

# RS-232/422 and RS-485 Data Cables

## Industrial Use Data Cables

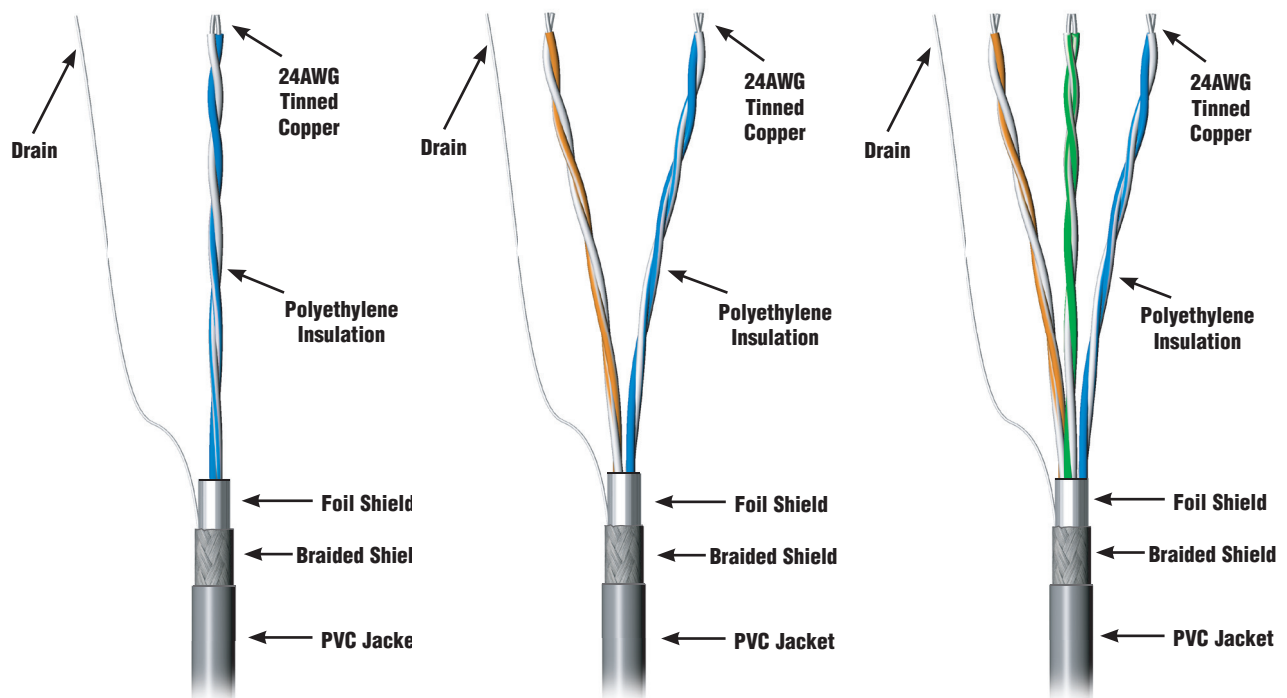
Electrically radiated noise frequently present in factory floor environments can interfere with device-to-device communication circuits, causing delayed signals or data loss. One important factor in establishing a good, reliable communication circuit is cable selection. AutomationDirect offers high quality, low-capacitance data cables designed with impedances specific for RS-232/422 and RS-485 communication applications in industrial environments. The 24 AWG tinned copper conductors are twisted pairs to reduce electrical noise sensitivity and are available in one, two, or three-pair color coded constructions. The polyethylene conductor insulation provides a very high insulation resistance with a low, stable dielectric constant resulting in lower capacitance and excellent velocity of propagation for superior signal transmission.

To protect from radiated or conducted electromagnetic interference (EMI), our data cables have combination shields consisting of an overall foil shield layer with drain wire and a woven braid shield layer. The overall foil shield has 100% cable coverage for excellent protection against higher frequency noise. A drain wire is provided to easily terminate and ground the foil shield. A second shield layer consists of a woven braid that is ideal for minimizing low frequency interference while providing superior structural integrity to the overall cable. Our combination foil/braid shielded cables offer maximum shield effectiveness across the frequency spectrum compared to other single layer shielded cables. The rugged gray PVC jacket is durable enough for use in demanding industrial applications.



## Features

- Low capacitance data cables for RS-232, RS-422, and RS-485 applications in industrial environments
- Color coded 24 AWG tinned copper twisted pair conductors to reduce electrical noise sensitivity
- Polyethylene insulation provides a very high insulation resistance with a low, stable dielectric constant
- Combination overall foil shield with tinned copper drain wire plus tinned copper braid shield maximizes shielding effectiveness compared to single layer shielded cables
- Rugged gray PVC jacket provides durability in demanding installations
- UL CM/CL2 or AWM Style 2919



# RS-485 Data Cable Specifications

RS-485 Data Cables		<i>L19827 Series</i>	<i>L19954 Series</i>	<i>L19773 Series</i>
<b>Construction</b>		24 AWG 7-strand tinned copper; 1 twisted pair; overall foil and tinned copper braid shielding; PVC jacket. AWM Style 2919; EIA-485; CM/CL2	24 AWG 7-strand tinned copper; 2 twisted pairs; overall foil and tinned copper braid shielding; PVC jacket. AWM Style 2919; EIA-485; CM/CL2	24 AWG 7-strand tinned copper; 3 twisted pairs; overall foil and tinned copper braid shielding; PVC jacket. AWM Style 2919; EIA-485; CM/CL2
<b>Insulation</b>		Polyethylene	Polyethylene	Polyethylene
<b>Color Code</b>	<b>Pair 1</b>	White/Blue Line & Blue/White Line	White/Blue Line & Blue/White Line	White/Blue Line & Blue/White Line
	<b>Pair 2</b>	N/A	White/Orange Line & Orange/White Line	White/Orange Line & Orange/White Line
	<b>Pair 3</b>	N/A	N/A	White/Green Line & Green/White Line
<b>Assembly</b>		1 Twisted pair, overall shield	2 Twisted pairs cabled; overall foil tape shield and 95% Tc braid, jacketed	3 Twisted pairs cabled; overall foil tape shield and 95% Tc braid, jacketed
<b>Pair Twist</b>		2.8" Lay (4.3 Twists per foot)	1" Lay (12 twists/foot)/cabling 2.5" lay (4.8 twists/foot)	1" Lay (12 twists/foot)/cabling 2.5" lay (4.8 twists/foot)
<b>Shield/Drain</b>		Overall foil shield & 24 AWG strand tinned copper drain wire, plus 95% tinned copper braid	Overall foil shield & 24 AWG strand tinned copper drain wire, plus 95% tinned copper braid	Overall foil shield & 24 AWG strand tinned copper drain wire, plus 95% tinned copper braid
<b>Jacket</b>		Chrome Gray PVC	Chrome Gray PVC	Gray PVC
<b>Diameter</b>		0.236" Nominal	0.353" Nominal	0.380" Nominal
<b>Minimum Bend Radius</b>		2.5" (Install)	3.6" (Install)	3.8" (Install)
<b>Cable Weight</b>		34.4 lb/1000' Approx.	57.9 lb/1000' Approx.	64.6 lb/1000' Approx.
<b>Impedance</b>		120Ω	120Ω	120Ω
<b>Capacitance</b>		12.8 pF/ft Nom.	12.8 pF/ft Nom.	12.8 pF/ft Nom.
<b>Resistance</b>		27.2Ω DC per 1000 ft @ 20°C (68°F) max	27.2Ω DC per 1000 ft @ 20°C (68°F) max	27.2Ω DC per 1000 ft @ 20°C (68°F) max
<b>Attenuation</b>		0.6 dB/100 ft @ 1 MHz (Nominal)	0.6 dB/100 ft @ 1 MHz (Nominal)	0.6 dB/100 ft @ 1 MHz (Nominal)
<b>Velocity of Propagation</b>		66.2%	66.2%	66.2%
<b>Max. Current</b>		2.1 Amps per conductor @ 25°C (77°F) (Maximum recommended)	2.1 Amps per conductor @ 25°C (77°F) (Maximum recommended)	1.54 Amps per conductor @ 25°C (77°F) (Maximum recommended)
<b>Temp/Voltage</b>		80°C (176°F)/30V (AWM 2919) or 60°C (140°F)/300V (UL CM)	80°C (176°F)/30V (AWM 2919) or 60°C (140°F)/300V (UL CM)	80°C (176°F)/30V (AWM 2919) or 60°C (140°F)/300V (UL CM)
<b>Temp Range</b>		-20°C to 80°C (-4°F to 176°F)	-20°C to 80°C (-4°F to 176°F)	-20°C to 80°C (-4°F to 176°F)
<b>Plenum</b>		No	No	No
<b>Spool/Coil Length</b>		100, 500 or 1000 feet	100, 500 or 1000 feet	100, 500 or 1000 feet
<b>UL Classification</b>		CM/CL2 or AWM Style 2919	CM/CL2 or AWM Style 2919	CM/CL2 or AWM Style 2919
<b>Agency Approvals</b>		UL (E118871), RoHS & REACH Compliant	UL (E118871), RoHS & REACH Compliant	UL (E118871), RoHS & REACH Compliant

## Illustration Examples



Single Twisted Pair



2 Twisted Pairs



3 Twisted Pairs

# RS-232/422 Data Cable Specifications

RS-232/422 Data Cables		
	<b>L19772 Series</b>	<b>L19853 Series</b>
<b>Construction</b>	24 AWG 7-strand tinned copper; 2 twisted pairs; cabled; overall foil and 65% tinned copper braid shield, PVC jacket	24 AWG 7-strand tinned copper; 3 twisted pairs; cabled; overall foil and 65% tinned copper braid shield, PVC jacket
<b>Insulation</b>	Foam polyethylene	Foam polyethylene
<b>Color Code</b>	<b>Pair 1</b>	White/Blue Line & Blue/White Line
	<b>Pair 2</b>	White/Orange Line & Orange/White Line
	<b>Pair 3</b>	N/A
<b>Assembly</b>	2 Twisted pairs cabled; overall foil tape shield and 65% tinned copper braid, jacketed	3 Twisted pairs cabled; overall foil tape shield and 65% tinned copper braid, jacketed
<b>Pair Twist</b>	1" Lay (12 twists/foot)/cabling 2.0" lay (6 twists/foot)	1" Lay (12 twists/foot)/cabling 2.0" lay (6 twists/foot)
<b>Shield/Drain</b>	Overall foil shield & 24 AWG strand tinned copper drain wire plus 65% tinned copper braid	Overall foil shield, & 24 AWG strand tinned copper drain wire plus 65% tinned copper braid
<b>Jacket</b>	Gray PVC	Gray PVC
<b>Diameter</b>	0.266" Nominal	0.291" Nominal
<b>Min. Bend</b>	2.75" (Install)	3.0" (Install)
<b>Cable Wt</b>	34.2 lb/1000' Approx.	43.3 lb/1000' Approx.
<b>Impedance</b>	100Ω	100Ω
<b>Capacitance</b>	12.5 pF/ft Nom.	12.5 pF/ft Nom.
<b>Resistance</b>	27.2Ω DC per 1000 ft @ 20°C (68°F) max	27.2Ω DC per 1000 ft @ 20°C (68°F) max
<b>Attenuation</b>	0.6 dB/100 ft @ 1 MHz	0.6 dB/100 ft @ 1 MHz
<b>Velocity of Propagation</b>	79.1%	79.1%
<b>Max. Current</b>	1.5 Amps per conductor @ 25°C (77°F) (Maximum recommended)	1.5 Amps per conductor @ 25°C (77°F) (Maximum recommended)
<b>Temp/Voltage</b>	80°C (176°F)/30V (AWM 2919) or 60°C (140°F)/300V (UL CM)	80°C (176°F)/30V (AWM 2919) or 60°C (140°F)/300V (UL CM)
<b>Temp Range</b>	-20°C to 80°C (-4°F to 176°F)	-20°C to 80°C (-4°F to 176°F)
<b>Plenum</b>	No	No
<b>Spool/Coil Length</b>	100, 500 or 1000 feet	100, 500 or 1000 feet
<b>UL Classification</b>	CM/CL2 or AWM Style 2919	CM/CL2 or AWM Style 2919
<b>Agency Approvals</b>	UL (E118871), RoHS & REACH Compliant	UL (E118871), RoHS & REACH Compliant

## Illustration Examples



**2 Twisted Pairs**



**3 Twisted Pairs**

# RS-232/422 and RS-485 Data Cables Selection

Data Cables							
Part Number	Wiring Standard	Length	No. of Pairs	Pair Colors	Description	Weight (lbs)	Price
<b>L19827-100</b>	RS-485	100 ft (30.5m)	1	Pair 1 - White/Blue Line & Blue/White Line Pair 2 - N/A Pair 3 - N/A	RS-485 cable, multi-conductor low capacitance, 120Ω impedance data cable, 1 twisted pair, 24 AWG conductors with polyethylene insulation, overall foil shield and tinned copper braid shield with 24 AWG tinned copper drain wire, chrome gray PVC jacket, UL cable type CM/CL2 and AWM style 2919	4	
<b>L19827-500</b>		500 ft (152.4m)				18	
<b>L19827-1000</b>		1000 ft (304.8m)				35	
<b>L19954-100</b>	RS-485	100 ft (30.5m)	2	Pair 1 - White/Blue Line & Blue/White Line Pair 2 - White/Orange Line & Orange/White Line Pair 3 - N/A	RS-485 cable, multi-conductor low capacitance, 120Ω impedance data cable, 2 twisted pairs, 24 AWG conductors with polyethylene insulation, overall foil shield and tinned copper braid shield with 24 AWG tinned copper drain wire, chrome gray PVC jacket, UL cable type CM/CL2 and AWM style 2919	7	
<b>L19954-500</b>		500 ft (152.4m)				37	
<b>L19954-1000</b>		1000 ft (304.8m)				66	
<b>L19773-100</b>	RS-485	100ft (30.5m)	3	Pair 1 - White/Blue Line & Blue/White Line Pair 2 - White/Orange Line & Orange/White Line Pair 3 - White/Green Line & Green/White Line	RS-485 cable, multi-conductor low capacitance, 120Ω impedance data cable, 3 twisted pairs, 24 AWG conductors with polyethylene insulation, overall foil shield and tinned copper braid shield with 24 AWG tinned copper drain wire, chrome gray PVC jacket, UL cable type CM/CL2 and AWM style 2919	7	
<b>L19773-500</b>		500 ft (152.4m)				37	
<b>L19773-1000</b>		1000 ft (304.8m)				64	
<b>L19772-100</b>	RS-232 & RS-422	100 ft (30.5m)	2	Pair 1 - White/Blue Line & Blue/White Line Pair 2 - White/Orange Line & Orange/White Line Pair 3 - N/A	RS-422/RS-232 cable, multi-conductor low capacitance, 100Ω impedance data cable, 2 twisted pairs, 24 AWG conductors with foam polyethylene insulation, overall foil shield and tinned copper braid shield with 24 AWG tinned copper drain wire, chrome gray PVC jacket, UL cable type CM/CL2 and AWM style 2919	4	
<b>L19772-500</b>		500 ft (152.4m)				21	
<b>L19772-1000</b>		1000 ft (304.8m)				38	
<b>L19853-100</b>	RS-232 & RS-422	100 ft (30.5m)	3	Pair 1 - White/Blue Line & Blue/White Line Pair 2 - White/Orange Line & Orange/White Line Pair 3 - White/Green Line & Green/White Line	RS-422/RS-232 cable, multi-conductor low capacitance, 100Ω impedance data cable, 3 twisted pairs, 24 AWG conductors with foam polyethylene insulation, overall foil shield and tinned copper braid shield with 24 AWG tinned copper drain wire, chrome gray PVC jacket, UL cable type CM/CL2 and AWM style 2919	5	
<b>L19853-500</b>		500 ft (152.4m)				23	
<b>L19853-1000</b>		1000 ft (304.8m)				41	

Data Cables Cross Reference						
ADC Part #	Belden Cable	Alpha Wire & Cable	Carol Wire & Cable	Allied Wire & Cable	Provo Cable	Delco Cable
<b>L19772-xxxx</b>	8102 / 9729	6222C	C0515A	1030	5402	30702
<b>L19853-xxxx</b>	8103	6223C	C0516A	1032	5403	30702
<b>L19827-xxxx</b>	9841	6412	C0841A	9682	5401	43901
<b>L19954-xxxx</b>	9842	6413	C0842A	9684	5402	43902
<b>L19773-xxxx</b>	9843	6414	C0843A	9686	5404	43903