Dual Band Duplexed Antenna Kit 108-174 380-870 MHz
NMO Mount/N Type Connectors

HG1038DU

Features

- Duplexer (VHF/UHF 108-174 MHz/380-870 MHz), with integral N-type (m) Connectors (3 ea.)
- Low Loss 195 NMO mount with cable (1 ea.)
- RG-58/U NMO mount with cable (1 ea.)
- Field Tunable Antennas (2 ea.)
- RG-58/U Feed Cable (1 ea.)

Applications

- Service Vehicles
- Public Safety
- Public Transportation
- Mining & Construction

Description

This VHF/UHF mobile duplexed antenna kit is ideally suited for multipoint mobile applications including service vehicles, public transportation, public safety, mining and construction vehicles, as well numerous other commercial and industrial applications where mobility and wide coverage is desired. The antenna kit features a VHF/UHF duplexer and a pair of field tunable antennas. This gives users the flexibility to operate radio transceivers in any VHF and UHF band with optimum performance. The kit allows the user to upgrade/switch to any NMO-type antenna.

Configuration

Design: Duplexed
Application Band: VHF/UHF
Band Type: Dual
Cable Length: 204 in [518.16 cm]
Connector Type: NMO Mount
Interface 2: N

Duplexer Electrical Specifications

<table>
<thead>
<tr>
<th>Description</th>
<th>Minimum</th>
<th>Typical</th>
<th>Maximum</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency Range (VHF)</td>
<td>100</td>
<td></td>
<td>180</td>
<td>MHz</td>
</tr>
<tr>
<td>Frequency Range (UHF)</td>
<td>380</td>
<td></td>
<td>870</td>
<td>MHz</td>
</tr>
<tr>
<td>Input VSWR (All Ports)</td>
<td></td>
<td></td>
<td>1.6:1</td>
<td></td>
</tr>
<tr>
<td>Impedance</td>
<td></td>
<td>50</td>
<td></td>
<td>Ohms</td>
</tr>
<tr>
<td>Isolation (VHF↔UHF-870)</td>
<td>50</td>
<td></td>
<td></td>
<td>dB</td>
</tr>
</tbody>
</table>

Electrical Specification Notes:
Electrical specifications data applies to Duplexer
Dual Band Duplexed Antenna Kit 108-174 380-870 MHz
NMO Mount/N Type Connectors

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Field Tunable Antenna Electrical Specifications

<table>
<thead>
<tr>
<th>Description</th>
<th>Min</th>
<th>Typ</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency Range</td>
<td>108</td>
<td>870</td>
<td>MHz</td>
</tr>
<tr>
<td>VSWR (Field Tunable)</td>
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<td>1.6:1</td>
<td></td>
</tr>
<tr>
<td>Impedance</td>
<td>50</td>
<td></td>
<td>Ω</td>
</tr>
<tr>
<td>Gain</td>
<td>2</td>
<td></td>
<td>dBi</td>
</tr>
<tr>
<td>Power Rating</td>
<td>100</td>
<td></td>
<td>W</td>
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<tr>
<td>Polarization</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E-Plane</td>
<td>50</td>
<td></td>
<td>Degrees</td>
</tr>
<tr>
<td>H-Plane</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ground Plane</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Field Tunable Antenna Mechanical Specifications

- Height: 31.75 in [806 mm]
- Radiator Material: 300 Series SS
- Radiator Plating: Black Chrome
- Base Material: Xenoy™ w/TPV Skirt
- Mounting Application: ¼” thru-hole NMO mount
- Operating Temperature: -40°C to 85°C
- Corrosion: Salt and UV Resistant

Specifications by Band

<table>
<thead>
<tr>
<th>Description</th>
<th>Band 1</th>
<th>Band 2</th>
<th>Band 3</th>
<th>Band 4</th>
<th>Band 5</th>
<th>Units</th>
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</thead>
<tbody>
<tr>
<td>Range</td>
<td>100-180</td>
<td>380-520</td>
<td>746-870</td>
<td></td>
<td></td>
<td>MHz</td>
</tr>
<tr>
<td>Insertion Loss</td>
<td>0.2</td>
<td>0.3</td>
<td>0.5</td>
<td></td>
<td></td>
<td>dB</td>
</tr>
<tr>
<td>Maximum Input Power</td>
<td>150</td>
<td>100</td>
<td>75</td>
<td></td>
<td></td>
<td>Watts</td>
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</table>

Duplexer Mechanical Specifications
Dual Band Duplexed Antenna Kit 108-174 380-870 MHz
NMO Mount/N Type Connectors

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<table>
<thead>
<tr>
<th>Duplexer Connectors</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Size</strong></td>
<td></td>
</tr>
<tr>
<td>Length</td>
<td>3.27 in [83.06 mm]</td>
</tr>
<tr>
<td>Width</td>
<td>2.1 in [53.34 mm]</td>
</tr>
<tr>
<td>Height</td>
<td>1.1 in [27.94 mm]</td>
</tr>
</tbody>
</table>
Dual Band Duplexed Antenna Kit 108-174 380-870 MHz NMO Mount/N Type Connectors

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Installation Instructions

Parts (Figure 1): Verify all parts are included. Reference items in Figure 1:
1. (1 ea.) Multi-Band Duplexer
2. (2 ea.) Z-Nut™ Field Tunable ¼ Wave Antenna
3. (3 ea.) Type N Connectors, RG-58/U & 195 Type
4. (1 ea.) RG-58/U NMO Cable Mount
5. (1 ea.) 195 Low Loss NMO Cable Mount
6. (1 ea.) RG-58/U Feed Cable, 17 ft. (5.1m) length

Tools/Materials Required:
- Drill and Hole Punch, ¾” (19.05mm) Diameter – NMO Cable Mount Installation
- #8 Self Tapping or Machine Screws (2 ea.) – Duplexer Installation
- Cable Stripping Tools for RG-58/U & 195 type cable – Connector Installations
- Coaxial Connector (sold separately) for attaching Feed Cable (RG-55/U) to radio transceiver

Pre-Installation Checklist and Tips:
- Locate a suitable mounting location for the Duplexer providing the shortest cable lengths for installing both antennas.
- Important: Duplexer intended for interior or environmentally protected installation only. Do not install with direct exposure to outdoor environment.
- Follow all instructions provided with each NMO Cable Mount and Field Tunable Antenna to be installed.
- Best Performance Recommendations:
  - Minimize all cable lengths during installation to reduce unnecessary cable insertion loss.
  - Feed the UHF of 700/800 MHz Antenna using the 195 Low Loss NMO Cable Mount.
  - Separate antennas by largest distance possible to prevent VSWR mismatch or radiated obstruction. (Note: Duplexer provides >50 dB isolation between VHF and UHF/700-800 MHz antenna ports, maximizing cross-talk rejection.)

Installation:
1. Refer to figure 1 for antenna/duplexer system configuration.
2. Install Duplexer to a suitable mounting surface using #8 screws. Mounting Hole spacing: 2-15/16" (74.6mm).
3. Install NMO Cable mounts for each antenna according to the individual instructions.
4. Verify antenna cable routing. Cut excess cable. Strip ends of the NMO cable mounts according to the N Type Connector instructions provided with the connectors. Attach N Type connectors to the cables. Crimp and verify operation.
5. Repeat Step 4 for one end only of RG-58/U Feed Cable. Attach radio transceiver connector (sold separately) to the opposite end of the RG-58/U Feed Cable.
6. Install all remaining connections according to the system diagram in Figure 1.
7. Verify radio transceiver performance for all required operating bands or channels.
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Installation Instructions
FIELD TUNABLE “X”-NUT™
ANTENNA & REPLACEMENT WHIP
108-960 MHZ

PLEASE READ INSTRUCTIONS CAREFULLY BEFORE INSTALLING AND TUNING ANTENNA

1. IMPORTANT: When Installing Replacement Whips, press Rubber Friction Washer is secure and pressed completely flat around the base of the threaded stud. Attach Replacement Whip to the NMO Antenna Base by threading with firm hand torque until completely seated against Rubber Friction Washer.

2. Attach antenna to NMO mount (sold separately) with firm hand torque.

3. Refer to Table 1 to determine desired frequency and cut length.

4. Note: Vehicle ground-plane variations will affect final tuned length and VSWR match. Always make first cut longer than referenced in Table 1. The tuned length always includes the ball tip attached.

5. Loosen the ball tip from the whip using a 1/16” hex wrench.

6. Measure the cut length “W” as shown in figure 1. The length includes ball tip.

7. Cut the whip longer than desired length using heavy-duty wire cutters.

8. During the tuning process, attach the ball tip to the top of the cut whip using hex wrench.

9. Verify that reflected power is minimized for best performance at desired frequency using VSWR meter or similar device. If necessary, frequency tuning is achieved by cutting the whip in small incremental cuts until desired frequency match is verified.

10. Secured ball tip with hex wrench using firm hand torque.

Automatic Car Wash Features: - For optimal protection and extended reliability of the antenna and the NMO vehicle mount, remove the whip only from the antenna base (as shown in Figure 1) before entering automatic car wash. Before reinstallation, wipe the stud and base dry with a clean cloth. Attach whip to the antenna adapter with firm finger tight grip.

<table>
<thead>
<tr>
<th>Freq (Bandwidth) MHz</th>
<th>“W” Length inch (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>108</td>
<td>27-1/8 (69)</td>
</tr>
<tr>
<td>120</td>
<td>23-1/8 (59)</td>
</tr>
<tr>
<td>122</td>
<td>22 (56)</td>
</tr>
<tr>
<td>124</td>
<td>21-5/8 (54)</td>
</tr>
<tr>
<td>126</td>
<td>21-3/8 (54)</td>
</tr>
<tr>
<td>128</td>
<td>20-5/8 (52)</td>
</tr>
<tr>
<td>130</td>
<td>20 (51)</td>
</tr>
<tr>
<td>132</td>
<td>19-1/4 (48)</td>
</tr>
<tr>
<td>136</td>
<td>18-7/8 (47)</td>
</tr>
<tr>
<td>138</td>
<td>18-1/8 (45)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Freq (Bandwidth) MHz</th>
<th>“W” Length inch (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>140</td>
<td>18-1/8 (45)</td>
</tr>
<tr>
<td>142</td>
<td>18-1/8 (45)</td>
</tr>
</tbody>
</table>

Table 1
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Environmental Specifications

Temperature
Operating Range
-40 to +85 deg C

Compliance Certifications (see product page for current document)

Plotted and Other Data

Notes:

Typical Radiation Pattern

Dual Band Duplexed Antenna Kit 108-174 380-870 MHz NMO Mount/N Type Connectors from L-com has same day shipment for domestic and International orders. Our portfolio includes coaxial cable assemblies, connectors, adapters and custom products as well as lightning and surge protectors, NEMA rated enclosures, and an RF product line which includes antennas, amplifiers, passive, and active components.

The information contained within this document is accurate to the best of our knowledge and representative of the part described herein. It may be necessary to make modifications to the part and/or the documentation of the part in order to implement improvements. L-com reserves the right to make such changes as required. Unless otherwise stated, all specifications are nominal. L-com does not make any representation or warranty regarding the suitability of the part described herein for any particular purpose, and L-com does not assume liability arising out of the use of any part or document.
L-com CAD Drawing

Dual Band Duplexed Antenna Kit 108-174 MHz 380-870 MHz NMO Mount/N Type Connectors

- UHF 1/4 Wave Antenna 380-870 MHz (field tune as req.)
- VHF 1/4 Wave Antenna 108-174 MHz (field tune as req.)
- 3x N-Male Plug Connectors
- DUPLEXER
- ROUTE FEED CABLE FOR TRANSCEIVER CONNECTION
- NMO MOUNT CABLE RG-58/U 17.0 FEET (5.18 METER)
- NMO ANTENNA ADAPTER
- 2X ANTENNA ADAPTER NMO

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