



THE DATASHEET OF LMR-400



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
- **NEW!** Times Protect[®] 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) |

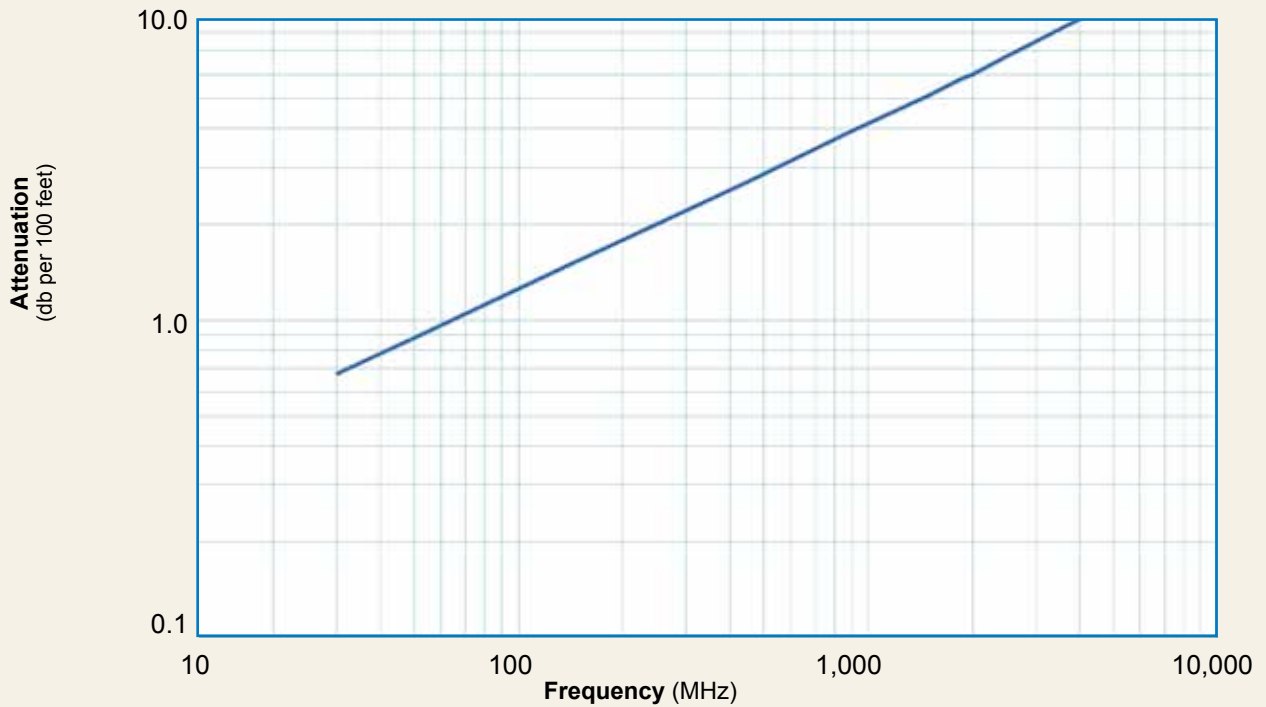
| Environmental Specifications | | |
|--------------------------------|----------|---------|
| Performance Property | °F | °C |
| Installation Temperature Range | -40/+185 | -40/+85 |
| Storage Temperature Range | -94/+185 | -70/+85 |
| Operating Temperature Range | -40/+185 | -40/+85 |

| 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 |
|-----------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| 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 | 13.0 |
| 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 | 42.7 |
| 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 | 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)

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[®]-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 | Weight (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. 7-16 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 | (<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>  |

| 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 |

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Optimize Your Supply Chain with WIN SOURCE Solutions

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-  Cost Control Management
-  Shortage Management
-  Alternative Solution
-  Excess Inventory Management