

PB 314

Belden® DataTuff® Cat 5e 600V AWM-rated Cable

Belden DataTuff Category 5e cables, utilizing Belden's patented Bonded-Pair technology, are 600V AWM-rated for motor control center and switch gear applications.



Belden DataTuff Shielded Industrial Ethernet Cables Are Designed Specifically for Switch Gear and Motor Control Center (MCC) Applications in Tough EMI Environments

The drives that control process functions, and the switch gear that handle critical power functions, must perform flawlessly and at peak efficiency. Current control and communications systems are very reliable, but with the advance of Ethernet technology now reaching motor control centers (MCCs) and switch gear, the Ethernet cabling component must be especially reliable and robust.

Ethernet is finding increased use in industrial environments since it is a standards-based technology that utilizes a single cabling platform with Ethernet connectivity and IP addressing. This convergence of open, standards-based Ethernet communications provides for secure, seamless interoperability between the corporate office and the plant, plus it enables Internet connectivity, anytime and anywhere. Industrial Ethernet communications are also faster than current network protocol technologies and they provide greater bandwidth.

The advance of Ethernet has prompted an increased use of intelligent devices equipped with Ethernet ports. As these devices are often in close proximity to noise-producing machinery, an electromagnetic interference (EMI) problem might occur that could prove detrimental to signal integrity. In MCCs, drives could produce enough EMI to interfere with many traditional Ethernet cables. Moreover, the need to monitor and control these devices will demand that the cable enter the MCC. As a result, these applications require an Ethernet cable with excellent noise immunity, as well as the ability to run on or near listed devices.

Benefits of Using Belden DataTuff Category 5e 600V AWM-Rated Cables

Belden provides two Industrial Ethernet Category 5e cables designed specifically for superior electrical performance and outstanding noise immunity. The Belden DataTuff 4-pair shielded cables carry a 600V AWM rating which makes them approved for use in listed MCCs and switch gear, and they feature Belden's patented Bonded-Pair technology.

While these cables have the design and certifications that make them ideal for MCC and switch gear applications, they can also be used for more traditional Ethernet applications. They are not, however, intended for 600V power delivery.

Belden's Bonded-Pair Technology

Belden Bonded-Pair cables have the conductor insulation of the cable pairs affixed along their longitudinal axes to ensure that no performance robbing gaps can occur between the conductor pairs. Since no gaps can occur, and the conductor-to-conductor spacing, or centricity, is always uniform, the cable offers excellent and consistently reliable electrical performance – even when it is subjected to the rigors of the installation process and the factory floor environment.

Cable Construction Overview

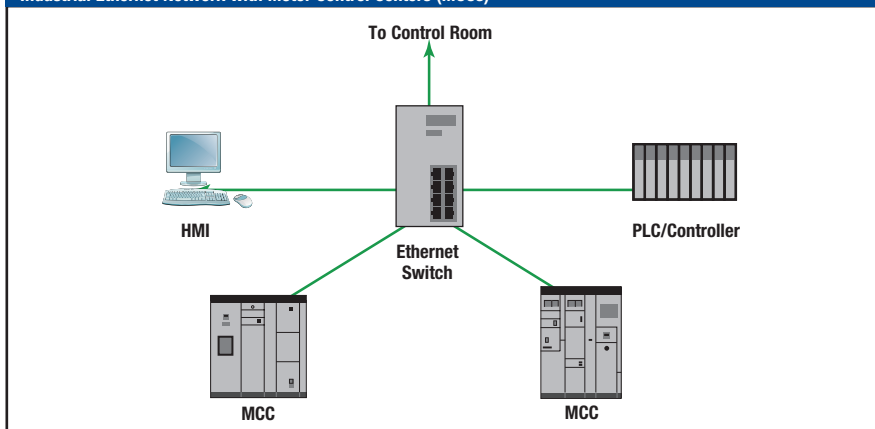
Belden DataTuff Category 5e Industrial Ethernet cables feature 24 AWG Bonded-Pair solid bare copper conductors, polyolefin insulation, 24 AWG stranded tinned copper drain wires and industrial-grade oil- and sunlight-resistant PVC jackets.

Belden has designed shielded designs to provide assured performance in highly concentrated EMI/RFI environments. Part No. 7958A has an overall Beldfoil® shield; Part No. 7957A has an overall Beldfoil shield + 70% tinned copper braid. Belden's patented Beldfoil shield, with its aluminum/polyester foil, offers 100 percent protection against EMI/RFI. When the Beldfoil shield is used in combination with the 70% braid shield, the cable offers enhanced structural integrity and a lower DC resistance.

Cable Ratings/Approvals

Part Nos. 7958A and 7957A are Ethernet/IP compliant and offer the following ratings and approvals: UL 600V AWM 21047, UL C(UL) CMR FT4, RoHS and CE.

Industrial Ethernet Network with Motor Control Centers (MCCs)



This schematic shows the connection made between an Ethernet switch and different devices using Industrial Ethernet cable.

UL AWM 21047 600V Enhanced Category 5e DataTuff Shielded Twisted Pair Cables

Description	Part No.	UL NEC/ C(UL) CEC Type	No. of Pairs	Standard Lengths		Standard Unit Wt.		Nominal OD		Freq. (MHz)	Max. Atten. (dB/ 100m)	Min. PSUM NEXT (dB)	Min. PSUM ACR (dB/ 100m)	Min. PSUM ELFEXT (dB/100m)	Input Imped. (Ω)	Min. RL (dB)
				Ft.	m	Lbs.	kg	Inch	mm							

Enhanced Cat 5e • 24 AWG Bonded-Pairs Solid BC • Overall Beldfoil Shield • 24 AWG Stranded TC Drain Wire

Non-Plenum • Polyolefin Insulation • .030" Industrial Grade Sunlight- and Oil-resistant Black, Blue or Teal PVC Jacket

EtherNet/IP Compliant Shielded MSHA Approved 	7958A	NEC:	4	1000	304.8	37.0	16.8	.265	6.73	1	2.0	62.3	60.3	60.8	100±15	20.0
		CMR,		2000†	609.6	72.0	32.7			4	4.1	53.3	49.2	48.7	100±15	23.0
		CMX-								10	6.5	47.3	40.8	40.8	100±15	25.0
		Outdoor								16	8.2	44.3	36.1	36.7	100±15	25.0
		CEC:								31.25	11.7	39.9	28.2	30.9	100±15	23.6
		CMR FT4								62.5	17.0	35.4	18.4	24.8	100±15	21.5
		AWM 21047								100	22.0	32.3	10.3	20.8	100±15	20.1
										200	32.4	27.8	1.0	14.7	100±15	15.0

Drain Wire

†2000 ft. put-up available in Black only.

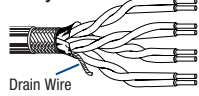
Installation Temperature: -25°C to +75°C; Operating Temperature: -40°C to +75°C* • P-07-KA060003-MSHA**

RJ-45 Compatible†† • Cable passes -40°C Cold Bend per UL1581 • U.S. Patents 5,606,151 and 5,734,126

Shield is bonded to jacket inner wall for electrical stability. • Jacket sequentially marked at 2 ft. intervals • Third party verified to TIA/EIA-568-B.2, Category 5e

Enhanced Cat 5e • 24 AWG Bonded-Pairs Solid BC • Overall Beldfoil + 70% TC Braid • 24 AWG Solid Spiral Drain Wire

Non-Plenum • Polyolefin Insulation • .030" Industrial Grade Sunlight- and Oil-resistant Black, Blue or Teal PVC Jacket

EtherNet/IP Compliant Heavy-shielded 	7957A	NEC:	4	1000	304.8	55.0	24.9	.330	8.38	1	2.0	62.3	60.3	60.8	100±15	20.0
		CMR,		2000†	609.6	106.0	48.1			4	4.1	53.3	49.2	48.7	100±15	23.6
		CMX-								10	6.5	47.3	40.8	40.8	100±15	26.0
		Outdoor								16	8.2	44.3	36.1	36.7	100±15	26.0
		CEC:								31.25	11.7	39.9	28.2	30.9	100±15	25.6
		CMR FT4								62.5	17.0	35.4	18.4	24.8	100±15	23.5
		AWM 21047								100	22.0	32.3	10.3	20.8	100±15	22.5

†2000 ft. put-up available in Black only.

Installation Temperature: -25°C to +75°C; Operating Temperature: -40°C to +75°C* • Cable passes -40°C Cold Bend per UL1581 • RJ-45 Compatible††

U.S. Patents 5,606,151 and 5,734,126 • Jacket sequentially marked at 2 ft. intervals • Third party verified to TIA/EIA-568-B.2, Category 5e

ACR = Attenuation Crosstalk Ratio • BC = Bare Copper • ELFEXT = Equal Level Far-end Crosstalk • NEXT = Near-end Crosstalk

PSUM = Power Sum • RL = Return Loss • TC = Tinned Copper

* Subject to length de-rating.

** Pennsylvania Department of Environmental Resources and United States Mine Safety and Health Administration Certification

†† Special RJ-45 plugs required, see www.belden.com-tools-connector cross reference