# BELDEN
SENDING ALL THE RIGHT SIGNALS

## NP 123E

### Belden® Industrial Ethernet Copper Cabling

With its new range of copper cabling, Belden is the single, proven source for Industrial Ethernet connectivity solutions that are engineered for high performance, flawless reliability and long life in the most demanding industrial environments.

## Belden Offers Unparalleled Choice In Industrial Ethernet Connectivity Solutions From A Single Source.

Building upon its proven Fieldbus cable solutions for industrial environments, Belden has introduced a comprehensive range of copper cabling to support Industrial Ethernet and associated communication networks, including EtherNet/IP™ and Profinet. The addition of this new Industrial Ethernet cable range to the existing Belden portfolio offers customers a single source for all their industrial network connectivity needs. Belden Industrial Ethernet copper cabling not only provides a wide choice of products and the option to customize cable designs, but also ensures the highest level of reliability, quality and performance in the industrial automation and data processing environment.

### One Proven Source for All Your Industrial Ethernet Needs

Belden Industrial Ethernet copper cabling solutions deliver the highest level of quality, consistency and performance possible in the industrial environment to ensure maximum uptime and productivity.

### Customer Benefits Include:

- Comprehensive cable range consisting over 30 different designs, including two-pair, four-pair and star quad twist cable designs

- Choice of gauge sizes, insulation materials and jacket materials

- Low smoke, zero-halogen cable options to meet international standards , a prerequisite in many environments.

- High electromagnetic interference (EMI) shielding capability to maintain signal integrity

- Star quad twist cable design for Profinet cable for enhanced communication performance

- Complementary to Belden's Fieldbus cabling products

## Ethernet Networking Expands From the Office to the Factory

Belden offers a comprehensive range of industrial data cabling for a wide range of industrial communications protocols.

Originally, the use of Ethernet LAN networking was limited to offices and homes, with the industrial sector using more traditional Fieldbus systems for transmitting data. However, Ethernet technology is gaining traction in manufacturing and other industrial environments because organizations have found out that it reduces cost and brings improvements in data volume and transmission speed for more-efficient operations. In comparison to traditional office scenarios, harsh and hazardous factory environments expose Ethernet solutions to electromagnetic interference, high humidity, extreme temperatures, and chemicals. Therefore, industrial Ethernet products must be specifically designed for these demands.

An additional advantage of Industrial Ethernet for the industrial environment is its interoperability with traditional Fieldbus systems. The two technologies complement each other across the industrial arena and work well together.

Industrial Ethernet data transmission is able to bridge the gap between the top-level management functions in an organization and the actual devices on the factory floor – a huge advantage in terms of visibility and consistency of communication. Industrial Ethernet provides the means to take data from top-level functions right down to the device level at the factory floor with one single protocol.

As a result of this progress in data transmission in the industrial environment, the major Fieldbus organizations now offer Ethernet variants to secure their systems in industrial businesses.

### Meeting the Growing Demand for Robust Industrial Ethernet Solutions

This trend is driving increased demand for industrial-grade Ethernet cabling offering high reliability and seamless performance, particularly in view of the time-critical applications utilized in manufacturing. With the introduction of its portfolio of copper cables, Belden now offers an exceptionally broad range of Industrial Ethernet solutions – all from a single source well known for reliability, performance and quality. Belden Industrial Ethernet cable complements and extends the company's extensive selection of Fieldbus cables to support Profibus, DeviceNet, Modbus and other protocols.
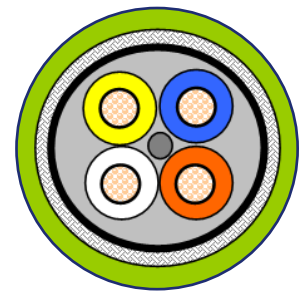
### Supporting Key Industrial Ethernet Standards

Belden offers a choice of two ranges according to Ethernet Protocol. Profinet cabling, a range of copper cabling conforming to the standard managed by PI International; and standard copper cabling to support other Industrial Ethernet standards.

**Profinet cabling features:**

- Compliant with Profinet Cabling Guide
- Universal conductor AWG 22
- Cat 5e transmission performance
- Star quad conductor design
- Overall braided shield (greater than 85 % coverage)
- SF/UTP (Overall Foil Braided Shield / Unshielded Twisted Pair)
- Green RAL 6018 cable jacket
- Three main designation types (Type A / Type B / Type C)

### Belden Profinet Cable Type A / Type B

Star Quad Design
Cat 5e Transmission Performance



Type A for stationary applications (AWG 22/1 Solid Conductor) There will be no movement after installation

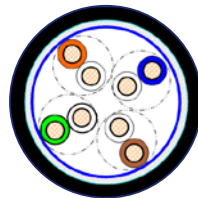Type B for flexible applications (AWG 22/7 Stranded Conductor) Will be subject to occasional movement or vibration

(Type C for trailing and torsion applications (AWG 22/19 Stranded Conductor) also available)

## Standard cabling features

- Conductor sizes AWG 23 / 24 / 26

- Solid and stranded conductors for different application types

- Cat 5e and Cat 7 transmission performance

- Four-pair and two-pair conductor design

- Overall braided shield (greater than 80 % coverage for Cat 5e)

- Overall braided shield (greater than 65 % coverage for Cat 7)

- SF/UTP (Overall Foil Braided Shield / Unshielded Twisted Pair) for Cat5e

- S/FTP (Overall Shielded / Foil Shielded Twisted Pair) for Cat 7

- Black cable jacket

- Three main designation types (Permanent / Flexible / Trailing - Torsion)

### Standard Industrial Ethernet 4 Pair Cat 5e

Solid conductor AWG 24/1 for stationary applications
There will be no movement after installation

Stranded conductor AWG 26/7 for flexible applications
Will be subject to occasional movement or vibration

(Type C for trailing and torsion applications (AWG 22/19 Stranded Conductor) also available)

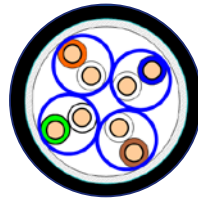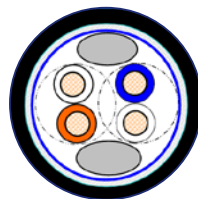### Standard Industrial Ethernet 4 Pair Cat 7

Solid conductor AWG 23/1 for stationary applications
There will be no movement after installation

Stranded conductor AWG 26/7 for flexible applications
Will be subject to occasional movement or vibration
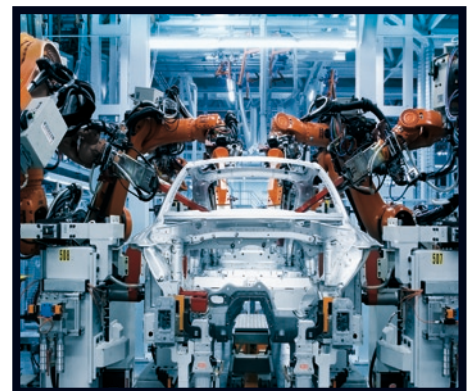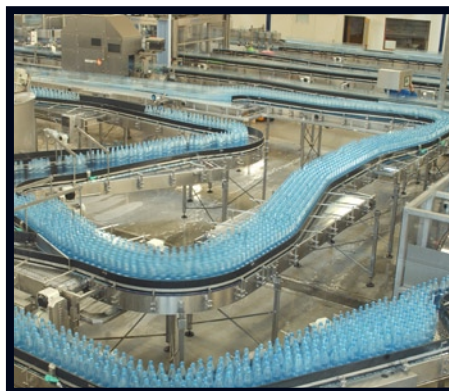
### Standard Industrial Ethernet 2 Pair Cat 5e

Solid conductor AWG 24/1 for stationary applications
There will be no movement after installation

Stranded conductor AWG 26/7 for flexible applications
Will be subject to occasional movement or vibration

## Many Additional Options

In addition to its broad scope, the new portfolio offers other key advantages. Also available is a choice of robust jacket grades for bulk cabling to meet the different requirements of general, harsh and extreme conditions. Armoured and application-specific cable jackets are available upon request, including non-cross-linked, weld splatter-resistant jackets.

Belden Industrial Ethernet cables can be used in conjunction with Hirschmann™ and Lumberg Automation™ switches and connectors to provide effective industrial automation solutions for a number of industries.

## Order Information

### Always the right solution

Belden is one of the world's leading suppliers of signal transmission solutions including cable, connectivity and active components for mission-critical applications ranging from industrial automation to data centers, broadcast studios, and aerospace. Belden offers an extensive and highly specialized product portfolio of signal transmission solutions for information, control and field levels, which the company produces and markets under its proprietary Belden®, Hirschmann™ and Lumberg Automation™ brands.

We would welcome the opportunity to tell you more about our extensive industry portfolio and Belden worldwide service. Further information and technical data are available online at www.beldensolutions.com.
You can also contact our sales team directly by dialing +31 (0) 77 3875 414.

Belden Profinet Cat 5e Cabling Range Overview

| Belden Item Code | Application Type | Item Description | Category | AWG | Conductor Type | Conductor Design | Cable Jacket | Cable Jacket Colour |
|---|---|---|---|---|---|---|---|---|
| 70006E | Type A | Profinet Type A (AWG22/1) PVC | 5e | 22 | Solid (1) | Quad | PVC | Green RAL 6018 |
| 70006NH | Type A | Profinet Type A (AWG22/1) FRNC | 5e | 22 | Solid (1) | Quad | Premium FRNC | Green RAL 6018 |
| 70006PU | Type A | Profinet Type A (AWG22/1) PUR | 5e | 22 | Solid (1) | Quad | PUR | Green RAL 6018 |
| 70007E | Type B | Profinet Type B (AWG22/7) PVC | 5e | 22 | Stranded (7) | Quad | PVC | Green RAL 6018 |
| 70007NH | Type B | Profinet Type B (AWG22/7) FRNC | 5e | 22 | Stranded (7) | Quad | Premium FRNC | Green RAL 6018 |
| 70007PU | Type B | Profinet Type B (AWG22/7) PUR | 5e | 22 | Stranded (7) | Quad | PUR | Green RAL 6018 |
| 70008PU | Type C Trailing | Profinet Trailing (AWG22/19) PUR | 5e | 22 | Stranded (19) | Quad | PUR | Green RAL 6018 |
| End 2009 | Type C Torsion | Profinet Torsion (AWG22/19) PUR | 5e | 22 | Stranded (19) | Quad | PUR | Green RAL 6018 |

Belden Cat 5e Standard Industrial Ethernet (4 Pair) Cabling Range Overview

| Belden Item Code | Application Type | Item Description | Category | AWG | Conductor Type | Conductor Design | Cable Jacket | Cable Jacket Colour |
|---|---|---|---|---|---|---|---|---|
| 74001E | Permanent | Indus Cat 5e 4PR (AWG24/1) PVC | 5e | 24 | Solid (1) | 4 Pair | PVC | Black |
| 74001NH | Permanent | Indus Cat 5e 4PR (AWG24/1) FRNC | 5e | 24 | Solid (1) | 4 Pair | Premium FRNC | Black |
| 74001PU | Permanent | Indus Cat 5e 4PR (AWG24/1) PUR | 5e | 24 | Solid (1) | 4 Pair | PUR | Black |
| 74002E | Flexible | Indus Cat 5e 4PR (AWG26/7) PVC | 5e | 26 | Stranded (7) | 4 Pair | PVC | Black |
| 74002NH | Flexible | Indus Cat 5e 4PR (AWG26/7) FRNC | 5e | 26 | Stranded (7) | 4 Pair | Premium FRNC | Black |
| 74002PU | Flexible | Indus Cat 5e 4PR (AWG26/7) PUR | 5e | 26 | Stranded (7) | 4 Pair | PUR | Black |
| 74003PU | Trailing | Indus 4PR Trailing (AWG26/19) PUR | 5e | 26 | Stranded (19) | 4 Pair | PUR | Black |
| End 2009 | Torsion | Indus 4PR Torsion (AWG26/19) PUR | 5e | 26 | Stranded (19) | 4 Pair | PUR | Black |

Belden Cat 7 Standard Industrial Ethernet (4 Pair) Cabling Range Overview

| Belden Item Code | Application Type | Item Description | Category | AWG | Conductor Type | Conductor Design | Cable Jacket | Cable Jacket Colour |
|---|---|---|---|---|---|---|---|---|
| 74004E | Permanent | Indus Cat 7 4PR (AWG23/1) PVC | 7 | 23 | Solid (1) | 4 Pair | PVC | Black |
| 74004NH | Permanent | Indus Cat 7 4PR (AWG23/1) FRNC | 7 | 23 | Solid (1) | 4 Pair | Premium FRNC | Black |
| 74004PU | Permanent | Indus Cat 7 4PR (AWG23/1) PUR | 7 | 23 | Solid (1) | 4 Pair | PUR | Black |
| 74005PU | Flexible | Indus Cat 7 4PR (AWG26/7) PUR | 7 | 26 | Stranded (7) | 4 Pair | PUR | Black |

Belden Cat 5e Standard Industrial Ethernet (2 Pair) Cabling Range Overview

| Belden Item Code | Application Type | Item Description | Category | AWG | Conductor Type | Conductor Design | Cable Jacket | Cable Jacket Colour |
|---|---|---|---|---|---|---|---|---|
| 72001E | Permanent | Indus Cat 5e 2PR (AWG24/1) PVC | 5e | 24 | Solid (1) | 2 Pair | PVC | Black |
| 72001NH | Permanent | Indus Cat 5e 2PR (AWG24/1) FRNC | 5e | 24 | Solid (1) | 2 Pair | Premium FRNC | Black |
| 72001PU | Permanent | Indus Cat 5e 2PR (AWG24/1) PUR | 5e | 24 | Solid (1) | 2 Pair | PUR | Black |
| 72002E | Flexible | Indus Cat 5e 2PR (AWG26/7) PVC | 5e | 26 | Stranded (7) | 2 Pair | PVC | Black |
| 72002NH | Flexible | Indus Cat 5e 2PR (AWG26/7) FRNC | 5e | 26 | Stranded (7) | 2 Pair | Premium FRNC | Black |
| 72002PU | Flexible | Indus Cat 5e 2PR (AWG26/7) PUR | 5e | 26 | Stranded (7) | 2 Pair | PUR | Black |