

### PB373

#### Shielded Cabling Systems

Belden's complete portfolio of shielded Category 6A, Category 6 and Category 5e Systems offer superior performance, outstanding reliability and effective noise immunity in the most demanding installation environments.



#### Belden® Shielded Cabling Systems

- Industry-leading performance in Shielded Systems
- Choice of Category 6A, Category 6 and Category 5e Systems
- Superior immunity against EMI/RFI and Alien Crosstalk noise
- Innovative features reduce costs while maximizing reliability and performance

As their name implies, shielded twisted-pair cabling systems utilize an internal metallic shield as their primary defense against EMI and Alien Crosstalk noise impairments. Today's shielded cables use different shielding materials and different design strategies that shield either the overall cable, the individual pairs within the cable, or both (Table 1).

Both shielded and unshielded technologies have proven effective in providing noise immunity, and each approach has its own comparative strengths and advocates. So the question of shielded versus unshielded is really a matter related to each network's specific needs and the network manager's preference, comfort and choice in addressing those needs. If that choice favors shielded, then a Belden Shielded Cabling System provides superior performance and reliability in even the most demanding networking environments.

#### Ideal for severe noise environments

Belden Shielded Cabling Systems are particularly well suited and beneficial in installation environments subject to severe EMI/RFI conditions, as often found in hospitals and healthcare facilities, certain government facilities and some modern data centers. Networks with high density Category 6A infrastructure, such as found in some data centers, will also benefit from the superior Alien Crosstalk immunity offered by Belden's 10GX Shielded Cabling System. The light industrial and gaming markets may also be interested in the performance and reliability advantages of Belden's 2400 Shielded Cabling System (Category 6) and 1200 Shielded Cabling System (Category 5e).

Table 1

ISO/IEC 11801 Cable Naming Convention		
Acronym	Cable Shielding	Pair Shielding
U/UTP	None	None
U/FTP	None	Foil
F/UTP	Foil	None
S/FTP	Braided	Foil
SF/UTP	Foil, Braided	None

TP=Twisted Pair • U=Unshielded • S=Braided Shield

One Enterprise.  
One Infrastructure.  
One Partner.

## Why Use Belden Shielded Cabling Systems?

Belden's U/UTP cabling systems have always been at the forefront of technology innovation and performance leadership. Exclusive, patented features such as 'bonded-pair' cable construction and patented noise cancelling have established our 10GX System as the industry's clear performance leader in Category 6A cabling systems.

Why is this important? Belden's shielded systems incorporate many of these patented U/UTP features **in addition** to the benefits of a physically shielded design. The result: a complete portfolio of shielded cabling systems with multiple layers of defense against EMI/RFI and Alien Crosstalk impairments that can reduce network performance and reliability. Only Belden integrates patented U/UTP features with an innovative F/UTP design to create the industry's leading portfolio of shielded cabling systems.

Belden Shielded Cabling System advantages:

- Guaranteed bandwidth and performance margins beyond industry standards
- Shielding integrity features that reduce failures and increase reliability
- Bonded-pair technology protects against installation stresses; maintains pair balance
- Flexible and small OD cable with fast and easy termination in 'tool-less' connectors
- Shielded metallic jacks with color-coding feature for simplified network management
- KeyConnect Shielded Patch Panels with ground wire meet TIA-607-B requirements
- Shielded modular cords meet/exceed TIA mechanical stress test requirements as previously specified in TIA 568-B.2 Annex F, Clause F.4.3.1
- Fully compliant 2-connector channels as short as 3.6 meters – especially important in data center applications
- All shielded systems are eligible for Belden's IBDN System Certification Program, including guaranteed installed performance, lifetime Application Assurance, and a 25-year labor-included Product Warranty

Use Belden's 10GX Shielded System for Category 6A applications, 2400 Shielded System for Category 6 applications, and 1200 Shielded System for Category 5e applications.

### 10GX System Overview

The ultimate in EMI/RFI and Alien Crosstalk immunity delivers unsurpassed 10 Gigabit Network performance and reliability.

Belden's 10GX Shielded System is ideal for any application where enhanced noise immunity is required, including environments with high EMI/RFI conditions. The 10GX Shielded System has been specifically engineered to address the mission-critical networking needs found in today's data centers, server farms, storage area networks, network access nodes and high-traffic campus backbones.

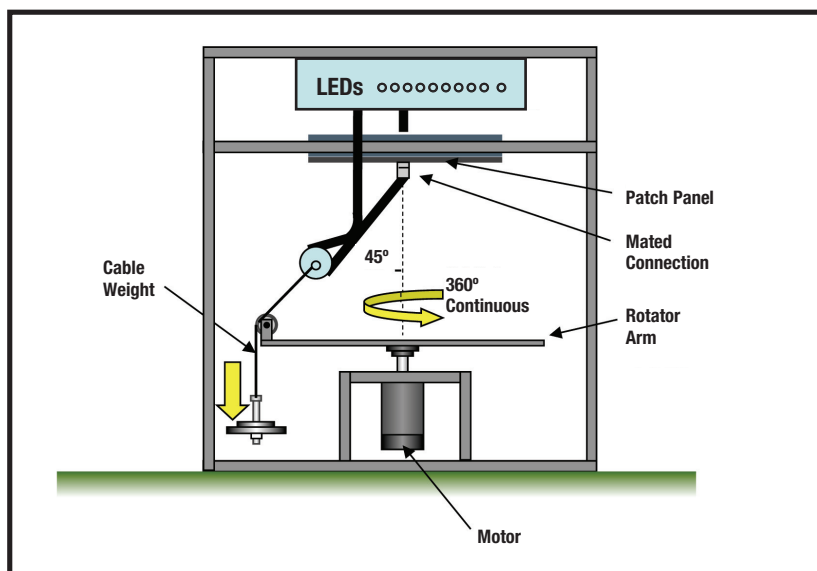
If your network is supporting bandwidth-intensive, error-sensitive applications such as uncompressed high-res digital video, medical imaging, digital animation, CAD/CAM, high-speed data storage or cluster computing, your users will benefit from a 10GX Shielded Cabling System infrastructure.

Belden's 10GX Shielded System is the industry's clear performance leader in 10 Gigabit shielded cabling systems, exceeding all performance specifications of ANSI/TIA-568-C.2 (Category 6A), ISO/IEC 11801 (Class E<sub>A</sub>), and EN 50173-1 (Class E<sub>A</sub>).

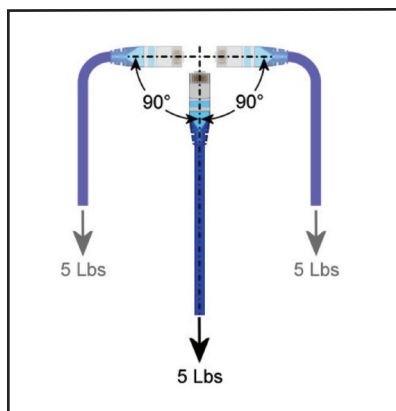
### Noise Immunity

Coupling attenuation is a measure of the relative noise immunity of shielded components (cables, connectors and cords) as well as shielded channels. Different levels of noise immunity are defined in the ANSI/TIA-1005 Industrial Cabling Standard for shielded channels corresponding to MICE classifications E1, E2 or E3. The electromagnetic environment for Class E1 resembles that of a commercial office building. The electromagnetic environment for Class E2 and E3 are increasingly more severe, where E3 resembles the environment in proximity to heavy machinery.

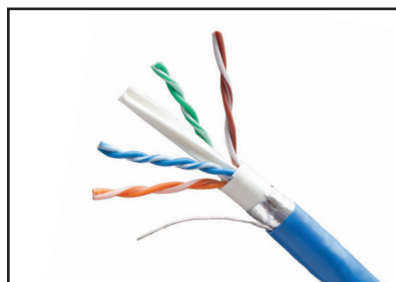
Belden has tested the coupling attenuation of the 10GX shielded cabling system in accordance with the test procedure specified in EN-50289-1-15. Belden's 10GX shielded systems meet and exceed the requirements of ANSI/TIA-1005 standard at the highest level of severity for a Class E3 environment.



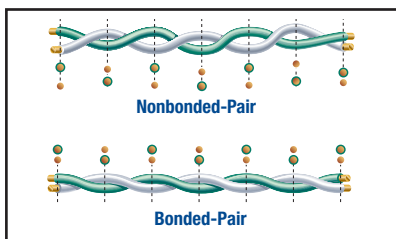
**Figure 1:** The Wiggle Test is a severe test that is used to evaluate the integrity of the mated plug/jack connection and the risk of loss of electrical continuity.



**Figure 2:** The Flex Fatigue Test verifies the mechanical integrity of patch cord terminations to lateral 180 degrees flexions under 5 lbs of tension until an electrical open occurs.



F/UTP Dual Jacket Design



Bonded-Pair Cables

For shielded systems, ensuring the integrity of the shield at the cable and connectivity component level is a critical first step in ensuring the end-to-end integrity of the shielded system once installed in your network. Examples of Belden's commitment to ensuring shield integrity at the component level can be seen in two mechanical endurance tests that were developed for 10GX Shielded System patch cords and pre-terminated cable assemblies. Our Wiggle (Gorilla) Test (*Figure 1*) and Flex Fatigue Test (*Figure 2*) verify the mechanical integrity of both the conductors and the shield in factory-terminated cable assemblies and patch cords.

### Two Powerful Enabling Technologies:

Integrating an innovative F/UTP Dual Jacket design with patented cable and connector technologies provides a multi-faceted, synergistic approach to achieving superior cabling performance and reliability for 10 Gigabit Ethernet networks.

### F/UTP Dual Jacket Design

Belden's F/UTP Dual Jacket design provides a continuous foil cable shield with 100% cable coverage. The foil is sandwiched between the dual jackets, protecting the foil's integrity and reducing impedance variability. The result is robust, small OD, flexible cable that meets TIA's 4x bend radius requirements and stands up to installation stresses and manipulation.

### Bonded-Pair Cables

Belden's patented Bonded-Pair Cable construction bonds each conductor in a twisted pair to each other along their longitudinal axes. This maintains the relative positioning of each conductor to its partner throughout the stresses of initial installation and subsequent manipulations over the cable's installed lifetime. This is a key aspect in achieving consistently superior electrical performance with less trouble-shooting and greater reliability over an extended operational lifespan.

## Belden Shielded System Components: Key Features

Shielded System Cables	10GX	System 2400	System 1200
F/UTP Dual Jacket Design	X		
Bonded-Pair Technology	X		
Meets TIA-568-C.2 and exceeds link/channel specifications in Belden Shielded Cabling Systems	Category 6A	Category 6	Category 5e
Meets 4X Bend Radius Requirements	X	X	X
Shielded Modular Jacks	10GX	System 2400	System 1200
2-piece die-cast metal construction	X	X	X
Tool-less termination with color-coded Wire Guide simplifies installation and increases quality	X	X	X
Shielding Shutter with 360° coverage for superior shield contact/integrity	X	X	X
High-tensile Spring Shield Contacts for superior shield contact/integrity	X	X	X
Meets and exceeds TIA-568-C.2 specifications for Plug-Jack mated connections	Category 6A	Category 6	Category 5e
Color-coding option facilitates network management	X	X	X
KeyConnect Shielded Patch Panels	10GX	System 2400	System 1200
Robust all-metal construction	X	X	X
Flush- or Angled-front in 24-Port, 1U and 48-Port, 2U configurations	X	X	X
Meets TIA-568-C.2 component specifications	X	X	X
Meets TIA-607-B grounding/bonding specs; ground lug and UL-listed 12 AWG stranded cable included	Category 6A	Category 6	Category 5e
Integrated cable management features facilitate cable dressing and proper bend radius	X	X	X
10GX Shielded Modular Cords	10GX	System 2400	System 1200
Bonded-Pair technology assures stable electrical performance with repeated use over time	X		
Small OD, flexible patch cable	X	X	X
Small boot design for use in high-density 48-Port, 1U Patch Panels	X	X	X
Robust design and durable materials assure shielding integrity	X	X	X

Detailed Technical Data Sheets, Installation Guides & Videos, Third-party (ETL) Channel Test Certificates and other collateral are available at [www.belden.com](http://www.belden.com) or by contacting Belden's Technical Support Department.



## 10GX Shielded Cabling System (Field-Terminated)

### 10GX Shielded System Cable

Description	Belden Part Number		
	CMR	CMP	LSZH
<b>10GX, Nonbonded-Pair, 4-pair, 23 AWG, Category 6A, F/UTP</b>			
Yellow, 305 m (1000 ft)	10GX52F 0041000	10GX53F 0041000	—
Blue, 305 m (1000 ft)	10GX52F 0061000	10GX53F D151000	—
Gray, 305 m (1000 ft)	10GX52F 0081000	10GX53F 0081000	—
White, 305 m (1000 ft)	10GX52F 0091000	10GX53F 0091000	—
Black, 305 m (1000 ft)	10GX52F 0101000	10GX53F 0101000	—
Purple, 305 m (1000 ft)	—	—	Available soon
<b>10GX, Bonded-Pair, 4-pair, 23 AWG, Category 6A, F/UTP</b>			
Yellow, 305 m (1000 ft)	10GX62F 0041000	10GX63F 0041000	—
Blue, 305 m (1000 ft)	10GX62F 0061000	10GX63F D151000	—
Gray, 305 m (1000 ft)	10GX62F 0081000	10GX63F 0081000	—
White, 305 m (1000 ft)	10GX62F 0091000	10GX63F 0091000	—
Black, 305 m (1000 ft)	10GX62F 0101000	10GX63F 0101000	—
Purple, 305 m (1000 ft)	—	—	Available soon

### 10GX Modular Jacks

Description	Belden Part Number
10GX Shielded KeyConnect Modular Jack, Metallic	AX104562
KeyConnect Color-coded Icon Kit for Shielded Jacks	AX104632-XX

Replace -XX by: Red-RD, Orange-OR, Yellow-YE, Green-GN, Blue-BL, Purple-PR, White-EW, Black-BK

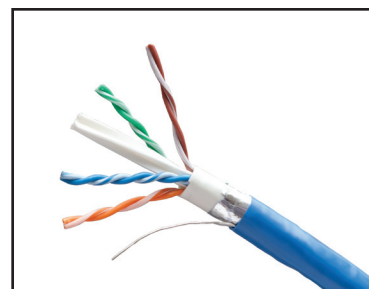
### Modular Patch Panels

Description	Belden Part Number
KeyConnect Shielded Patch Panel, 24-port, 1U, Titanium (Empty)	AX104563
KeyConnect Shielded Patch Panel, 48-port, 2U, Titanium (Empty)	AX104564
KeyConnect Shielded Angled Patch Panel, 24-port, 1U, Titanium (Empty)	AX104622
KeyConnect Shielded Angled Patch Panel, 48-port, 2U, Titanium (Empty)	AX104623

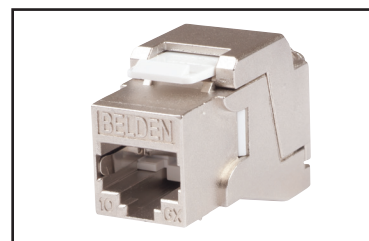
### 10GX Shielded Modular Cords

Description	Belden Part Number			
	Blue	Gray	White	Black
<b>10GX Shielded Patch Cords, Bonded-Pair, 4-pair, 24 AWG Solid, T568A/B - T568A/B, CMR</b>				
2ft (0.6m)	CAF1106002	CAF1108002	CAF1109002	CAF1100002
4ft (1.2m)	CAF1106004	CAF1108004	CAF1109004	CAF1100004
7ft (2.1m)	CAF1106007	CAF1108007	CAF1109007	CAF1100007
10ft (3.0m)	CAF1106010	CAF1108010	CAF1109010	CAF1100010
15ft (4.6m)	CAF1106015	CAF1108015	CAF1109015	CAF1100015
25ft (7.6m)	CAF1106025	CAF1108025	CAF1109025	CAF1100025
xxx*	CAF1106xxx	CAF1108xxx	CAF1109xxx	CAF1100xxx
Description	Belden Part Number			
	CMR Blue	CMR Gray	CMP Blue	CMP Gray
<b>10GX Shielded Pigtails, Bonded-Pair, 4-pair, 23 AWG Solid, T568A - open</b>				
15ft (4.6m)	CAF1206015	CAF1208015	CAF2206015	CAF2208015
25ft (7.6m)	CAF1206025	CAF1208025	CAF2206025	CAF2208025
35ft (10.6m)	CAF1206035	CAF1208035	CAF2206035	CAF2208035
50ft (15.2m)	CAF1206050	CAF1208050	CAF2206050	CAF2208050
xxx*	CAF1206xxx	CAF1208xxx	CAF2206xxx	CAF2208xxx
<b>10GX Shielded Pigtails, Bonded-Pair, 4-pair, 23 AWG Solid, T568B - open</b>				
15ft (4.6m)	CAF1306015	CAF1308015	CAF2306015	CAF2308015
25ft (7.6m)	CAF1306025	CAF1308025	CAF2306025	CAF2308025
35ft (10.6m)	CAF1306035	CAF1308035	CAF2306035	CAF2308035
50ft (15.2m)	CAF1306050	CAF1308050	CAF2306050	CAF2308050
xxx*	CAF1306xxx	CAF1308xxx	CAF2306xxx	CAF2308xxx

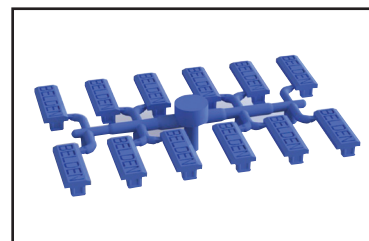
\*xxx = available 6ft to 50ft in increments of 1ft; 55ft to 295ft in increments of 5ft.



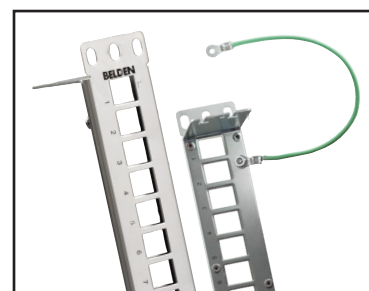
10GX Shielded System Cable



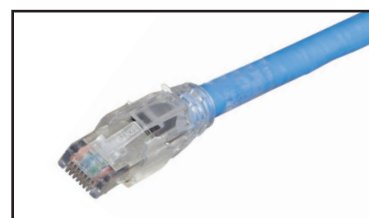
10GX Shielded KeyConnect Modular Jack



Color Coded Icon Kit



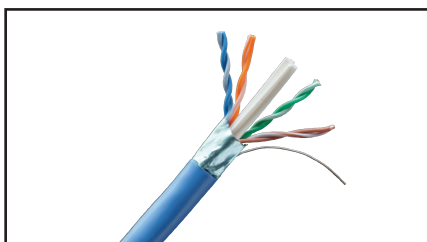
10GX Shielded Modular Patch Panel (Empty)



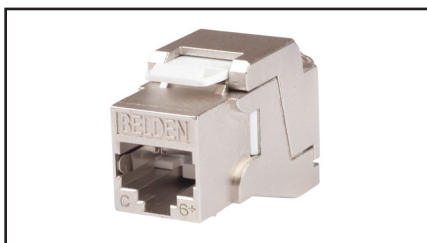
10GX Shielded Modular Cord



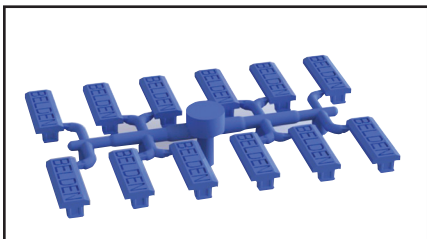
## 2400 Shielded Cabling System (Field Terminated)



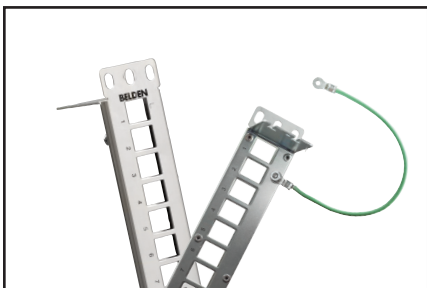
DataTwist 2400 Shielded System Cable



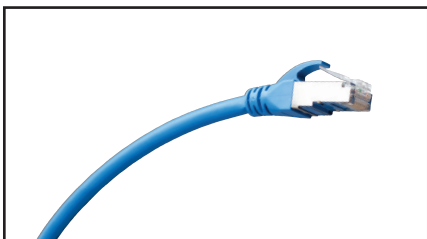
CAT6+ Shielded KeyConnect Modular Jack



Color Coded Icon Kit



Shielded Modular Patch Panel (Empty)



CAT6+ Shielded Modular Cord

### DataTwist 2400 Shielded Cable

Description	Belden Part Number	
	CMR	CMP
<b>DataTwist 2400, Nonbonded-Pair, 4-pair, 23 AWG, CMR, Category 6, F/UTP</b>		
Red, 305 m (1000 ft)	2412F 0021000	2413F 0021000
Orange, 305 m (1000 ft)	2412F 0031000	2413F 0031000
Yellow, 305 m (1000 ft)	2412F 0041000	2413F 0041000
Green, 305 m (1000 ft)	2412F 0051000	2413F 0051000
Blue, 305 m (1000 ft)	2412F 0061000	2413F D151000
Gray, 305 m (1000 ft)	2412F 0081000	2413F 0081000
White, 305 m (1000 ft)	2412F 0091000	2413F 0091000
Black, 305 m (1000 ft)	2412F 0101000	2413F 0101000

### CAT6+ Modular Jacks

Description	Belden Part Number
CAT6+ Shielded KeyConnect Modular Jack, Metallic	AX104596
KeyConnect Color-coded Icon Kit for Shielded Jacks	AX104632-XX
Replace -XX by: Red-RD, Orange-OR, Yellow-YE, Green-GN, Blue-BL, Purple-PR, White-EW, Black-BK	

### Modular Patch Panels

Description	Belden Part Number
KeyConnect Shielded Patch Panel, 24-port, 1U, Titanium (Empty)	AX104563
KeyConnect Shielded Patch Panel, 48-port, 2U, Titanium (Empty)	AX104564
KeyConnect Shielded Angled Patch Panel, 24-port, 1U, Titanium (Empty)	AX104565
KeyConnect Shielded Angled Patch Panel, 48-port, 2U, Titanium (Empty)	AX104566

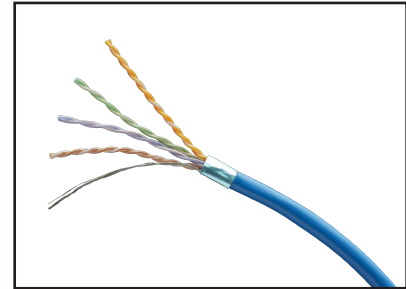
### CAT6+ Shielded Modular Cords

Description	Belden Part Number			
	Blue	Gray	White	Black
<b>CAT6+ Shielded Modular Cords, 4-pair, 24 AWG Solid, T568A/B-T568A/B, CMR</b>				
2ft (0.6 m)	C6F1106002	C6F1108002	C6F1109002	C6F1100002
4ft (1.2 m)	C6F1106004	C6F1108004	C6F1109004	C6F1100004
7ft (2.1 m)	C6F1106007	C6F1108007	C6F1109007	C6F1100007
10ft (3.0 m)	C6F1106010	C6F1108010	C6F1109010	C6F1100010
15ft (4.6 m)	C6F1106015	C6F1108015	C6F1109015	C6F1100015
25ft (7.6 m)	C6F1106025	C6F1108025	C6F1109025	C6F1100025
<b>CAT6+ Shielded Pigtaills, 4-pair, 24 AWG Solid, T568A-Open, CMR</b>				
15ft (4.6 m)	C6F1206015	C6F1208015	—	—
25ft (7.6 m)	C6F1206025	C6F1208025	—	—
35ft (10.6 m)	C6F1206035	C6F1208035	—	—
50ft (15.2 m)	C6F1206050	C6F1208050	—	—
<b>CAT6+ Shielded Pigtaills, 4-pair, 24 AWG Solid, T568B-Open, CMR</b>				
15ft (4.6 m)	C6F1306015	C6F1308015	—	—
25ft (7.6 m)	C6F1306025	C6F1308025	—	—
35ft (10.6 m)	C6F1306035	C6F1308035	—	—
50ft (15.2 m)	C6F1306050	C6F1308050	—	—

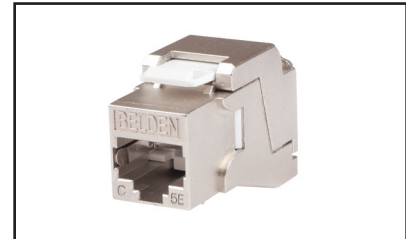
## 1200 Shielded Cabling System (Field Terminated)

### DataTwist 1200 Shielded Cable

Description	Length/Packaging	Belden Part Number	
		CMR	CMP
DataTwist 1200, Nonbonded-Pair, 4-pair, 24 AWG, Category 5e, F/UTP			
Red	305 m (1000 ft), Spool-in-the-Box	1212F 002A1000	1213F 002A1000
Orange	306 m (1000 ft), Spool-in-the-Box	1212F 003A1000	1213F 003A1000
Yellow	307 m (1000 ft), Spool-in-the-Box	1212F 004A1000	1213F 004A1000
Green	308 m (1000 ft), Spool-in-the-Box	1212F 005A1000	1213F 005A1000
Blue	309 m (1000 ft), Spool-in-the-Box	1212F 006A1000	1213F D15A1000
Gray	310 m (1000 ft), Spool-in-the-Box	1212F 008A1000	1213F 008A1000
White	311 m (1000 ft), Spool-in-the-Box	1212F 009A1000	1213F 009A1000
Black	312 m (1000 ft), Spool-in-the-Box	1212F 010A1000	1213F 010A1000
Red	315 m (1000 ft), Spool	1212F 0021000	1213F 0021000
Orange	316 m (1000 ft), Spool	1212F 0031000	1213F 0031000
Yellow	317 m (1000 ft), Spool	1212F 0041000	1213F 0041000
Green	318 m (1000 ft), Spool	1212F 0051000	1213F 0051000
Blue	319 m (1000 ft), Spool	1212F 0061000	1213F D151000
Gray	320 m (1000 ft), Spool	1212F 0081000	1213F 0081000
White	321 m (1000 ft), Spool	1212F 0091000	1213F 0091000
Black	322 m (1000 ft), Spool	1212F 0101000	1213F 0101000



Data Twist 1200 Shielded System Cable



CAT5E Shielded KeyConnect Modular Jack

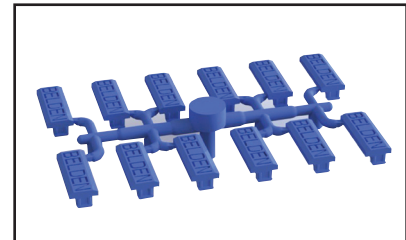
### CAT5E Modular Jacks

Description	Belden Part Number
CAT5E Shielded KeyConnect Modular Jack, Metallic	AX104595
KeyConnect Color-coded Icon Kit for Shielded Jacks	AX104632-XX

Replace -XX by: Red-RD, Orange-OR, Yellow-YE, Green-GN, Blue-BL, Purple-PR, White-EW, Black-BK

### Modular Patch Panels

Description	Belden Part Number
KeyConnect Shielded Patch Panel, 24-port, 1U, Titanium (Empty)	AX104563
KeyConnect Shielded Patch Panel, 48-port, 2U, Titanium (Empty)	AX104564
KeyConnect Shielded Angled Patch Panel, 24-port, 1U, Titanium (Empty)	AX104622
KeyConnect Shielded Angled Patch Panel, 48-port, 2U, Titanium (Empty)	AX104623



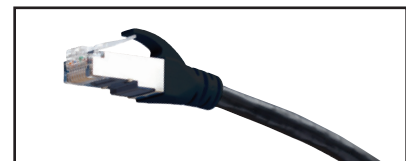
Color Coded Icon Kit

### CAT5E Shielded Modular Cords

Description	Belden Part Number			
	Blue	Gray	White	Black
<b>CAT5E Shielded Patch Cords, 4-pair, 24 AWG Solid, T568A/B - T568A/B, CMR</b>				
2ft (0.6m)	C5F1106002	C5F1108002	C5F1109002	C5F1100002
4ft (1.2m)	C5F1106004	C5F1108004	C5F1109004	C5F1100004
7ft (2.1m)	C5F1106007	C5F1108007	C5F1109007	C5F1100007
10ft (3.0m)	C5F1106010	C5F1108010	C5F1109010	C5F1100010
15ft (4.6m)	C5F1106015	C5F1108015	C5F1109015	C5F1100015
25ft (7.6m)	C5F1106025	C5F1108025	C5F1109025	C5F1100025
<b>CAT5E Shielded Pigtails, 4-pair, 23 AWG Solid, T568A - open, CMR</b>				
15ft (4.6m)	C5F1206015	C5F1208015	—	—
25ft (7.6m)	C5F1206025	C5F1208025	—	—
35ft (10.6m)	C5F1206035	C5F1208035	—	—
50ft (15.2m)	C5F1206050	C5F1208050	—	—
<b>CAT5E Shielded Pigtails, 4-pair, 23 AWG Solid, T568B - open, CMR</b>				
15ft (4.6m)	C5F1306015	C5F1308015	—	—
25ft (7.6m)	C5F1306025	C5F1308025	—	—
35ft (10.6m)	C5F1306035	C5F1308035	—	—
50ft (15.2m)	C5F1306050	C5F1308051	—	—



Shielded Modular Patch Panel (Empty)



CAT5E Shielded Modular Cord