

# LMR<sup>®</sup>-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
- **NEW!** Times Protect<sup>®</sup> LP-18-400 protector-series



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

Construction Specifications			
Description	Material	In.	(mm)
Inner Conductor	Solid BCCAI	0.108	(2.74)
Dielectric	Foam PE	0.285	(7.24)
Outer Conductor	Aluminum Tape	0.291	(7.39)
Overall Braid	Tinned Copper	0.320	(8.13)
Jacket	(see table)	0.405	(10.29)

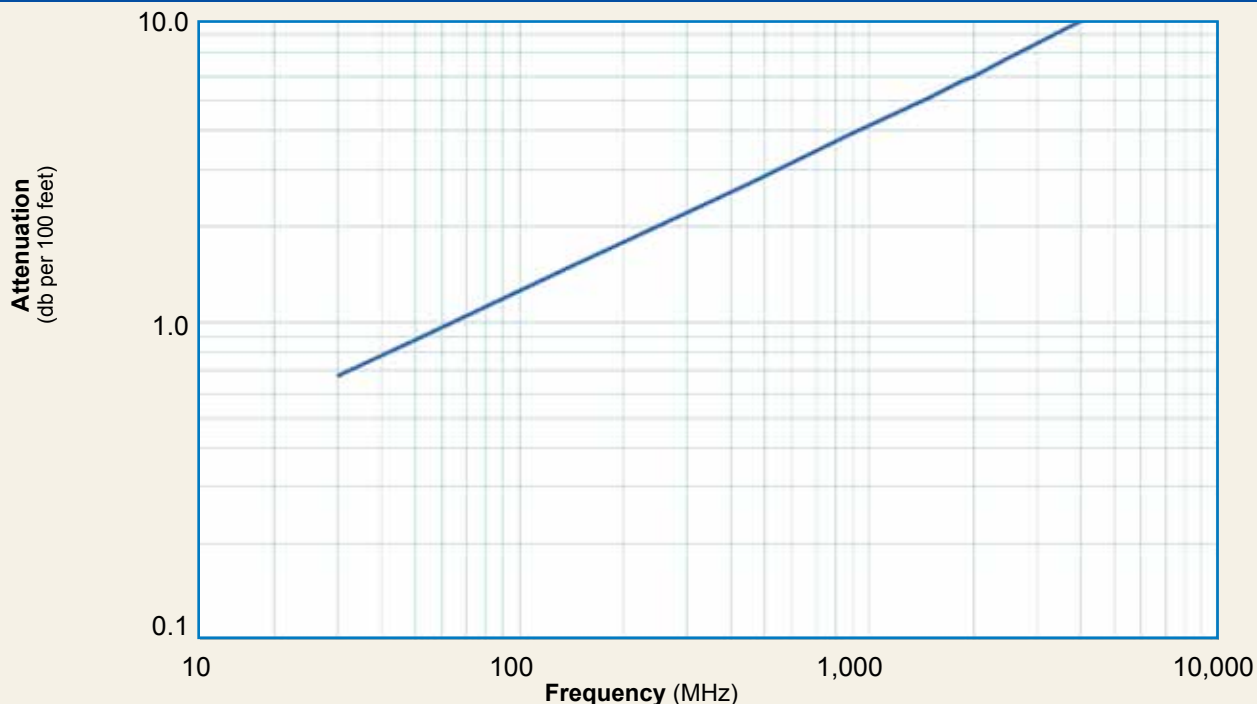
Environmental Specifications		
Performance Property	°F	°C
Installation Temperature Range	-40/+185	-40/+85
Storage Temperature Range	-94/+185	-70/+85
Operating Temperature Range	-40/+185	-40/+85

Mechanical Specifications			
Performance Property	Units	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)

Electrical Specifications			
Performance Property	Units	US	(metric)
Velocity of Propagation	%	84	
Dielectric Constant	NA	1.38	
Time Delay	nS/ft (nS/m)	1.20	(3.92)
Impedance	ohms	50	
Capacitance	pF/ft (pF/m)	23.9	(78.4)
Inductance	uH/ft (uH/m)	0.060	(0.20)
Shielding Effectiveness	dB	>90	
DC Resistance			
Inner Conductor	ohms/1000ft (/km)	1.39	(4.6)
Outer Conductor	ohms/1000ft (/km)	1.65	(5.4)
Voltage Withstand	Volts DC	2500	
Jacket Spark	Volts RMS	8000	
Peak Power	kW	16	

TIMES MICROWAVE

**Attenuation vs. Frequency (typical)**



Frequency (MHz)	30	50	150	220	450	900	1500	1800	2000	2500	5800	8000
<b>Attenuation dB/100 ft</b>	0.7	0.9	1.5	1.9	2.7	3.9	5.1	5.7	6.0	6.8	10.8	13.0
<b>Attenuation dB/100 m</b>	2.2	2.9	5.0	6.1	8.9	12.8	16.8	18.6	19.6	22.2	35.5	42.7
<b>Avg. Power kW</b>	3.33	2.57	1.47	1.20	0.83	0.58	0.44	0.40	0.37	0.33	0.21	0.17

**Calculate Attenuation =**

$(0.122290) \cdot \sqrt{\text{FMHz}} + (0.000260) \cdot \text{FMHz}$  (interactive calculator available at [http://www.timesmicrowave.com/cable\\_calculators](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

# LMR<sup>®</sup>-400 Flexible Low Loss Communications

Connectors													
Interface	Description	Part Number	Stock Code	VSWR**	Coupling	Inner Contact Attach	Outer Contact Attach	Finish* /Pin	Length in (mm)	Width in (mm)	Weight lb (g)		
1. 4.1-9.5 mini DIN Female	Straight Jack	EZ-400-4195F-X	3190-2968	<1.25:1	(6)	Hex	Spring Finger Crimp	A/G	1.8 (45.0)	0.55 (14.0)	0.074 (33.6)		
2. 4.1-9.5 mini DIN Female	Straight Plug	EZ-400-4195M-X	3190-2969	<1.25:1	(6)	Hex	Spring Finger Crimp	A/G	1.5 (38.1)	0.89 (22.6)	0.103 (46.8)		
3. 716 DIN Female	Straight Jack	TC-400-716-FC	3190-376	<1.25:1	(2.5)	N/A	Solder Clamp	S/S	1.6 (41)	1.13 (28.7)	0.281 (127.5)		
4. 7-16 DIN	Right Angle	TC-400-716M-RA-D	3190-2598	<1.35:1	(6)	Hex	Solder Crimp	A/S	1.7 (43.20)	1.98 (50.3)	0.374 (169.5)		
5. 7-16 DIN Male	Straight Plug	EZ-400-716M-X	3190-2524	<1.25:1	(6)	Hex	Spring Finger Crimp	A/G	1.6 (39.5)	1.38 (35)	0.277 (126.0)		
6. 7-16 DIN Male	Straight Plug	TC-400-716M-X	3190-2597	<1.25:1	(6)	Hex	Solder Crimp	A/S	1.6 (39.5)	1.42 (36.0)	0.320 (145.0)		
7. 7-16 DIN Male	Straight Plug	TC-400-716-MC	3190-279	<1.25:1	(2.5)	Hex	Solder Clamp	S/S	1.4 (36)	1.40 (35.6)	0.268 (121.6)		
8. 7-16 DIN Male	Right Angle	TC-400-716MC-RA	3190-1671	<1.25:1	(<3)	Hex	Solder Clamp	A/S	2.4 (61.5)	1.88 (47.8)	0.35 (159)		
9. 7-16 DIN Male	Right Angle	EZ-400-716M-RA-X	3190-2545	<1.35:1	(6)	Hex	Spring Finger Crimp	A/G	1.6 (41.7)	1.75 (44.3)	0.374 (0.17)		
10. BNC Male	Straight Plug	TC-400-BM-X	3190-6232	<1.30:1	(4)	Knurl	Solder Crimp	A/G	1.8 (46.8)	0.60 (14.5)	0.630 (28.6)		
11. BNC Male	Straight Plug	EZ-400-BM-X	3190-2852	<1.35:1	(2)	Knurl	Spring Finger Crimp	A/G	1.7 (42.7)	0.56 (14.2)	0.066 (29.9)		
12. BNC Male	Right Angle	EZ-400-BM-RA-X	3190-2847	<1.35:1	(2)	Knurl	Spring Finger Crimp	A/G	1.9 (48.0)	1.32 (33.5)	0.097 (44.0)		
13. HN Male	Straight Plug	TC-400-HNM	3190-923	<1.25:	(<1)	Knurl	Solder Clamp	S/G	2.3 (59.2)	0.88 (22.4)	0.25 (113.4)		
14. HN Male	Right Angle	TC-400-HNM-RA	3190-2541	<1.25:1	(2.5)	Hex	Solder Crimp	A/G	1.6 (41.4)	1.56 (39.6)	0.198 (90.0)		
15. UHF Male	Straight Plug	EZ-400-UM	3190-997	<1.25:1	(2.5)	Knurl	Spring Finger Crimp	N/G	1.8 (48)	0.80 (20.3)	0.076 (34.4)		
16. Mini-UHF	Straight Plug	TC-400-MUHF	3190-520	<1.25:1	(2.5)	Knurl	Solder Crimp	N/G	1.1 (28)	0.50 (12.7)	0.020 (9.1)		
17. N Female	Straight Jack	TC-400-NFC	3190-299	<1.25:1	(2.5)	N/A	Solder Clamp	N/S	1.6 (41)	0.75 (19.1)	0.119 (54.0)		
18. N Female	Straight Jack	EZ-400-NF-X	3190-2818	<1.25:1	(2.5)	N/A	Spring Finger Crimp	N/G	1.8 (45)	0.66 (16.8)	0.105 (47.6)		
19. N Female	Straight Jack	TC-400-NF-X	3190-2815	<1.25:1	(2.5)	N/A	Solder Crimp	N/G	1.8 (45)	0.66 (16.8)	0.105 (47.6)		
20. N Female	Bulkhead Jack	EZ-400-NF-BH	3190-518*	<1.25:1	(2.5)	N/A	Spring Finger Crimp	N/G	1.8 (46)	0.88 (22.4)	0.102 (46.3)		
21. N Female	Bulkhead Jack	TC-400-NFC-BH (A)	3190-872	<1.25:1	(2.5)	N/A	Solder Clamp	A/G	1.8 (46)	0.88 (22.4)	0.145 (65.8)		
22. N Male	Straight Plug	SC-400-NM	3190-1454	<1.25:1	(2.5)	Knurl	Solder Crimp	N/G	1.5 (38)	0.75 (19.1)	0.090 (40.8)		
23. N Male	Straight Plug	TC-400-NMC	3190-6077	<1.25:1	(2.5)	Knurl	Solder Clamp	N/G	1.5 (38)	0.70 (17.8)	0.121 (54.9)		
24. N Male	Straight Plug	EZ-400-NMC-2-D	3190-2640	<1.25:1	(2.5)	Hex/Knurl	Spring Finger Crimp	N/G	1.5 (38)	0.75 (19.1)	0.121 (54.9)		
25. N Male	Straight Plug	EZ-400-NMH-X	3190-2590	<1.25:1	(10)	Hex/Knurl	Spring Finger Crimp	A/G	1.5 (38)	0.89 (22.6)	0.103 (46.8)		
26. N Male	Straight Plug	TC-400-NMH-X	3190-2626	<1.25:1	(10)	Hex/Knurl	Solder Crimp	A/G	1.5 (38)	0.89 (22.6)	0.113 (51.3)		
27. N Male	Right Angle	EZ-400-NMH-RA-X	3190-2638	<1.35:1	(6)	Hex/Knurl	Spring Finger Crimp	A/G	1.87 (47)	1.42 (36.0)	0.177 (80.2)		
28. N Male	Right Angle	TC-400-NMH-RA-SS	3190-1668	<1.25:1	(2.5)	Hex	Solder Crimp	SS/G	1.5 (38.1)	0.89 (2.6)	0.130 (59.0)		
29. N Male	Right Angle	TC-400-NMH-RA-D	3190-2293*	<1.35:1	(6)	Hex/Knurl	Solder Crimp	A/G	1.8 (46)	1.25 (31.8)	0.130 (59.0)		
30. N Male	Right Angle	TC-400-NMC-RA (A)	3190-870	<1.35:1	(2.5)	Hex	Solder Clamp	A/G	1.8 (46)	1.25 (31.8)	0.150 (68.0)		
31. N Male	Reverse Polarity	TC-400-NM-RP	3190-960	<1.25:1	(2.5)	Knurl	Solder Crimp	N/G	1.5 (38)	0.75 (19.1)	0.090 (40.8)		
32. QN Male	Straight Plug	EZ-400-QNM-X	3190-2979	<1.25:1	(6)	Hex	Spring Finger Crimp	A/G	1.5 (38)	0.89 (22.6)	0.103 (46.8)		
33. QN Male	Straight Plug	TC-400-QNM-X	3190-6212	<1.25:1	(6)	Hex	Solder Crimp	A/G	2.0 (50.2)	0.74 (18.9)	0.103 (46.8)		
34. QN Male	Right Angle	EZ-400-QNM-RA-X	3190-2981	<1.25:1	(6)	Hex	Spring Finger Crimp	A/G	1.9 (47.0)	1.42 (36.0)	0.177 (80.2)		
35. QN Female	Straight Jack	EZ-400-QNF-X	3190-2980	<1.25:1	(6)	N/A	Spring Finger Crimp	A/G	1.8 (45.0)	0.66 (16.8)	0.105 (47.6)		
36. SMA Male	Straight Plug	TC-400-SM-X	3190-3046	<1.25:1	(8)	Hex	Solder Crimp	N/G	1.2 (29)	0.50 (12.7)	0.032 (14.5)		
37. SMA Female	Straight Jack	TC-400-SF-X	3190-6174	<1.35:1	(6)	N/A	Solder Crimp	A/G	1.2 (29.7)	0.50 (12.7)	0.026 (12.0)		
38. TNC Female	Reverse Polarity	TC-400-TF-RP	3190-1063	<1.25:1	(2.5)	N/A	Solder Crimp	N/G	1.8 (46)	0.55 (14.0)	0.074 (33.6)		
39. TNC Female	Reverse Polarity	EZ-400-TF-RP	3190-795	<1.25:1	(2.5)	N/A	Spring Finger Crimp	A/G	1.8 (46)	0.55 (14.0)	0.074 (33.6)		
40. TNC Female	Straight Jack	EZ-400-TF-X	3190-3049	<1.25:1	(6)	N/A	Spring Finger Crimp	A/G	1.8 (45)	0.55 (14.0)	0.074 (33.6)		
41. TNC Female	Straight Jack	TC-400-TF-X	3190-3051	<1.25:1	(6)	N/A	Solder Crimp	A/G	1.8 (45.0)	0.55 (14.0)	0.074 (33.6)		
42. TNC Male	Straight Plug	TC-400-TM-X	3190-2532	<1.25:1	(6)	Hex/Knurl	Solder Crimp	A/G	1.9 (48)	0.67 (17.5)	0.075 (34.3)		
43. TNC Male	Straight Plug	EZ-400-TM-X	3190-2533	<1.25:1	(6)	Hex/Knurl	Spring Finger Crimp	A/G	1.9 (48)	0.67 (17.5)	0.075 (34.3)		
44. TNC Male	Reverse Polarity	TC-400-TM-RP	3190-1062	<1.25:1	(2.5)	Knurl	Solder Crimp	N/G	1.7 (43)	0.59 (15.0)	0.074 (33.6)		
45. TNC Male	Reverse Polarity	EZ-400-TM-RP	3190-794	<1.25:1	(2.5)	Knurl	Spring Finger Crimp	A/G	1.7 (43)	0.59 (15.0)	0.074 (33.6)		
46. TNC Male	Right Angle	TC-400-TM-RA-D	3190-2671	<1.35:1	(6)	Hex/Knurl	Solder Crimp	A/G	1.4 (35)	1.41 (35.8)	0.130 (59.0)		
47. TNC Male	Right Angle	EZ-400-TM-RA-X	3190-2800	<1.24:1	(6)	Hex	Spring Finger Crimp	A/G	2.0 (50.0)	0.62 (15.7)	0.130 (59.0)		
48. TNC Male	Right Angle RP	TC-400-TM-RP-RA-D	3190-6147	<1.35:1	(6)	Hex	Solder Crimp	A/G	1.4 (36.0)	1.20 (30.3)	0.130 (59.0)		

\* Finish metals: N=Nickel, S=Silver, G=Gold, SS=Stainless Steel, A=Alballoy \*\*VSWR spec based on 3 foot cable with a connector \*Available in bulk pack

<p>1-2</p>  <p>EZ-400-4195F-X / 3190-2968 TC-400-4195M-X / 3190-2969</p>	<p>3</p>  <p>TC-400-716FC 3190-376</p>	<p>4</p>  <p>TC-400-716M-RA-D 3190-2598</p>	<p>5</p>  <p>EZ-400-716M-X 3190-2524</p>
<p>6</p>  <p>TC-400-716M-X 3190-2597</p>	<p>7</p>  <p>TC-400-716MC 3190-279</p>	<p>8</p>  <p>TC-400-716MC-RA 3190-1671</p>	<p>9</p>  <p>EZ-400-716M-RA-X 3190-2545</p>
<p>10</p>  <p>TC-400-BM-X 3190-6232</p>	<p>11</p>  <p>EZ-400-BM-X 3190-2852</p>	<p>12</p>  <p>EZ-400-BM-RA-X 3190-2847</p>	<p>13</p>  <p>TC-400-HNM 3190-923</p>
<p>14</p>  <p>TC-400-HNM-RA 3190-2541</p>	<p>15</p>  <p>EZ-400-UM 3190-997</p>	<p>16</p>  <p>TC-400-MUHF 3190-520</p>	<p>17</p>  <p>TC-400-NFC 3190-299</p>
<p>18</p>  <p>EZ-400-NF-X 3190-2818</p>	<p>19</p>  <p>TC-400-NF-X 3190-2815</p>	<p>20</p>  <p>EZ-400-NF-BH 3190-518</p>	<p>21</p>  <p>TC-400-NFC-BH (A) 3190-872</p>
<p>22</p>  <p>SC-400-NM 3190-1454</p>	<p>23</p>  <p>TC-400-NMC 3190-6077</p>	<p>24</p>  <p>EZ-400-NMC-2-D 3190-2640</p>	<p>25</p>  <p>EZ-400-NMH-X 3190-2590</p>
<p>26</p>  <p>TC-400-NMH-X 3190-2626</p>	<p>27</p>  <p>EZ-400-NMH-RA-X 3190-2638</p>		

 <p>28 TC-400-NMH-RA-SS 3190-1668</p>	 <p>29 TC-400-NMH-RA-D 3190-2293</p>	 <p>30 TC-400-NMC-RA (A) 3190-870</p>	 <p>31 TC-400-NM-RP 3190-960</p>
 <p>32 EZ-400-QNM-X 3190-2979</p>	 <p>33 TC-400-QNM-X 3190-6212</p>	 <p>34 EZ-400-QNM-RA-X 3190-2981</p>	 <p>35 EZ-400-QNF-X 3190-2980</p>
 <p>36 TC-400-SM-X 3190-3046</p>	 <p>37 TC-400-SF-X 3190-6174</p>	 <p>38-39 TC-400-TF-RP / 3190-1063 EZ-400-TF-RP / 3190-795</p>	 <p>40-41 EZ-400-TF / 3190-3049 TC-400-TF-X / 3190-3051</p>
 <p>42-43 TC-400-TM-X / 3190-2532 EZ-400-TM-X / 3190-2533</p>	 <p>44-45 TC-400-TM-RP / 3190-1062 EZ-400-TM-RP / 3190-794</p>	 <p>46-47 TC-400-TM-RA-D 3190-2671 EZ-400-TM-RA-X 3190-2800</p>	 <p>48 TC-400-TM-RP-RA-D 3190-6147</p>

## Hardware

 <p>HG-400T</p>	 <p>GK-S400TT</p>	 <p>IPB-400-NM 3109-417-1</p>	 <p>IPB-400-NF 3109-417-2</p>	 <p>WSB-400 3109-394</p>
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Type	Part Number	Stock Code	Description
Hoisting Grip	HG-400T	HG-400T	Laced Type (each)
Ground Kit	GK-S400TT	GK-S400TT	Standard Ground Kit (each)
Weather Proof Boots	3109-417-1	IPB-400 NM	LMR-400 Male IP boot suitable for type N, TNC, BNC, 4310, 4195
Weather Proof Boots	3109-417-2	IPB-400 NM	LMR-400 Female IP boots suitable for type N, TNC, BNC, 4310, 4195
Weather Seal Strain Relief Boots	3109-394	WSB-400	Weather seal strain relief boots (10 pk) for use with most popular LMR-400-X series connectors



## Install Tools

Type	Part Number	Stock Code	Description
Crimp Tool	CT-U	3192-181	Crimp Handle
Crimp Dies	Y1719	3190-202	.429" Hex Dies
Crimp Tool	CT-400/300	3190-666	Crimp tool for LMR 400 connectors
Crimp Rings	CR-400	3190-830	Crimp rings for TC/EZ-400 connectors (package of 10)
Strip Tool	ST-400C-2	3190-1972	Prep tool for EZ-400-NMC-2 two piece clamp style connector
Strip Tool	CST-400	3192-004	Combination prep tool for LMR-400 crimp and clamp style connectors
Mid-Span Strip Tool	GST-400	3190-2174	For ground strap attachment
Replacement Blades	RB-456	3190-421	Replacement blades for Strip Tool
Deburr Tool	DBT-U	3192-001	Removes center conductor rough edges
Cutting Tool	CCT-02	3192-165	Cable end flush cut tool
Replacement Blade	RB-02	3192-166	Replacement blade for cutting tool
Tool Kit	TK-400EZ	3190-1601	Tool kit for LMR-400 Crimp Connectors (includes CCT-02, CST-400, CT-400/300, Tool Pouch)
Replacement Blade Kit	RB-CST	3192-086	Replacement blade kit for all CST strip tools