



QuickNet™ Copper Cabling in the Data Center

QuickNet™ Copper Cabling Systems

With the benefits of quick network deployment, assured performance, quality, and easy redeployment, the Panduit™ QuickNet™ Copper Cabling System is the perfect infrastructure solution for today's data centers.

Available in a range of configurations from standard to fully custom, these factory terminated cable assemblies meet the unique needs of data center projects of any scale.

This guide covers common considerations for using QuickNet Copper systems:

- Applications in the data center
- QuickNet termination options & common configurations
- Specifying options, measuring for lengths and selecting QuickNet part numbers

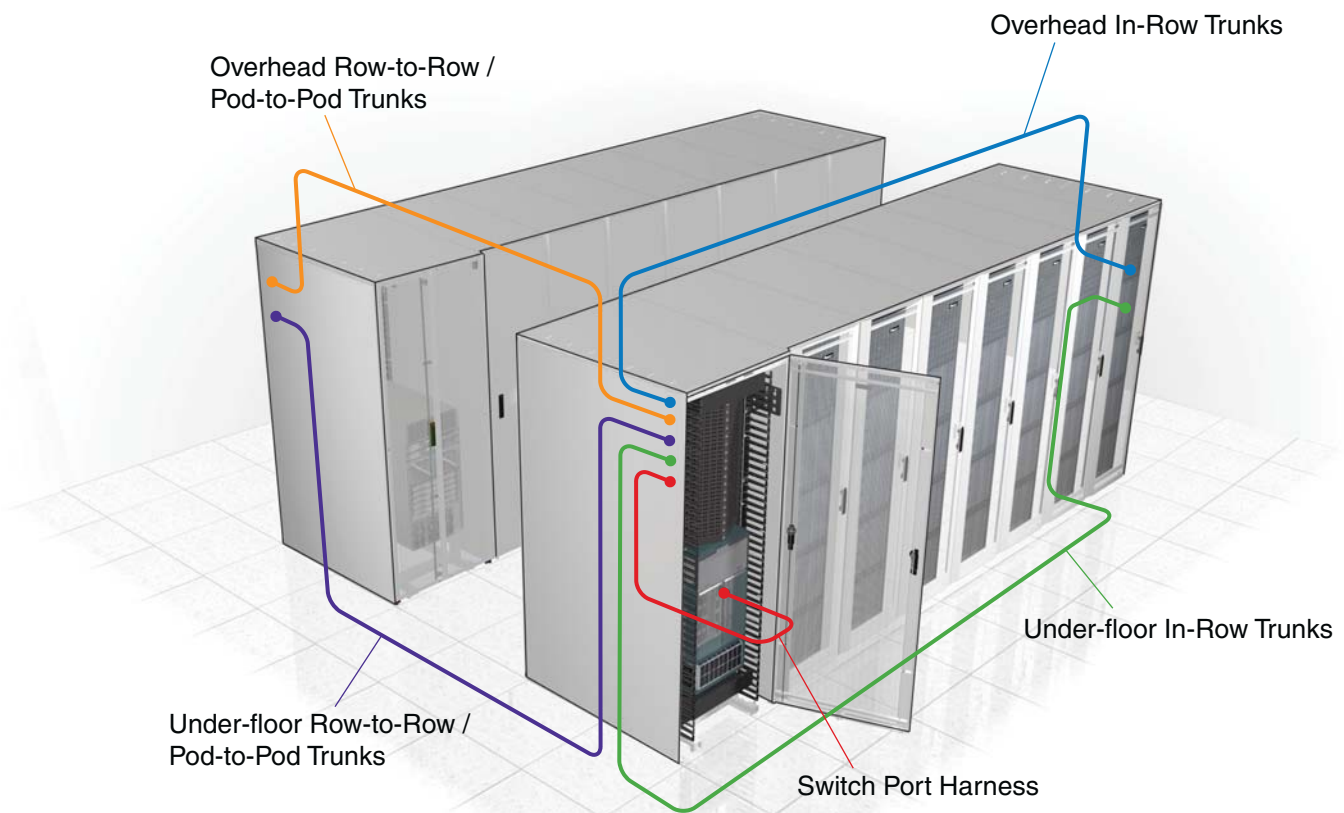


Quick Reference

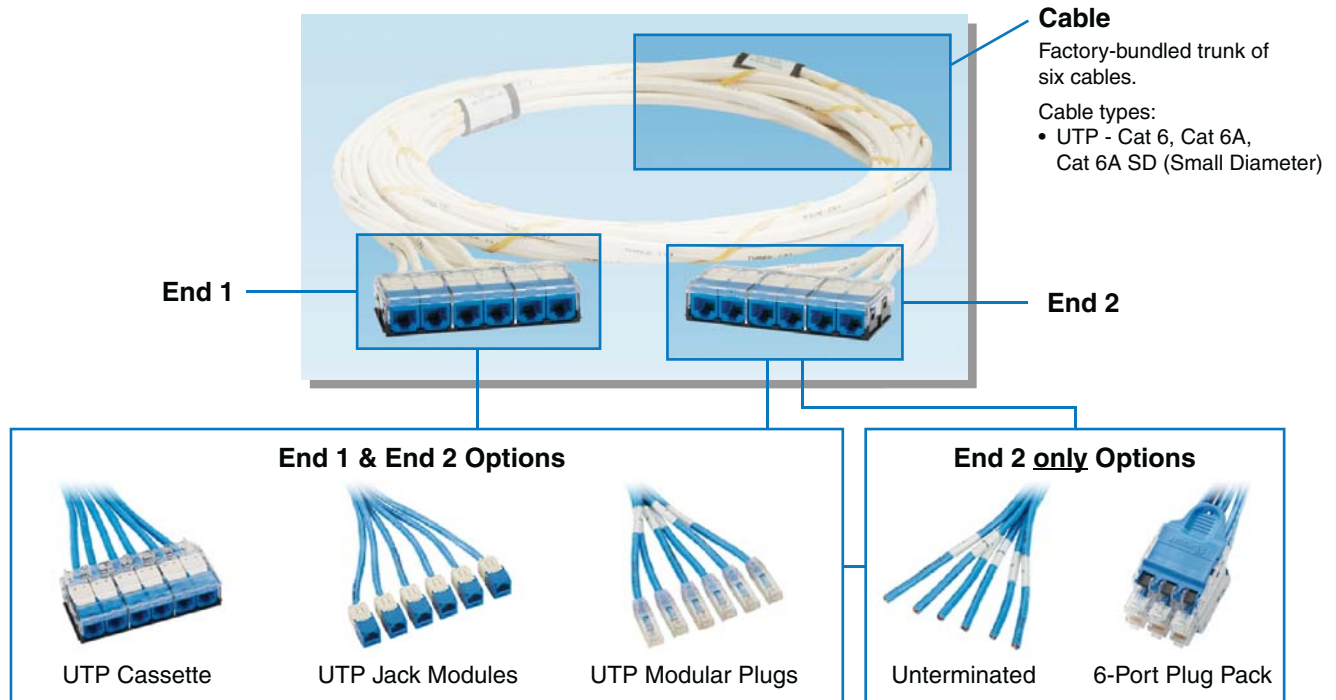
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QuickNet™ Applications in the Data Center

QuickNet can be used for a wide variety of permanent link trunks and equipment cord harnesses that are common in data center architectures such as Middle of Row or End of Row configurations.

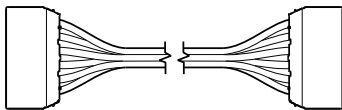


QuickNet™ Cable Assembly Components



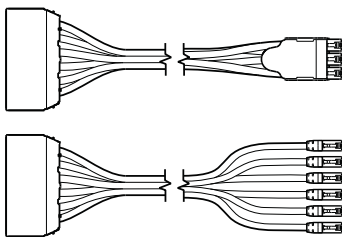
Common QuickNet™ Cable Assembly Configurations

Cassette to Cassette



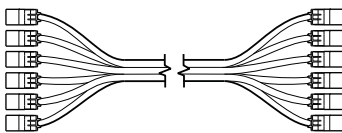
- Cassette of six jack modules on both ends of assembly
- Typically used in cabinet-to-cabinet permanent link trunks
- Installs into QuickNet™ Patch Panels on both ends in common interconnect and cross connect architectures, with cassette enabling quick installation into panels
- The most common QuickNet configuration for permanent link trunks
- QuickNet Standard Parts for Asia Pacific: UTP, Cassette-Cassette, white cable, blue jack modules (See p. 13 for more information on standard part numbers)

Cassette to Plug Pack / Cassette to Plug



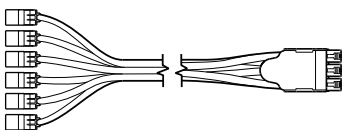
- Similar configuration as above, but with plug pack of six modular plugs on one end or six loose modular plugs
- Typically used for in-cabinet or cabinet-to-cabinet equipment cord harnesses
- Installs into QuickNet™ Patch Panels on one end and switch ports on the other for switch port replication applications
- Plug pack enables quick installation & removal of modular plugs into switch ports

Jack to Jack



- Six loose jack modules on both ends of assembly
- Typically used in cabinet-to-cabinet permanent link trunks
- Installs into Mini-Com™ Modular Patch Panels (or QuickNet™ Patch Panels with panel adapters) on both ends in common interconnect and cross connect architectures
- Compatible with PVIQ™ and PanView™ intelligent modular patching systems

Jack to Plug Pack



- Similar configuration as above, but with plug pack of six modular plugs on one end
- Typically used for in-cabinet or cabinet-to-cabinet equipment cord harnesses
- Installs into Mini-Com™ Modular Patch Panels on one end and switch ports on the other for switch port replication applications
- Plug pack enables quick installation & removal of modular plugs into switch ports

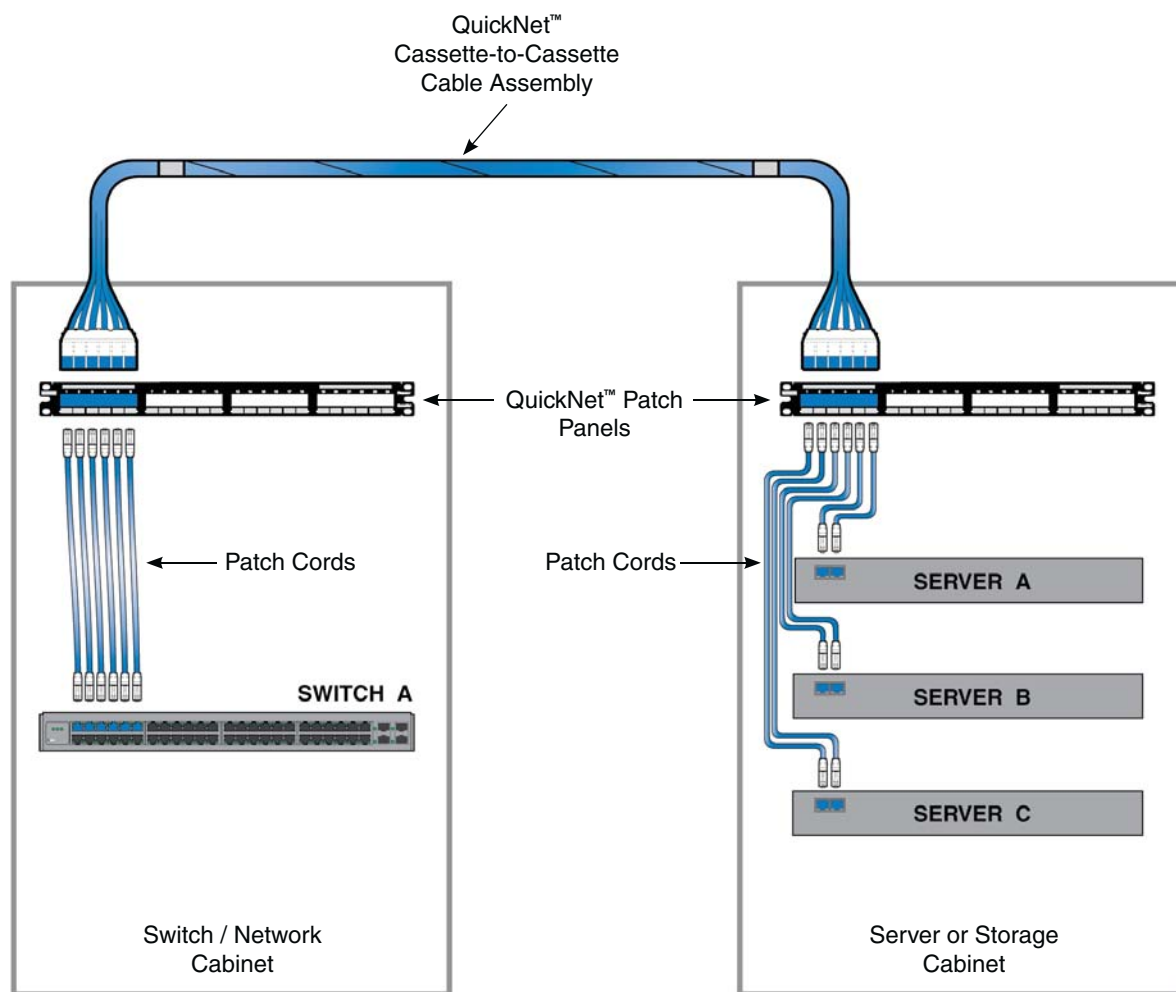
How to Use QuickNet™ Cable Assemblies

The following sections illustrate and describe in greater detail how QuickNet trunks and harnesses are used in common data center cabling configurations.

Two-Connector Interconnect

In this very common data center cabling configuration, a permanent link trunk runs between patch panels on each end, with patch cords used to interconnect the active equipment. Often the panel on one end is in a switch (or network) cabinet, and the panel on the other end is in a server or storage cabinet.

Figure 1 - Two-Connector Interconnect



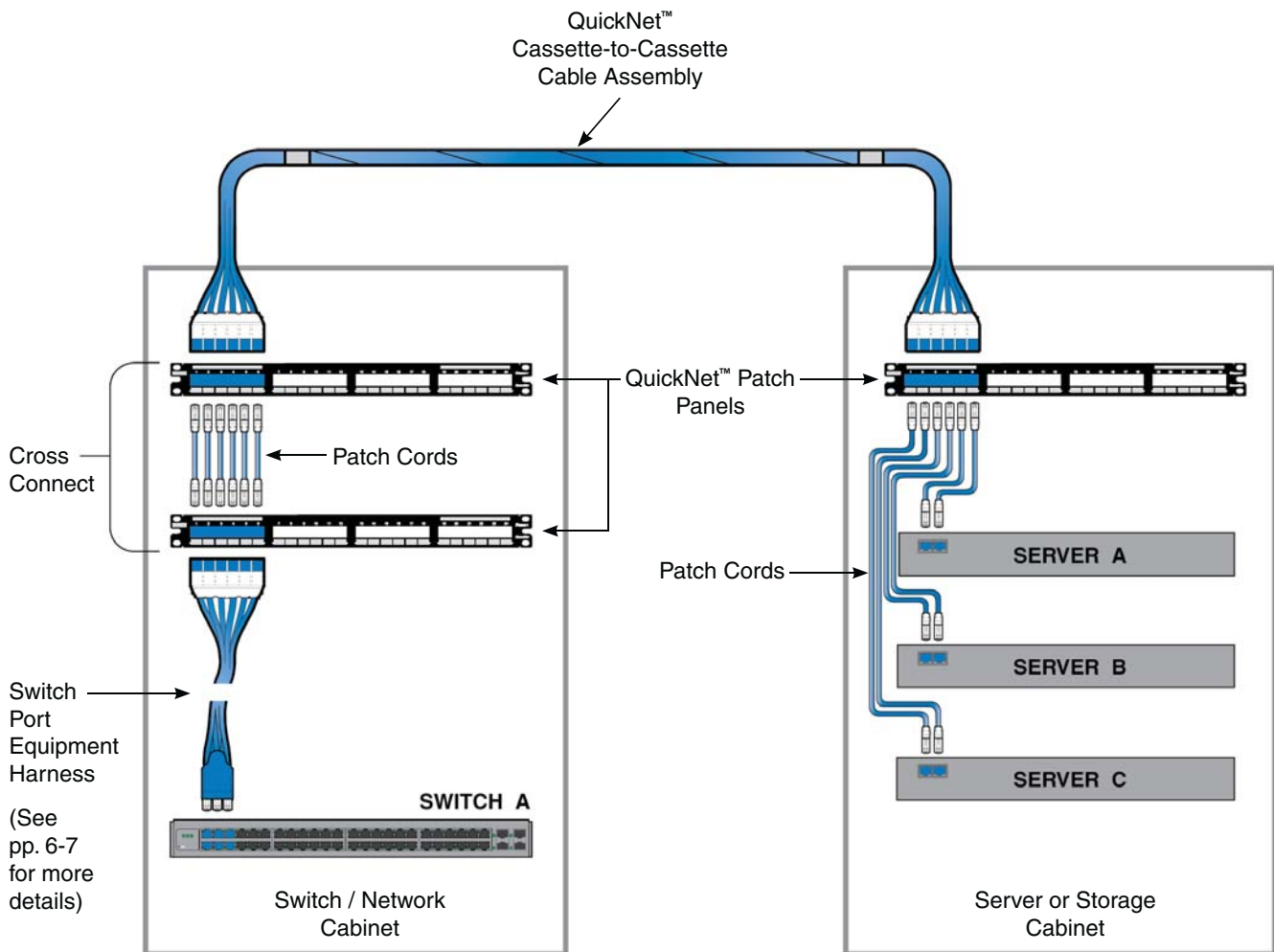
Best QuickNet choice: Cassette-to-Cassette cable assembly used as the permanent link trunk, mated to QuickNet™ Patch Panels at each end.

Alternative QuickNet choice: Cassette-to-Jack or Jack-to-Jack cable assemblies used as the permanent link, mating to Mini-Com™ Modular Patch Panels as appropriate.

Three-Connector Cross Connect

In this data center cabling configuration, a patch field (two or more adjacent patch panels) is created between a switch cabinet and a server or storage cabinet to enable cross connect patching. A switch port equipment harness (or equipment cords) runs from the switch to the cross connect patch panel, a permanent link trunk runs from the cross connect patch panel to the patch panel in the server or storage cabinet, and patch cords are used at the cross connect field and at the server/storage cabinet to connect the active equipment. The cross connect patch field may be located inside the switch cabinet.

Figure 2 - Three-Connector Cross Connect



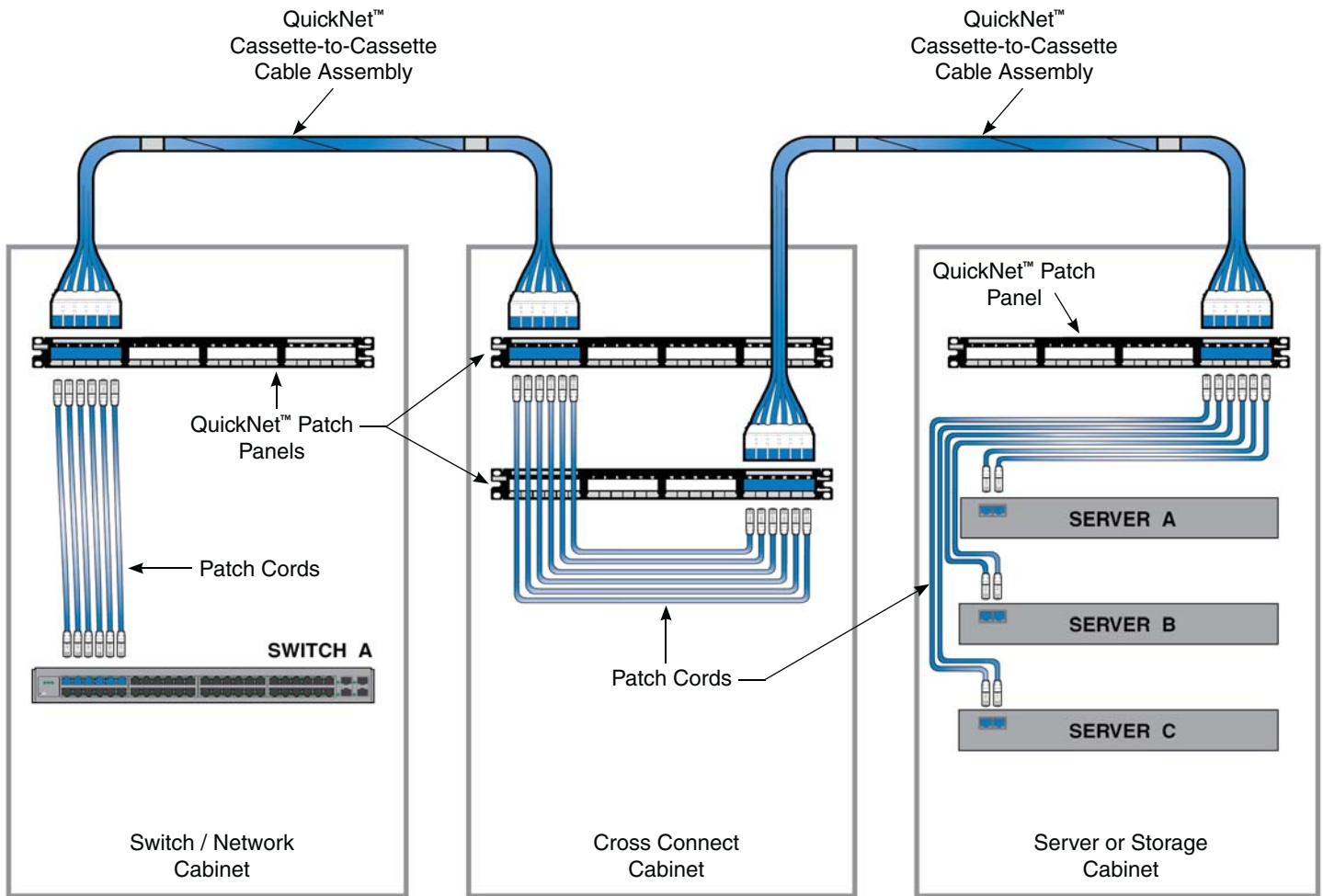
Best QuickNet choice: A Cassette-to-Cassette assembly as the permanent link trunk, mated to QuickNet™ Patch Panels at each end. For the switch port equipment harness, a Cassette-to-Plug Pack assembly (see pp. 6-7 for more switch port harness details).

Alternative QuickNet choice: A Cassette-to-Jack or Jack-to-Jack assembly used as the permanent link, mating to Mini-Com™ Modular Patch Panels as appropriate. For switch port equipment harness, a Cassette-to-Plug or Jack-to-Plug assembly (please see pp. 6-7 for more switch port harness details).

Four-Connector Cross Connect

In this data center cabling configuration, a stand-alone patch field (two or more adjacent patch panels) is created, typically in its own cabinet or adjacent cabinets, and two permanent link trunks are used: one trunk runs from the switch cabinet panel to the cross connect patch panel, and the other trunk runs from the cross connect patch panel to the patch panel in the server/storage cabinet. Patch cords are used at the switch cabinet, the cross connect field, and at the server/storage cabinet to connect the active equipment.

Figure 3 - Four-Connector Cross Connect



Best QuickNet choice: Two Cassette-to-Cassette cable assemblies as the permanent link trunks, mated to QuickNet™ Patch Panels at each end.

Alternative QuickNet choice: Two Cassette-to-Jack or Jack-to-Jack cable assemblies used as the permanent links, mating to Mini-Com™ Modular Patch Panels as appropriate.

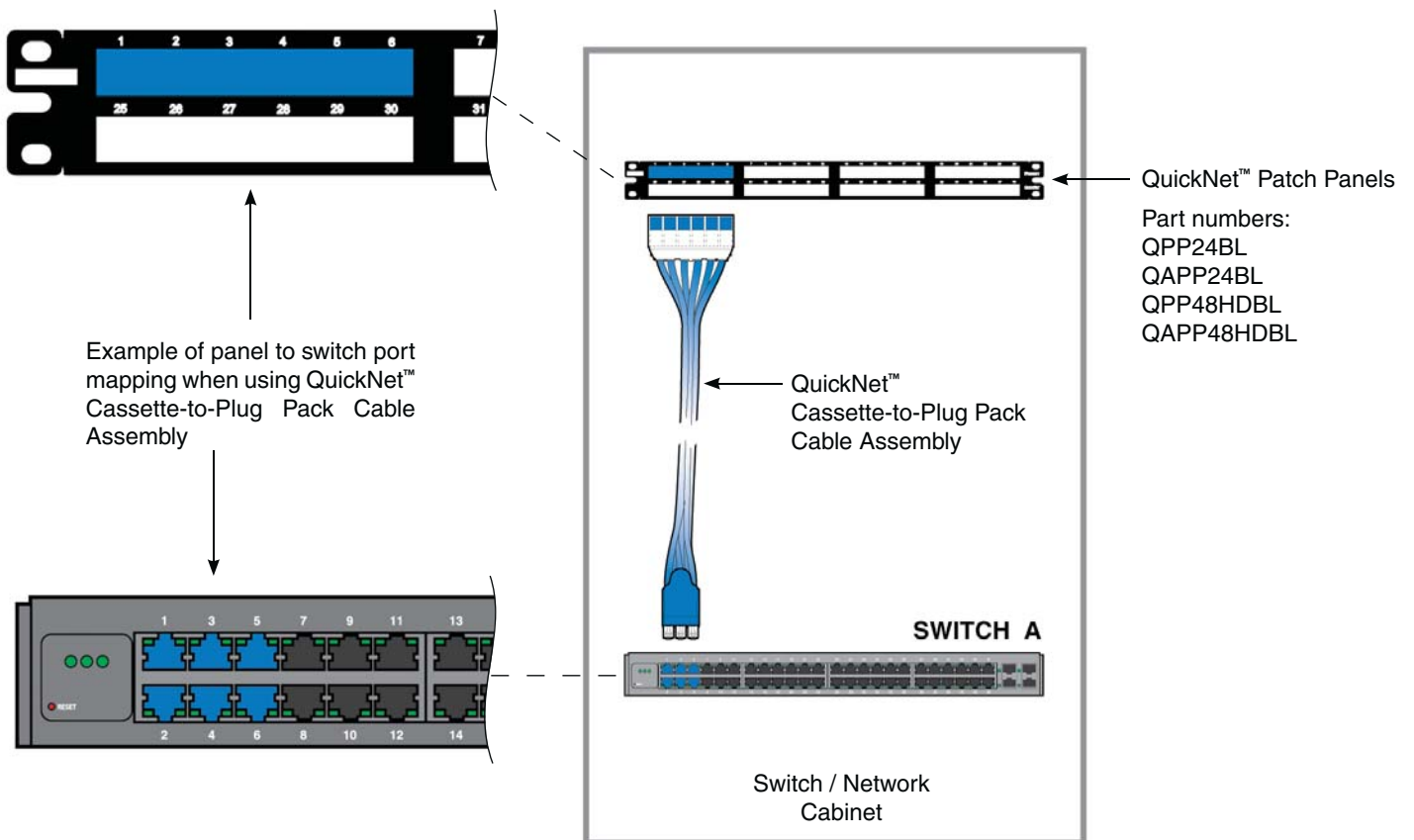
Switch Port Equipment Harnesses

Switch port equipment harnesses, also known as switch port replication harnesses, are increasingly being used to mate to switches and effectively replicate the switch ports to a nearby patch panel, with the advantage of less interface with the switch ports for routine MACs and much quicker changeover times in cases of switch replacement. One end of the switch port harness has modular plugs that mate directly to the ports of the switch, and the other end of the harness connects to a patch panel that may be in the switch cabinet or in a separate cabinet.

There are several QuickNet configurations available for switch port equipment harnesses, with the best choice determined by user and application considerations.

Best QuickNet choice (for quickest installation): A Cassette-to-Plug Pack cable assembly mated to a QuickNet™ Patch Panel at one end and into switch ports on the other.

Figure 4a - QuickNet Cassette-to-Plug Pack Cable Assembly



Switch Port Equipment Harnesses (cont.)

Best QuickNet choices (for replicating switch port layout at panel): Either a Cassette-to-Plug cable assembly mated to a QuickNet™ Patch Panel or a Jack-to-Plug Pack cable assembly mated to a Mini-Com™ Modular Patch Panel.

Note: In both cases, the vertically numbered panels below must be used to correctly replicate the switch port numbering.

Figure 4b - QuickNet™ Cassette-to-Plug Cable Assembly

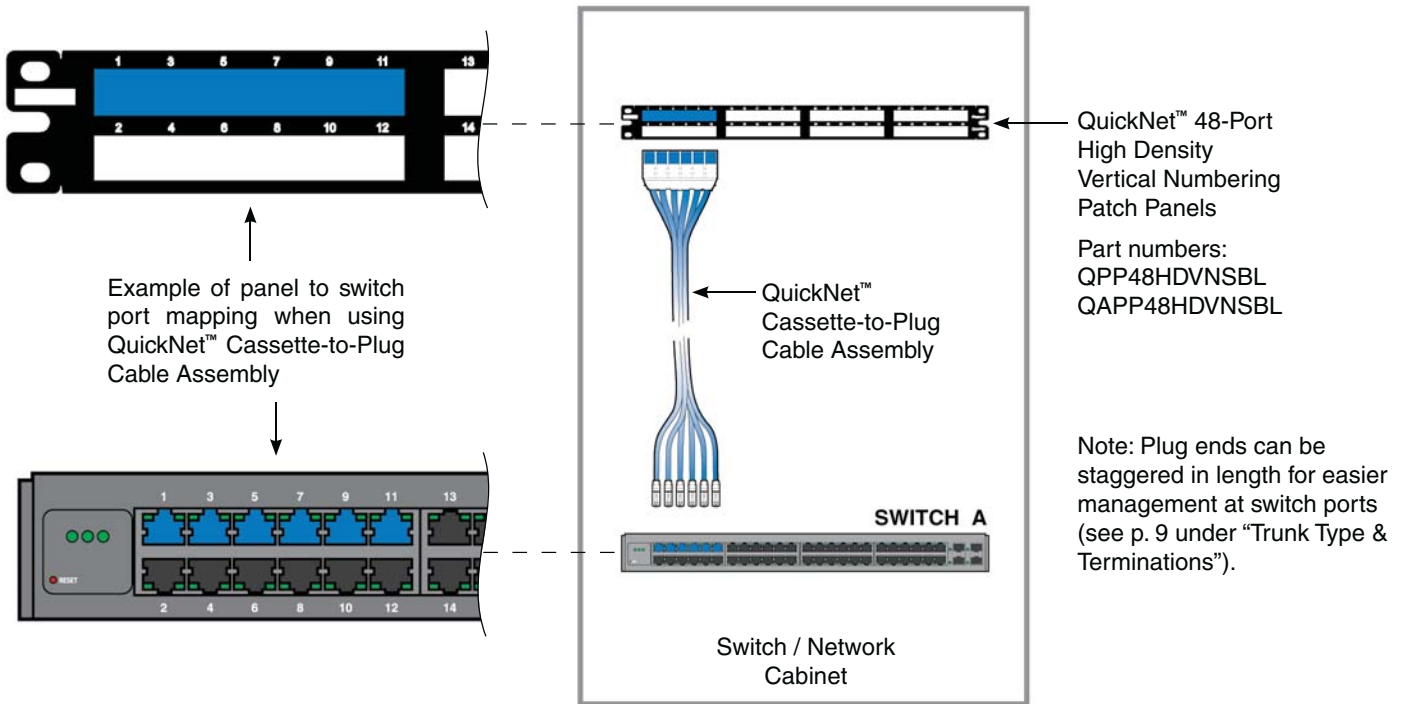
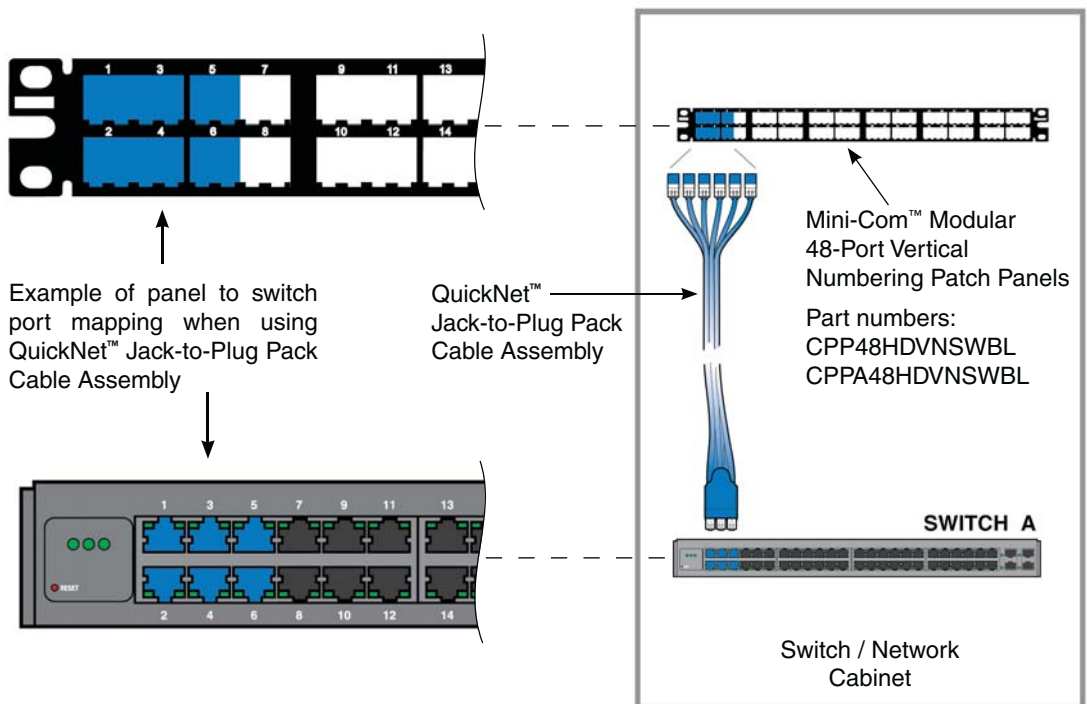


Figure 4c - QuickNet™ Jack-to-Plug Pack Cable Assembly



How to Configure QuickNet™ Cable Assemblies

The QuickNet product family has a wide range of available configuration options from standard “Cassette-to-Cassette” cable assemblies to fully custom assemblies that are user-defined in a number of areas. In this section, each of the main configuration options for QuickNet are explained and typical considerations for data center applications are covered.

Cable Performance Level & Color

The performance level of the cable selected in the assembly indicates the maximum data rate that the cable assembly will support and should be selected to support the active equipment speeds projected over the life of the cabling. Connectivity is matched to the performance level of the cable selected.

Performance level choices are:

- UTP - Category 6, Category 6A or Category 6A SD (Small Diameter)

In QuickNet™ Cable Assemblies, six channels of the selected cable are grouped together and bundled with a spiral-wrapped binder to form a factory-engineered six-cable trunk.

Category 6 cable supports Gigabit data rates, while Category 6A cables support 10 Gigabit data rates, both up to a maximum channel length of 100 meters (328 feet). Category 6A SD (Small Diameter) cable supports 10 Gigabit data rates up to a maximum channel length of 70 meters (229 feet).

Panduit's TX6A™ 10Gig™ UTP Copper Cable with MaTriX Technology provides 10 Gigabit performance in a UTP solution.

Cable color choices for cable performance levels are:

- White or Blue (for LSZH flame ratings)
- Blue (for CM flame ratings)

Note: Other colors may be available for given performance levels and flame ratings. Please contact Panduit customer service for assistance.

QuickNet Standard Parts: Category 6 UTP and Category 6A SD UTP performance levels are available, both with white color cable.

Cable Flame Rating

Cable flame rating choices for all cable types are:

- Low Smoke Zero Halogen (LSZH, IEC 60332-1)
- CM

Note: Other flame ratings may be available for certain cable performance levels. Please contact Panduit customer service for assistance.

QuickNet Standard Parts: LSZH (IEC 60332-1) flame rating on all cable performance levels.

Trunk Type & Terminations

Both ends of a QuickNet™ Cable Assembly include one of a range of factory termination options – each end can be different and are selected based upon the desired application of the trunk or harness within the data center. Color choices are available for several of the termination types.

Termination choices are:

- Cassette with six jack modules
- Six loose jack modules
- Six loose modular plugs
- Plug pack with six modular plugs (one end only)
- Unterminated (one end only)

The most common QuickNet termination combinations for permanent link horizontal cable trunks are Cassette-to-Cassette or Jack-to-Jack. Cassette terminations are preferred for rapid installation and ease of later moves, adds and changes. Loose jack terminations are used when the jack modules must be separated within panels or when used with Mini-Com™ Modular Patch Panels.

For equipment cord harnesses for use in switch port replication applications, Cassette (or Jack) to loose plug (or plug pack) terminations are typically used.

Staggered configurations are available for loose jack and loose plug terminations to assist in dressing the cable trunk or harness to one side or the other.

Termination options color choices are:

- Cassette or jack modules – blue, white, black, green, red, yellow, orange, violet, electric ivory, international grey and off white.
- Modular plugs – all plugs are clear (no color choice).
- Plug packs – blue, white, red, black for standard plug pack. Recessed plug pack is available in silver only.

QuickNet Standard Parts: Termination on both ends is a Cassette with blue jack modules.

Assembly Options

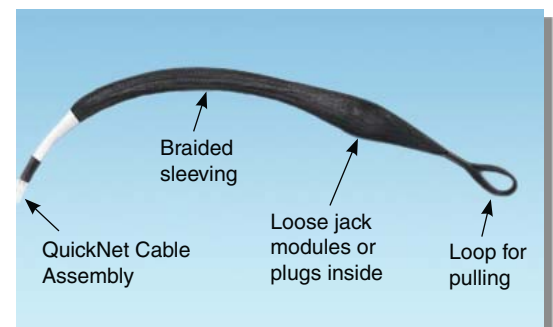
The main assembly options available are:

- Pulling Eye

A pulling eye is a loop of braided sleeve material that is applied to one end of the QuickNet assembly, over either loose jack modules or loose modular plugs, and is used to aid in laying the cable in pathways at deployment.

Note: Pulling eye cannot be used on an end that has cassette termination.

Note: Panduit recommends that all QuickNet assemblies be laid into data center pathways during deployment; however, if pulling of the assemblies is required, care must be taken to ensure the assemblies are not pulled across sharp edges or corners which can damage the spiral binder which holds the cable bundle.



Pulling Eye Option

QuickNet Standard Parts: No assembly option is included.

Labeling

Labeling options are:

- Assembly labels
- Individual cable labels
- Custom labeling

By default, all QuickNet assemblies (both standard and semi-custom) have an assembly label on each end which includes the part number, length, description, and a serialized quality control number. For termination types other than Cassettes, each individual cable has a label indicating the number of the cable within the bundle (from 1 to 6).

Options are available for both custom assembly and custom cable labels. Up to two additional lines of customer-provided information can be added to the assembly or cable labels. Typically custom labels are used by customers to list codes to indicate patch panel or cabinet locations, or to uniquely identify trunks or individual cables.

QuickNet Standard Parts: Default assembly and cable labels are included.

Length of Assembly

Length options are:

- From 3m to 90m, in 0.5 meter increments – for all cable types, except Category 6A SD (Small Diameter) UTP cable
- From 3m to 60m, in 0.5 meter increments – for Category 6A SD (Small Diameter) UTP cable

The length of a QuickNet assembly is the total distance from the terminated connector on one end to the terminated connector on the other. For staggered assemblies, the distance is measured from the longest end of the stagger.

QuickNet Standard Parts: Length options are 5m, 10m, 15m, 20m, 25m, and 30m for all standard QuickNet cable types.

Common QuickNet™ Accessories

(See p. 15 for a full list of QuickNet accessories and part numbers)

QuickNet™ Patch Panels:

- Designed to work with cassette end terminations to enable rapid installation of trunks into panels.
- Available as standard parts in angled or flat versions and in standard density (24 ports in 1 RU) or high density (48 ports in 1 RU).
- Standard QuickNet™ Patch Panels include horizontal numbering. For Cassette-terminated switch port harnesses, QuickNet™ High Density Patch Panels with vertical numbering are available with odd numbers across the top row of ports and even numbers across the bottom (to emulate switch port numbering).
- Standard Mini-Com™ Modular Patch Panels accept loose jack module terminated assemblies.

QuickNet™ Patch Panel Adapter & Panel Blank:

- QuickNet™ Panel Adapters are available to use jack-terminated QuickNet™ Cable Assemblies or other Mini-Com™ Modules in QuickNet™ Patch Panels.
- QuickNet™ Panel Blanks are available to block out temporarily unused openings in QuickNet™ Patch Panels to ensure proper airflow.

QuickNet™ Patch Panels



QuickNet™ Panel Adapter & Panel Blank



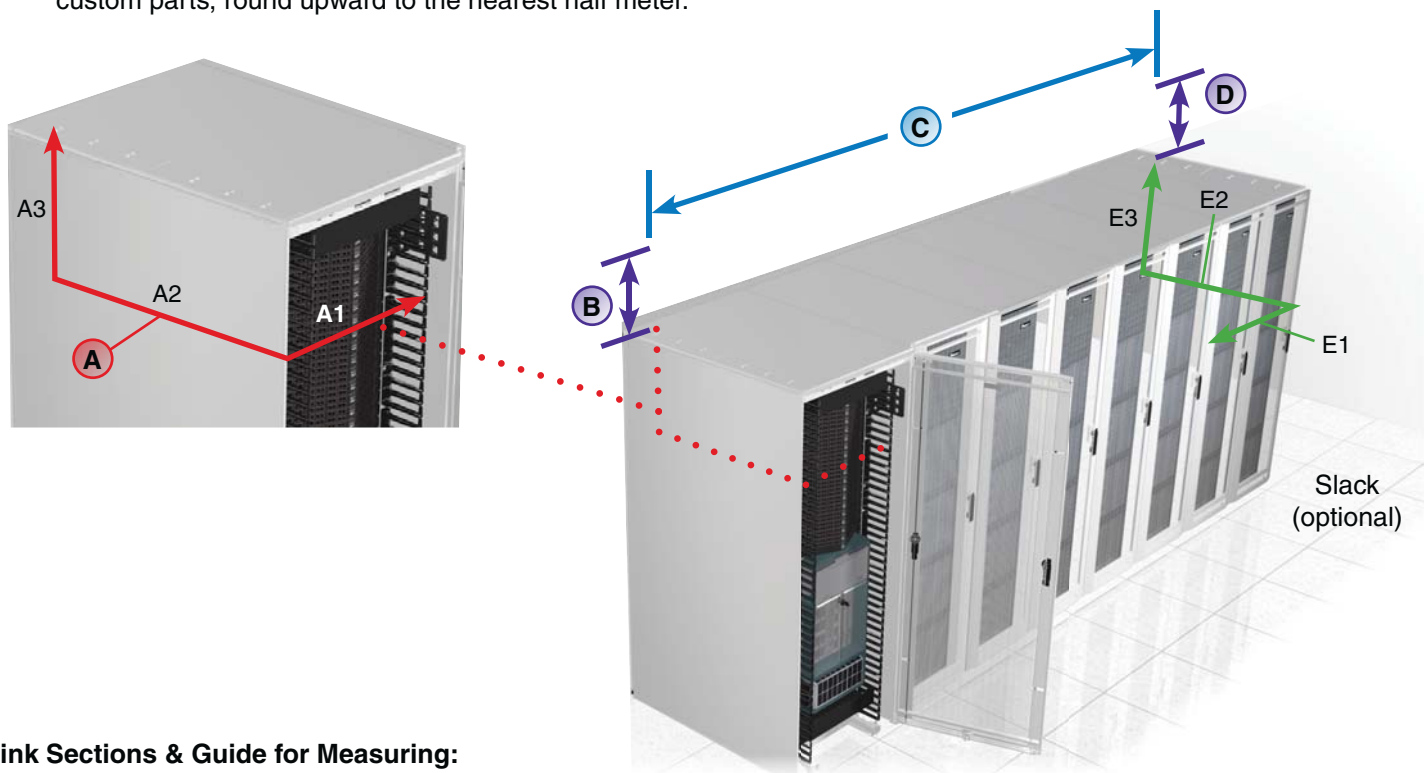
Guide for Measuring QuickNet™ Cable Assembly Lengths

Proper measuring for QuickNet™ Cable Assembly lengths is straightforward but does require some detailed information about the data center layout. For the most accurate length measurements, it is best to work from layout drawings and know the specific equipment to be used, the cabinet dimensions, and the desired positions in the cabinets of patch panels and equipment.

The illustration below shows a typical data center link and the sections that must be considered to properly measure for QuickNet™ Cable Assembly lengths. This example shows an overhead in-row installation. For other configurations, adjust accordingly. (For example, with under-floor configurations, measure down from the panels to the pathway).

Recommended Steps for Measuring QuickNet™ Cable Assembly Lengths:

1. Calculate or measure the length of each section of the link.
2. Add up all the section lengths, including the buffer length. ($A + B + C + D + E + F + \text{Slack}$)
3. Round the total upward to the nearest full meter to get the minimum QuickNet™ Cable Assembly length. For semi-custom parts, round upward to the nearest half meter.

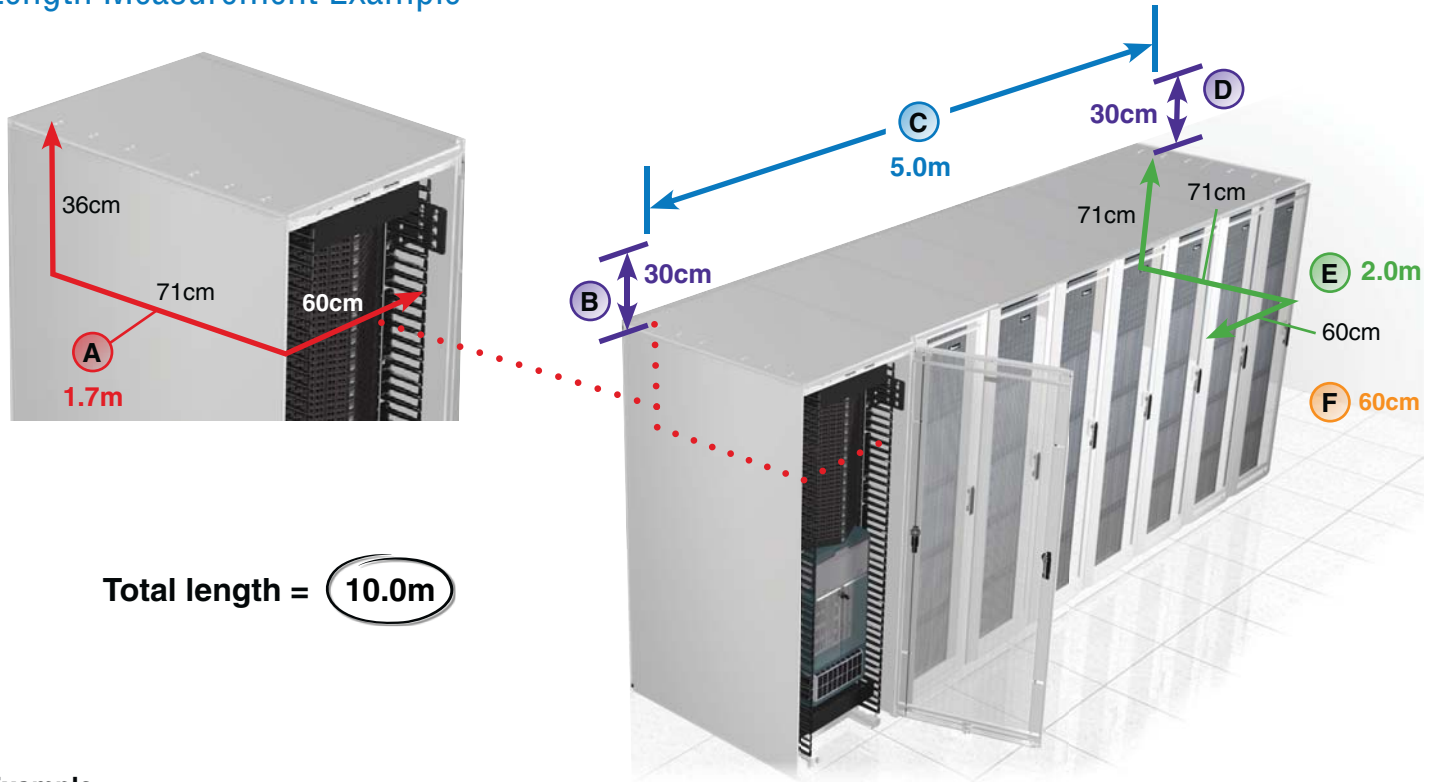


Link Sections & Guide for Measuring:

- A** – **In-cabinet length:** The total length of the cable inside the cabinet including three distances, $A1 + A2 + A3$:
 - A1 – Horizontal distance along patch panel to vertical manager – Panduit recommends 60cm to allow for cable routing.
 - A2 – Horizontal distance from panel to location of cable entry/exit point in cabinet – this can vary depending upon where the cable pathway is located above (or below) the cabinet.
 - A3 – Vertical distance from panel to cable entry/exit point in cabinet – found by multiplying the number of rack units that the panel is away from the entry/exit point and multiplying by 44.5mm.
- B** – **Cabinet-to-pathway length:** The distance from the top of the cabinet to the cable pathway.
- C** – **Length along pathway:** The total distance along the pathway between the cabinet entry/exit points.
- D** – **Pathway-to-cabinet length:** Similar to B.
- E** – **In-cabinet length:** Similar to A, remember to include lengths for all three distances, $E1 + E2 + E3$.
- F** – **Buffer length (recommended):** An additional amount of length to account for cable bulk in pathways and the lengths of cable bends – Panduit recommends a minimum of 60cm.

Slack (optional): Additional length determined by user to allow for later movement of assemblies within the cabinet (for example, for later moves, adds, or changes).

Length Measurement Example



Total length = **10.0m**

Example:

- A** – In-cabinet length = **1.7m** (60cm + 71cm + 36cm)
 - A1 – Horizontal distance along patch panel = 60cm
 - A2 – Horizontal distance from panel to cable entry/exit point = 71cm
 - A3 – Vertical distance from panel to cable entry/exit point = 36cm (8 x 44.5mm), assuming panel is 8 RU from cabinet top.
- B** – Cabinet-to-pathway length = **30cm**
- C** – Length along pathway = **5.0m** (assuming seven 60cm wide server cabinets and cable exit on far side of 76cm wide network cabinet = (7 x 60cm) + 76cm)
- D** – Pathway-to-cabinet length = **30cm**
- E** – In-cabinet length = **2.0m** (60cm + 71cm + 71cm, same as A above but with panel at 16 RU from cabinet top so E3 = 71cm)
- F** – Buffer length = **60cm**

Slack length = none for this example

Total length = (A+B+C+D+E+F) = (1.7m + 30cm + 5.0m + 30cm + 2.0m + 60cm) = 9.9m, round up to **10.0m**

Tips for Measuring Lengths:

- The specified length of a QuickNet™ Cable Assembly is the distance as measured from the front of the connector on one end to the front of the connector on the other end. Other than a nominal manufacturing tolerance there is no additional length built into a QuickNet™ Cable Assembly.
- Remember to account for any turns or obstructions in the pathway that may lead to additional length needed (for example, ducting, support posts, etc.).
- Cable assembly bend radius limits must be taken into consideration, especially for multiple turns within cabinets or as the cable assembly transitions to or from the pathways, and may require additional length of the assembly.

QuickNet™ Cable Assembly Standard Part Numbers

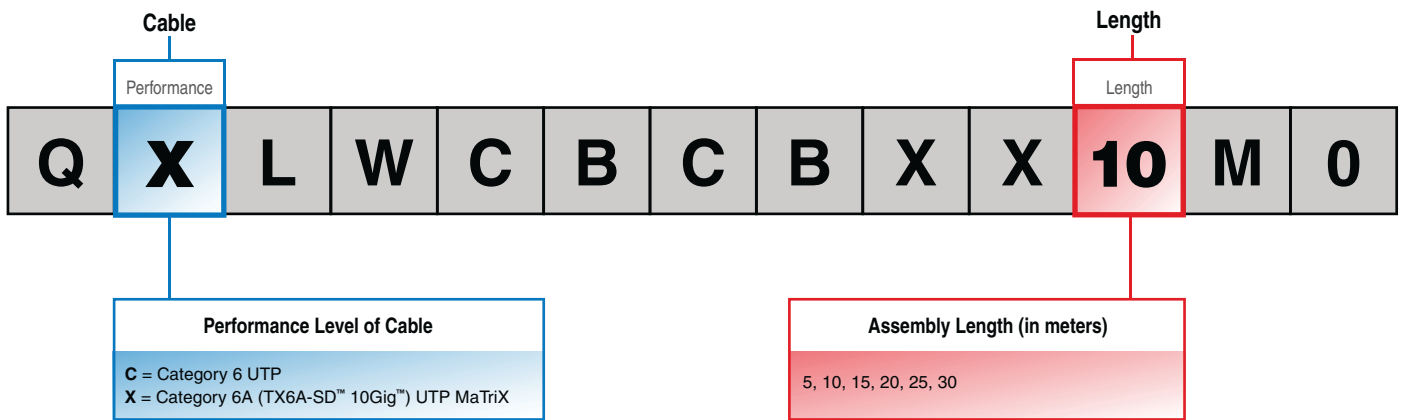
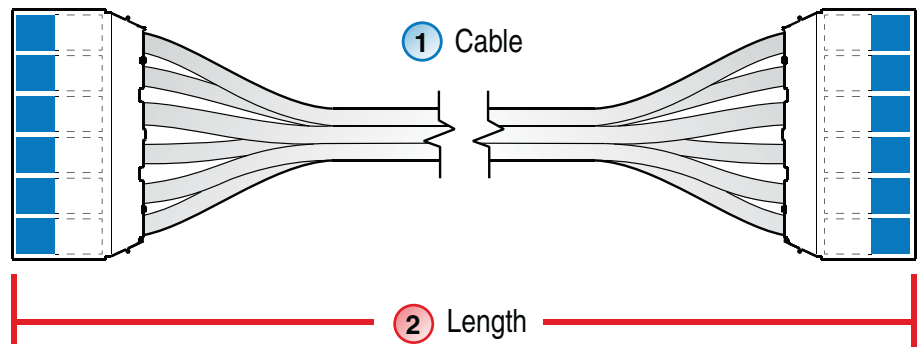
QuickNet standard parts are the most common QuickNet™ Cable Assembly configurations and are the most readily available. All parts have list prices and many are in stock.

All QuickNet Standard Parts include:

- Cassette-to-Cassette configuration with white cable, blue jack modules, and no additional options.

Steps to Select:

- 1 Select Performance Level of Cable
- 2 Select Assembly Length (in meters)



Above part number: Category 6A SD UTP MaTriX LSZH White Cable, Cassette-Cassette (Blue Jack Modules), 10m

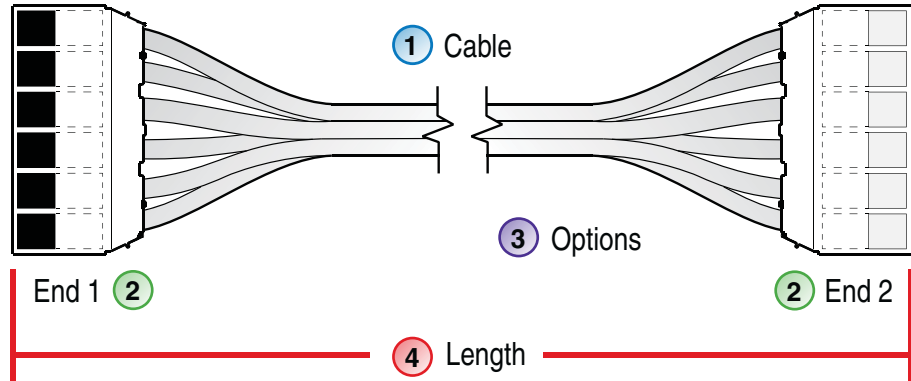
Other part number example:

QCLWCBCBXX20M0 Category 6 UTP LSZH White Cable, Cassette-Cassette (Blue Jack Modules), 20m

Selection Guide for QuickNet™ Cable Assembly Semi-Custom Part Numbers

Steps to Select:

- 1 Select Cable Options
- 2 Select Ends 1 & 2
- 3 Select Options
- 4 Select Length



QuickNet	Cable			End 1		End 2		Options		Length		
	Performance	Flame Rating	Color	Termination	Color	Termination	Color	Assembly	Labeling	Length	Meter	Additional Length
Q	X	C	W	C	L	C	W	X	L	37	M	5

Performance Level of Cable

C = Category 6 UTP
X = Category 6A (TX6A-SD™ 10Gig™) UTP MaTriX**
Z = Category 6A (TX6A™ 10Gig™) UTP MaTriX

Cable Flame Rating

C = LSZH
L = LSZH

Cable Color

W = White
B = Blue

Termination Method / Color

End 1 or End 2 Options:
C = Cassette
J = Jack modules
P = Modular plugs
K = Jack modules staggered right
L = Jack modules staggered left
Q = Modular plugs staggered right
S = Modular plugs staggered left

Jack Module Color Options:
A = Arctic White, **B** = Blue, **E** = Electric Ivory, **G** = Green, **H** = Off White, **I** = International Grey, **L** = Black, **O** = Orange, **R** = Red, **V** = Violet, **W** = White, **Y** = Yellow

Shielded Jack Modules: Chose option **L** (all Shielded Jack Modules are Black)

Modular Plug Color Options:
X = All modular plugs are clear

End 2 ONLY Options:
A = Plug pack (6-pack)
R = Recessed plug pack (6-pack)
U = Underminated
O = Underminated with cassette and jack modules for on-site termination

Plug Pack Color Options:
B = Blue, **W** = White, **R** = Red, **L** = Black

Recessed Plug Pack Color Option:
S = Silver

Underminated Color Option:
X = No color option available

Assembly Options

P = Pulling eye†
X = No options requested

Custom Labeling*

L = Custom assembly label
C = Custom cable labels
B = Custom assembly and cable labels
X = No custom labels

Assembly Length**

3m to 90m
 (one meter increments)

Additional Length

0 = No additional length
5 = 0.5m additional length

Above part number: Category 6A SD UTP MaTriX CM White Cable, Cassette (Black Jack Module) - Cassette (White Jack Module), Custom Assembly Label, 37.5m

*Custom cable assembly labels are available up to eighteen characters; individual cable labels are available up to fifteen characters.

**For cable assemblies constructed of Category 6A S/FTP Stranded (TX6A™ 10Gig™) Copper Cable or Category 6A (TX6A-SD™ 10Gig™) UTP MaTriX Copper Cable, the maximum length is 60m.

†Pulling eye cannot be used on an end that has cassette termination.

QuickNet™ Accessory Part Numbers

The part numbers and brief descriptions for common QuickNet accessories are shown below.



QAPP24BL



QASP24BL



QAPP48HDBL



QASP48HDBL



QPP24BL



QSP24BL



QPP48HDBL



QSP48HDBL



QPPABL



QPPBBL

Part Number	Part Description	No. of Rack Spaces	Std. Pkg. Qty.	Std. Ctn. Qty.
QuickNet™ Angled Patch Panels				
QAPP24BL	24-port angled patch panel which accepts QuickNet™ Pre-Terminated Cassettes and Patch Panel Adapters.	1	1	10
QASP24BL	24-port, all metal angled patch panel which accepts QuickNet™ Pre-Terminated Shielded Cassettes and Patch Panel Adapters.	1	1	10
QAPP48HDBL	48-port angled patch panel which accepts QuickNet™ Pre-Terminated Cassettes and Patch Panel Adapters.	1	1	10
QAPP48HDVNSBL	48-port angled patch panel which accepts QuickNet™ Pre-Terminated Cassettes and Patch Panel Adapters. Numbering sequence is top to bottom across patch panel.	1	1	10
QASP48HDBL	48-port, all metal angled patch panel which accepts QuickNet™ Pre-Terminated Shielded Cassettes and Patch Panel Adapters.	1	1	10
QuickNet™ Flat Patch Panels				
QPP24BL	24-port patch panel which accepts QuickNet™ Pre-Terminated Cassettes and Patch Panel Adapters.	1	1	10
QSP24BL	24-port, all metal patch panel which accepts QuickNet™ Pre-Terminated Shielded Cassettes and Patch Panel Adapters.	1	1	10
QPP48HDBL	48-port patch panel which accepts QuickNet™ Pre-Terminated Cassettes and Patch Panel Adapters.	1	1	10
QPP48HDVNSBL	48-port patch panel which accepts QuickNet™ Pre-Terminated Cassettes and Patch Panel Adapters. Numbering sequence is top to bottom across patch panel.	1	1	10
QSP48HDBL	48-port, all metal patch panel which accepts QuickNet™ Pre-Terminated Shielded Cassettes and Patch Panel Adapters.	1	1	10
Patch Panel Adapter				
QPPABL	QuickNet™ Patch Panel Adapter which accepts Mini-Com™ Modules for UTP, fiber optic, and audio/visual applications.	—	1	10
Patch Panel Blank				
QPPBBL	QuickNet™ Patch Panel Blank reserves space for future use and promotes proper airflow and cooling.	—	1	10
Patch Panel Label Kit				
QPPLC24	Label/label cover kit for 24-port QuickNet™ Patch Panels. Each kit contains four labels and four clear label covers per bag.	—	1	10

PANDUIT

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