

## 9963 Multi-Conductor - Communication and Instrumentation Cable



### Description:

20 AWG stranded (19x32) tinned copper conductors, conductors cabled, nylon skin over insulation, PVC insulation, tinned copper braid shield (90% coverage), PVC jacket.

### Physical Characteristics (Overall)

#### Conductor

##### AWG:

# Conductors	AWG	Stranding	Conductor Material
3	20	19x32	TC - Tinned Copper

#### Insulation

##### Insulation Material:

Layer #	Insulation Material	Wall Thickness (in.)
1	PVC - Polyvinyl Chloride	.011
2	Nylon	.004

##### Insulation Resistance:

500 megohms/1000 ft. @ 500 VDC

#### Outer Shield

##### Outer Shield Material:

Type	Outer Shield Material	Coverage (%)
Braid	TC - Tinned Copper	90

#### Outer Jacket

##### Outer Jacket Material:

Outer Jacket Material	Nom. Wall Thickness (in.)
PVC - Polyvinyl Chloride	.025

#### Overall Cabling

##### Overall Cabling Lay Length & Direction:

Length (in.)	Twists (ft.)
1.75	6.88

##### Overall Cabling Color Code Chart:

Number	Color
1	White
2	Black
3	Red

##### Overall Nominal Diameter:

0.210 in.

### Mechanical Characteristics (Overall)

Operating Temperature Range: -20°C To +105°C

UL Temperature Rating: 105°C

Bulk Cable Weight: 28.900 lbs/1000 ft.

Max. Recommended Pulling Tension: 45 lbs.

Min. Bend Radius (Install)/Minor Axis: 2 in.

## 9963 Multi-Conductor - Communication and Instrumentation Cable

### Applicable Specifications and Agency Compliance (Overall)

#### Applicable Standards & Environmental Programs

EU CE Mark:	Yes
EU Directive 2000/53/EC (ELV):	Yes
EU Directive 2002/95/EC (RoHS):	Yes
EU RoHS Compliance Date (mm/dd/yyyy):	10/01/2005
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
Military Specification:	MIL-W-16878E/17 (insulated conductor)

#### Flame Test

UL Flame Test:	UL1685 UL Loading, VW-1
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#### Plenum/Non-Plenum

Plenum (Y/N):	No
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### Electrical Characteristics (Overall)

#### Nom. Inductance:

Inductance (µH/ft)

.145

#### Nom. Capacitance Conductor to Conductor:

Capacitance (pF/ft)

49

#### Nom. Capacitance Cond. to Other Conductor & Shield:

Capacitance (pF/ft)

84

#### Nom. Conductor DC Resistance:

DCR @ 20°C (Ohm/1000 ft)

9.1

#### Nominal Outer Shield DC Resistance:

DCR @ 20°C (Ohm/1000 ft)

5.8

#### Max. Operating Voltage - UL:

Voltage

600 V RMS

#### Max. Recommended Current:

Current

3.8 Amps per conductor @ 25°C

### Put Ups and Colors:

Item #	Putup	Ship Weight	Color	Notes	Item Desc
9963 009100	100 FT	3.600 LB	WHITE		3 #20 PVC/NY SHLD PVC
9963 0091000	1,000 FT	29.000 LB	WHITE	C	3 #20 PVC/NY SHLD PVC
9963 009500	500 FT	14.500 LB	WHITE	C	3 #20 PVC/NY SHLD PVC

#### Notes:

C = CRATE REEL PUT-UP.

## Introduction

Belden® multi-conductor cables are manufactured in a wide variety of gage sizes, dimensions, insulation materials, shielding configurations, and jacketing materials including Plenum and High-Temperature versions. These cables meet the technical requirements of many different types of systems. In fact, Belden offers one of the broadest lines of UL Listed, NEC and CEC multi-conductor cables available from any single source.

Applications for multi-conductor cables include computers, communications, instrumentation, sound, control, audio, and data transmission. Each of these cables is designed to protect signal integrity under critical conditions by reducing hum, noise, and crosstalk.

To assist you in selecting the proper cable for your application, both the suggested working voltages and the maximum temperature ratings are indicated for each applicable product in this section.

Most of our multi-conductor cables are available from stock. Many of these are available off the shelf from distributors. If you have a new or unusual application or you cannot find a multi-conductor cable in this catalog section that meets your technical requirements, contact Technical Support at 1-800-BELDEN-1.

### Multi-Conductor Cables Packaging

Belden's unique UnReel® cable dispenser is available for many of the multi-conductor products listed in this section. The letter "U" before the specified put-up length denotes UnReel packaging.

## Selection Guide

### Shielded Multi-Conductor Computer Cables for RS-232 Applications

Specifications		Cable Series*			
		9925	9608	9533	9939
<b>Conductor Size:</b> (AWG)	28				
	24	✓	✓	✓	
	22				✓
	20				
	18				
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<b>Insulation:</b>	S-R PVC		✓	✓	✓
	Polyethylene				
	Polypropylene				
	Datalene®†	✓			
<b>Shield:</b>	Overall Foil			✓	
	Drain Wire	✓		✓	
	Overall Foil/Braid	✓	✓		✓
	Braid Coverage	65%	65%		65%
<b>Drain Wire Overall:</b>		Yes	No	Yes	No
<b>No. of Cond. Available:</b>	1				
	2				
	3	✓	✓	✓	✓
	4	✓	✓	✓	✓
	5	✓	✓	✓	✓
	6	✓	✓	✓	✓
	7	✓	✓	✓	✓
	8	✓	✓	✓	✓
	9	✓	✓	✓	✓
	10	✓	✓	✓	✓
	11				
	12				
	13				
	15	✓	✓	✓	✓
	17				
	18				
	19				
	20			✓	
	25	✓	✓	✓	✓
	27				
30			✓		
31					
37	✓	✓		✓	
40			✓		
50		✓	✓	✓	
<b>Capacitance ** (pF/ft.)</b>		12.0	30.0	30.0	35.0




\*All cables are UL-listed.

\*\*Capacitance may vary on some cables.

† Foam high density polyethylene.

## Overall Braid Shield

MIL-W-16878 (Type B) Conductors, Shielded and Jacketed<sup>†</sup>  
Communication and Instrumentation Cables

Description	Part No.	UL NEC/ C(UL) CEC Type	No. of Cond.	Color Code	Standard Lengths		Standard Unit Weight		Insulation Thickness		Jacket Thickness		Nominal OD		Nominal Capacitance							
					Ft.	m	Lbs.	kg	Inch	mm	Inch	mm	Inch	mm	pF/ Ft.	pF/ m	pF/ Ft.	pF/ m				
<b>22 AWG</b> Stranded (19x34) TC Conductors • .003" (.76mm) Clear Nylon Skin over Insulation • Tinned Copper Braid Shield (90% Coverage)																						
<b>PVC Insulation • White PVC Jacket</b>																						
600V RMS 105°C VW-1	<b>9965</b>	—	1	White	1000	304.8	10.0	4.5	.010	.25	.010	.25	.100	2.54	—	—	100	328				
					<b>9966</b>	—	2	White, Black	100	30.5	2.9	1.3	.010	.25	.020	.51	.176	4.47	52	171	87	285
									500	152.4	10.5	4.8										
	1000	304.8	19.0	8.7																		
	<b>9967</b>	—	3 <sup>††</sup>	White, Black, Red	100	30.5	3.4	1.5	.010	.25	.020	.51	.184	4.67	45	148	88	289				
					500	152.4	13.0	5.9														
					1000	304.8	24.0	10.9														
	<b>9968</b>	—	4 <sup>††</sup>	White, Black, Red, Green	100	30.5	3.9	1.8	.010	.25	.020	.51	.200	5.08	42	138	69	226				
					500	152.4	14.5	6.6														
					1000	304.8	29.0	13.2														
<b>20 AWG</b> Stranded (19x32) Tinned Copper Conductors • .004" (.10mm) Clear Nylon Skin over Insulation • TC Braid Shield (90% Coverage)																						
<b>PVC Insulation • White PVC Jacket</b>																						
600V RMS 105°C VW-1	<b>9961</b>	—	1	White	500	152.4	4.5	2.0	.011	.27	.010	.25	.109	2.77	—	—	103	338				
					<b>9962</b>	—	2 <sup>††</sup>	White, Black	100	30.5	3.3	1.5	.011	.27	.020	.51	.192	4.88	53	174	91	299
									500	152.4	11.0	5.0										
	1000	304.8	22.0	10.0																		
	<b>9963</b>	—	3 <sup>††</sup>	White, Black, Red	100	30.5	3.9	1.8	.011	.27	.025	.64	.210	5.33	49	161	84	276				
					500	152.4	14.5	6.6														
					1000	304.8	29.0	13.2														
	<b>9964</b>	—	4 <sup>††</sup>	White, Black, Red, Green	100	30.5	4.6	2.1	.011	.27	.025	.64	.226	5.74	40	131	100	328				
					500	152.4	18.0	8.2														
					1000	304.8	39.0	17.7														
<b>16 AWG</b> Stranded (19x29) Tinned Copper Conductors • .004" (.10mm) Clear Nylon Skin over Insulation • TC Braid Shield (90% Coverage)																						
<b>PVC Insulation • White PVC Jacket</b>																						
600V RMS 105°C VW-1	<b>9951</b>	—	1	White	1000	304.8	20.0	9.1	.012	.30	.016	.41	.143	3.63	—	—	138	453				
					<b>9952</b>	—	2 <sup>††</sup>	White, Black	100	30.5	4.6	2.1	.012	.30	.025	.64	.250	6.35	57	187	95	312
									500	152.4	19.0	8.7										
	1000	304.8	42.0	19.1																		
	<b>9953</b>	—	3 <sup>††</sup>	White, Black, Red	100	30.5	5.2	2.4	.012	.30	.025	.64	.264	6.71	58	190	101	331				
					500	152.4	26.0	11.9														
					1000	304.8	56.0	25.5														
	<b>9954</b>	—	4 <sup>††</sup>	White, Black, Red, Green	100	30.5	7.7	3.5	.012	.30	.027	.69	.291	7.39	49	161	94	308				
					500	152.4	34.5	15.7														
					1000	304.8	73.0	33.1														

TC = Tinned Copper

\* Capacitance between conductors.

\*\* Capacitance between one conductor and other conductors connected to shield.

<sup>†</sup> Manufactured to Government specifications: MIL-W-16878 Rev. D.

<sup>††</sup> Conductors cabled.