Continuous Flexing Profinet Cable

QUABBIN® WIRE & CABLE CO., INC.
www.quabbin.com

Quabbin DataMax® Extreme Profinet Cable*

Many industrial applications expose cables to hazards not present in commercial data cabling installations.

Although a cable suited for commercial applications may initially work in a harsh industrial environment, it will quickly fail when used in continuous flexing applications. While commercial grade cables may have a low initial product cost, downtime due to premature failure can be avoided by using a cable that is specifically designed and tested for continuous flexing industrial applications.

Typical Profinet cables have a tube jacket surrounding the conductor pairs with room within for the pairs to move around and even untwist in flexing applications, resulting in early mechanical or electrical failure of the cable. Quabbin DataMax Industrial Profinet cable jackets were developed to survive the many industrial hazards that commercial jackets will not. DataMax cable jackets are pressure extruded over the cable core, effectively "locking" the conductor pairs in place. This type of jacket construction provides very stable electrical performance, even when the cable is impacted, bent, or repeatedly flexed. Pressure extrusion also provides a very smooth, round, and firm jacket profile that is crush resistant and ideal for obtaining a reliable termination and seal when installing connectors.

Quabbin has performed extensive testing on their pressure extruded jacketed DataMax Industrial Profinet cables. Samples are subjected to up to 10 million cycles in a flex testing device that simulates an unsupported bend, simulating a situation the cable would be exposed to on a robotic arm. The unsupported bend test is much more abusive than a C-Track or Tick-tock test, both of which add protection to the cable by supporting the bend.

Quabbin DataMax Industrial Profinet cable provides superior design and construction that will withstand the rigors of continuous flexing applications and the harsh environments found in industrial installations. Quabbin DataMax Industrial Profinet cable performs above industry standards, thereby reducing downtime and increasing productivity. DataMax Industrial Profinet cables fully comply POE and CAT 5e industrial communication specifications.

Features

- Designed and tested for continuous flexing Industrial applications
- Profinet Type B & C
- Designed for EtherNet/IP™ systems **
- 22AWG, 2 twisted pairs with color coded high density polyethylene insulation
- Overall braid and foil shields
- Pressure extruded TPE jacket for excellent chemical, moisture, and exceptional low temperature flexibility
- Mechanical properties tests include:
  - » minimum of 1 million cycles (10x cable O.D. minimum radius)
  - » minimum of 10 million cycles (20x cable O.D. minimum radius)
  - » minimum of 3 million cycles torsion test
- UL Type PLTC
- Cut to length in 1 foot increments
- Low 20 foot minimum length
- Made in the USA

** DataMax is a registered trademark of Quabbin Wire and Cable Corporation.*
*** EtherNet/IP is a trademark of ODVA, Inc.*

Description

DataMax Extreme Industrial Profinet cables are a two pair shielded construction with 22AWG twisted pair conductors and 7/30 stranded tinned copper with color coded high density polyethylene insulation. polyethylene insulation. Shielded constructions include both a tinned copper braid shield and aluminized polyester foil overall shield. Available in a pressure extruded Thermoplastic Elastomer (TPE) jacket with excellent moisture, chemical, UV and weathering resistance, exceptional low-temperature flexibility, and good flame and fire resistance. Specifically designed and constructed for continuous flexing applications, DataMax Extreme cables have been tested for a minimum of 1 million cycles (10x cable O.D. minimum radius), a minimum of 10 million cycles (20x cable O.D. minimum radius), and a minimum of 3 million cycles torsion test. Agency approvals include UL Type CMX OUTDOOR - CM, and UL AWM Style 2463 (80°C, 600V).

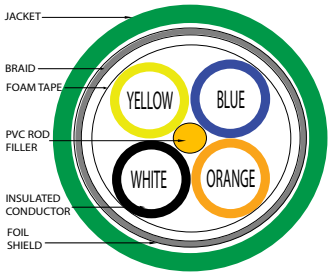
Click on the above thumbnail or go to
https://www.automationdirect.com/VID-WD-0016
for a short introduction on our cut to length cable

Continuous Flexing PROFINET Cable

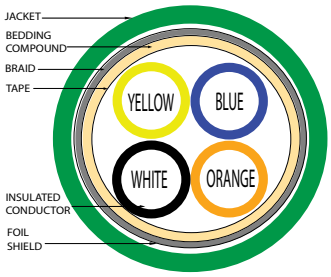
Continous Flexing PROFINET Cable Selection								
Part Number	***Wiring Standard***	***Minimum Cut Length (ft)****	***Shield***	***No. of Pairs***	***Pair Colors***	***Description***	***Approximate Weight (lb/ft)***	***Price per foot***
Q5094-1	Cat5e	20ft (6m)	Foil	2	Pair 1 - White / Blue Pair 2 - Yellow / Orange	Quabbin continuous flexing Profinet cable, shielded, PLTC and CL3, 4 conductors, 22 AWG, tinned copper, polyethylene conductor insulation material, white, blue, yellow and orange, TPE jacket, green, cut to length.	0.0390	$4c1e:
Q5099-1		20ft (6m)		2	Pair 1 - White / Blue Pair 2 - Yellow / Orange	Quabbin continuous flexing Profinet cable, shielded, PLTC-ER and CM, 4 conductors, 22 AWG, tinned copper, polyethylene conductor insulation material, white, blue, yellow and orange, TPE jacket, green, cut to length.	0.0569	$;4c1f:

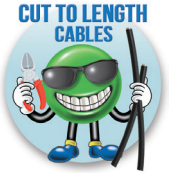
** See web store for maximum cut lengths*

Q5094 Series



Q5099 Series





Please Note: Our prices on Continuous Flexing IE Cable are closely tied to the market price for copper. This allows us to offer the best savings possible if conditions are favorable; however, it also means that our prices may increase if market conditions warrant.

Continuous Flexing PROFINET Cable - Shielded

Continuous Flexing PROFINET Cable Specifications			
		Physical Properties	
		Q5094 Series	***Q5099 Series***
Conductor Gauge and Stranding		22 AWG 7/30 stranded tinned copper; 2 twisted pairs	22 AWG 7/30 stranded tinned copper; 2 twisted pairs
Assembly		(4) color coded wires cabled together with a Polyvinylchloride (PVC) rod fill (0.27" ± 0.005") and wrapped with a foam Polypropylene (PP) tape to form a cable core	(4) color coded wires cabled together wrapped with a clear Polyester tape embedded within a core of Thermoplastic Elastomer.
Jacket		Thermoplastic Elastomer, Green (CR #70)	
Jacket Insulation Thickness		0.035 inch; Nominal	0.047 inch; Nominal
Shield		An overall shield of 38 AWG tinned copper braid (80% min. coverage), shall be applied over the cable core. A second shield of overall aluminized polyester foil shield (foil in, 100% coverage) shall be applied over the braid	
Cable Overall Diameter		0.250 inch; Nominal	0.305 inch; Nominal
Temp/Voltage		75°C & 80°C (167°F & 176°F)	75°C (167°F)
Minimum Temperature Rating		-40°C (-40°F)	
Plenum		No	
Sunlight Resistant		Yes	
Static Minimum Bend Radius		8 x cable O.D.	
Conductor Insulation		High Density Polyethylene (HDPE)	
Color Code	***Pair 1***	White & Blue	White & Blue
	Pair 2	Yellow & Orange	Yellow & Orange
Bare Conductor Diameter		0.030 inch; Nominal	
Conductor Insulation Thickness		0.018 inch; Nominal	0.010 inch; Nominal
Insulated Conductor Diameter		0.066 ± 0.001 inch; Nominal	0.050 ± 0.001 inch; Nominal
Cabled Core Diameter		0.160 inch; Nominal	0.190 inch; Nominal
Shield + Cabled Core Diameter		0.180 inch; Nominal	0.208 inch; Nominal
Print Legend		QUABBIN DATAMAX INDUSTRIAL PROFINET TYPE B AND C CAT 5E SHIELDED P/N 5094 -- (UL) TYPE PLTC OR CL3 4C 22 AWG SF/QUAD 75C SUNLIGHT RESISTANT OIL RES I & II OR AWM 2463 80C 600V -- CE RoHS -- (LOT DESIGNATOR) (SEQUENTIAL FOOTAGE)	QUABBIN DATAMAX EXTREME HIGH FLEX PROFINET TYPE B AND C CAT 5E SHIELDED P/N 5099 (UL) TYPE PLTC-ER 4C 22 AWG SF/QUAD 75C SUN RES -40C OR C(UL)US TYPE CM -- CE RoHS -- (LOT DESIGNATOR) (SEQUENTIAL FOOTAGE)
		Performance	
Flex Life *		1 million cycles minimum (10x cable O.D. minimum radius)	
		10 million cycles minimum (20x cable O.D. minimum radius)	
Torsion Test**		3 million cycles minimum	
Cutting/ Machine Oil Resistance ***		Tensile strength retention 80%; Nominal Elongation retention 100%; Nominal	N/A

** 126 Cycles per minute, @ 20°C*
*** 1lb load, 360 degrees, 71 cycles per minute, @20C*
**** Per Quabbin test report #TR 08-0001*

Continuous Flexing PROFINET Cable - Shielded

Continuous Flexing PROFINET Cable Specifications		
Electrical Characteristics (for 100 meters of cable)		
	Q5094 Series	***Q5099 Series***
Impedance, Characteristic	1 ≤ f ≤ 100 MHz 100 ±15 Ω TYPICAL	
Impedance,	N/A	1 ≤ f ≤ 100 MHz 10f mΩ /m
Mutual Capacitance (max)	5.6 nF/100m @ 1 kHz @ 20°C	
Capacitance Unbalanced (max)	Pair-to-ground 330 pF/100m AT 1 kHz @ 20°C	
DC Resistance (max)	17.5 Ω per 1000ft @ 20°C (68°F)	
DC Resistance Unbalanced (max)	5% @ 20°C (68°F)	
Voltage Rating (max)	600V	300V
Dielectric Withstand, Min.	2000V RMS	1500V RMS
Return Loss	1 ≤ f < 10 MHz 20 + 5 LOG (f) dB MIN* 10 ≤ f < 20 MHz 25 dB MIN* 20 ≤ f ≤ 100 MHz 25 - 8.6 LOG(f/20) dB MIN*	
Near End Crosstalk (NEXT)	1 ≤ f ≤ 100 MHz 35.3 - 15 LOG(f/100) dB MIN	
Power Sum Near End Crosstalk (PSNEXT)	N/A	
Power Sum Attenuation to Crosstalk Ratio, Far End (PSACRF)	N/A	
Attenuation Crosstalk Ratio, Far End (ACRF)	1 ≤ f ≤ 100 MHz 23.8 - 20 LOG(f/100) dB MIN	
Insertion Loss	1 ≤ f ≤ 100 MHz 1.02(1.967 $\sqrt{f}$ + 0.023(f) + 0.050/$\sqrt{f}$ dB) MAX**	
Propagation Delay	1 ≤ f ≤ 100 MHz 534 + 36/$\sqrt{f}$ ns MAX	
Propagation Delay Skew	1 ≤ f ≤ 100 MHz < 20ns	
Coupling Attenuation Per IEC 62153-4-9	30 ≤ f ≤ 100 MHz ≥ 60dB MIN	
Tested Length	P. O. E. Compliant (802.3af) to 100 meters (328 feet) when installed per recommendations in TIA TSB-184 Cable will meet CAT5e channel requirements up to 100 meter length	
Agency Approvals	NEC (UL) TYPE PLTC NEC (UL) TYPE CL3 UL AWM 2463	NEC (UL) TYPE PLTC-ER NEC (UL) TYPE CM CEC C(UL) TYPE CM

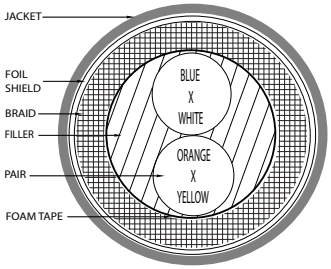
** Per ODVA Volume 2 EtherNet/IP*
*** 2% HIGHER THAN HORIZONTAL CABLE SPECIFICATION PER TIA 568-C.2*
NOTE: All testing conducted off the reel.

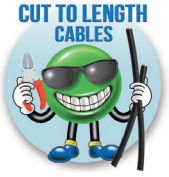
Continuous Flexing PROFINET Cable

Continous Flexing PROFINET Cable Selection								
Part Number	*Wiring Standard*	*Minimum Cut Length (ft)**	*Shield*	*No. of Pairs*	*Pair Colors*	*Description*	*Approximate Weight (lb/ft)*	*Price per foot*
Q5924-1	Cat5e	20ft (6m)	Foil	2	Pair 1 - Blue - While Pair 2 - Orange - Yellow		0.0494	$;-5v!i:

** See web store for maximum cut lengths*

Q5924 Series





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Continuous Flexing PROFINET Cable Specifications		
		Physical Properties
		Q5924 Series
Conductor Gauge and Stranding		22 AWG 19/.0058 stranded tinned copper; 2 twisted pairs
Assembly		Assembly Individual conductors twisted into pairs
Jacket		Green Thermoplastic Elastomer, (TPE)
Jacket Insulation Thickness		0.042 inch; Nominal
Shield		38AWG tinned copper braid, aluminized polyester foil shield (100% coverage)
Cable Overall Diameter		0.233 inch; Nominal
Temp/Voltage		75°C & 80°C (167°F & 176°F)
Minimum Temperature Rating		-40°C (-40°F)
Plenum		Yes
Sunlight Resistant		Yes
Static Minimum Bend Radius		8 x cable O.D.
Conductor Insulation		High Density Polyethylene (HDPE)
Color Code	***Pair 1***	White & Blue
	Pair 2	Yellow & Orange
Bare Conductor Diameter		0.028 inch; Nominal
Conductor Insulation Thickness		0.013 inch; Nominal
Insulated Conductor Diameter		0.054 ± 0.001 inch; Nominal
Cabled Core Diameter		0.233 inch; Nominal
Shield + Cabled Core Diameter		0.180 inch; Nominal
Print Legend		QUABBIN DATAMAX INDUSTRIAL PROFINET TYPE B AND C CAT 5E SHIELDED P/N 5924 -- U.S. PATENT NO. US 8,487,184 B2 -- (UL) TYPE PLTC 2PR 22 AWG SF/UTP 75C SUNLIGHT RESISTANT OIL RES I & II OR ITC OR AWM 2463 80C 600V -- P-07-KA140018-MSHA -- CE RoHS --(LOT DESIGNATOR) (SEQUENTIAL FOOTAGE)
Performance		
Flex Life *		1 million cycles minimum (10x cable O.D. minimum radius)
		10 million cycles minimum (20x cable O.D. minimum radius)
Torsion Test**		3 million cycles minimum
Cutting/ Machine Oil Resistance ***		Tensile strength retention 80%; Nominal Elongation retention 100%; Nominal

**** 126 Cycles per minute, @ 20°C***
***** 1lb load, 360 degrees, 71 cycles per minute, @20C***
****** Per Quabbin test report #TR 08-0001***

Continuous Flexing PROFINET Cable - Shielded

Continuous Flexing PROFINET Cable Specifications	
Electrical Characteristics (for 100 meters of cable)	
	Q5924 Series
Impedance 1-100 MHz	100 ±15 Ω TYPICAL
Mutual Capacitance (max)	13.5 pF/ft @ 1 MHz
Capacitance Unbalanced (max)	Pair-to-ground 330 pF/100m AT 1 kHz @ 20°C
DC Resistance (max)	15.9 Ω per 1000ft @ 20°C (68°F)
Voltage Rating (max)	600V
Dielectric Withstand, Min.	2000V RMS
Return Loss	1 ≤ f < 10 MHz 20 + 5 LOG (f) dB MIN* 10 ≤ f < 20 MHz 25 dB MIN* 20 ≤ f ≤ 100 MHz 25 - 7 LOG(f/20) dB MIN*
Near End Crosstalk (NEXT)	1 ≤ f ≤ 100 MHz 35.3 - 15 LOG(f/100) dB MIN
Power Sum Near End Crosstalk (PSNEXT)	N/A
Power Sum Attenuation to Crosstalk Ratio, Far End (PSACRF)	N/A
Attenuation Crosstalk Ratio, Far End (ACRF)	1 ≤ f ≤ 100 MHz 23.8 - 20 LOG(f/100) dB MIN
Insertion Loss	1 ≤ f ≤ 100 MHz 1.02(1.967 $\sqrt{f}$ + 0.023(f) + 0.050/$\sqrt{f}$ dB) MAX**
Propagation Delay	1 ≤ f ≤ 100 MHz 534 + 36/$\sqrt{f}$ ns MAX
Propagation Delay Skew	1 ≤ f ≤ 100 MHz < 20ns per IEC 61156-5
Coupling Attenuation Per IEC 62153-4-9	30 ≤ f ≤ 100 MHz ≥ 80dB MIN
Tested Length	P. O. E. Compliant (802.3af) to 100 meters (328 feet) when installed per recommendations in TIA TSB-184 Cable will meet CAT5e channel requirements up to 100 meter length
Agency Approvals	UL AWM 2463 (80C 600V) NEC (UL) TYPE PLTC NEC (UL) TYPE ITC Pennsylvania D.E.P. - MSHA EU CE MARK: MEETS EU DIRECTIVE 2011/65/EU (RoHS II)

** Per ODVA Volume 2 EtherNet/IP*
*** 2% HIGHER THAN HORIZONTAL CABLE SPECIFICATION PER TIA 568-C.2*
NOTE: All testing conducted off the reel.