

7931A Multi-Conductor - Category 6 DataTwist® Twisted Pair Cable



Description:

23 AWG Bonded-Pairs solid bare copper conductors, FEP insulation, sunlight- oil- and gas-resistant FEP jacket. Sequential marking at two foot intervals.

Usage (Overall)

Suitable Applications:

Industrial Ethernet Cable, Harsh Environments, 350MHz Enhanced Category 6, Gigabit Ethernet, 100BaseTX, 100BaseVG ANYLAN, 155ATM, 622ATM, NTSC/PAL Component or Composite Video, AES/EBU Digital Audio, AES51, RS-422, RJ-45 Compatible, High and Low Temperature, Oil and Gasoline Exposure, Limited Combustible FHC 25/50

Physical Characteristics (Overall)

Conductor

AWG:

# Pairs	AWG	Stranding	Conductor Material
4	23	Solid	BC - Bare Copper

Insulation

Insulation Material:

Insulation Material
FEP - Fluorinated Ethylene Propylene

Outer Shield

Outer Shield Material:

Outer Shield Material
Unshielded

Outer Jacket

Outer Jacket Material:

Outer Jacket Material
FEP - Fluorinated Ethylene Propylene

Overall Cabling

Overall Cabling Fillers: Rod Center Member

Overall Nominal Diameter: 0.214 in.

Pair

Pair Color Code Chart:

Number	Color
1	White/Blue Stripe & Blue
2	White/Orange Stripe & Orange
3	White/Green Stripe & Green
4	White/Brown Stripe & Brown

Mechanical Characteristics (Overall)

Installation Temperature Range: -55°C To +150°C

Operating Temperature Range: -70°C To +150°C

Bulk Cable Weight: 28 lbs/1000 ft.

Max. Recommended Pulling Tension: 40 lbs.

7931A Multi-Conductor - Category 6 DataTwist® Twisted Pair Cable

Min. Bend Radius (Install)/Minor Axis: 0.500 in.

Applicable Specifications and Agency Compliance (Overall)

Applicable Standards & Environmental Programs

NEC/(UL) Specification: FHC 25/50, CMP, UL444

NEC Articles: NFPA 259

CEC/C(UL) Specification: CMP

EU Directive 2000/53/EC (ELV): Yes

EU Directive 2002/95/EC (RoHS): Yes

EU RoHS Compliance Date (mm/dd/yyyy): 04/01/2005

EU Directive 2002/96/EC (WEEE): Yes

EU Directive 2003/11/EC (BFR): Yes

CA Prop 65 (CJ for Wire & Cable): Yes

MII Order #39 (China RoHS): Yes

Telecommunications Standards: 568-B.2-1 Category 6

Other Specification: UL verified to Category 6

Flame Test

UL Flame Test: UL723 (NFPA 255), NFPA 262

CSA Flame Test: FT6

Suitability

Oil Resistance: Yes

Plenum/Non-Plenum

Plenum (Y/N): Yes

Electrical Characteristics (Overall)

Nom. Mutual Capacitance:

Capacitance (pF/ft)

15

Nominal Velocity of Propagation:

VP (%)

72

Maximum Capacitance Unbalance (pF/100 m): 330

Maximum Delay:

Delay (ns/100 m)

537 @ 100MHz

Max. Delay Skew:

Delay Skew (ns/100 m)

45

Maximum Conductor DC Resistance:

DCR @ 20°C (Ohm/100 m)

9.38

Max. Operating Voltage - UL:

Voltage

300 V RMS

Maximum DCR Unbalanced:

DCR Unbalance @ 20°C (%)

5

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Electrical Characteristics-Premise (Overall)

Premise Cable Electrical Table 1:

Freq. (MHz)	Max. Attenuation (dB/100 m)	Min. NEXT (dB)	Min. PSNEXT (dB)	Min. ACR (dB)	Min. PSACR (dB)	Min RL (dB)	Min. SRL (dB)
1	2.0	74.3	72.3	72.3	70.3	20.0	na
4	3.8	65.3	63.3	61.5	59.5	23.0	na
8	5.3	60.8	58.8	55.4	53.4	24.5	na
10	6.0	59.3	57.3	53.3	51.3	25.0	na
16	7.6	56.2	54.3	48.7	46.7	25.0	na
20	8.5	54.8	52.8	46.3	44.3	25.0	na
25	9.5	53.3	51.3	43.8	41.8	24.3	na
31.25	10.7	51.9	49.9	41.2	39.2	23.6	na
62.5	15.4	47.4	45.4	32.0	30.0	21.5	na
100	19.8	44.3	42.3	24.5	22.5	20.1	na
155	25.2	41.5	39.5	16.3	14.3	18.8	na
200	29.0	39.8	37.8	10.8	8.8	18.0	na
250	32.8	38.3	36.3	5.5	3.5	17.3	na

Premise Cable Electrical Table 2:

Freq. (MHz)	Input (Unfitted) Imp. (Ohms)	Fitted Impedance	Min. ELFEXT (dB)	Min. PSELFEXT (dB)
1	100 ± 15	100 ± 15	67.8	64.8
4	100 ± 15	100 ± 15	55.8	52.7
8	100 ± 15	100 ± 15	49.7	46.7
10	100 ± 15	100 ± 15	47.8	44.8
16	100 ± 15	100 ± 15	43.7	40.7
20	100 ± 15	100 ± 15	41.8	38.7
25	100 ± 15	100 ± 15	39.8	36.8
31.25	100 ± 15	100 ± 15	37.9	34.9
62.5	100 ± 15	100 ± 15	31.9	28.8
100	100 ± 15	100 ± 15	27.8	24.8
155	100 ± 22	100 ± 15	23.9	20.9
200	100 ± 22	100 ± 15	21.8	18.7
250	100 ± 32	100 ± 15	19.8	16.8

Notes (Overall)

Notes: US Patents 5, 606, 151& 5, 573, 126. Operating temperatures subject to length de-rating.

Notes (Cont'd.): Cable passes -70C Cold Bend per UL 1581.

Put Ups and Colors:

Item #	Putup	Ship Weight	Color	Notes	Item Desc
7931A 0101000	1,000 FT	35.000 LB	BLACK		4 PR #23 FEP FEP

Industrial Data Solutions® — Industrial Ethernet

DataTuff® Twisted Pair and TrayOptic® Fiber Optic Cables

Overview

The reliability of your industrial Ethernet network depends on the cable infrastructure. Data transmission errors can lead to interruptions in critical control functions resulting in lost production time and even safety issues. Belden's family of industrial Ethernet cables is designed to withstand the rigors of industrial environments. Whether it's exposure to oil and sunlight, temperature variation, abrasion and crushing, or the presence of electromagnetic interference (EMI) or radio frequency interference (RFI), turn to Belden for the solution.

Belden offers an extensive line of high performance cables in both copper constructions with DataTuff cables as well as fiber optic designs with TrayOptic cables.

Performance Assurance from Blue Hose® to Industrial Ethernet

To assist you in achieving optimum network performance, Belden has built

quality and reliability into each cable it manufactures. Decades of leadership and experience in supplying reliable high-end cable solutions, such as Blue Hose®, to industrial networks and control systems are combined to give you industrial Ethernet cables that perform to maximum network capability.

Our dedication to quality manufacturing practices and processes assures consistent products of uncompromising quality.

Installable Performance® with Patented Bonded-Pair Technology

Belden's Bonded-Pair versions of DataTuff cables are unique in the industry to give you an Installable Performance advantage. This patented design yields superior electrical performance even after the effects and stresses of pulling, twisting and bending during typical installations.

This performance advantage is achieved by bonding the individual insulated conductors along their longitudinal axes, resulting in uniform conductor-to-conductor spacing and the elimination of gaps between conductors that can occur during installation. This is a critical construction feature because non-uniform conductor spacing and gaps change the physical characteristics of the cable such that the electrical performance of the cable suffers. Only Bonded-Pair cables deliver the electrical integrity you demand.

TrayOptic Cables

Belden® TrayOptic cables are a line of indoor/outdoor fiber optic cables designed to meet the demanding requirements of industrial applications. When the installation demands the combination of sophisticated fiber optic technology and rugged durability, turn to Belden.

DataTuff® Industrial Ethernet Cable Selection Guide

Part No.	No. of Pairs	Shielding		Conductor		Installation		Environmental Issues					Industrial Grade Jacket			
		Unshielded	Shielded *	Solid	Stranded **	Installation Stress Resistance†	Pull Tension	Oil Resistance	UV Sunlight Resistance	CMX/Outdoor	Underground (burial)	Gasoline Resistance	Hi/Lo Temp	Heavy	Upjacket	Armored
Category 5e Cable																
new 7932A <i>EtherNet/IP</i>	2	●		●		●	20	●	●							●
new 7933A <i>EtherNet/IP</i>	2		●	●		●	20	●	●							●
7923A <i>EtherNet/IP</i>	4	●		●		●	40	●	●	●						●
7918A	4	●		●			35	●	●	●						●
7924A	4	●			●	●	40	●	●	●						●
new 7930A	4	●			●		25	●	●	●						●
new 7922A PLTC	4	●		●		●	40	●	●	●						●
new 7934A <i>EtherNet/IP</i>	4	●		●		●	40		●		●					●
7928A <i>EtherNet/IP</i>	4	●		●		●	40	●	●			●	●			●
11700A <i>EtherNet/IP</i>	4	●		●		●	40	●	●	●						●
new 11700A2 Oil Res I&II	4	●		●		●	40	●	●							●
121700A	4	●		●		●	40	●	●							●
new 121700R	4	●		●		●	40	●	●							●
7929A	4		●	●		●	35	●	●	●						●
7919A	4		●	●		●	25	●	●	●						●
7921A <i>EtherNet/IP</i>	4		●	●		●	75	●	●	●						●
Category 6 Cable																
7927A	4	●		●		●	45	●	●							●
7931A	4	●		●		●	40	●	●			●	●			●
11872A	4	●		●		●	45									●
121872A	4	●		●		●	45	●	●							●

*Shielded products are recommended for high-noise environments. **Stranded products are recommended where more flexibility is needed.

†Products with Bonded-Pair technology provide Installable Performance® advantages — refer to Belden's Bonded-Pair Cable Bulletin #BP02

EtherNet/IP is a trademark of ControlNet International, Ltd. under license by Open DeviceNet Vendor Association, Inc.



Industrial Data Solutions® — Industrial Ethernet

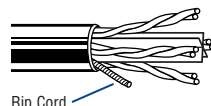
Category 6 DataTuff® Twisted Pair Cables, 4-Pair

Heavy-Duty Jackets

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 6 • 23 AWG Bonded-Pairs Solid BC Conductors • Patented E-Spline Center Member • Rip Cord • See Color Code Chart

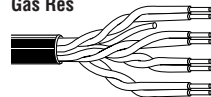
Polyolefin Insulation • .030" Industrial Grade Sunlight- and Oil-resistant Black PVC Jacket

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									
	7927A	NEC: CMR CEC: CMR FT4	4	1000	304.8	44.0	20.0	.251	6.38	1	1.9	80.3	78.5	70.8	100±12	20.0		
				2000	609.6	88.0	39.9	x	x	10	5.7	65.3	59.6	50.8	100±12	25.0		
												31.25	10.2	57.9	47.7	40.9	100±15	25.0
												62.5	14.7	53.4	38.7	34.9	100±15	25.0
												100	18.9	50.3	31.4	30.8	100±15	25.0
												155	23.9	47.5	23.5	27.0	100±15	22.8
												200	27.5	45.8	18.3	24.8	100±15	21.7
												250	31.2	44.3	13.2	22.8	100±20	20.5
												350	37.7	40.2	4.5	19.9	100±22	19.8
												400	40.6	39.3	0.6	18.8	100±22	19.5
												500	46.2	37.8	>0.0*	16.8	100±22	18.4
								550	48.8	37.2	—	16.0	100±22	18.0				
								600	51.4	36.6	—	15.2	100±22	17.6				

RJ-45 Compatible • Jacket sequentially marked at 2 ft. intervals • Third party verified to TIA/EIA-568-B.2-1, Category 6
Cable passes -40°C Cold Bend per UL1581 • Installation Temperature: -25°C to +75°C • Operating Temperature: -40°C to +75°C**
*PSUM ACR >0 is guaranteed to 460 MHz. • U.S. Patents 5,606,151; 5,734,126; 5,789,711 and 6,297,454-B1

Cat 6 • 23 AWG Bonded-Pairs Solid BC Conductors • See Color Code Chart (below)

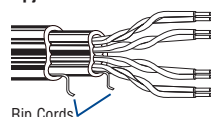
Plenum • FEP Insulation • Sunlight-, Oil- and Gas-resistant Black FEP Jacket

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										
	7931A	NEC: Limited CEC: FHC 25/50 CMP CEC: CMP FT6	4	1000	304.8	35.0	15.9	.214	5.44	1	2.0	72.3	70.3	64.8	100±15	20.0			
												10	6.0	57.3	51.3	44.8	100±15	25.0	
													20	8.5	52.8	44.3	38.7	100±15	25.0
													31.25	10.7	49.9	39.2	34.9	100±15	23.6
													62.5	15.4	45.4	30.0	28.8	100±15	21.5
													100	19.8	42.3	22.5	24.8	100±15	20.1
									200	29.0	37.8	8.8	18.7	100±22	18.0				
									250	32.8	36.3	3.5	16.8	100±32	17.3				

RJ-45 Compatible
Cable passes -70°C Cold Bend per UL1581 • Installation Temperature: -55°C to +150°C • Operating Temperature: -70°C to +150°C**
Jacket sequentially marked at 2 ft. intervals • Third party verified to TIA/EIA-568-B.2-1, Category 6 • U.S. Patents 5,606,151 and 5,734,126

Enhanced Cat 6 • 23 AWG Bonded-Pairs Solid BC Conductors • Rip Cord • See Color Code Chart (below)

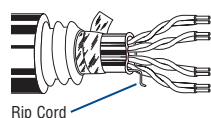
Polyolefin Insulation • PVC Inner Jacket • .035" Industrial Grade PVC Outer Jacket (Black or Gray)

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												
	11872A	NEC: CM CEC: FT1	4	1000	304.8	66.0	30.0	.475	12.07	1	1.9	72.3	70	64.8	100±12	20.0					
												4	3.7	63.3	59	52.7	100±12	23.0			
													10	5.9	57.3	51	44.8	100±12	25.0		
													.265	6.73	16	7.5	54.3	46	40.7	100±12	25.0
															31.25	10.6	49.9	39	34.9	100±15	23.6
															62.5	15.4	45.4	30	28.8	100±15	21.5
															100	19.8	42.3	25	24.8	100±15	21.0
															155	25.1	39.5	14	20.9	100±15	21.0
															200	29.0	37.9	10	18.7	100±15	21.0
															310	37.1	34.9	—	14.9	100±20	18.0
															x	x	—	13.9	100±22	17.0	
											.165	4.19	—	12.7	100±32	14.0					
											500†	49.0	31.8	—	10.8	100±32	14.0				

†Value provided for information only. • RJ-45 Compatible • Cable passes -25°C Cold Bend per UL1581
Installation Temperature: -10°C to +75°C • Operating Temperature: -25°C to +75°C**
Jacket sequentially marked at 2 ft. intervals • Verified to TIA/EIA-568-B.2-1, Category 6 • U.S. Patents 5,606,151, 5,734,126 and 5,821,467

Enhanced Cat 6 • 23 AWG Bonded-Pairs Solid BC Conductors • Polyester Wrap • Rip Cord • See Color Code Chart (below)

AL Interlocked Armor • Polyolefin Insulation • PVC Inner Jacket • .055" Industrial Grade PVC Outer Jacket (Black or Gray)

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											
	121872A	NEC: HL CEC: CMG FT4	4	1000	304.8	222.0	100.6	.684	17.37	1	1.9	72.3	70	64.8	100±12	20.0				

†Value provided for information only. • RJ-45 Compatible • Jacket sequentially marked at 1 meter intervals
Cable passes -40°C Cold Bend per UL1581 • Installation Temperature: -25°C to +75°C • Operating Temperature: -40°C to +75°C**
Verified to TIA/EIA-568-B.2-1, Category 6 • U.S. Patents 5,606,151, 5,734,126 and 5,821,467

ACR = Attenuation Crosstalk Ratio • AL = Aluminum • 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.

Color Codes: DataTuff

Pair No.	Color Combination
1	White/Blue Stripe & Blue
2	White/Orange Stripe & Orange
3	White/Green Stripe & Green
4	White/Brown Stripe & Brown