

LMR[®]-400 Flexible Low Loss Communications Coax

Ideal for...

- Drop-in replacement for RG-8/9913 Air-Dielectric type Cable
- Jumper Assemblies in Wireless Communications Systems
- Short Antenna Feeder runs
- Any application (e.g. WLL, GPS, LMR, WLAN, WISP, WiMax, SCADA, Mobile Antennas) requiring an easily routed, low loss RF cable

LMR[®] standard is a UV Resistant Polyethylene jacketed cable designed for 20-year service outdoor use. The bending and handling characteristics are significantly better than air-dielectric and corrugated hard-line cables.

• **LMR-DB** is identical to standard LMR plus has the advantage of being watertight. The addition of waterproofing compound in and around the foil/braid insures continuous reliable service should the jacket be inadvertently damaged during installation or in the future.

• **LMR-FR** is a non-halogen (non-toxic), low smoke, fire retardant cable designed for in-building runs that can be routed anywhere except air handling plenums. LMR-FR is UL/NEC & CSA rated 'CMR' and 'FT4' respectively, meets FAA FAR25 requirements and is MSHA-P for mining applications.

• **LMR-FR-PVC** is a general-purpose indoor cable and has a UL/NEC & CSA rating of 'CMR' and 'FT4' respectively. It is less expensive than LMR-FR, however it emits toxic fumes (HCL) and greater smoke density when burned.

• **LMR-PVC** is designed for low loss general-purpose applications and is somewhat more flexible than the standard polyethylene jacketed LMR.

• **LMR-PVC-W** is a white-jacketed version of LMR-PVC for marine and other applications where color compatibility is desired.

Size for size LMR has the lowest loss of any flexible cable and comparable loss to semirigid hard-line cables.

• **RF Shielding** is 50 dB greater than typical single shielded coax (40 dB). The multi-ply bonded foil outer conductor is rated conservatively at > 90 dB (i.e. > 180 dB between two adjacent cables).

• **Weatherability:** LMR-400 cables designed for outdoor exposure incorporate the best materials for UV resistance and have life expectancy in excess of 20 years.

• **Connectors:** A wide variety of connectors are available for LMR-400 cable, including all common interface types, reverse polarity, and a choice of solder or non-solder center pins. Most LMR connectors employ crimp outer attachment using standard hex crimp sizes.

• **Cable Assemblies:** All LMR-400 cable types are available as pre-terminated cable assemblies. Refer to the section on FlexTech for further details.

Part Number	Application	Jacket Color	Stock Code
LMR-400	Outdoor	PE Black	54001
LMR-400-DB	Outdoor/Watertight	PE Black	54091
LMR-400-FR	Indoor/Outdoor Riser	FRPE Black	54030
LMR-400-FR-PVC	Indoor/Outdoor Riser	FRPVC Black	54073
LMR-400-PVC	General Purpose	PVC Black	54218
LMR-400-PVC-W	General Purpose	PVC White	54204

Construction Specifications		In.	(mm)
Inner Conductor	Solid BCCA	0.108	(2.74)
Dielectric	Foam PE	0.285	(7.24)
Outer Conductor	Aluminum Tape	0.291	(7.39)
Overall Braid	Timed Copper	0.820	(8.13)
Jacket	(see table above)	0.405	(10.29)

• **Flexibility** and bendability are hallmarks of the LMR-400 cable design. The flexible outer conductor enables the tightest bend radius available for any cable of similar size and performance.

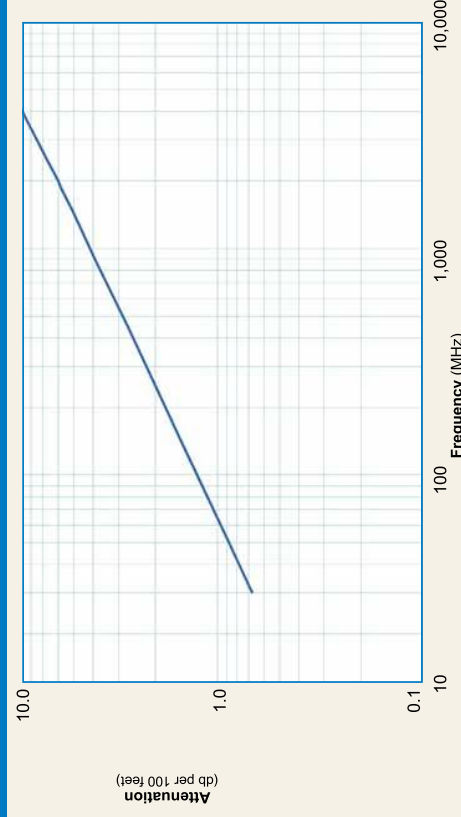
• **Low Loss** is another hallmark feature of LMR-400.

Mechanical Specifications		US	(metric)
Bend Radius: installation	in. (mm)	1.00	(25.4)
Bend Radius: repeated	in. (mm)	4.0	(101.6)
Bending Moment	ft-lb (N-m)	0.5	(0.68)
Weight	lb/ft (kg/m)	0.068	(0.10)
Tensile Strength	lb (kg)	160	(72.6)
Flat Plate Crush	lb/in. (kg/mm)	40	(0.71)

Environmental Specifications		F	C
Installation Temperature Range		-40/+185	-40/+85
Storage Temperature Range		-94/+185	-70/+85
Operating Temperature Range		-40/+185	-40/+85

Electrical Specifications		Units	US	(metric)
Velocity of Propagation	%	NA	85	
Dielectric Constant	nS/ft (nS/m)	NA	1.38	
Time Delay	ohms	ohms	1.20	(3.92)
Impedance	pF/ft (pF/m)	ohms	50	
Capacitance	uH/ft (uH/m)	ohms	23.9	(78.4)
Inductance	ohms/1000ft (ohms/1000ft)	ohms	0.060	(0.20)
Shielding Effectiveness	dB	dB	>90	
DC Resistance				
Inner Conductor	ohms/1000ft (ohms/1000ft)	(ohms/1000ft)	1.39	(4.6)
Outer Conductor	ohms/1000ft (ohms/1000ft)	(ohms/1000ft)	1.65	(5.4)
Voltage Withstand	Volts DC	Volts DC	2500	
Jacket Spark	Volts RMS	Volts RMS	8000	
Peak Power	kW	kW	16	

Attenuation vs. Frequency (typical)



Frequency (MHz)	30	50	150	220	450	900	1500	1800	2000	2500	5800
Attenuation dB/100 ft	0.7	0.9	1.5	1.9	2.7	3.9	5.1	5.7	6.0	6.8	10.8
Attenuation dB/100 m	2.2	2.9	5.0	6.1	8.9	12.8	16.8	18.6	19.6	22.2	35.5
Avg. Power kW	3.33	2.57	1.47	1.20	0.83	0.58	0.44	0.40	0.37	0.33	0.21

Calculate Attenuation = $(0.122290) \cdot \sqrt{\text{FMHz}} + (0.000260) \cdot \text{FMHz}$ (interactive calculator available at http://www.timesmicrowave.com/cable_calculators)
 Attenuation: VSWR=1.0; Ambient = +25°C (77°F)
 Power: VSWR=1.0; Ambient = +40°C; Inner Conductor = 100°C (212°F); Sea Level; dry air; atmospheric pressure; no solar loading

