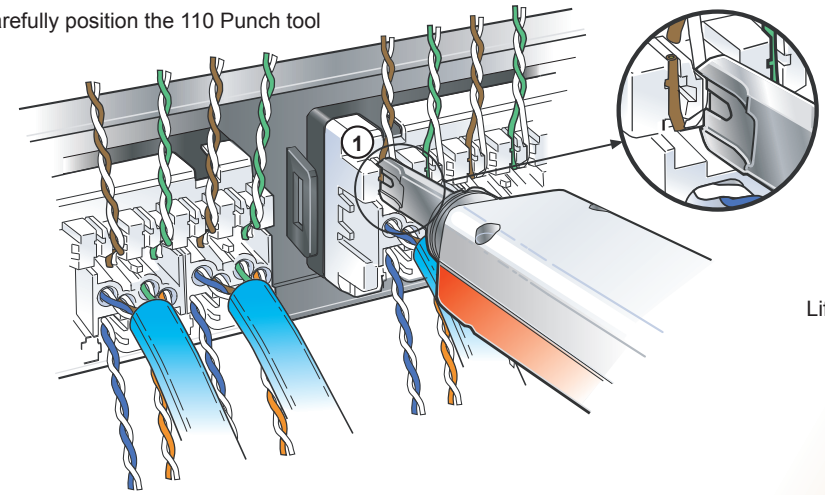


Place the termination managers

Unwind pairs and push them into the proper
Note: Ensure no twist going into the slots

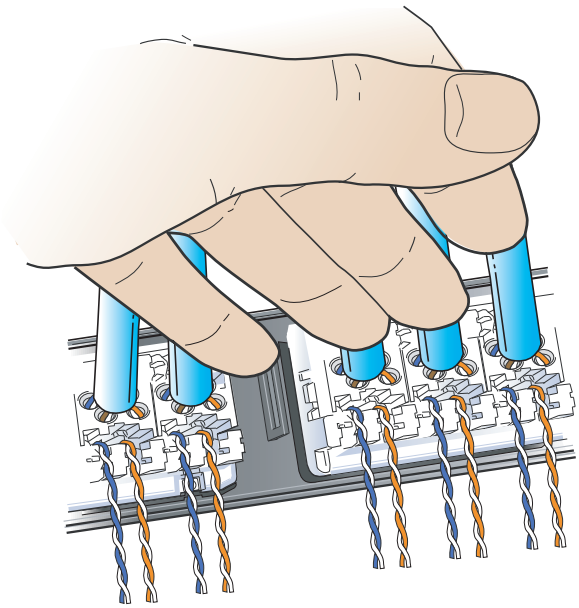


Carefully position the 110 Punch tool



② The second punch position is lower than the first

Lift the cables to complete the bottom pairs



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