Detailed Specifications & Technical Data

ENGLISH MEASUREMENT VERSION

121872A Multi-Conductor - Category 6 DataTuff® Twisted Pair Cable

Description:

23 AWG Bonded-Pairs solid bare copper conductors, polyolefin insulation, PVC inner jacket, aluminum interlocked armor, industrial grade PVC jacket. Sequential marking at one meter intervals.

Usage (Overall)

Suitable Applications: Industrial Ethernet Cable, Harsh Environments, 350 MHz 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, Armored

Physical Characteristics (Overall)

Conductor

AWG:

# Pairs	AWG	Stranding	Conductor Material	Dia. (in.)
4	23	Solid	BC - Bare Copper	.022

Insulation

Insulation Material:

Insulation Material	Wall Thickness (in.)	Dia. (in.)
PO - Polyolefin	.009	.038

Inner Jacket

Inner Jacket Material:

Inner Jacket Material	Nom. Dia. (in.)
PVC - Polyvinyl Chloride	.365 x .165

Outer Shield

Outer Shield Material:

Outer Shield Material
Unshielded

Outer Jacket

Outer Jacket Material:

Outer Jacket Material
PVC - Polyvinyl Chloride

Outer Jacket over Armor (y/n): Yes

Armor

Armor Type: Interlocked

Armor Material: Aluminum

Overall Cabling

Overall Nominal Diameter: 0.688 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:	-25°C To +75°C
Operating Temperature Range:	-40°C To +75°C
Bulk Cable Weight:	29 lbs/1000 ft.
Max. Recommended Pulling Tension:	45 lbs.
Min. Bend Radius (Install)/Minor Axis:	7 in.

Applicable Specifications and Agency Compliance (Overall)

Applicable Standards & Environmental Programs

NEC/(UL) Specification:	CM, UL444
CSA Specification:	CMG
EU Directive 2000/53/EC (ELV):	Yes
EU Directive 2002/95/EC (RoHS):	Yes
EU RoHS Compliance Date (mm/dd/yyyy):	01/01/2006
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

Flame Test

UL Flame Test:	UL1685 FT4 Loading
CSA Flame Test:	FT4

Plenum/Non-Plenum

Plenum (Y/N):	No

Electrical Characteristics (Overall)

Nom. Mutual Capacitance:

Capacitance (pF/ft)
15.0

Nominal Velocity of Propagation:

VP (%)
70

Maximum Capacitance Unbalance (pF/100 m):	49.2

Maximum Delay:

Delay (ns/100 m)
510 @ 100MHz

Max. Delay Skew:

Delay Skew (ns/100 m)
25

Maximum Conductor DC Resistance:

DCR @ 20°C (Ohm/100 m)
9

Max. Operating Voltage - UL:

Voltage
300 V RMS

Maximum DCR Unbalanced:

DCR Unbalance @ 20°C (%)

3

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)
1	1.9	74.3	72.3	70	70	20.0
4	3.7	65.3	63.3	59	59	23.0
8	5.3	60.3	58.8	53	53	24.5
10	5.9	59.3	57.3	51	51	25.0
16	7.5	56.3	54.3	46	46	25.0
20	8.4	54.8	52.8	44	44	25.0
25	9.5	53.4	51.4	42	42	24.3
31.25	10.6	51.9	49.9	39	39	23.6
62.5	15.4	47.4	45.4	30	30	21.5
100	19.8	44.3	42.3	25	25	21.0
155	25.1	41.5	39.5	14	14	21.0
200	29.0	39.9	37.9	10	10	21.0
250	32.8	38.3	36.3	3	3	18.0
300	35.2	37.2	34.2	0	0	18.0
310	37.1	36.9	34.9			18.0
350	39.8	36.2	34.2			17.0
400	43.0	35.3	33.3			14.0
500	49.0	33.8	31.8			14.0

Premise Cable Electrical Table 2:

Freq. (MHz)	Input (Unfitted) Imp. (Ohms)	Fitted Impedance	Min. ELFEXT (dB)	Min. PSELFEXT (dB)
1	100 ± 12	100 ± 15	67.8	64.8
4	100 ± 12	100 ± 15	55.7	52.7
8	100 ± 12	100 ± 15	49.7	46.7
10	100 ± 12	100 ± 15	47.8	44.8
16	100 ± 12	100 ± 8	43.7	40.7
20	100 ± 12	100 ± 8	41.7	38.7
25	100 ± 15	100 ± 8	39.8	36.8
31.25	100 ± 15	100 ± 8	37.9	34.9
62.5	100 ± 15	100 ± 8	31.8	28.8
100	100 ± 15	100 ± 8	27.8	24.8
155	100 ± 15	100 ± 8	23.9	20.9
200	100 ± 15	100 ± 8	21.7	18.7
250	100 ± 20	100 ± 8	19.8	16.8
300	100 ± 20	100 ± 8	18.2	15.2
310	100 ± 20	100 ± 8	17.9	14.9
350	100 ± 22	100 ± 8	16.9	13.9
400	100 ± 32	100 ± 8	15.7	12.7
500	100 ± 32	100 ± 8	13.8	10.8

Notes (Overall)

Notes: US Patent #'s 5606151; 5734126; 5821467 **Values above 350 MHz are information only. Operating temperatures are subject to length de-rating. Cable passes -40C Cold Bend per UL 1581.

Put Ups and Colors:

Item #	Putup	Ship Weight	Color	Notes	Item Desc
121872A J221000	1,000 FT	196.000 LB	BLUE, STRONG		1872A ALUM ARMOR PVC
121872A 0052500	2,500 FT	455.000 LB	GREEN, DARK		1872A ALUM ARMOR PVC - SPECIAL
121872A 0081000	1,000 FT	196.000 LB	GRAY	C Z	4 PR 24 ARM PVC CABLE
121872A 0101000	1,000 FT	196.000 LB	BLACK	C Z	4 PR 24 ARM PVC CABLE
121872A 0105000	5,000 FT	1,100.000 LB	BLACK		1872A ALUM ARMOR PVC - SPECIAL

Notes:
C = CRATE REEL PUT-UP.
Z = FINAL PUT-UP LENGTH MAY VARY (+ OR -) 10% FOR SPOOLS OR REELS AND(+ OR -) 5% FOR UNREEL CARTONS FROM LENGTH SHOWN.

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	Under-ground (burial)	Gasoline Resistance	Hi/Lo Temp	Heavy	Upjacket	Armored
	Category 5e Cable																
new	**7932A** EtherNet/IP	2	●		●		●	20	●	●					●		
new	**7933A** EtherNet/IP	2		●	●		●	20	●	●					●		
	7923A EtherNet/IP	4	●		●		●	40	●	●	●				●		
	7918A	4	●		●			35	●	●	●				●		
	7924A	4	●			●	●	40	●	●	●				●		
new	**7930A**	4	●			●		25	●	●	●				●		
new	**7922A** PLTC	4	●		●		●	40	●	●	●				●		
new	**7934A** EtherNet/IP	4	●		●		●	40		●		●			●		
	7928A EtherNet/IP	4	●		●		●	40	●	●			●	●	●		
	11700A EtherNet/IP	4	●		●		●	40	●	●	●					●	
new	**11700A2** Oil Res I&II	4	●		●		●	40	●	●						●	
	121700A	4	●		●		●	40	●	●							●
new	**121700R**	4	●		●		●	40	●	●							●
	7929A	4		●	●		●	35	●	●	●				●		
	7919A	4		●	●			25	●	●	●				●		
	7921A EtherNet/IP	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.

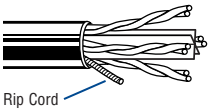
Industrial Data Solutions® — Industrial Ethernet

Category 6 DataTuff® Twisted Pair Cables, 4-Pair
Heavy-Duty Jackets

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 Ft.	Standard Lengths m	Standard Unit Wt. Lbs.	Standard Unit Wt. kg	Nominal OD Inch	Nominal OD mm	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)
	7927A	NEC:	4	1000	304.8	44.0	20.0	.251	6.38	1	1.9	80.3	78.5	70.8	100±12	20.0
		CMR		2000	609.6	88.0	39.9	x	x	10	5.7	65.3	59.6	50.8	100±12	25.0
		CEC:						.339	8.61	31.25	10.2	57.9	47.7	40.9	100±15	25.0
		CMR FT4								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

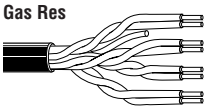


RJ-45 Compatible • Jacket sequentially marked at 2 ft. intervals • Third party verified to TIA/EIA-568-B.2-1, Category 6
Cable passes -40°C Cold Bend per UL1581 • Installation Temperature: -25°C to +75°C • Operating Temperature: -40°C to +75°C**
◆PSUM ACR >0 is guaranteed to 460 MHz. • U.S. Patents 5,606,151; 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 Ft.	Standard Lengths m	Standard Unit Wt. Lbs.	Standard Unit Wt. kg	Nominal OD Inch	Nominal OD mm	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)
High & Low Temp Oil Res I & II Gas Res	**7931A**	NEC:	4	1000	304.8	35.0	15.9	.214	5.44	1	2.0	72.3	70.3	64.8	100±15	20.0
		Limited Combustible								10	6.0	57.3	51.3	44.8	100±15	25.0
		FHC 25/50								20	8.5	52.8	44.3	38.7	100±15	25.0
		CMP								31.25	10.7	49.9	39.2	34.9	100±15	23.6
		CEC:								62.5	15.4	45.4	30.0	28.8	100±15	21.5
		CMP FT6								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

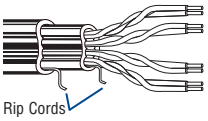


RJ-45 Compatible
Cable passes -70°C Cold Bend per UL1581 • Installation Temperature: -55°C to +150°C • Operating Temperature: -70°C to +150°C**
Jacket sequentially marked at 2 ft. intervals • Third party verified to TIA/EIA-568-B.2-1, Category 6 • U.S. Patents 5,606,151 and 5,734,126

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 Ft.	Standard Lengths m	Standard Unit Wt. Lbs.	Standard Unit Wt. kg	Nominal OD Inch	Nominal OD mm	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)
Upjacketed	**11872A**	NEC:	4	1000	304.8	66.0	30.0	.475	12.07	1	1.9	72.3	70	64.8	100±12	20.0
		CM						x	x	4	3.7	63.3	59	52.7	100±12	23.0
		CEC:						.265	6.73	10	5.9	57.3	51	44.8	100±12	25.0
		CM FT1								16	7.5	54.3	46	40.7	100±12	25.0
								Nominal Core OD:		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
								.365	9.27	200	29.0	37.9	10	18.7	100±15	21.0
								x	x	310	37.1	34.9	—	14.9	100±20	18.0
								.165	4.19	350	39.8	34.2	—	13.9	100±22	17.0
										400 †	43.0	33.3	—	12.7	100±32	14.0
										500 †	49.0	31.8	—	10.8	100±32	14.0

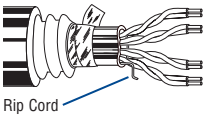


†Value provided for information only. • RJ-45 Compatible • Cable passes -25°C Cold Bend per UL1581
Installation Temperature: -10°C to +75°C • Operating Temperature: -25°C to +75°C**
Jacket sequentially marked at 2 ft. intervals • Verified to TIA/EIA-568-B.2-1, Category 6 • U.S. Patents 5,606,151, 5,734,126 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 Ft.	Standard Lengths m	Standard Unit Wt. Lbs.	Standard Unit Wt. kg	Nominal OD Inch	Nominal OD mm	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)
Interlocked AL Armor	**121872A**	NEC:	4	1000	304.8	222.0	100.6	.684	17.37	1	1.9	72.3	70	64.8	100±12	20.0
		CM								4	3.7	63.3	59	52.7	100±12	23.0
		CEC:								10	5.9	57.3	51	44.8	100±12	25.0
		HL								16	7.5	54.3	46	40.7	100±12	25.0
		CMG FT4						Nominal Core OD:		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
								.365	9.27	200	29.0	37.9	10	18.7	100±15	21.0
								x	x	310	37.1	34.9	—	14.9	100±20	18.0
								.165	4.19	350	39.8	34.2	—	13.9	100±22	17.0
										400 †	43.0	33.3	—	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 • 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