Kymeta™ u7 Terminal Installation Guide

Includes Kymeta™ u7 antenna

For Integrator and Standard u7 terminal configurations
Covers TRM-U7Hxx-xxx and TRM-U7Xxx-xxx Kymeta u7 terminal configurations

Document number: 700-00065-000-revD

31 January 2020
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1 Introduction

This document contains important step-by-step details for the installation and set up of the Kymeta™ u7 terminal. Read this document in its entirety.

For information on the Kymeta u7 antenna web-based user interface and instructions on checking the antenna status, refer to 700-00006-003 Kymeta™ u7 antenna software user guide.

For your safety, read section Safety and handling instructions before beginning assembly.

The Kymeta u7 terminal is available in two configurations - integrator and standard.

Kymeta u7 terminal integrator configuration

Outdoor unit:
» Kymeta™ u7 antenna
» Support plate with the attached RF chain (BUC, diplexer, LNB, and RX IN cable) and power components
» Cable connectors (for power and Ethernet cables)

Indoor unit: Modem

Kymeta u7 terminal standard configuration

Outdoor unit:
» Kymeta™ u7 antenna
» Support plate with the attached RF chain (BUC, diplexer, LNB, and RX IN cable) and power components
» Cables (power, RX, TX, and Ethernet)
» Mounting handle

Indoor unit: Modem
2 Safety and handling instructions

This section describes general safety precautions that must be observed during all phases of operation, service, and repair of Kymeta products. Failure to comply with these precautions or with specific warnings elsewhere in this document violates safety standards of design, manufacture, and intended use of the equipment. Kymeta assumes no liability for the customer’s failure to comply with these requirements.

2.1 Handling

Take special care when handling and installing the Kymeta™ u7 antenna and Kymeta parts and accessories.

**u7 antenna**

- Use proper lifting technique and safety precautions for handling heavy or bulky objects; Kymeta recommends lifting the antenna with a minimum of two people.
- Do not drop the antenna.
- Do not bump the edges or the face of the antenna.
- Do not apply pressure to the radiating face of the antenna.
- Protect the antenna against excessive shock and vibration.
- Never apply paint or put stickers on the antenna.
- Never put any metal over the front or in close proximity to the antenna, in order to avoid interference with the RF function.

**u7 terminal components**

- Never block the BUC fan. It requires 10.16 cm (4 in.) of clearance for air circulation and ventilation.
- Provide the specified voltage for all components.
- Never lift the ODU by any mounted RF components or cables.

2.2 Electrostatic discharge (ESD) precautions

Do not open the u7 antenna housing, transceiver component housings, or modem housing. Doing any of the above will void the warranty.

Opening or removing the enclosure may cause exposure to high voltages, electric shock, and other hazards. In addition, electronic components contained within the enclosure are sensitive to ESD and could be damaged if ESD precautions are not observed.

2.3 RF energy exposure

The Kymeta u7 terminal complies with FCC guidelines for protecting individuals from harmful levels of RF exposure.
Power density measurements in the 8 W terminal configuration show full compliance with the general population/uncontrolled minimum permissible exposure (MPE) level of 1 mW/cm² in all scan conditions and measurement points around the antenna regardless of the use case considered. Therefore, there are no concerns with RF exposure with the 8 W configuration.

Power density measurements in the 16 W terminal configuration show full compliance with the occupational/controlled MPE of 5 mW/cm². When operating the u7 terminal in a 16 W configuration, to avoid exposure, do not place your head or other body parts near the top and sides of the satellite antenna when the system is operational. Maintain a distance of 30 cm (11.81 in.) or more from the face and within 20 cm (7.87 in.) from the center of the antenna. The figure below identifies the keep out region (gray cylinder) and safe region (the area outside the cylinder) for a 16 W u7 terminal.

2.4 Information for operators and maintenance technicians

Operators and maintenance technicians requiring access to the u7 antenna and its immediate surroundings should be properly trained on the potential for exposure and the time-averaging considerations specified in FCC OET Bulletin 65 or other relevant national regulations. To conduct maintenance requiring access to this region, technicians must either ensure the antenna is in non-transmit (receive-only) mode or switch off the ODU power.

If operating the terminal in the 16 W configuration, post one or more signs around the antenna stating "NOTICE - Radiofrequency fields may exceed FCC limits for the public within 20 cm of the center of the antenna" (or substantially similar wording).

In any case where a 16 W terminal is not in a secured area inaccessible to the public, install an indicative barrier a safe distance around the antenna.
2.5 Distance to other equipment

Radars and other high-power transmitters affect the performance of the u7 antenna installed within the beam path. To mitigate the risk of interference and damage, install the u7 terminal ODU or the antenna as far from the radar/transmitter as possible and outside of the beam width, typically ±15° elevation range, as shown in the image below:

![Diagram showing the beam path and Antenna installation](image)

Evaluate the performance of the u7 terminal ODU or antenna with all radar and transmitters operating normally before finalizing the installation.

2.6 mTenna™ Plus and mTenna™ Select rack mounting safety

Elevated operating ambient temperature

If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than the room ambient temperature. Install the equipment in an environment compatible with the maximum ambient temperature (Tma) specified by the manufacturer.

Air flow

Ensure the rack equipment has enough air flow required for safe operation.

Mechanical loading

Avoid hazardous mechanical loading conditions when mounting the equipment in the rack.

Circuit overloading

Consider the effects and risks of current overload when connecting equipment to the supply circuit. Refer to equipment nameplate ratings to ensure sufficient overcurrent protection.
Reliable earthing

Maintain reliable earthing of rack-mounted equipment. Supply connections other than direct connections to the branch circuit (e.g., use of power strips).

2.7 Declaration of conformity

Kymeta Corp., of 12277 134th Ct NE, Suite 100, Redmond, WA 98052, USA, declares under our sole responsibility that the product Kymeta u7 antenna to which this declaration relates, is in conformity with the following standards and/or other normative documents: ETSI EN 301 428, ETSI EN 302 340, ETSI EN 302 448, ETSI EN 302 977, ETSI EN 301 489-1, ETSI EN 301 489-12, ETSI EN 301 489-20, IEC 60950-1, IEC 62368, Council Recommendation 1999/519/EC. We hereby declare that all essential radio test suites have been carried out and that the above-named product is in conformity to all the essential requirements of R&TTE Directive 1999/5/EC, IC/FCC Class A Part 15. Kymeta Corp. declares that this Satellite Antenna is in compliance with the essential requirements and other relevant provisions of Directive 2014/53/EU. These limits are designed to provide a reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. To ensure regulatory and safety compliance, use power and interface cables according to the guidelines in this manual. The technical documentation relevant to the above equipment will be held at:

Kymeta Corp, 12277 134th Ct NE, Suite 100, Redmond, WA 98052, USA

2.8 FCC regulatory information

Compliance Statement (Part 15.19)

The enclosed hardware device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received including interference that may cause undesired operation.

Warning (Part 15.21)

Changes or modifications not expressly approved by Kymeta could void the user’s authority to operate the equipment. Manufacturer is not responsible for any radio or TV interference caused by unauthorized modifications to this equipment.

Compliance Statement (Part 15.105(b))

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in an industrial installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference.
3 Before you start

3.1 Reduce the risk of RF exposure

Install the Kymeta u7 terminal in an area above accessible range of personnel within the operational range of the antenna to reduce the risk of RF exposure. Mount the ODU in an area that has limited access to people and does not allow for people to pass through the path of the antenna beam in any direction the antenna beam may point.

Refer to Safety and handling instructions for details.

3.2 ODU site selection

For maximum communication with the satellite it is important to prevent obstructions, the antenna should have a clear line of sight: 15° – 90° elevation (broadside to 75° scan angle), full 360° azimuth (broadside to 75° scan angle).

Obstructing the direct path to the satellite degrades performance and may cause a loss of connection with the satellite.

Obstructing the face of the antenna degrades RF performance and could impair the GPS capability of the antenna.

Reacquisition is most efficient if you install the antenna in direction of travel.

If you need support in assessing your mounting configuration, contact Kymeta customer support at support@kymetacorp.com for additional information.

The following images show example installation sites.
3.3 Prevent RF interference

Do not install the ODU closer to radar equipment than the minimum safe distance specified in the Safety and handling instructions. It may cause damage to the ODU.

3.4 Prevent magnetic interference

Proximity to magnetic interference caused by motors, fans, or ferrous metals may increase acquisition times. Install the ODU as far as possible from any equipment or materials that may cause magnetic interference for faster acquisition times.

3.5 Check electrical systems for safety

Prior to installation, check that:

- the ODU and IDU have a common ground;
- the electrical power is disconnected from both the modem;
- electrical connections are made to the ODU first and then to the modem; and
- the power switch is in the off position before connecting electrical power to the modem.

Practice basic electrical safety measures. Follow local, national, and other regulations with respect to these devices.

3.6 IDU site selection

Install the IDU in a climate controlled environment with proper temperature and humidity control.

If the modem temperature indicator light turns yellow or red during operations, it means the air temperature is too high for the modem and climate control measures are insufficient. The IDU shall not be operated in an environment which allows it to heat to more than 50 °C.

Refer to the modem manufacturer’s installation and support guide for details regarding the iDirect X7.
4 Prerequisites

4.1 Installation hardware

Before you start, ensure you have all installation hardware required for the u7 terminal assembly. Kymeta provides the following hardware required to assemble the terminal.

<table>
<thead>
<tr>
<th>Hardware diagram</th>
<th>Hardware description</th>
<th>Quantity</th>
<th>Part number</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="OUTDOOR UNIT ASSEMBLY" /></td>
<td>u7 terminal ODU assembly (integrator or standard configuration)</td>
<td>1</td>
<td>TRM-u7Hxx-xxx TRM-u7Xxx-xxx</td>
</tr>
<tr>
<td><img src="image" alt="OUTDOOR UNIT ASSEMBLY" /></td>
<td>Power cable (120 VAC) (standard configuration only)</td>
<td>1</td>
<td>115-00281-025</td>
</tr>
<tr>
<td><img src="image" alt="OUTDOOR UNIT ASSEMBLY" /></td>
<td>RX and TX cable (LMR) (standard configuration only)</td>
<td>2</td>
<td>115-00288-025</td>
</tr>
<tr>
<td><img src="image" alt="OUTDOOR UNIT ASSEMBLY" /></td>
<td>Ethernet cable (standard configuration only)</td>
<td>1</td>
<td>115-00282-000</td>
</tr>
<tr>
<td><img src="image" alt="OUTDOOR UNIT ASSEMBLY" /></td>
<td>Connector for data interface box connector (Amphenol RJ6MB) (integrator configuration only)</td>
<td>1</td>
<td>125-00413-000</td>
</tr>
<tr>
<td><img src="image" alt="OUTDOOR UNIT ASSEMBLY" /></td>
<td>Input AC power connector for power interface box (Amphenol LTW M23) (integrator configuration only)</td>
<td>1</td>
<td>125-00422-000</td>
</tr>
</tbody>
</table>
### Hardware diagram | Hardware description | Quantity | Part number
---|---|---|---
**INDOOR UNIT ASSEMBLY**

| | Modem | 1 | TRM-u7Hxx-xxx  
| | | | TRM-u7XXx-xxx  
| | N-type-to-F-type adapter for the modem | 2 | 160-00200-000  
| | M6 cage nut | 4 | 451-00003-000  
| | M6 x 16 socket head cap screw, modem to rack | 4 | 471-00032-000  

Kymeta sells the following hardware as accessories:

- Cable accessory kit (KPN #100-00020-000)
  - Power cable
  - RX cable
  - TX cable
  - Ethernet cable
- Mounting handle accessory kit (KPN #400-00018-000), shown on the right.

For more details, contact your Kymeta representative.

### 4.2 Installation tools

Before you start, ensure you have all installation tools required for the assembly. Installation tools are not provided with the product.
<table>
<thead>
<tr>
<th>Hardware diagram</th>
<th>Hardware description</th>
</tr>
</thead>
</table>
| ![Hex bit](image) | Hex bit  
Sizes required: 5 mm for the modem |
| ![Break-over torque wrench](image) | Break-over torque wrench for N-type connectors  
0.9 N·m (8.1 in.-lb.) |
| ![Torque screwdriver](image) | Torque screwdriver with 3 in. (minimum) ball head extension  
0.2 N·m (2 in.-lb.) minimum rating |
5 Installation

To ensure the u7 terminal is installed for maximum performance in each deployed platform, only Kymeta-certified installers should install and commission the unit.

Before beginning installation, read *Safety and handling instructions*.

⚠️ The diplexer is a precision tuned piece of RF equipment and not a structural member of the u7 terminal. Kymeta recommends that installers, integrators, and handlers of the terminal do not lift or hold the terminal by using any of the RF chain as a handle or grip.

5.1 Assemble the ODU

1. Clear a **flat surface**: ensure it is clean with no objects or debris that may damage the Kymeta u7 antenna.
2. Unpack the ODU. To open the case, lay it flat on an open area where it’s easy for one person to stand on each side near the clean assembly surface.
3. With two people (one person on each side), lift the ODU out of the case, keeping the antenna parallel to the floor, and lay the antenna face down on the clean flat surface. Note, a piece of foam, fabric, or non-abrasive material may be placed on the clean flat surface to prevent marks or damage to the face of the antenna.
5.2 Assemble the IDU

1. Install four M6 cage nuts to mount the modem on the rack.
2. Mount the modem.

   **Hardware:** (4) BHCS, M4 x 16
   **Tool:** Torque screwdriver with 3 in. (minimum) ball head extension, 7/64” standard hex bit size required: 5 mm.
   Torque: 20 in-lbf (2.3 N-m).

Hardware provided with the u7 terminal allows the modem installation into a standard 4 post rack (cage nuts). If your mounting solution does not fit the provided hardware, you will have to provide your own.
5.3 Install the cables

General considerations

» Ensure all the components are powered off prior to connecting the cables.
» Finger-tighten all N-type and connector cables.
» Avoid confusing the RX and TX cables. Before installing the cables, apply colored tape to each end of the cable. The recommended convention is RED for the TX cable and BLUE for the RX cable.

Kymeta u7 terminal IDU components should be in a climate-controlled environment. Kymeta recommends the following cable schedule:

» Ethernet cable (UTP/CAT-6) maximum run = 100 m (330 ft.). Cable shielding recommended especially when in proximity of RF sources, or noisy electromechanical environments.

» Coaxial cables:
  » LMR-240 maximum run - 15 m (50 ft.) at 2000 MHz
  » LMR-400 maximum run - 30 m (100 ft.)

Refer to Appendix E: Cable drawings for detailed cable drawing diagrams.

5.3.1 Assemble the power connector

If you purchased the cable accessory kit (KPN# 100-00020), skip this section.

1. Turn and open the metal nut. Take out the internal plastic components.
   Take out the holder from the plastic part.

2. Measure the diameter of the cable. If the cable measures less than 12 mm, remove the gasket from the holder (B) and install the smaller-radius gasket (A) (located in the bag with the pins) onto the holder.
3. Insert the cable into the holder and metal nut. Strip cable jacket at maximum length 25 mm.

4. Make the cable braid extroversion. Strip inner wires at maximum length from 3.5 mm to 5.0 mm.

5. Assemble the pin on the wire and crimp the pin with the HSC8 16-4 crimper plier.
6. Press the plastic part to the unlocked position. Insert the crimped pin and wire into the pin hole of the plastic part.
7. Press the plastic part to the locked position. Then the wire will be fixed on the plastic part. Attention: Ensure all parts are locked correctly, otherwise the plastic part cannot be inserted into the metal shell. Gently tug on the cable to ensure the pins are properly locked in place and do not come out from the plastic shell.

8. Grip internal plastic body hooks on both sides of the plastic hook in the slot. Make the cable braid extroversión on the spring wall of the plastic clip. Cut off the braid end over the O-ring.

9. Insert the plastic part into the metal shell, until the O-ring is assembled into the metal shell and such that the installed warning label aligns with the ground pin (Pin 3). Screw and lock tightly the metal nut and the metal shell.
5.4 Install RJ45 connector housing (for integrator configuration)

If you purchased the cable accessory kit (KPN# 100-00020), skip this section.

1. Assemble the RJ45 connector housing using the instructions provided with the packaging on the housing part.
2. Install connector housing.
3. If necessary, remove the plastic covering the RJ45 connector clip.
5.4.1 Connect the cables

1. Connect the **RX cable** (BLUE) to the **power interface box**, finger-tighten.
2. Connect the **TX cable** (RED) to the BUC. Use 8.1 in.-lb. break over torque wrench.
3. Connect the **Ethernet cable** to the **data interface box**.
4. Connect one **power cable** to the **power interface box** with the sticker facing the antenna. Check the keying: the threads may engage slightly when the connector is 180 degrees incorrect. Ensure that the threading fully engages. If the **power cable** is correctly attached and fully seated, the metal nut at the end of the cable will cover the gasket on the power box input.

   ⚠ Incorrectly seating the power connector is likely to result in a short circuit damaging the cable and interface box such that they will need to be replaced.

   ⚠ Ensure the power cable is not energized when plugging it into the power interface box.

3. Screw an N-type to F-type adapter to the RX IN port (RX 1) connector at the back of the modem, and then connect the **RX cable** (BLUE), finger-tighten. **Do not use RX 2 port**.
4. Screw an N-type to F-type adapter to the TX OUT port connector at the back of the modem, and then connect the **TX cable** (RED), finger-tighten.
5. Connect the **Ethernet cable** from the data interface box to port 1 on the modem.
6. *(optional)* If you want to connect your device to the Ethernet port of the modem, do the following:
   a. If your u7 terminal configuration includes **iDirect Evolution X7**, connect the Ethernet cable to any modem port in the range from 2 to 8.
   b. If your u7 terminal configuration includes **iDirect Velocity X7**, connect the Ethernet cable to any modem port in the range from 5 to 8.
7. Connect one **power cable** to the **power interface box**, and another one to the modem. Ensure drip loops and proper precautions to protect the power outlet from water ingress.
8. Use cable ties to clean up loose cables.
5.5 Power on the Kymeta u7 terminal

1. Check that all cables are connected.
2. Power on the ODU using the power switch on the power interface box.
3. Check the power light on the power interface box. It should be solid green.
4. Check the Status light on the back of the antenna. It should be solid green.
5. Check the BUC power light. It should be red or orange.
6. Power on the modem and wait 90 seconds while the modem goes through boot process.
7. Check the Power, Status, and Temp lights on the front of the modem. They should be solid green.
8. Verify that the Ethernet port 1 link light on the back side of the modem is blinking.

5.6 Access the u7 antenna

Kymeta supports Chrome and Firefox browsers.

To access the u7 antenna web-based user interface, do the following:

1. Connect an available Ethernet port on your laptop to the Ethernet port 2 on the modem.
2. Configure the TCP/IPv4 properties of the Ethernet port on your laptop to use static IP address/subnet mask of 192.168.44.3 / 255.255.255.0.
3. In your browser, go to http://192.168.44.2.
4. In the Authentication Required window, provide the following credentials: username: admin, password: 2Cfg^Ant.

When you connect directly to the antenna through the interface box via Ethernet, set your laptop IP address to 192.168.0.11, and reach the antenna at the IP address 192.168.0.10.
Refer to 700-00020-000 Kymeta™ u7 terminal troubleshooting guide, section "Cannot access the web-based UI" if you cannot access the antenna.

The u7 antenna automatically reboots every 7 days or 24 hours (software version 1.0.0.2295 and 1.0.0.2210). To set the auto-reboot time based on the current user's local time zone, go to the Settings page > System window, and then update the time in the Auto Reboot Time field.

The power interface box and data interface box do not contain antenna control software; all antenna control is achieved by the electronics of the ODU.

5.7 Provision and commission the u7 terminal

With the purchase of KĀLO™ services, Kymeta provides customers with the ability to provision Kymeta u7 terminals on the KĀLO network services to assure that all systems and components are fully operational.

Refer to the 700-00022-000 Provisioning and commissioning KĀLO™ services customer guide when performing initial configuration and commissioning for KĀLO network services.

For all other networks, contact Kymeta customer support at support@kymetacorp.com or 1-855-525-6638 (Monday to Friday, 07:00-18:00 Pacific Time (UTC-8)) to schedule your commissioning window.

⚠ Do not run the commissioning wizard if your terminal is already commissioned, even if the modem's UI indicates that the terminal is not commissioned. Running the commissioning wizard past step six erases the terminal's commissioning file. If the terminal commissioning file is erased, you will need to recommission the terminal with Kymeta Support or following the 700-00022-000 Provisioning and commissioning KĀLO™ services customer guide.
6  u7 antenna orientation setup

When in motion, the antenna's yaw (heading), relative to north, is provided by the GPS heading. The Kymeta u7 antenna out-of-the-box configuration assumes that the X axis of the antenna is aligned with the heading vector of the vehicle. If this is not the case, you can set the vehicle to ant-yaw value to inform the antenna of the offset. Set the offset correctly to expedite acquisition of the satellite while in motion.

⚠️ If the offset is not set or is set incorrectly, the antenna can acquire the satellite, but it takes up to one minute.

In the figure below, the antenna is correctly aligned, using the antenna's default value of zero.

For an unaligned antenna, set vehicle-to-ant-yaw to the angle between the X axis and the heading vector as in the figure below. The range is from -360° to 360° with positive angles representing a clockwise rotation of the antenna from the vehicle heading vector.
Ensure vehicle-to-antenna-roll and vehicle-to-antenna-pitch are set to their default values of 0. The onboard accelerometers measure these values directly, so no offset is required.

You can adjust the vehicle-to-antenna-yaw offset value using the antenna’s API. Navigate to Help > API Documentation > /setup/vehicle-to-ant. Then, set the necessary value. Refer to 700-00007-000 Kymenta™ u7 antenna public RESTful application programmers’ interface reference for further information on using the RESTful API.

The vehicle-to-antenna-yaw value will persist through software updates once set, but it will be removed with a factory reset of the antenna.

For an adjustment to the vehicle-to-antenna-yaw to expedite acquisition under motion, the offset must be accurately estimated to within 3°.
7 Install an inverter system inside a vehicle

This section describes how to install an inverter system inside a vehicle. Vehicle structure, chassis, and electrical systems vary, so some options may require adjustment. A qualified installer should perform the install.

This section provides guidelines for the installation of the inverter system and related components. Kymeta disclaims all representations, warranties, and liability relating to the installation of the inverter system and related components, whether installed by Kymeta or by you. Please arrange your installation in such a way that any possible malfunction of the product will not result in personal injury or damage to equipment.

✎ Read the instructions for inverters and fuse kits before starting the installation, and make sure you have the tools and parts before starting. Always assemble in a clean area and follow all Safety and handling instructions. For cable connections and system information, see Connect the cables. Follow all manufacturer instructions for any purchased components.

7.1 Required materials

» Automotive amplifier wiring kit with all instructions
» Inverter kit with all instructions
» Tools matching the above (varies by brand—conform on the packaging)
» Tools for working on the vehicle (will vary by make/model)
» Silicone caulk
» Zip ties, electrical tape, or other fasteners may be used to route and isolate the movement of cables
» Automotive ground strap
» u7 terminal indoor unit (IDU), including all supporting parts and documentation
» Power strip
» Means to secure IDU components in the vehicle

7.2 Suggested installation

Before you begin, read all instructions for all components thoroughly.

1. Set the parking brake and disconnect the negative terminal from your battery to prevent any electrical shorts.
2. Run the power wire through the vehicle. The power wire from your amplifier wiring kit (~20' in length) needs to run from the battery, through the car's firewall, through the car's body, usually down the driver's side, and on to the inverter.
   a. Find a grommet in the firewall that already has wires or cables passing through and has enough room for the power wire to fit through.
» Often, the main ECM/TCM or body harness is the best through point.

» Glass cleaner is a clean and easy way to relieve friction.

b. Place a fuse holder. The power wire from your amplifier wiring kit may have a fuse holder installed. If so, go to step 4.
   i. If not, find a good spot close to the battery to place the fuse-holder (included in the kit). Less than 6" from the battery is ideal.
   ii. Anchor the fuse holder to a suitable spot with a screw or cable tie, so it won't hang loose or bounce around.
   iii. Cut a short piece off the end of the power wire (to cover the distance from the battery to the fuse holder location), and strip the insulation off both ends with a wire stripper.
   iv. Crimp the terminal ring (included in the kit) onto one end of the short piece of wire, and attach the fuse holder onto the other end.
   v. Strip the insulation off the end of the power wire that leads into the passenger compartment, and connect it to the other end of the fuse holder.

3. Attach the power cable to the positive battery terminal (not directly to the battery post itself).
   a. The most common way to do this is to crimp a ring terminal onto the end of the power cable (our cables in wiring kits come with it already attached).
   b. Remove the battery terminal's nut, slip the power cable's ring over the bolt that secures the battery terminal to the battery post, and replace and tighten the nut.

4. Follow the instructions supplied with your inverter.
   a. As near to the inverter location as possible, find a bolt to the vehicle's metal frame to use for a ground.
   b. If you can't find a convenient ground screw or bolt, drill a hole for one — be careful not to drill into any wiring, the gas tank, or a gas or brake line.
   c. Crimp a ring terminal (may be included with the amplifier kit) to the short piece of ground cable (included in the kit).
   d. Scrape away any paint and clean the bolt location thoroughly, and then bolt the terminal tightly to the vehicle's metal chassis.
   e. Use a lock washer, extra screws, and any other technique or device to keep the connection tight, clean and electrically conducting.
   f. *(optional)* Coat the final connection with silicone caulk to prevent corrosion (included in the toolkit).

   ✍️ A bad ground is usually the first item to check in power troubleshooting situations.

5. *(optional)* Once the inverter is properly installed, install a ground strap to the outside of the vehicle to provide grounding for AC power.

6. Install the modem in a well-ventilated location. Ensure it is secured to the vehicle and does not pose dangers of damage or injury.

7. Attach power from the modem to a power strip. Ensure the power strip has a breaker.
8. Attach the power strip to the inverter.
9. Connect the power back to the battery negative.
10. Power on the u7 terminal.

### 7.3 Suggestions for internal components

» When mounting equipment inside a vehicle, observe safety guidelines for your vehicle and region.

» Since electronic components are rated for indoor use in a climate-controlled facility, keep the modem at an appropriate temperature and humidity. Consider ventilation and moisture condensation in your planning.

» Firmly secure the modem so it doesn’t become loose.

» You can use a built-in rack. Secure all small components with Velcro or other material.

» You can use a 4-unit plastic case with two large openings to contain materials.

» Follow the suggested rack mount order (firewall equipment is optional):
  - Firewall (from back)
  - Power outlet (from back)
  - iDirect X7 modem

» Install the rack case so airflow is going from the front of the modem for optimum cooling.

### 7.4 Car component removal

Component removal should be performed by a dealer or authorized representative.

**Removing the door scuff plates.** The plates are usually removed by prying up the edges to release clips. Some vehicles will have screws present, which will need to be removed.

**Removing the seats.** The seat belt may be located on a panel that needs to be removed. Most seat belt anchor covers pry off. The seat belt anchor is secured with a large nut or bolt.

**Removing the pillar trim panel.** Remove screw covers, screws, and plastic retaining clips if present. Pry up edges of panel to remove outwards.
8 Customer support

Contact Kymeta customer support at support@kymetacorp.com or 1-855-525-6638 (Monday to Friday, 07:00-18:00 PT (UTC-8)).

9 Revision history

<table>
<thead>
<tr>
<th>Revision</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Initial document.</td>
</tr>
<tr>
<td>B</td>
<td>Removed draft watermark. Updates and edits to language throughout.</td>
</tr>
<tr>
<td>C</td>
<td>Updated section &quot;Connect the cables.&quot; Added section &quot;Assemble the power connector.&quot;</td>
</tr>
<tr>
<td>D</td>
<td>Added section &quot;Provision and commission the u7 terminal.&quot;</td>
</tr>
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10 Copyright and trademark information

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Appendix A: Kymeta u7 terminal configuration diagram

* if your Kymeta™ u7 terminal KÅLO configuration includes iDirect Evolution X7, connect the Ethernet cable to any modem port in the range from 2 to 8. If your Kymeta™ u7 terminal KÅLO configuration includes iDirect Velocity X7, connect the Ethernet cable to any modem port in the range from 5 to 8.
Appendix B: Accessories

Cable kit

Kymeta provides the following cables as accessories for the u7 terminal:

- RX cable
- TX cable
- Power cable
- Ethernet cable

Available in 7.62 m (25 ft.)

To ensure performance of the system across the full operational range, Kymeta recommends using the following IF cable types for the RX cable and TX cable. The maximum attenuation levels of the table assumes 4 Ω of DC resistance and an RF attenuation of 10 MHz at 1.5 dB with a maximum value of 12 dB RF attenuation at 950 MHz to 2150 MHz.

<table>
<thead>
<tr>
<th>IF cable type</th>
<th>Maximum length</th>
</tr>
</thead>
<tbody>
<tr>
<td>LMR-195</td>
<td>19 m (65 ft.)</td>
</tr>
<tr>
<td>LMR-240</td>
<td>28 m (93 ft.)</td>
</tr>
<tr>
<td>LMR-400</td>
<td>54 m (179 ft.)</td>
</tr>
<tr>
<td>LMR-600</td>
<td>83 m (276 ft.)</td>
</tr>
</tbody>
</table>
Mounting handle kit
Appendix C: Outdoor unit dimensions
Appendix D: Indoor unit dimensions

SHOWN INSTALLED INTO 19" NETWORK RACK USING KYMETA PROVIDED HARDWARE (M6 W/ CAGE NUTS) OR CUSTOMER SOURCED SOLUTION

INSTALL MODEM IN 19" NETWORK RACK COMPLIANT WITH EIA-310-E.
Appendix E: Cable drawings

RX and TX cables

The RF coaxial cables have a minimum bend radius of 2 cm and a one-time bend radius of 0.5 cm.

AC power cable