Kymeta™ u7 Terminal User Manual

Includes Kymeta™ u7 Antenna

For Integrator and Standard u7 terminal configurations

Covers TRM-U7Hxx-xxx and TRM-U7Xxx-xxx Kymeta u7 terminal configurations

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1 Introduction

This document describes use, maintenance, and hardware of the Kymeta™ u7 terminal.

This document is intended for u7 terminal owners and operators.

For information on installing the u7 terminal, refer to 700-00065-000 Kymeta™ u7 terminal installation guide TRM U7H U7X configurations.

For your safety, read 700-00065-000 Kymeta™ u7 terminal installation guide TRM U7H U7X configurations, section “Safety and handling instructions” before performing any maintenance on the u7 terminal.

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

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

The initial release of the u7 terminal requires installation and initialization upon commissioning it to a known satellite network. This initialization must be performed by a trained field engineer. Once the product is installed and commissioned, it will be ready to facilitate data communications through a satellite network. For information on commissioning, contact Kymeta customer support.

✎ The power interface box and data interface box do not contain antenna control software; the ODU manages all antenna control.

✎ This is a transmit and receive satellite terminal; you must comply with all applicable local, national, and international laws and regulations regarding the installation and use of this product.
3 Indoor unit (IDU)

3.1 Modem

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

If the modem temperature indicator light turns yellow or red during operation, the air temperature is too high for the modem and climate control measures are insufficient. Do not operate the IDU in an environment which allows the modem temperature to exceed 50°C.

Refer to the modem manufacturer's installation and support guide for details regarding the iDirect X7 modem.
4 Physical connection interfaces

The Kymeta u7 terminal includes the following physical connection interfaces:

- Power out cable
- Antenna control cable
- BUC control cable
- Ethernet cable
- TX cable
- RX cable
- Power cable
- RX out cable
- RX in cable
4.1 Power cable

The power cable connects the external power supply to the power interface box.

When attaching the power cable, check the keying: the threads may engage slightly when the connector is rotated by 180° from the correct alignment. 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 will likely result in a short circuit, which will damage the cable and interface box.

4.2 RX in cable (LMR-195)

This LMR-195 cable connects the LNB to the antenna RX IN port. The cable requires a right-angle N-type connector at the antenna end to maintain the low profile of the antenna without sharp or protruding cable bends. The connector has standard N-type connectors at each end.

4.3 TX cable

This N-type IF cable connects the BUC in the ODU to the TX Out of the modem within the IDU. The TX cable works in the frequency range from 1050 MHz to 1700 MHz and passes a 10 MHz reference signal to the BUC. This protocol and the cabling is dependent on the specific modem and BUC used for each solution. Kymeta provides an N-type to F-type adapter to connect this cable to the modem.

4.4 RX cable

This N-type IF cable sends the L-Band (950 MHz to 2150 MHz) signal from the antenna to the modem and provides DC power for the LNB. It connects the antenna RX OUT port to the modem primary RX IN port (Rx 1). The RX cable works in the frequency range from 950 MHz to 2150 MHz and provides power for the LNB. Kymeta provides an N-type to F-type adapter to connect this cable to the modem.

4.5 Ethernet cable

This cable connects the data interface box to port 1 on the modem. The Ethernet port is for a standard 10/100/1000 network and is the primary monitor and control (M&C) port. It supports multiple protocols for a web server (GUI), ACU-Modem Interface (OpenAMIP™), and an M2M (machine-to-machine) RESTful API. Installation engineers can make multiple connections with an external switch.
5 u7 antenna automatic reboot schedule

The u7 antenna requires an automatic reboot every 24 hours (software version 1.0.0.2295 and 1.0.0.2210) or every 7 days (software version 1.1.0.3240 and later) to avoid potential failures in u7 antenna functionality, including loss of service and/or performance degradation.

u7 antenna software versions 1.0.0.2295 and 1.0.0.2210 allow the operator to set the time of day when the 24-hour automatic reboot occurs. Software versions 1.1.0.3240 and later allow the antenna operator to set the time of day and the day of the week when the weekly automatic reboot occurs. Note that the automatic reboot cannot be disabled.

u7 antenna software version 1.4.0.64 initiates an automatic reboot only if the system has been up for at least 6 days. If the system restarted (either via a manual reboot or as a part of software update) within the 6-day time period before the scheduled reboot, the scheduled reboot is skipped.

The u7 antenna detects the operator’s time zone from the computer being used to set the time of day; that is, if the operator’s laptop is set to EST and the time of day is set to 3 AM, the automatic reboot will occur at 3 AM EST. If the antenna changes time zones, the reboot time will need to be updated accordingly.
6 Over-the-air (OTA) updates

The Kymeta™ u7 antenna requires factory installed software to operate, which is pre-installed at the factory. Users with software version 1.0.0.2210 or later can opt in to secure, automatic OTA updates as new software releases are made available.

OTA updates are available to all Kymeta customers is their u7 antenna has access to the internet and Kymeta Cloud Services. Ao KĀLO™ network services subscription is not required to get OTA updates.

To enable OTA updates or update your software version to get OTA updates, contact Kymeta customer support.

6.1 OTA update process

1. The antenna checks on start-up to determine if an OTA update is available. The antenna performs this check through secure web services calls to Kymeta Cloud Services.
2. If the antenna is eligible for an update, a package is downloaded and installed. If the antenna is not eligible, no action is taken.

The u7 antenna operates normally during the OTA update process. The newly-installed software version takes effect on the next restart of the antenna. Restart is triggered on completion of the software installation in version 1.1.0 and later. Software version 1.0.0 reboots on the next scheduled reboot. You will experience a brief internet outage during the restart.

✎ It is not possible to monitor the status of the OTA download. However, you can verify the update has completed by the software version number displayed in the top right corner of the web-based user interface. Refer to 700-00006 Kymeta™ u7 antenna software user guide for details.

If the OTA update download is interrupted, the u7 antenna retries up to 10 times to successfully download the update package. You will not see any indication of the activity. If after 10 attempts the download does not complete, it retries on the next restart.

If the OTA update install is interrupted, the software reverts to the original version, and the antenna retries installation on the next restart.

6.2 Software rollback

Contact Kymeta customer support if you want to roll back to a previous software version.
7 Package the Kymeta u7 terminal

Kymeta recommends boxing the u7 terminal in the original packaging. If you need to return a terminal, Kymeta provides the replacement terminal first. Use the packaging from the replacement terminal to ship the original one back.

7.1 Package the u7 terminal

The order of the following steps may vary depending upon your mounting structure. Always follow the guidelines in 700-00065-000 Kymeta™ u7 terminal installation guide TRM U7H U7X configurations, section "Safety and handling instructions" for best practices.

1. Power off the terminal using the power switch on the power interface box.
2. Carefully disconnect and cap the power cable, RX cable, TX cable, and Ethernet cable, being mindful of pins and connectors.
   a. Ensure cable ends do not drop into water or dirt.
   b. Dry off cables and coil them into the box, binding with cable ties.
   c. Do not leave adapters on cables.
3. Remove the terminal ODU from the mounting structure and place face-down on a non-abrasive surface for safe and easy access.
4. Dry off all equipment and remove any debris.
5. Place the terminal ODU back into the shipping compartment in the original cardboard box.
   a. Secure any loose items (e.g., screws, tools, cable ends).
   b. Close the box.
6. Place the terminal ODU original shipping box inside a reusable container.
7. Close the container and fasten the latches carefully.

7.2 Package the u7 terminal IDU

1. Confirm power is off.
2. Carefully disconnect and cap all cables, being mindful of pins and connectors.
3. Coil and secure all cables with cable ties.
4. Check all fasteners to make certain they are still secure.
5. If the unit is warm, let it cool.
6. Place foam inside the rack mount unit.
7. Close unit and fasten latches carefully.
8 Clean the u7 antenna

Prior to cleaning any part of the u7 antenna, ensure it is powered off.

**General cleaning**

Blow or rinse off loose debris first, and then apply a cleaning agent and use a clean, soft towel to clean the stained area. Avoid scrubbing and do not use abrasive materials when cleaning the terminal components.

Avoid exposing rubber parts (for example, gaskets) to alcohol or alcohol-based cleaners, for these can deteriorate the rubber.

**General cleaning agents**

Clean fingerprints, smudges, salt spray, and light marks with isopropyl alcohol products (CAS Number 67-63-0). It is safe to use isopropyl alcohol on the antenna.

Clean difficult stains, such as oil, grease, soot, ink, and other soils with LPS Precision Clean Multi-Purpose Cleaner Degreaser at 10 to 1 dilution.

**Connectors**

Use a soft bristle acid brush or cotton swab with isopropyl or denatured alcohol to gently clean all connectors. Take extra care when cleaning RF air-dielectric connectors and don’t damage, bend, nick, push in, or pull out the center connector as this can affect your signal. Carefully clean any surface corrosion on the exterior of the connector. Do not scrape or overscrub the connector as this can damage the connector coating and render it more susceptible to corrosion.

Ensure connectors are completely dry before reconnecting.

**Screws**

Use a soft bristle brush and isopropyl or denatured alcohol to clean lightly oxidized screws. Replace heavily corroded or oxidized screws when possible. For information on replacing parts and components, see *Section 9 Replace components*. 
9 Replace components

Before replacing any components, familiarize yourself with 700-00065-000 Kymeta™ u7 terminal installation guide TRM U7H U7X configurations, section Safety and handling instructions.

⚠ Prior to replacing any parts, power down the u7 terminal and disconnect all power sources to avoid possible injury from electric shock.

General recommendations:

» Read all instructions carefully. Pictures are provided for your reference and do not replace text instructions.

» Always start fasteners by hand to ensure you do not to cross thread, then tighten with a tool.

» Follow torque recommendations.

» When there are multiple fasteners in an assembly, first start all fasteners by hand, then tighten partially in a star or cross pattern using a tool before tightening completely.

» There are some items that you should not tighten completely until instructed to do so. Follow tightening steps carefully.
9.1 Replace the BUC

1. Unplug the TX cable and the BUC control cable from the BUC.
2. Loosen the BUC support plate/ODU support plate screws.
3. Loosen the diplexer/antenna screws.
4. Detach the diplexer from the antenna WR-75 flange. Ensure you don’t lose the O-ring between the diplexer and the WR-75 flange.
5. Detach the BUC from the diplexer.
6. Detach the BUC from the BUC support plate.
7. Attach the replacement BUC to the BUC support plate. Check the illustration below to determine the orientation of the BUC support plate. Mount the plate toward the side of the BUC that has the Power and RF In ports. Tighten fasteners in a cross pattern.
   
   **Tools:** Torque screwdriver with 0.2 N-m (2 in.-lb.) minimum rating
   
   **Hardware:** (1) BUC, (1) BUC support plate, (4) BHCS, M4 x 10
   
   **Torque:** 1.47 N-m (13 in.-lb.)

8. Attach the BUC to the diplexer.
9. Loosely bolt the diplexer to the antenna WR-75 flange with four socket head cap screws. Ensure the O-ring is in place, correctly aligned, and not pinched when installing the diplexer. Poor O-ring installation can degrade RF performance.
   
   **Hardware:** (1) diplexer, (4) 6-32 × 1/2” socket head cap screw
   
   **Tools:** Torque screwdriver with a 1.47 N-m (13 in.-lb.) minimum rating, 7/64” bit with ball head and 3 in. (minimum) extension

10. Loosely attach the BUC to the support plate. Apply a small amount of Loctite (included in conversion kit) onto the threads of the (4) 6-32 x 1/2” socket head cap screws.
    
   **Hardware:** (1) BUC support plate with the attached BUC, (4) BHCS, M4 × 12
   
   **Tools:** Torque screwdriver with 0.2 N-m (2 in.-lb.) minimum rating, metric hex bit with 2.5 mm ball head and 3 in. (minimum) extension
   
   **Torque:** 1.47 N-m (13 in.-lb.)

11. Tighten the diplexer/antenna screws.
12. Tighten the BUC support plate/ODU support plate screws.
13. Tighten the ODU support plate/antenna screws.
14. Reattach the TX cable and the BUC control cable to the BUC.
9.2 Replace the LNB

1. Disconnect the RX in cable from the LNB.
2. Disconnect the LNB from the diplexer by removing the four socket head cap screws and the O-ring. Locate and save the black O-ring between the LNB and diplexer.
   **Tools:** M3 ball-head Allen driver.
3. Insert the provided orange O-ring into the provided WR-75 spacer groove and place it on the diplexer with the O-ring facing the diplexer.
4. Replace the original black O-ring in the groove on the WR-75 side of the LNB.
5. Connect the LNB to the diplexer with four M4 × 16 mm socket head cap screws, four metal bonded rubber washers, and apply a small amount of Loctite to the thread of each M4 x 16 mm socket head cap screw. Ensure the screws are aligned.
   **Tools:** Torque screwdriver with 0.2 N-m (2 in.-lb.) minimum rating, hex bit, M3 ball head with 3 in. (minimum) extension
   **Hardware:** (4) SHCS, M4 x 6, O-ring
   **Torque:** 1.47 N-m (13 in.-lb.)
6. Connect the RX in cable to the LNB.

⚠ Ensure the LNB film stays on. The film keeps dust from entering the LNB and does not reduce gain.

⚠ Do not cross thread or overtighten the screws.
9.3 Replace the diplexer

⚠️ Never grab or lift the support plate with the attached RF chain (BUC, diplexer, LNB, and RX IN cable) or the assembled ODU by the diplexer or any other part of the RF chain. Never use the diplexer or any part of the RF chain to mount the ODU. Avoid damaging the coating on the diplexer.

⚠️ Prior to replacing any parts, power down the u7 terminal and disconnect all power sources to avoid possible injury from electric shock.

Dismount the ODU and lay it face down on a clean, flat surface.

1. Remove the diplexer from the antenna WR-75 flange by unscrewing the four socket head cap screws.
   **Tools:** US standard driver with ball head, 7/64"

2. Remove the O-ring.

3. If you are not immediately replacing the diplexer, replace the antenna WR-75 flange protective cover.
   **Hardware:** Antenna WR-75 flange protective cover

4. If necessary, remove the protective cover from the antenna WR-75 flange.
   **Hardware:** Antenna WR-75 flange protective cover

5. Place an O-ring at the antenna WR-75 flange.
   **Hardware:** (1) O-ring, WR-75 flange

6. Bolt the diplexer to the antenna WR-75 flange with four socket head cap screws. Ensure the O-ring is in place, correctly aligned, and not pinched when installing the diplexer. Poor O-ring installation can degrade RF performance.
   **Tools:** Torque screwdriver with 1.47 N-m (13 in.-lb.) minimum rating, 7/64" bit with ball head and 3 in. (minimum) extension
   **Hardware:** (1) diplexer, (4) 6-32 x 1/2" socket head cap screw

7. Refer to **Section 9.1 Replace the BUC** and **Section 9.2 Replace the LNB** for remounting the BUC and LNB.
9.4 Replace the data interface box

What’s in the kit

The data interface box accessory kit consists of the following components:

» (1) Data interface box and antenna control cable assembly
» (1) Loctite 242
» (3) Button head cap screw (BHCS), M4 x 10 for mounting the item to support plate
» (1) 2.5 mm ball end Allen wrench

Before you begin

Before replacing any components, familiarize yourself with 700-00065-000 Kymeta™ u7 terminal installation guide TRM U7H U7X configurations, section Safety and handling instructions.

⚠ Prior to replacing any parts, power down the u7 terminal and disconnect all power sources to avoid possible injury from electric shock.

Assembly instructions

1. Dismount the ODU and lay it face down on a clean, flat cushioned surface to protect the radome coating.
2. Disconnect the Ethernet cable from the data interface box.
3. If the mounting handle has been attached, remove it. Use a 1/4" ball-end hex key wrench (not provided with the kit).
4. Disconnect the 18-pin connector of the BUC control cable from the data interface box.
5. Disconnect the power out cable from the back side of the data interface box.
6. Remove the data interface box from the support plate. Discard the screws.
7. Disconnect the 31-pin connector of the antenna control cable from the back of the antenna. Discard the data interface box and antenna control cable assembly per local regulations.
8. Holding the new data interface box and antenna control cable assembly, attach the 31-pin connector to the back of the antenna.
   a. Inspect the female and male pins of the 31-pin plug and jack connectors.
   b. Align the inner and outer key.
   c. Align the keyway of the connector with the key of the 31-pin receptacle. Gently press the connector into place with firm even pressure. The connector should sink into place when the pins and keyways are aligned. Do not force the connector down or apply pressure at an angle or with the keyway not aligned.
   d. Once the connector has seated, push down and twist the outer lock ring clockwise to secure the connector in place, until the lock ring is engaged. Do not over twist the lock ring; it is not a screw down fastener. When connected correctly, the 31-pin connector will not disconnect if you pull gently on the plug.
9. Placing a drop of Loctite on the thread of each screw, attach the **new data interface box** to the **support plate**.
   **Tools:** Torque screwdriver with 0.2 N-m (2 in.-lb.) minimum rating, metric hex bit with 2.5 mm ball head and 3 in. (minimum) extension
   **Hardware:** (3) BHCS, M4 × 10
   **Loctite:** One small drop per screw
   **Torque:** 1.47 N-m (13 in.-lb.)

10. Connect the **18-pin connector** of the **BUC control cable** to the **data interface box**.
    a. Inspect the female and male pins of the 18-pin connector.
    b. Align the inner and outer key of the connectors, place the cabled connector squarely against the connector on the back of the data interface box, and then press in until the connector engages.
    c. Screw the outer ring clockwise until the threads are engaged and the outer ring no longer turns easily to secure the connector in place.

11. Connect the **power out cable** to the back side of the **data interface box**.

12. Attach the **mounting handle**, if it’s been removed. Use a 1/4” ball-end hex key wrench (not provided with the kit).

13. Secure cables on the back of the modules using cables clamps and cable ties.

14. Connect the **Ethernet cable** to the **data interface box**.

15. Power on the terminal and do a self-check after the replacement. Refer to **700-00065-000 Kymeta™ u7 terminal installation guide TRM U7H U7X configurations** for details.
9.5  Replace the power interface box and power supply assembly

What’s in the kit

The power interface box accessory kit consists of the following components:

» (1) Power interface box and power supply assembly

» (1) RX OUT cable, to connect the power interface box to the antenna RX OUT port (12 in. LMR-195 male-to-male coaxial cable)

» (7) Button head cap screw (BHCS), M4 x 10 for mounting items to support plate

» (1) Loctite 242

» (1) 2.5 mm ball end Allen wrench

» Self-fusing silicon rubber electrical tape

» (6) cable clamps

Before you begin

Before replacing any components, familiarize yourself with 700-00065-000 Kymeta™ u7 terminal installation guide TRM U7H U7X configurations, section Safety and handling instructions.

⚠ Prior to replacing any parts, power down the u7 terminal and disconnect all power sources to avoid possible injury from electric shock.

Assembly instructions

1. Dismount the ODU and lay it face down on a clean, flat cushioned surface to protect the radome coating.

2. If the mounting handle has been attached, remove it. Use a 1/4" ball-end hex key wrench (not provided with the kit).

3. Disconnect the power cable and the RX cable from the power interface box.

4. Disconnect the RX OUT cable from the antenna RX OUT port

5. Disconnect the RX OUT cable from the power interface box. Discard the cable per local regulations.

6. Disconnect the power out cable connector from the back side of the data interface box.

7. Carefully open the installed cable clamps (or any other cable ties), to free up the power in cable and power out cable.

8. Using the provided 2.5 mm Allen wrench, remove 7 button cap screws to release the power interface box and power supply assembly from the ODU support plate. Discard the screws and assembly per local regulations.

9. From the new power supply, connect the power out cable to the back side of the data interface box.
10. Placing a drop of Loctite on the thread of each screw, attach the new power interface box and power supply assembly to the ODU support plate.
   **Tools:** Torque screwdriver with 0.2 N-m (2 in.-lb.) minimum rating, metric hex bit with 2.5 mm ball head and 3 in. (minimum) extension
   **Hardware:** (7) BHCS, M4 × 10
   **Loctite:** One small drop per screw
   **Torque:** 1.47 N-m (13 in.-lb.)

11. Connect the new RX OUT cable 90-degree angle side to the antenna RX OUT port, and the straight side to the power interface box, and torque to 8 in.-lb. or hand-tighten at both ends. DO NOT OVER-TORQUE RF CONNECTORS. Apply self-sealing silicon rubber tape to the RF connectors to inhibit water ingress.

12. Attach the cable clamps to hold the cables in place. If clamps fail or cannot be reclosed, replace them with the provided clamps.

13. Attach the mounting handle, if it’s been removed. Use a 1/4” ball-end hex key wrench (not provided with the kit).

14. Connect the power cable and the RX cable to the power interface box. Apply self-sealing silicon rubber tape to the RF connector to inhibit water ingress.

15. Power on the terminal and do a self-check after the replacement. Refer to 700-00065-000 Kymeta™ u7 terminal installation guide TRM U7H U7X configurations for details.
9.6 Attach mounting handle accessory kit

What’s in the kit

The mounting handle accessory kit consists of the following components:

» (1) mounting handle
» (1) Loctite 242
» (4) socket head cap screw, 5/16" X 1"L, 18-8SS
» Ball-end, hex key wrench, 1/4"

Mounting interface

Before you begin

Before replacing any components, familiarize yourself with 700-00065-000 Kymeta™ u7 terminal installation guide TRM U7H U7X configurations, section Safety and handling instructions.

⚠ Prior to replacing any parts, power down the u7 terminal and disconnect all power sources to avoid possible injury from electric shock.

Assembly instructions

1. Dismount the ODU and lay it face down on a clean, flat cushioned surface to protect the radome coating.
2. Remove the four installed hex stand-off posts.
3. Place the mounting handle on the ODU as shown below with the open section at the BUC.
4. Apply Loctite on two 5/16” X 1”L screws, and bolt screws (1) and (2) halfway.
5. Apply Loctite on one 5/16” X 1”L screw, and bolt the screw (3) halfway.
6. Pull/push the last hole into alignment to insert the last screw (if needed). Be sure to apply Loctite.
7. Tighten all four screws in cross pattern.
8. Check that all screws are tight before lifting the ODU.

Always lift the antenna by the sides or by the mounting handle.
Never grab or lift the ODU by the diplexer or any other part of the RF chain. Never use the diplexer or any part of the RF chain to mount the ODU.
9.7 Attach cable accessory kit

What’s in the kit

The cable accessory kit consists of four 7.62 m (25 ft.) cables:

» Power cable (120 VAC)
» RX cable (LMR)
» TX cable (LMR)
» Ethernet cable (Ethernet)

The electrical tape (61 cm) is included to better protect the cable connectors.

Before you begin

Before replacing any components, familiarize yourself with 700-00065-000 Kymeta™ u7 terminal installation guide TRM U7H U7X configurations, section Safety and handling instructions.

⚠ Prior to replacing any parts, power down the u7 terminal and disconnect all power sources to avoid possible injury from electric shock.

Avoid confusing the RX and TX cables. Before you begin to install the cables, apply colored labels to each end of the cable: RED is for the TX cable and BLUE is for the RX cable.

Cabling instructions

1. Connect the RX cable (BLUE) to the power interface box and finger tighten.
2. Connect the TX cable (RED) to the BUC. Use a torque wrench with an 8.1 in.-lb. break over.
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 only. Do not use RX 2 port.
4. Connect the Ethernet cable to the data interface box.
5. 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 only.
6. Connect the Ethernet cable from the data interface box to port 1 on the modem.
7. (Optional) If you want to connect your device to the Ethernet port of the modem, do the following:
   » If your u7 terminal configuration includes an iDirect Evolution X7, connect the Ethernet cable to any modem port in the range from 2 to 8.
   » If your u7 terminal configuration includes an iDirect Velocity X7, connect the Ethernet cable to any modem port in the range from 5 to 8.
8. Connect one power cable to the power interface box and another one to the modem. Ensure that cable drip loops are created to protect the power outlet from water ingress.
9. Wrap 1/2 of the electrical tape around each of the RX and TX connectors on the ODU side of the u7 terminal to protect from environmental factors.

10. Use cable ties to secure loose cables.
If your Kymeta™ u7 terminal KĀLO configuration includes iDirect Velocity X7, connect the Ethernet cable to any modem port in range from 5 to 8. If your Kymeta u7 terminal configuration includes iDirect Evolution X7, contact your service provider to confirm Ethernet port configurations for connectivity.
## 11 Component replacement tools

Before replacing any components on the u7 terminal, make sure you have all the required tools.

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<th>Tool diagram</th>
<th>Tool description</th>
</tr>
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<tbody>
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<td>3 mm ball-end Allen driver</td>
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<tr>
<td><img src="image" alt="M3 ball-end Allen driver" /></td>
<td>M3 ball-end Allen driver</td>
</tr>
<tr>
<td><img src="image" alt="#2 Philips screwdriver" /></td>
<td>#2 Philips screwdriver</td>
</tr>
<tr>
<td><img src="image" alt="US standard driver with ball head, 7/64”" /></td>
<td>US standard driver with ball head, 7/64”</td>
</tr>
<tr>
<td><img src="image" alt="5 mm Allen wrench" /></td>
<td>5 mm Allen wrench</td>
</tr>
<tr>
<td><img src="image" alt="M3 Allen wrench" /></td>
<td>M3 Allen wrench</td>
</tr>
<tr>
<td><img src="image" alt="Break-over torque wrench for N-type connectors" /></td>
<td>Break-over torque wrench for N-type connectors</td>
</tr>
<tr>
<td><img src="image" alt="Adjustable crescent wrench" /></td>
<td>Adjustable crescent wrench</td>
</tr>
<tr>
<td><img src="image" alt="Torque screwdriver with 0.2 N-m (2 in.-lb.) minimum rating" /></td>
<td>Torque screwdriver with 0.2 N-m (2 in.-lb.) minimum rating</td>
</tr>
<tr>
<td>Torque screwdriver with 1.47 N-m (13 in.-lb.) minimum rating</td>
<td></td>
</tr>
<tr>
<td>-------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>Metric hex bit, 2.5 mm ball head with 3 in. (minimum) extension</td>
<td></td>
</tr>
<tr>
<td>Metric hex bit, 5 mm ball head with 3 in. (minimum) extension</td>
<td></td>
</tr>
<tr>
<td>M3 ball head with 3 in. (minimum) extension</td>
<td></td>
</tr>
<tr>
<td>Hex bit, M3 ball head with 3 in. (minimum) extension</td>
<td></td>
</tr>
<tr>
<td>7/64” bit ball head with 3 in. (minimum) extension</td>
<td></td>
</tr>
</tbody>
</table>
12 Component replacement hardware

Before replacing any ODU components, take inventory to make sure you have all required hardware.

Kymeta provides all hardware for any replacement component for the ODU in the field replaceable units (FRU):

» 400-00004-0000 8 W Universal Series BUC FRU
» 400-00005-0000 16 W Universal Series BUC FRU
» 400-00006-0000 Universal N-type connector LNB FRU
» 400-00007-0000 Ku-band Diplexer FRU
» 400-00018-0000 Mounting handle FRU kit
» 400-00025-0000 Data interface box accessory kit
» 400-00026-0000 Power interface box and power supply assembly accessory kit

12.1 BUC replacement hardware

<table>
<thead>
<tr>
<th>Hardware diagram</th>
<th>Hardware description</th>
<th>Part number</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1" alt="Image" /></td>
<td>New Japan Radio Co. Universal Series 8 W BUC</td>
<td>160-00189-000</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>New Japan Radio Co. Universal Series 16 W BUC</td>
<td>160-00168-000</td>
<td></td>
</tr>
<tr>
<td><img src="image2" alt="Image" /></td>
<td>O-ring (provided with the BUC)</td>
<td>455-00006-100</td>
<td>1</td>
</tr>
<tr>
<td><img src="image3" alt="Image" /></td>
<td>BUC side mounting flange</td>
<td>430-00495-000</td>
<td>2</td>
</tr>
<tr>
<td><img src="image4" alt="Image" /></td>
<td>BUC side support flange</td>
<td>430-00496-000</td>
<td>2</td>
</tr>
<tr>
<td><img src="image5" alt="Image" /></td>
<td>BUC rear side mounting flange</td>
<td>430-00497-000</td>
<td>1</td>
</tr>
</tbody>
</table>
### Hardware Description

<table>
<thead>
<tr>
<th>Hardware diagram</th>
<th>Hardware description</th>
<th>Part number</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phillips head screw (PHS) with lock washer, M4 X 10</td>
<td>471-00022-000</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>Phillips head screw (PHS), M4 X 20</td>
<td>471-00024-000</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Button head cap screw (BHCS), M4 x 8</td>
<td>471-00016-000</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Socket head cap screw (SHCS), M4 x 10</td>
<td>471-00018-000</td>
<td>4</td>
<td></td>
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</tbody>
</table>

#### 12.2 LNB replacement hardware

<table>
<thead>
<tr>
<th>Hardware diagram</th>
<th>Hardware description</th>
<th>Part number</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Japan Radio Co. Universal LNB with N-type connector</td>
<td>160-00191-000</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Socket head cap screw (SHCS), M4 x 10</td>
<td>471-00018-000</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>O-ring</td>
<td>455-00006-100</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>LNB mounting flange</td>
<td>430-00498-000</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Socket head cap screw (SHCS), M4 x 8</td>
<td>471-00013-000</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>
## 12.3 Diplexer replacement hardware

<table>
<thead>
<tr>
<th>Hardware diagram</th>
<th>Hardware description</th>
<th>Part number</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Belleville washer</td>
<td>495-00064-000</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Ku-band diplexer</td>
<td>430-00302-000</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Antenna WR-75 flange protection cover</td>
<td>430-00518-000</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>O-ring</td>
<td>455-00006-100</td>
<td>1</td>
</tr>
</tbody>
</table>

## 12.4 Data interface box kit

<table>
<thead>
<tr>
<th>Hardware diagram</th>
<th>Hardware description</th>
<th>Part number</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Data interface box and antenna control assembly</td>
<td>820-000457-000</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Loctite 242</td>
<td>410-00014-001</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Button head cap screw (BHCS), M4 x 10 for mounting the item to support plate</td>
<td>471-00058-000</td>
<td>3</td>
</tr>
</tbody>
</table>
### 12.5 Power interface box and power supply assembly accessory kit

<table>
<thead>
<tr>
<th>Hardware diagram</th>
<th>Hardware description</th>
<th>Part number</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1.png" alt="Hardware diagram" /></td>
<td>2.5 mm ball-end Allen wrench</td>
<td>485-00031-000</td>
<td>1</td>
</tr>
<tr>
<td><img src="image2.png" alt="Hardware diagram" /></td>
<td>Power interface box and power supply assembly</td>
<td>820-00480-000</td>
<td>1</td>
</tr>
<tr>
<td><img src="image3.png" alt="Hardware diagram" /></td>
<td>RX OUT cable, to connect the power interface box to the antenna RX OUT port (12 in. LMR-195 male-to-male coaxial cable)</td>
<td>115-00290-000</td>
<td>1</td>
</tr>
<tr>
<td><img src="image4.png" alt="Hardware diagram" /></td>
<td>Button head cap screw (BHCS), M4 x 10 for mounting the item to support plate</td>
<td>471-00058-000</td>
<td>7</td>
</tr>
<tr>
<td><img src="image5.png" alt="Hardware diagram" /></td>
<td>Loctite 242</td>
<td>410-00014-001</td>
<td>1</td>
</tr>
<tr>
<td><img src="image6.png" alt="Hardware diagram" /></td>
<td>2.5 mm ball-end Allen wrench</td>
<td>485-00031-000</td>
<td>1</td>
</tr>
<tr>
<td><img src="image7.png" alt="Hardware diagram" /></td>
<td>Self-fusing silicon rubber electrical tape</td>
<td>480-00008-061</td>
<td>N/A-</td>
</tr>
<tr>
<td><img src="image8.png" alt="Hardware diagram" /></td>
<td>Cable clamps</td>
<td>445-00193-000</td>
<td>6</td>
</tr>
</tbody>
</table>
13 Accessories

13.1 Cable kit

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

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

Each cable is available in a length of 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 shown in the table assume 4 Ω of DC resistance and an RF attenuation of 1.5 dB at 10 MHz with a maximum value of 12 dB RF attenuation from 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>
13.2 Mounting handle kit
14 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)).

15 Revision history

<table>
<thead>
<tr>
<th>Revision</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Initial document.</td>
</tr>
</tbody>
</table>

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