

NP 241

ControlBus® Cables

Belden® ControlBus cables are Low-loss RG-6/U Type Coaxes. They meet the high-speed, time-critical requirements necessary for the operation of ControlNet™ factory-floor systems.



Belden Expands Its ControlBus Cable Line With a Continuously Corrugated Aluminum Armored Product

About ControlNet

ControlNet is a high-speed, serial communication system that provides for a time-critical exchange of information between complex control devices such as programmable logic controllers, HMIs and PC-based controllers. ControlNet operates in a totally deterministic and predictable manner, allowing the various devices and controllers on the network to communicate at a precise and pre-determined point in time.

ControlNet Features

A ControlNet network can support up to 48 nodes at a bus speed of 5Mb/s on a total end-to-end distance of 250m. The bus topology can be star, tree, bus, or any combination of the three. The time delay throughout the system and a maximum end-to-end distance of 30+ km, represent the only limiting factors on the number of repeaters that can be used.

Although ControlNet uses a larger bandwidth than other automation and control networks, it does not function as a traditional "broadband" network. In a ControlNet system, the network devices and controllers are expected to communicate/operate at a pre-determined point in time and for a specific length of time. Broadband communication networks differ in that their communication efforts take place when the network has room for the communication.

Because ControlNet is deterministic, it is robust and capable enough for industrial time-critical applications. This core philosophy of the system also requires that signal transmission be uncorrupted and high speed. Therefore, choosing an approved, tested and conformant Low-loss RG-6 made especially for ControlNet systems from Belden is truly important for maximum system performance.

Quad-shielded ControlBus Coaxial Cables

Belden ControlBus Low-loss coax cables for ControlNet applications incorporate a Duobond® IV Quad Shield for maximum signal integrity and run length. All products are sweep tested, ensuring that Return Loss, and other critical performance features, meet the requirements of the ControlNet physical layer specification. New to the line is 183092A— with continuously corrugated aluminum armoring for added protection in harsh environments. ControlBus cables can be supplied with a CPE jacket and/or aluminum or steel interlocked armoring. Belden also manufactures variations of the cable for different applications, environments, and identification purposes.

ControlNet™

ControlBus Quad Shielded Coax for ControlNet Applications

Description	Part No.	UL NEC/ C(UL) CEC Type	Standard Lengths		Standard Unit Weight		Conductor (stranding) Diameter Nom. DCR	Nominal Core OD		Shielding Materials Nom. DCR	Nominal OD		Nom. Imp. (Ω)	Nom. Vel. of Prop.	Nominal Capacitance		Nominal Attenuation		
			Ft.	m	Lbs.	kg		Inch	mm		Inch	mm			pF/Ft.	pF/m	MHz	dB/ 100 Ft.	dB/ 100m

RG-6/U Type • 18 AWG Solid Bare Copper-covered Steel • Duobond® IV* Quad Shield

Foam PE Insulation • PVC Jacket (Black, Red, or Intrinsically Safe Blue)																			
75°C	3092A	NEC:	500	152.4	22.0	10.0	18 AWG	.180	4.57	Duobond IV	.298	7.57	75	82%	16.2	53.1	1	.35	1.1
		CL2R CMR	1000♦	304.8	42.0	19.1	(solid)			Quad							2	.38	1.2
		CEC:	2000†	609.6	80.0	36.3	.040"			Shield							5	.45	1.5
		CMG FT4	2500▲	762.2	97.5	44.3	BCCS			3.6Ω/M'							10	.59	1.9
							28.0Ω/M'			11.8Ω/km							20	.86	2.8
							91.8Ω/km										50	1.37	4.5
																	100	1.97	6.5
																	200	2.82	9.3
																	300	3.48	11.4
																	400	4.04	13.3

Allen-Bradley P/N 1786

♦ Red available as standard in 1000 ft. only.
▲ 2500 ft. put-up available in Black only.

Plenum • Foam FEP Insulation • Fluorocopolymer Jacket (Black or Intrinsically Safe Blue*)																			
High Temp 150°C	3093A	NEC:	1000♦	304.8	40.0	18.2	18 AWG	.170	4.32	Duobond IV	.274	6.96	75	82%	16.3	53.5	1	.36	1.2
		CMF	2000†	609.6	80.0	36.3	(solid)			Quad							2	.38	1.2
		CEC:	2500†	762.0	95.0	43.1	.040"			Shield							5	.50	1.6
		CMF FT6					BCCS			3.6Ω/M'							10	.65	2.1
							28.0Ω/M'			11.8Ω/km							20	.95	3.1
							91.8Ω/km										50	1.50	4.9
																	100	2.12	7.0
																	200	2.99	9.8
																	300	3.66	12.0
																	400	4.23	13.9

Allen-Bradley P/N 1786

♦ Blue available as standard in 1000 ft. only.
Suitable for Outdoor and Direct Burial applications.

Aluminum Interlocked Armor • Foam PE Insulation • PVC Inner and PVC Sunlight-resistant Outer Jacket (Black)																			
Aluminum Interlocked Armor 75°C	123092A	NEC:	1000††	304.8	180.0	81.7	18 AWG	.180	4.57	Duobond IV	Inner Jacket:	75	82%	16.2	53.1	1	.35	1.2	
		CM					(solid)			Quad	.298	7.57				2	.38	1.3	
		CEC:					.040"			Shield						5	.45	1.5	
		CMG FT4					BCCS			3.6Ω/M'	Overall:					10	.59	1.9	
		HL (Haz. Loc.)					28.0Ω/M'			11.8Ω/km	.620	15.75				20	.86	2.8	
							91.8Ω/km									50	1.37	4.5	
																100	1.97	6.5	
																200	2.82	9.3	
																300	3.48	11.4	
																400	4.04	13.3	

Allen-Bradley P/N 1786

†† Final put-up length may vary ±5% from length shown.
Sequentially marked at 1 meter intervals.

Continuously Corrugated AL Armor • Foam PE Insulation • PVC Inner and PVC Sunlight-resistant Outer Jacket (Black)																			
Continuous Armor 75°C	183092A <small>NEW</small>	NEC:	2000▲	609.6	350.0	158.9	18 AWG	.180	4.57	Duobond IV	Inner Jacket	75	82%	16.2	53.2	1	.35	1.2	
		CL2, CM					(solid)			Quad	.298	7.57				2	.38	1.3	
							.040"			Shield	Overall:					5	.45	1.5	
							BCCS			3.6Ω/M'	.570	14.48				10	.59	1.9	
							28.0Ω/M'			11.8Ω/km						20	.86	2.8	
							91.9Ω/km									50	1.37	4.5	
																100	1.97	6.5	
																200	2.82	9.3	
																300	3.48	11.4	
																400	4.04	13.3	

Allen-Bradley P/N 1786

▲ Final put-up length may vary ±10% from length shown.
Jacket sequentially marked at 2 ft. intervals.

RG-6/U Type • 20 AWG Stranded (105x40) Bare Copper • Duobond IV* Quad Shield

Foam PE Insulation • PVC Jacket (Black)																			
High-Flex	3092F	NEC:	1000	304.8	44.0	20.0	20 AWG	.183	4.65	Duobond IV	.303	7.70	75	79%	17.0	55.8	1	.36	1.2
		CL2R CMR	5000†	1524.0	225.0	102.2	(105x40)			Quad							2	.47	1.5
		CEC:					.040"			Shield							5	.80	2.6
		CMG FT4					Bare			3.6Ω/M'							10	1.20	3.9
							Copper			11.8Ω/km							20	2.00	6.6
							10.5Ω/M'										50	3.20	10.5
							34.4Ω/km										100	4.60	15.1
																	200	6.50	21.3
																	300	8.00	26.2
																	400	9.30	30.5

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IEEE 802.4 MAP/IEEE 802.7 Mini-MAP.
For Rockwell authorized Flexible ControlNet order YR28890 (Tinned Copper Braid version).

AL = Aluminum • BCCS = Bare Copper-covered Steel • DCR = DC Resistance • FEP = Fluorinated Ethylene-propylene • PE = Polyethylene
* Duobond IV Quad Shield = Duobond II Foil + 60% aluminum braid + Duofoil + 40% aluminum braid.
† Final put-up length may vary -0% to +10% from length shown.