



KyWay™ Terminal Installation Guide

Includes mTenna^{u7} Antenna Subsystem Module

Document number: 700-00019-000-rev08

08 June 2018

Table of contents

1	Introduction	1
2	Before you start	2
2.1	Prerequisites	2
2.1.1	Reduce the risk of RF exposure	2
2.1.2	Site Selection	2
2.1.3	Prevent RF interference	4
2.1.4	Prevent magnetic interference	4
2.1.5	Check electrical systems for safety	4
2.2	Installation hardware required for ODU assembly	5
2.3	Installation tools required for ODU assembly	6
2.4	ODU components assembly rendering	7
2.5	Installation hardware for IDU assembly	8
2.6	Installation tools required for IDU assembly	9
3	Installation	10
3.1	ODU assembly instructions	11
3.2	IDU assembly instructions	20
3.3	Cabling instructions	21
3.4	Power on the KyWay™ terminal	23
3.5	Access the ASM	25
4	Revision history	26
5	Legal information	27
	Appendix A: Specification	28
	Appendix B: KyWay terminal configuration diagram	30
	Appendix C: Accessories	31
	Appendix D: ODU dimensions	32
	Appendix E: IDU dimensions	36
	Appendix F: Cable drawings	38

1 Introduction

This document contains important step by step details for the installation and set up of the Kymeta mTenna^{u7} antenna subsystem module (ASM). Please read this document in its entirety.

For information on the Kymeta mTenna^{u7} ASM web-based user interface and instructions on checking the ASM status, refer to the *Kymeta™ mTenna^{u7} Antenna Subsystem Module Software User Guide*.

For your safety, please read the *Kymeta™ KyWay™ Terminal Safety and Handling Guide* before beginning assembly.

2 Before you start

2.1 Prerequisites

2.1.1 Reduce the risk of RF exposure

Install the KyWay terminal in an area above accessible range of personnel within the operational range of the antenna to reduce the risk of 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 the "*KyWay Terminal Safety and Handling Guide*" included in the KyWay terminal shipment for details.


2.1.2 Site Selection

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

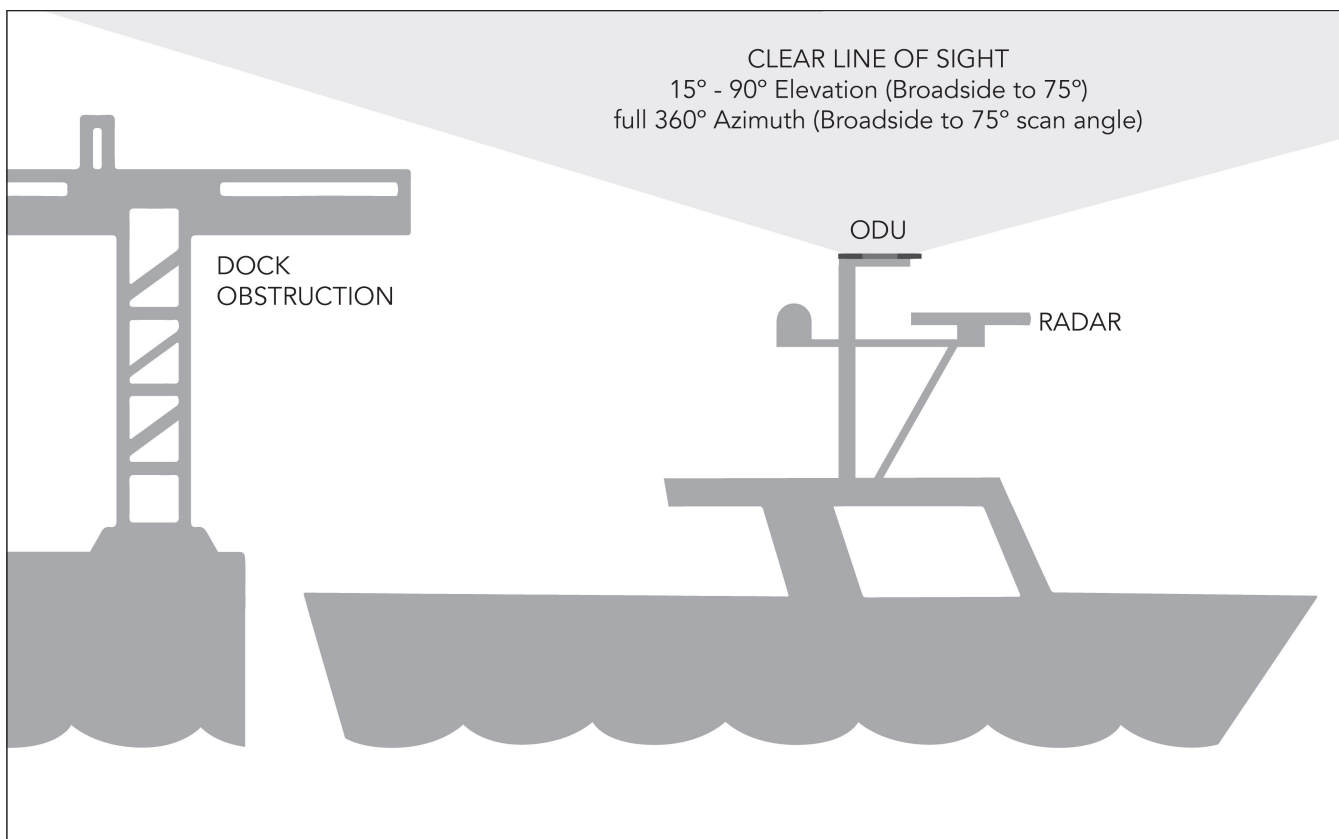
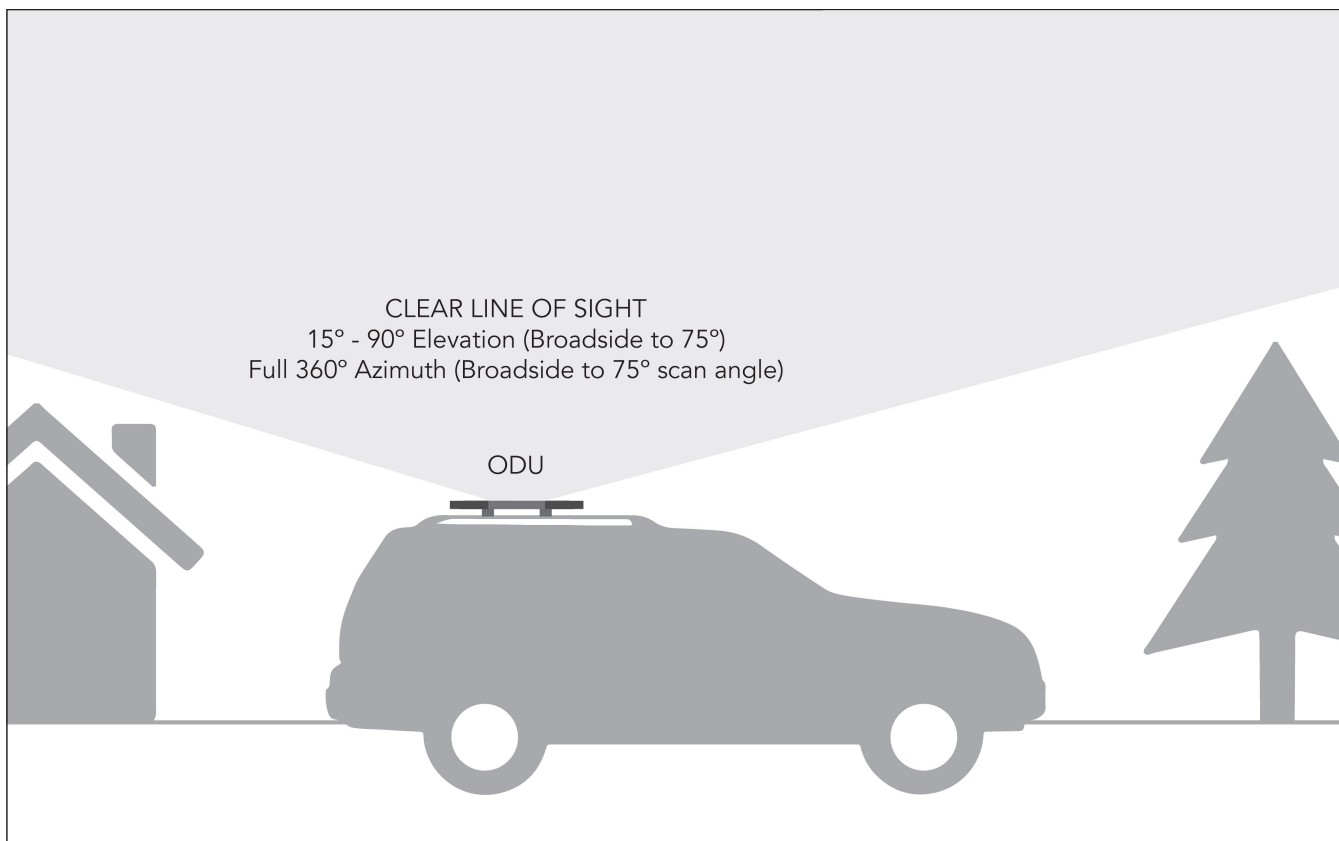
Obstructing the direct path to the satellite degrades performance and may cause a loss of connection with the satellite.

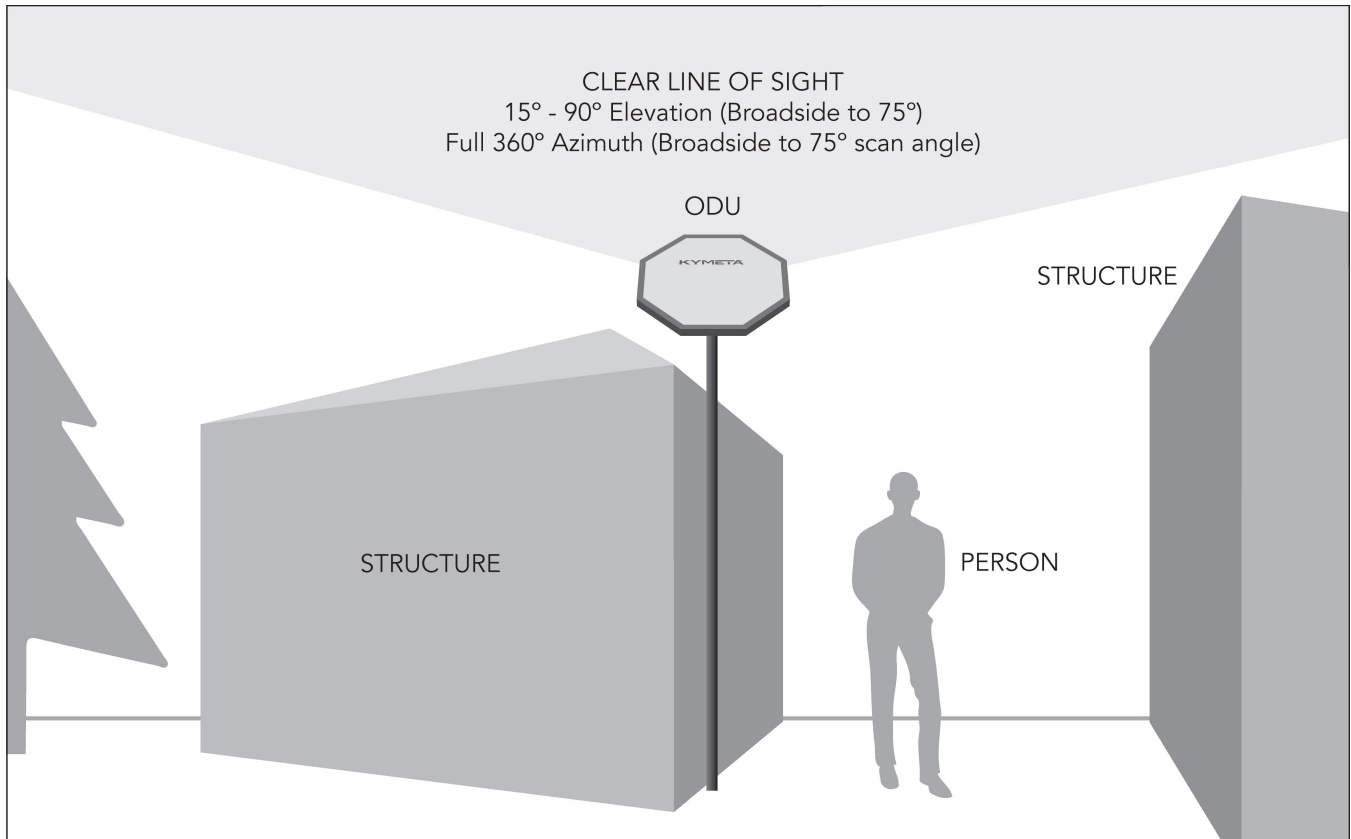
Obstructing the face of the antenna degrades RF performance and could impair the GPS capability of the mTenna^{u7} ASM.

Re-acquisition is most efficient if you install the ASM in direction of travel.

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

The following images show example installation sites.





2.1.3 Prevent RF interference

Do not install the ODU closer to radar equipment than the minimum safe distance specified in the "*KyWay Terminal Safety and Handling Guide*." It may cause damage to the ODU.

2.1.4 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.

2.1.5 Check electrical systems for safety

Prior to installation, check that:

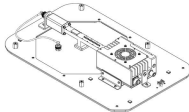


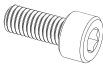
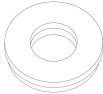


- » the ODU and mTenna I/O have a common ground;
- » the electrical power is disconnected from both the modem and the mTenna I/O;
- » electrical connections are made to the ODU first and then to the modem and mTenna I/O; and
- » the power switch is in the off position before connecting electrical power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

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

2.2 Installation hardware required for ODU assembly


Before you start, take inventory to make sure you have all installation hardware required for the ODU assembly.


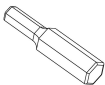

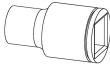
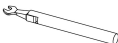
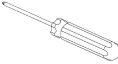
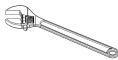

Kymeta ships certain ODU parts preassembled to make the installation process easier and faster. Kymeta provides all mounting hardware required to assemble the ODU.

HW diagram	HW description	Quantity	Part number
	mounting plate with the attached RF chain (BUC, diplexer, LNB, and LNB-to-ASM cable)	1	820-00397-000
	Hex stand-off post, short, 5/16 - M8 (19 mm), ODU to ASM	4	478-00042-000
	O-ring, diplexer to ASM 1.318 OD X 1.112 ID 70 durometer, silicone, -122, red	1	455-00006-100
	6-32 x 5/8" socket screw diplexer to ASM (shipped with the ASM)	4	472-00055-000
	neoprene sealing washer, to be used with 472-00055-000	8 (4 to be installed on diplexer, 4 extra)	495-00069-000
	Loctite 242 Prevent screws from backing out on 6-32 x 1/2" socket screw and 5/16 - M8 (19 mm) hex stand-off posts	1 (0.5 ml)	410-00014-001
	14.5" cable tie, black, cables to the cable tie mounts	6	432-00218-00

2.3 Installation tools required for ODU assembly

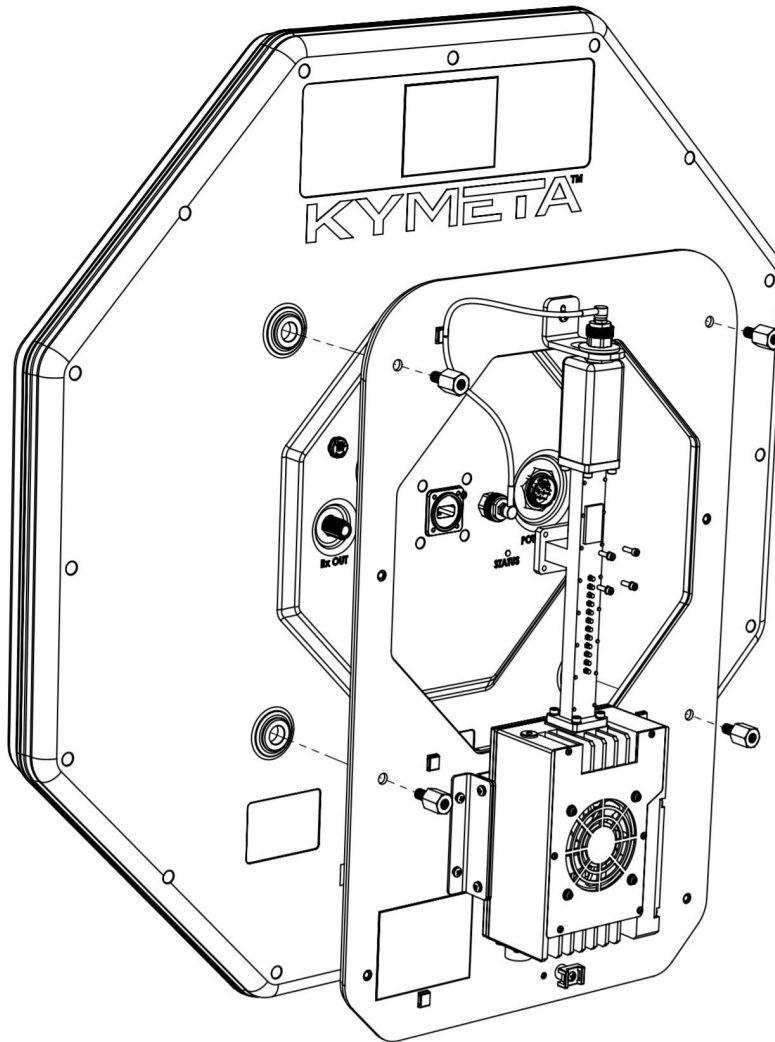
Before you start, make sure you have all installation tools required for the ODU assembly.

 Note that installation tools are not provided with the product.

Tool diagram	Tool description
	Torque screwdriver with 3 in. (minimum) ball head extension 0.2 N-m (2 in.-lb.) minimum rating
	7/64" standard hex bit
	Torque wrench minimum 4.4 N-m (220 in.-lb.) rating
	M16 drive socket
	Break-over torque wrench for N-type connectors 0.9 N-m (8.1 in.-lb.) and 4.5 N-m (40 in.-lb.) torque rating
	#2 Philips screwdriver
	Adjustable wrench
	7/64" Ball Head Allen Driver


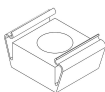
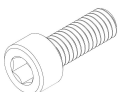

2.4 ODU components assembly rendering


Refer to 2.2 Installation hardware required for ODU assembly for the detailed description of the hardware components.



2.5 Installation hardware for IDU assembly


Before you start, make sure you have all installation hardware required for the IDU assembly. Kymeta provides all mounting hardware required to assemble the IDU.

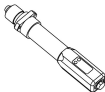
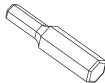
HW diagram	HW description	Quantity	Part number
	N-type to F-type adapter for the modem	2	160-00200-000
	M6 cage nut	8 (4 for the modem, 4 for the mTenna I/O)	451-00003-000
	M6 x 16 socket head cap screw, modem to rack	4	471-00032-000
	BHCS, M4 x 16 button head cap screw, mTenna I/O to rack	4	417-00030-000

 Hardware provided with IDU allows 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.

2.6 Installation tools required for IDU assembly

Before you start, make sure you have all installation tools required for the IDU assembly.

 Note that installation tools are not provided with the product.

HW diagram	HW description
	Torque screwdriver with 3 in. (minimum) ball head extension 0.2 N-m (2 in.-lb.) minimum rating
	hex bit sizes required: 5 mm for the modem, 4 mm for the mTenna I/O

3 Installation

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

Before beginning installation, refer to the "*KyWay Terminal Safety and Handling Guide*" to get familiar with the key steps to remember during the KyWay terminal installation.

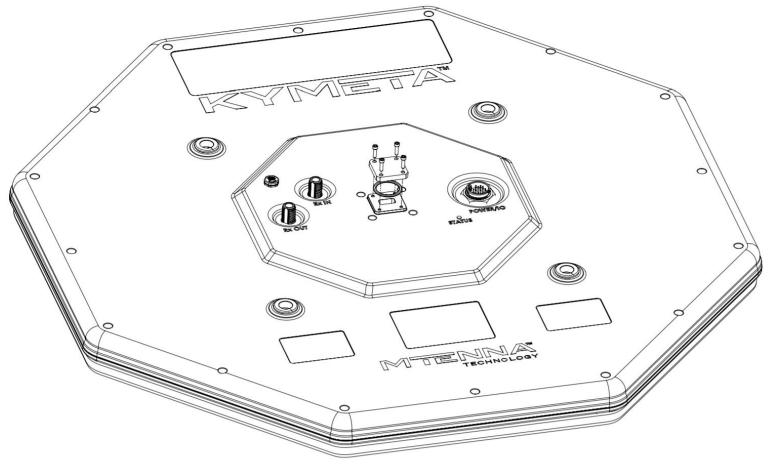
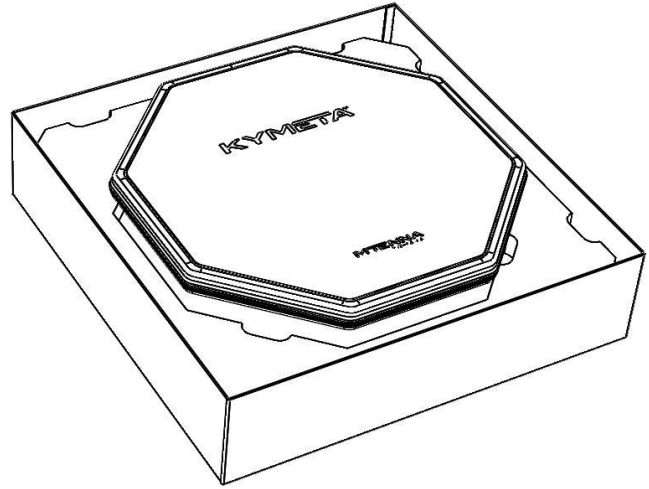
General recommendations:

- » Make sure to read these instructions carefully.
- » Pictures are provided for your reference and do not replace text instructions.
- » Always start fasteners by hand, ensuring you do not cross thread before tightening with a tool.
- » Follow torque recommendations.
- » Whenever tightening hardware, use a star or cross pattern and apply torque in steps. First attach all fasteners, then tighten partially in a star or cross pattern before tightening any hardware completely when there are multiple fasteners in an assembly.
- » Some items should not be tightened completely until instructed to do so, please follow tightening steps carefully.
- » Note that some items may come pre-assembled.
- » Use Loctite only where noted

3.1 ODU assembly instructions

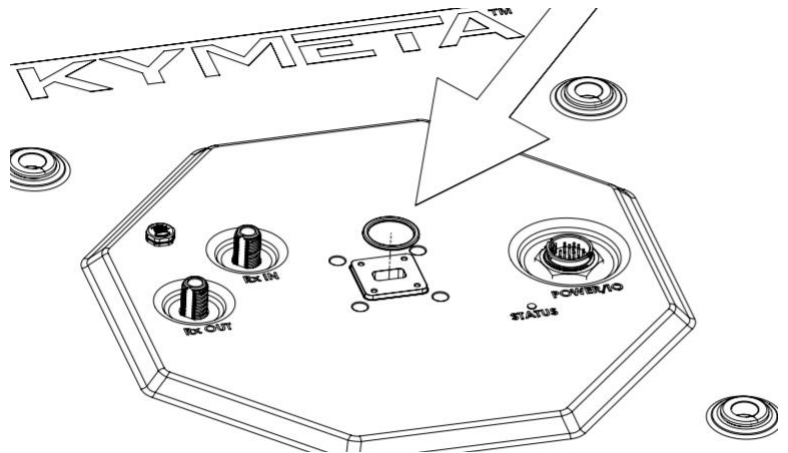
1. Clear a **flat surface ready**: ensure it is clean with no objects or debris that may damage the mTenna^{u7} ASM.
2. Unpack the **mTenna^{u7} ASM**. To open the case, lay it flat on an open area where it's easy for one person to stand on each side near the clean assembly surface.
3. With two people (one person on each side), lift the ASM out of the case, keeping the ASM parallel to the floor, and lay the ASM face (logo side) 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 ASM.
4. Remove the **protective cover** and the **O-ring** from the **ASM WR-75 flange**. Save the screws and the protective cover.

Tools: 7/64" ball head Allen driver

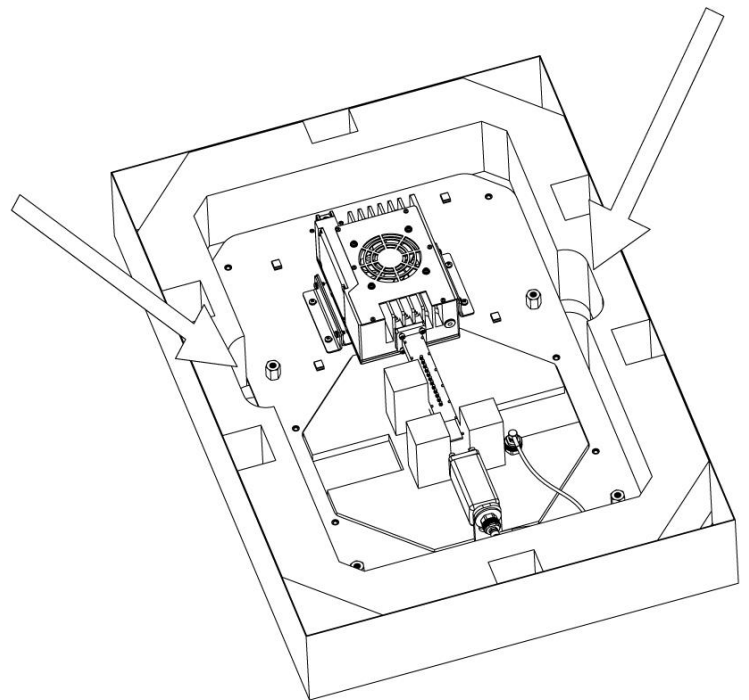


5. Place the new red **O-ring** (from the ODU box) at the **ASM WR-75 flange**.

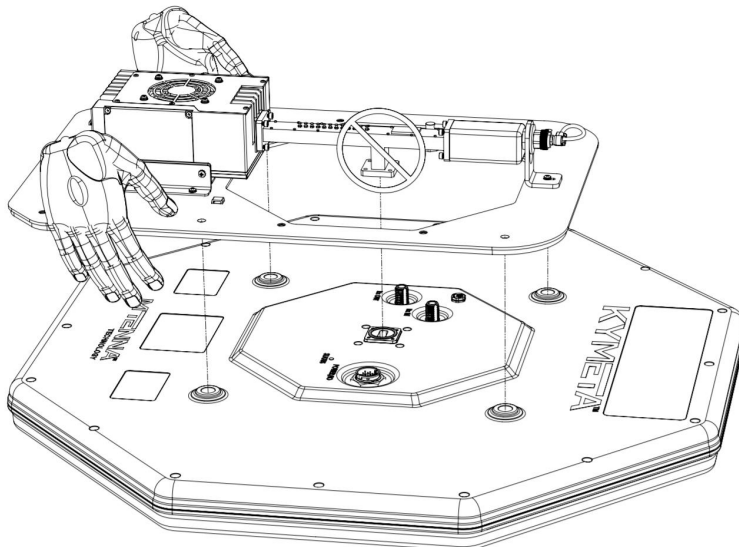
Hardware: O-ring, 455-00006-100



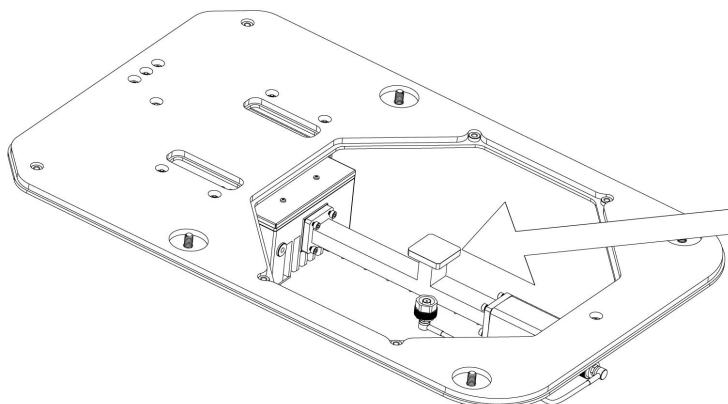
6. Remove the **ODU assembly** from the box by holding the mounting plate as pictured.



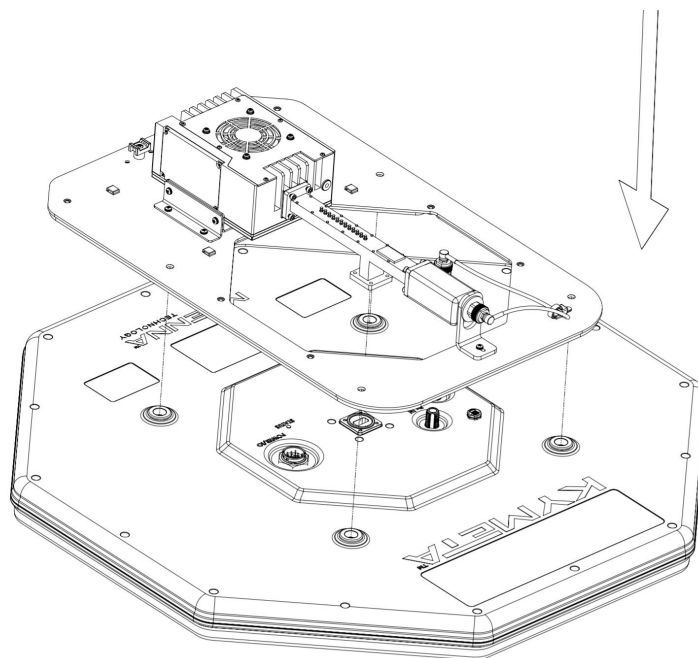
Never grab or lift the mounting plate with the attached RF chain (BUC, diplexer, LNB, and LNB-to-ASM cable) or the assembled ODU by the diplexer or any other part of the RF chain.



7. Remove the tape and protective cover from the **WR-75 flange of the diplexer.**

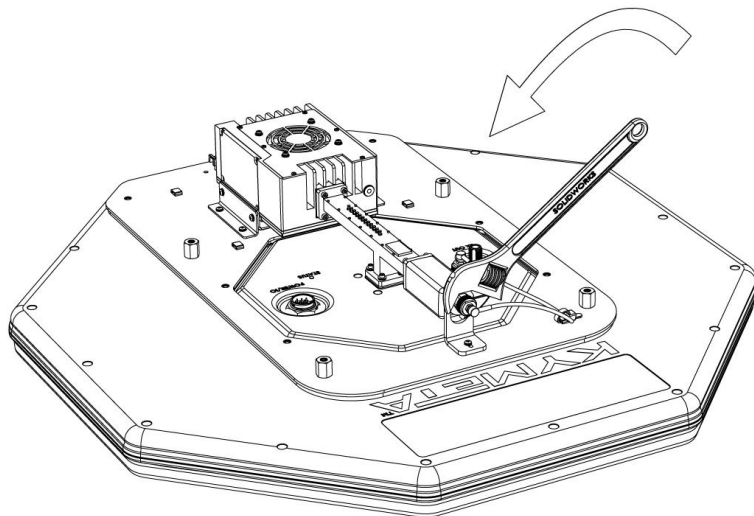


8. Place the **ODU assembly** directly on the **ASM**, so that the rectangular portion points to the bottom of the backshell. There should be a gap between the diplexer and the ASM WR-75 flange.



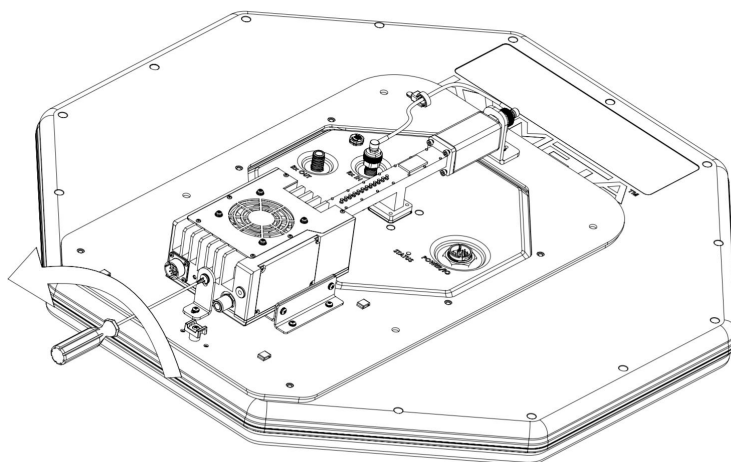
9. Loosen the **LNB N-type connector** to avoid putting stress on the diplexer.

Tools: Crescent wrench, box wrench, or spanner wrench as available



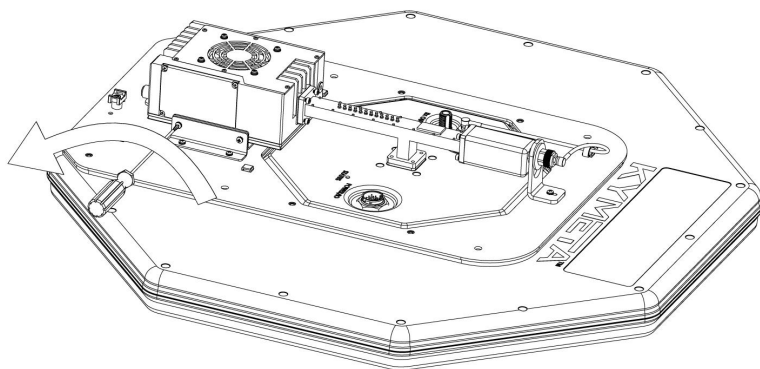
10. Loosen the **BUC rear-side mounting flange**.

Tools: #2 Philips screwdriver

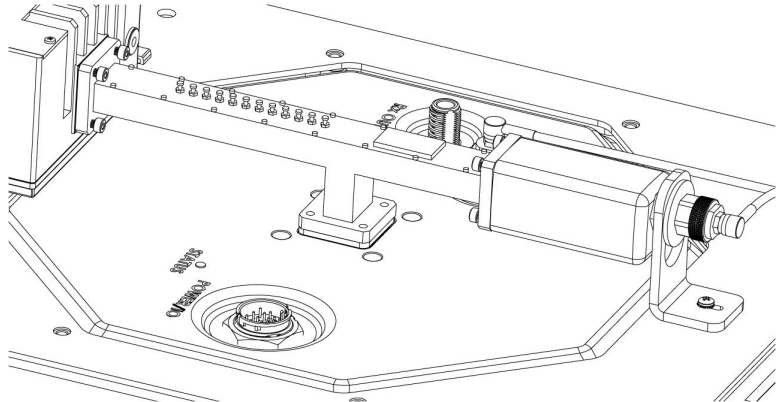


11. Loosen the **BUC side mounting flanges**. The RF chain will move down.

Tools: #2 Philips screwdriver



12. Adjust the **ODU assembly** to align the **diplexer WR-75 flange holes**.

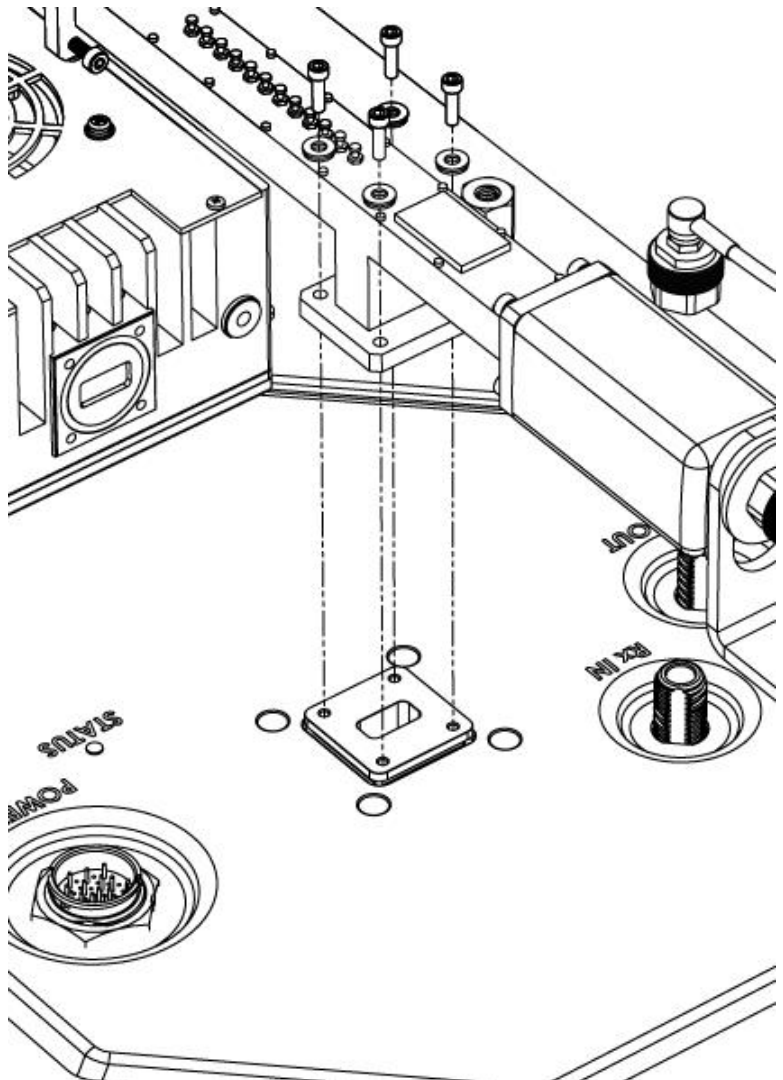


13. Add four neoprene sealing **washers** to four **screws** (you saved in Step 4) and begin tightening the screws to attach the **diplexer** to the **ASM WR-75 flange**. Ensure the O-ring is in place, fully aligned, and is not pinched when installing the diplexer. Poor O-ring installation can degrade RF performance. Screws should be tightened to about halfway in to align the diplexer flange holes.

Tools: 7/64" Ball Head Allen Driver

Hardware: (4) 6-32 x 5/8" socket head cap screw 472-00055-000;
(4) washer, 495-00003

⚠ Do not bend the diplexer!

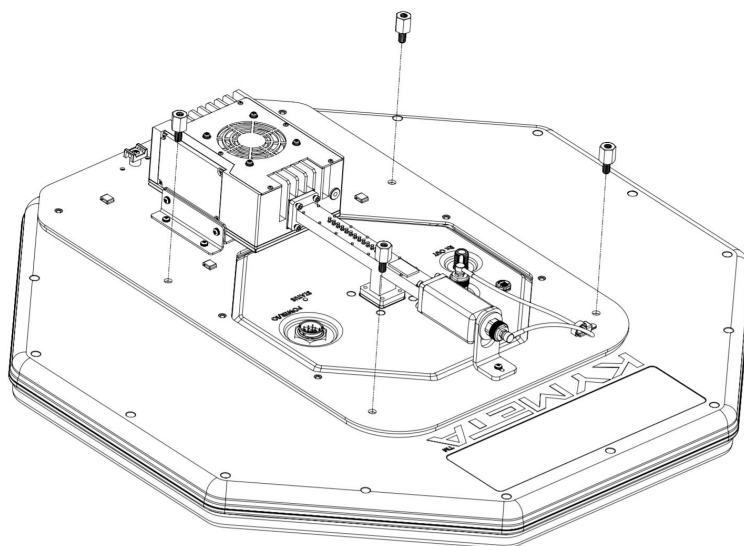


14. Attach four **short hex stand-offs**. Apply two drops of **Loctite** starting at the second thread from the end of the bolt. Tighten the stand-offs.

Tools: Torque wrench and M16 drive socket

Hardware: (4) short hex stand-off, 8M X 5/16" X 3/4" (19 mm), 478-00042-000;
(1) Loctite, 410-00014-000.

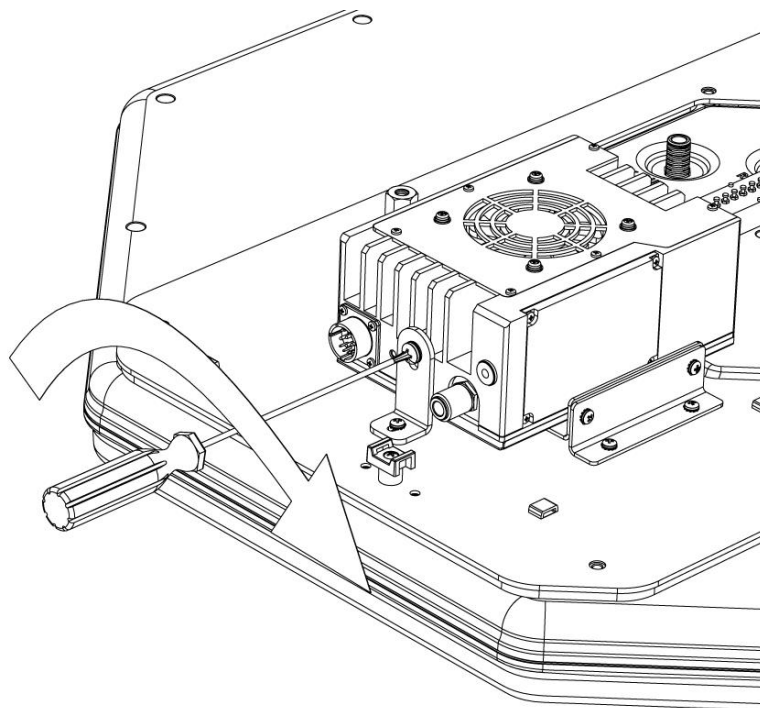
Torque: 20.34 N-m (180 in.-lb.)



15. Gently support the **rear side of the BUC**. The **diplexer flange** should be flush with the **ASM WR-75 flange**. Tighten the screw supporting the BUC rear-side mounting flange.

Tools: #2 Philips screwdriver

Torque: 2.23 N-m (20 in.-lb.)

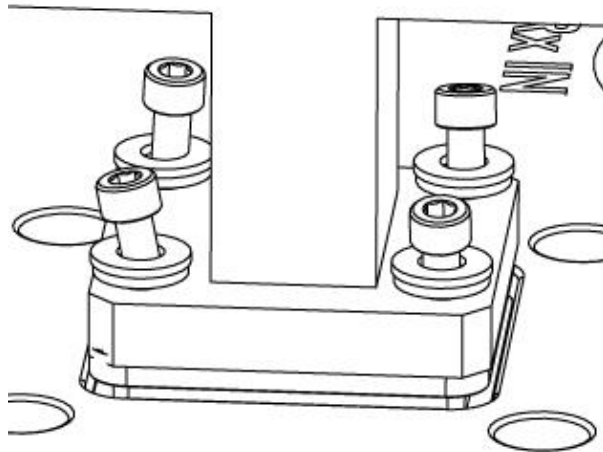


16. Tighten diplexer screws.

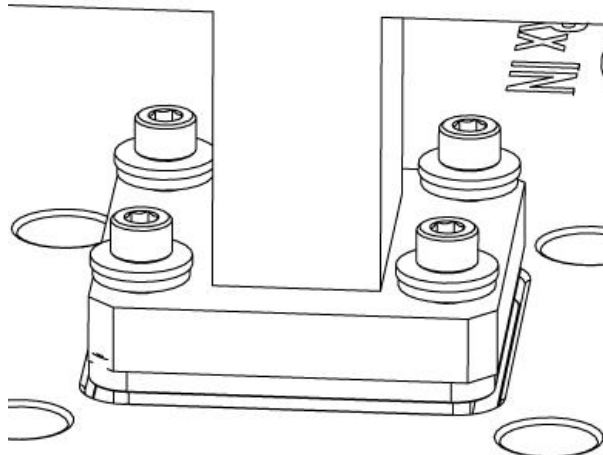
Tools: Torque screwdriver with 3 in. (minimum) ball head extension and 7/64" standard hex bit

Torque: 1.52 N-m (13.5 in.-lb.)

Confirm the diplexer is flush with the ASM.



Poor installation

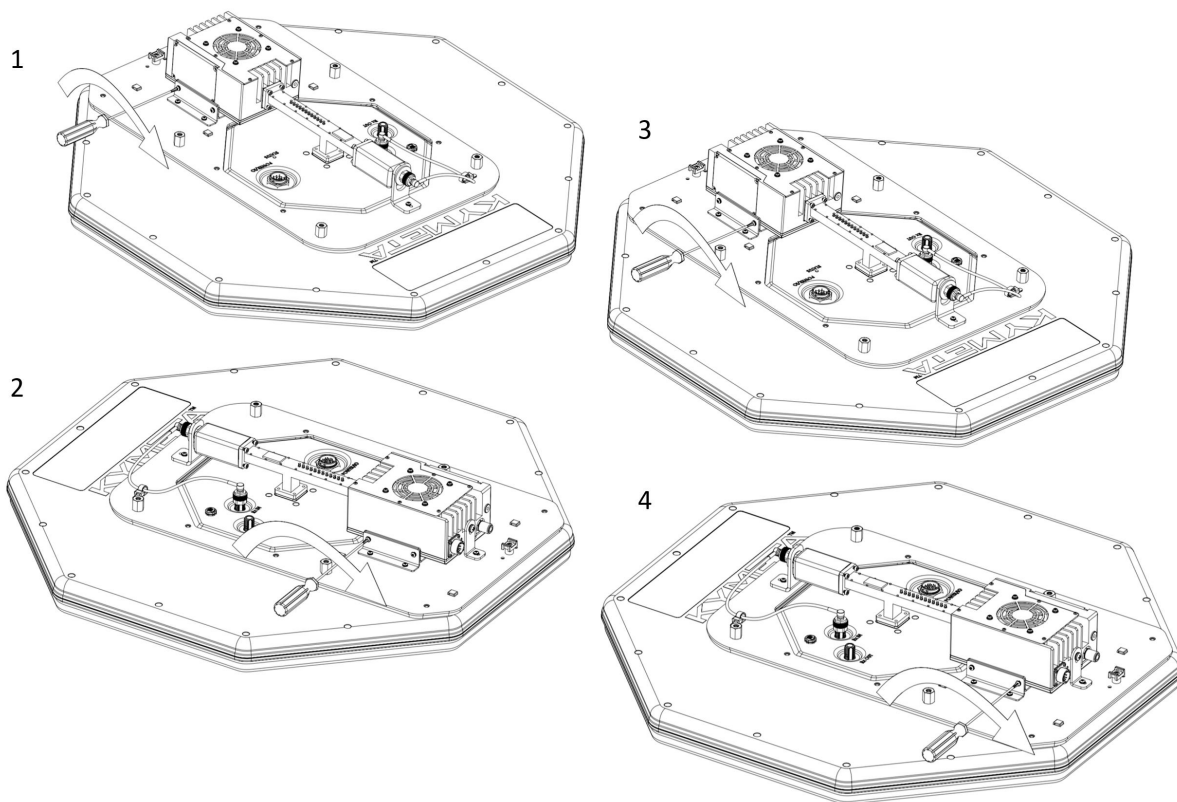


Correct flush installation

17. Tighten the **BUC side mounting flanges** in cross pattern.

Tools: #2 Philips screwdriver.

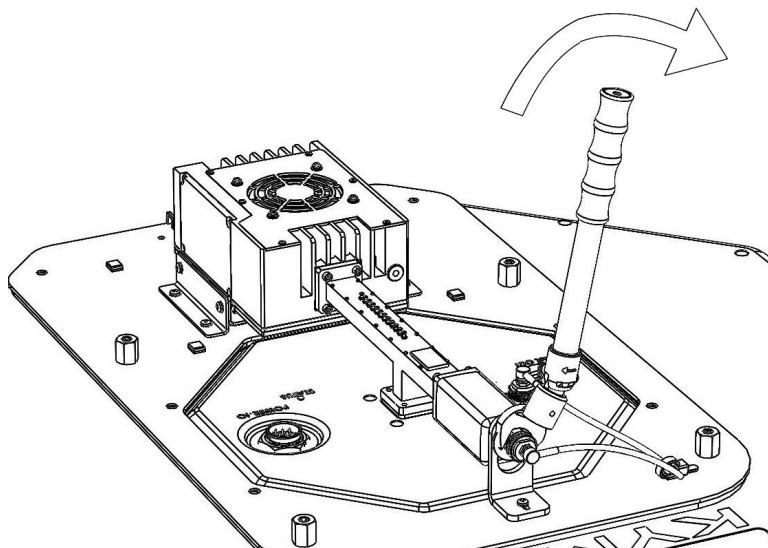
Torque: to 1.52 N-m (13.5 in.-lb.)



18. Tighten the **LNB N-type connector**.

Tools: Break-over torque wrench for N-type connectors.

Torque: 4.5 N-m (40 in.-lb.)



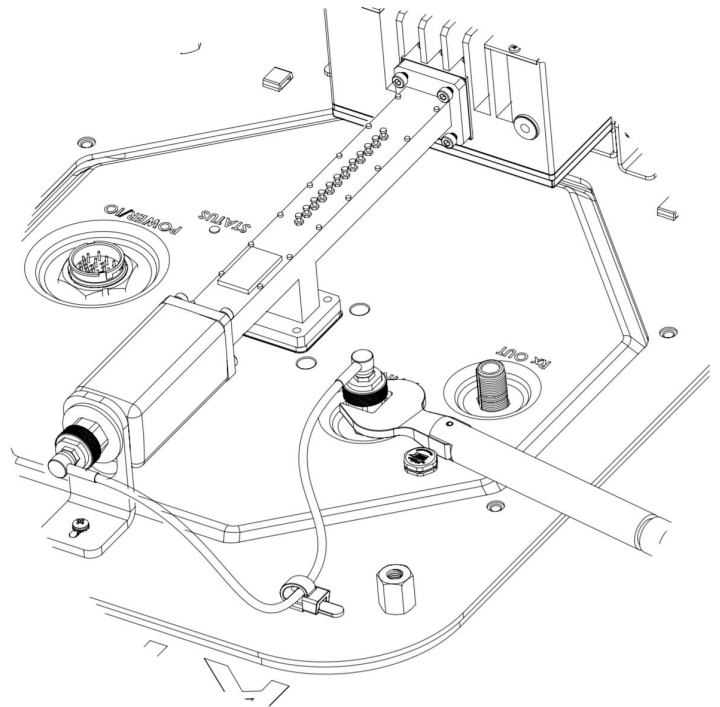
19. Connect the **LNB-to-ASM cable** to **RX IN port** on the ASM.

- » Ensure the center pin of the cabled connector is aligned to the center pin receptical on the ASM.
- » Press the cabled connector onto the threaded ASM receptacle and hand-tighten the outer ring clockwise until the threads are engaged and the outer ring no longer spins.

Tools: Break-over torque wrench for N-type connectors

Torque: 0.91 N-m (8.1 in.-lb.)

20. Fasten the **LNB-to-ASM cable** with a cable tie.



⚠ Check that all screws are tight before lifting the ODU.

⚠ Always lift the ASM by the sides. Never lift by any mounted components or cables.

3.2 IDU assembly instructions

1. Install four M6 cage nuts to mount the modem at the lower position of 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

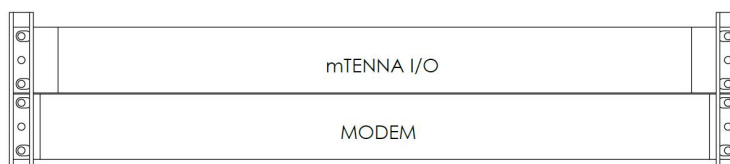
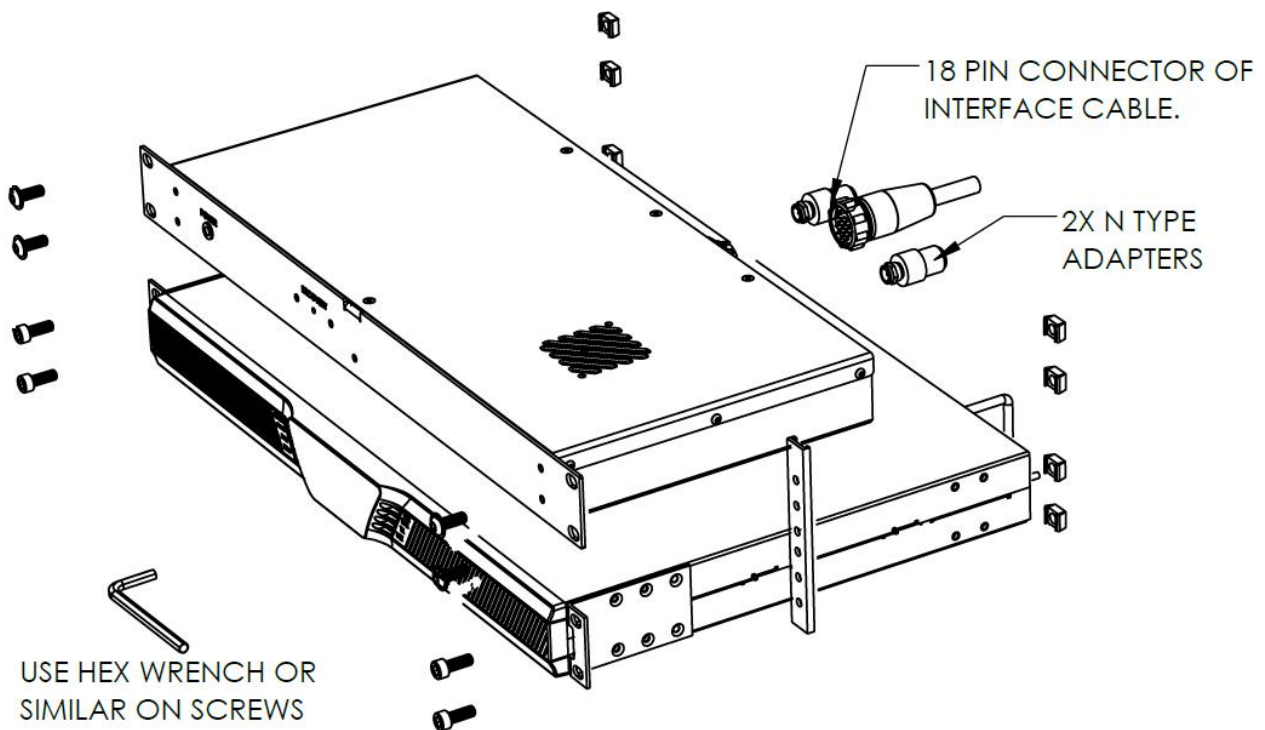
3. Install four M6 cage nuts to mount the mTenna I/O on top of the modem in the same rack.

4. Mount the mTenna I/O in the upper rack position.

Hardware: (4) SHCS, M6 x 16

Tool: Torque screwdriver with 3 in. (minimum) ball head extension, 7/64" standard hex bit size required: 4 mm

 The mTenna I/O vents are on top and on the left side from facing the front of the box. Standard rack spacing allows sufficient ventilation.



IDU STACKED IN STANDARD 19" NETWORK RACK

3.3 Cabling instructions

⚠ Ensure all the components are powered off prior to connecting the cables.

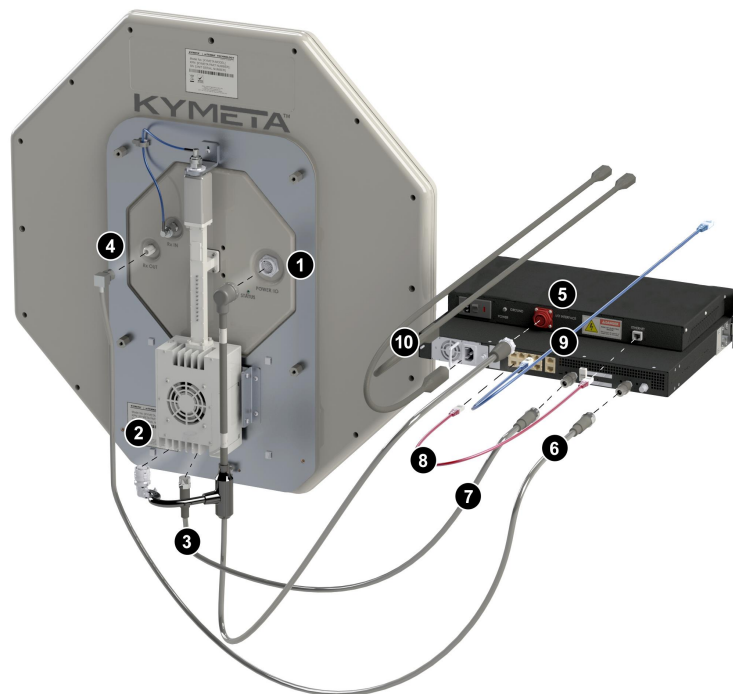
Please read the instructions below carefully, as it is important to avoid attaching the connectors in a manner that can damage any pins. If pins are damaged, contact your Kymeta representative.

⚠ **Finger-tighten all N-type and connector cables.**

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

✎ The RF coaxial cables have a minimum bend radius of 2 cm and a one-time bend radius of 0.5 cm.
The ODU interface cable has a bend radius 10 times the cable diameter: $0.580 \text{ cm} \times 10 = 5.8 \text{ cm}$.

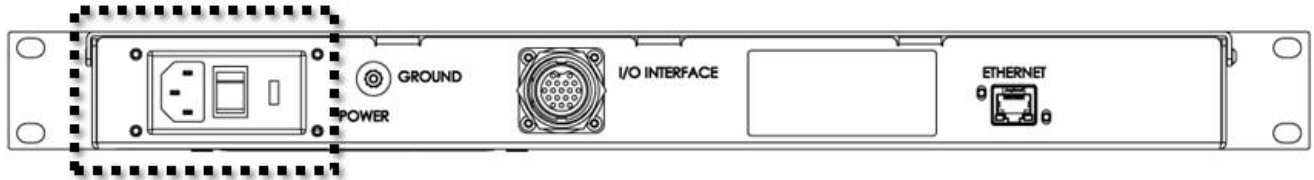
✎ Avoid confusing the RX and TX cables. Before installing the cables, apply colored tape to each end of the cable.
The recommended convention is **RED** for the **TX cable** and **BLUE** for the **RX cable**.



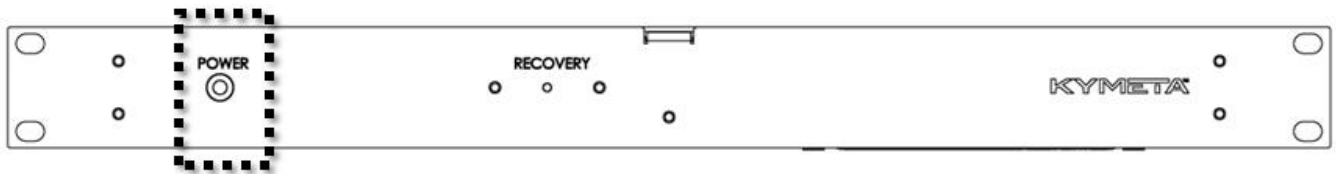
1. Connect the **ODU interface cable 31-pin connector** to the back of the ASM.
 - a. Inspect the female and male pins of the 31-pin connector.
 - b. Align the inner and outer key.
 - c. Align the keyway of the connector with the key of the 31-pin receptacle. Gently press the connector into place with 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 lift off if you grasp the back of the head of the plug and lift up gently.
2. Connect the **ODU interface cable 12-pin Amphenol connector** at the end of the long tail to the 12-pin receptacle on the BUC.
 - a. Align the inner and outer key of the connectors.
 - b. Place the cabled connector squarely against the connector on the back of the BUC, and then press in until the connectors engage.
 - c. Screw the outer ring clockwise until the threads are fully engaged and the ring no longer turns easily to secure the connector in place.
3. Connect the **TX cable (RED)** to the BUC (use the torque wrench).
4. Connect the **RX cable (BLUE)** to the ASM RX OUT port (use the torque wrench).
5. Connect the **ODU interface cable 18-pin connector** to the mTenna I/O.
 - a. Inspect the female and male pins of the 18-pin connector.
 - b. Align the inner and outer key. The key will be facing the top of the mTenna I/O.
 - c. Align the inner and outer key of the connectors, place the cabled connector squarely against the connector on the back of mTenna I/O, and then press in until the connector engages.
 - d. Screw the outer ring clockwise until the threads are engaged and the outer ring no longer turns easily to secure the connector in place.
6. 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.**
7. 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.
8. Connect the **Ethernet cable** to the mTenna I/O and port 1 on the modem.
9. *(optional)* If you want to connect your device to the Ethernet port of the modem, do the following:
 - a. If your KyWay terminal configuration includes **iDirect Evolution X7**, connect the Ethernet cable to any modem port in the range from **2 to 8**.
 - b. If your KyWay terminal configuration includes **iDirect Velocity X7**, connect the Ethernet cable to any modem port in the range from **5 to 8**.
10. Connect one **power cable** to the mTenna I/O, and another one to the modem.
Use cable ties to clean up loose cables.

3.4 Power on the KyWay™ terminal

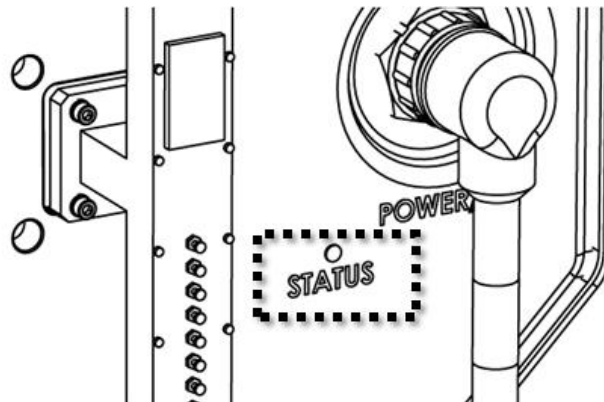
1. Check that all cables are connected, as shown in the 3.3 Cabling instructions.
2. Ensure the mTenna I/O is grounded.
3. Power on the mTenna I/O using the power switch on the back side.



4. Check the power light on the mTenna I/O front side—it should be solid green.

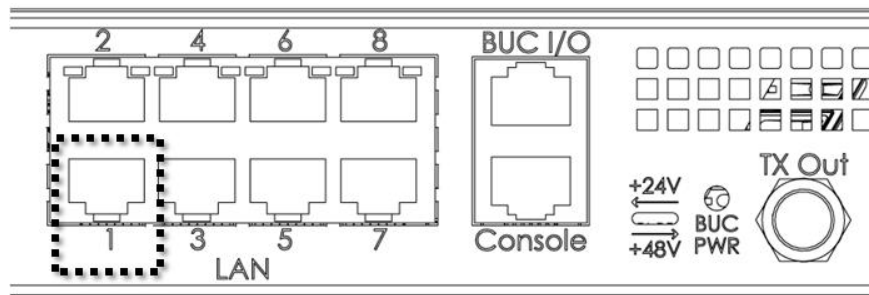


5. Check the **Status** light on the back of the ASM—it should be solid green.



6. Check the BUC power light—it should be red or orange.
7. Power on the modem and wait 90 seconds while the modem goes through boot process.
8. Check the Power, Status, and Temp lights on the front of the modem—they should be solid green.

9. Verify that the Ethernet **port 1** link light on the back side of the modem is blinking.




3.5 Access the ASM

Kymeta supports Chrome and Firefox browsers.

To access the mTenna^{u7} ASM web-based user interface, do the following:

1. Connect an available Ethernet port on your workstation to the Ethernet port 2 on the modem.
2. Configure the TCP/IPv4 properties of the Ethernet port 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**.

 Refer to the *KyWay Terminal Troubleshooting Guide*, section 3.1 "Cannot access the web-based UI" if you cannot access the mTenna^{u7} ASM web-based user interface.

The ASM automatically reboots every 7 days (software version 1.1.0.3240) 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 timezone, go to the **Settings** page > **System** window, and then update the time in the **Auto Reboot Time**.

4 Revision history

Revision	Change	Date
01	Initial document.	15 June 2017
02	Multiple changes to reflect the current state of the product.	15 July 2017
03	Multiple changes to reflect the current state of the product.	15 August 2017
04	Updated ODU assembly instructions, enhanced cabling instructions, added new sections: "Power on the KyWay terminal", "Access the ASM", and "Access the modem", updated information of the accessory mounting kit and handle kit.	20 October 2017
05	Removed accessories-related sections and general KyWay terminal information; updated graphics, edited installation instructions	12 December 2017
06	Updated "ODU assembly instructions", "Cabling instructions", added "Appendix: Accessories", changed the document number.	09 March 2018
07	Updated images to improve quality.	18 March 2018
08	Updated installation sites images, mechanical drawings, and KyWay terminal configuration diagram. Added shock and vibration parameters to the specification table. Updated to support software version 1.1.0.3240.	8 June 2018

5 Legal information

© 2018 Kymeta Corporation and its affiliates. KYMETA, CONNECTED BY KYMETA, MTENNA, KYWAY, KĀLO image, and KĀLO are trademarks of Kymeta Corporation, with registrations or pending applications for these marks in Brazil, the European Union, Japan, Norway, Singapore, South Korea, and the United States.

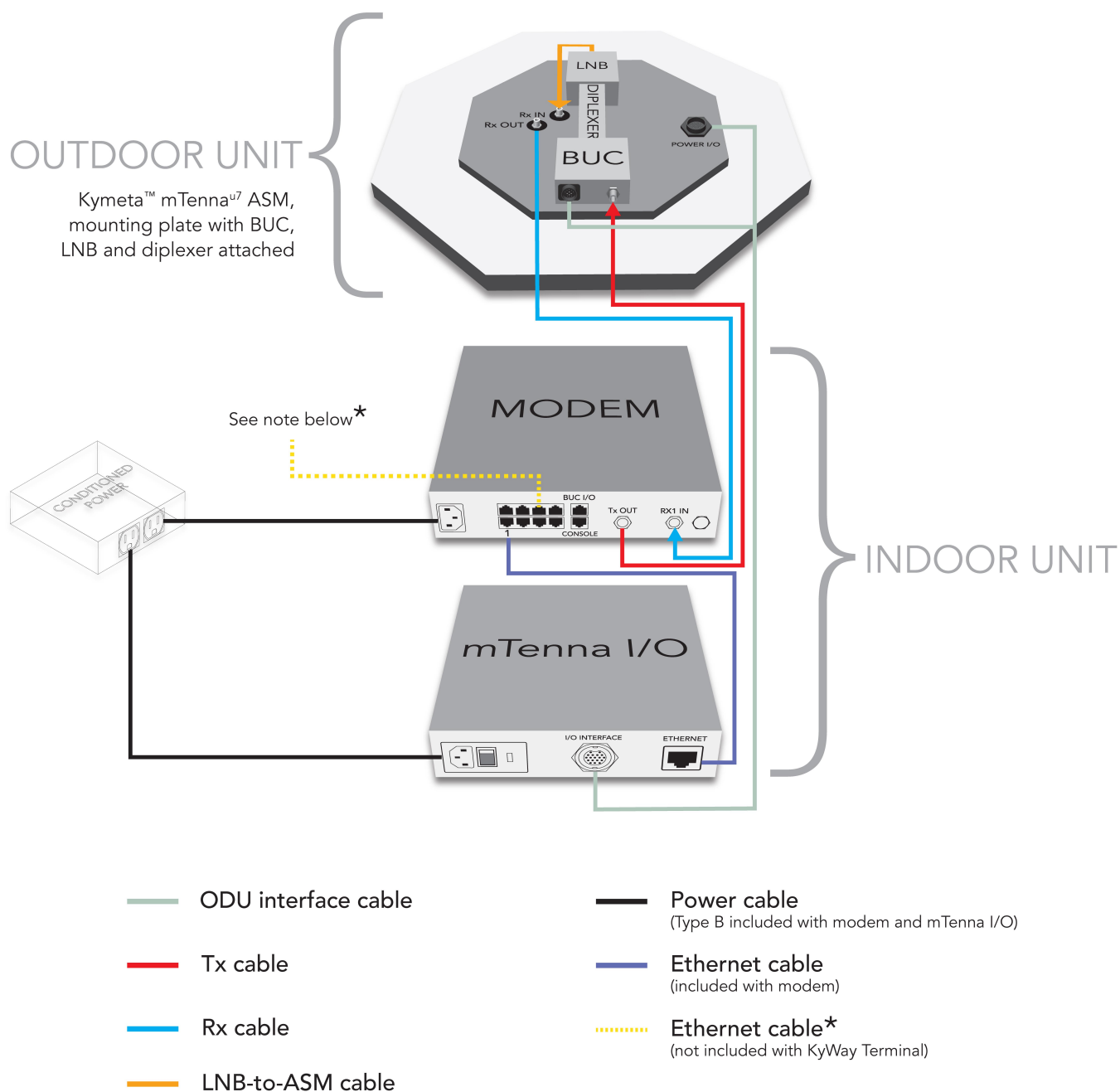
All other trademarks are the property of their respective owners.

Appendix A: Specification

Parameter	Specification
ODU dimensions	82.3 cm x 82.3 cm x 16.5 cm 32.4 in. x 32.4 in. x 6.4 in.
ODU weight	21.1 kg 46.5 lb.
ODU mounting interface (bolt pattern)	4 x M8 x 1.25 mounting threaded inserts (female thread, 0.375 in. (0.95 cm) deep on 13.435 in. (34.1 cm) centers
IDU dimensions	2 units, each unit is placed in a standard 48.27 cm (19 in.) rack
	mTenna I/O dimensions: W 42.42 cm x D 20.57 cm x H 4.37 cm W 16.7 in. x D 8.1 in. x H 1.72 in.
	iDirect X7 modem dimensions: W 44.5 cm x D 31.75 cm x H 4.37 cm W 17.5 in. x D 12.5 in. x H 1.72 in.
IDU weight	6.35 kg 14.0 lb.
Satellite modem	iDirect X7
Terminal weight	29.27 kg 64.5 lb.
Ingress protection	ODU: IP66 to protect against weather and environmental conditions expected during operation and storage IDU: Rated for use indoors
Operational temperature	IDU: 0°C to +50°C ODU: -25°C to +55°C
Storage temperature	IDU: -40°C to +75°C ODU: -40°C to +75°C
Input power	110-240 VAC 50/60 Hz 8 W BUC: peak: 500 W typical: 300 W 16 W BUC: peak: 600 W typical: 400 W
IDU data interface	mTenna I/O: RJ45 Ethernet to modem, 18-pin interface cable Satellite modem: RJ45 Ethernet LAN Port, RJ45 Ethernet to mTenna I/O
Network interface	RJ45 LAN port
RF specification	Ku-Band, 8 or 16 W BUC

Parameter	Specification
IDU BTU/hr	8 W BUC: peak: 1700 typical 1025 16 W BUC: peak: 2050 typical 1375
ODU shock	IEC 60068-2-27, Test Ea: Shock
ODU vibration	IEC 60068-2-64 Test Fh: Vibration, Broadband Random, IEC 60068-2-57 Test Ff: Vibration - Time-History and Sine-Beat Method, Mil-Std-167-1A, Type 1 and Mil-Std 810G, Method 514.6, Category 21, Watercraft – Marine Vehicle
IDU shock	IEC 60068-2-27, Test Ea: Shock
IDU vibration	MIL-STD-810G, Method 514.6, Vibration
KyWay terminal lifespan	5 years

Appendix B: KyWay terminal configuration diagram



*If your KyWay terminal configuration includes *iDirect Evolution X7*, connect the Ethernet cable to any modem port in the range **from 2 to 8**. If your KyWay terminal configuration includes *iDirect Velocity X7*, connect the Ethernet cable to any modem port in the range **from 5 to 8**.

Appendix C: Accessories

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

- » ODU interface cable
- » RX cable
- » TX cable

Available lengths:

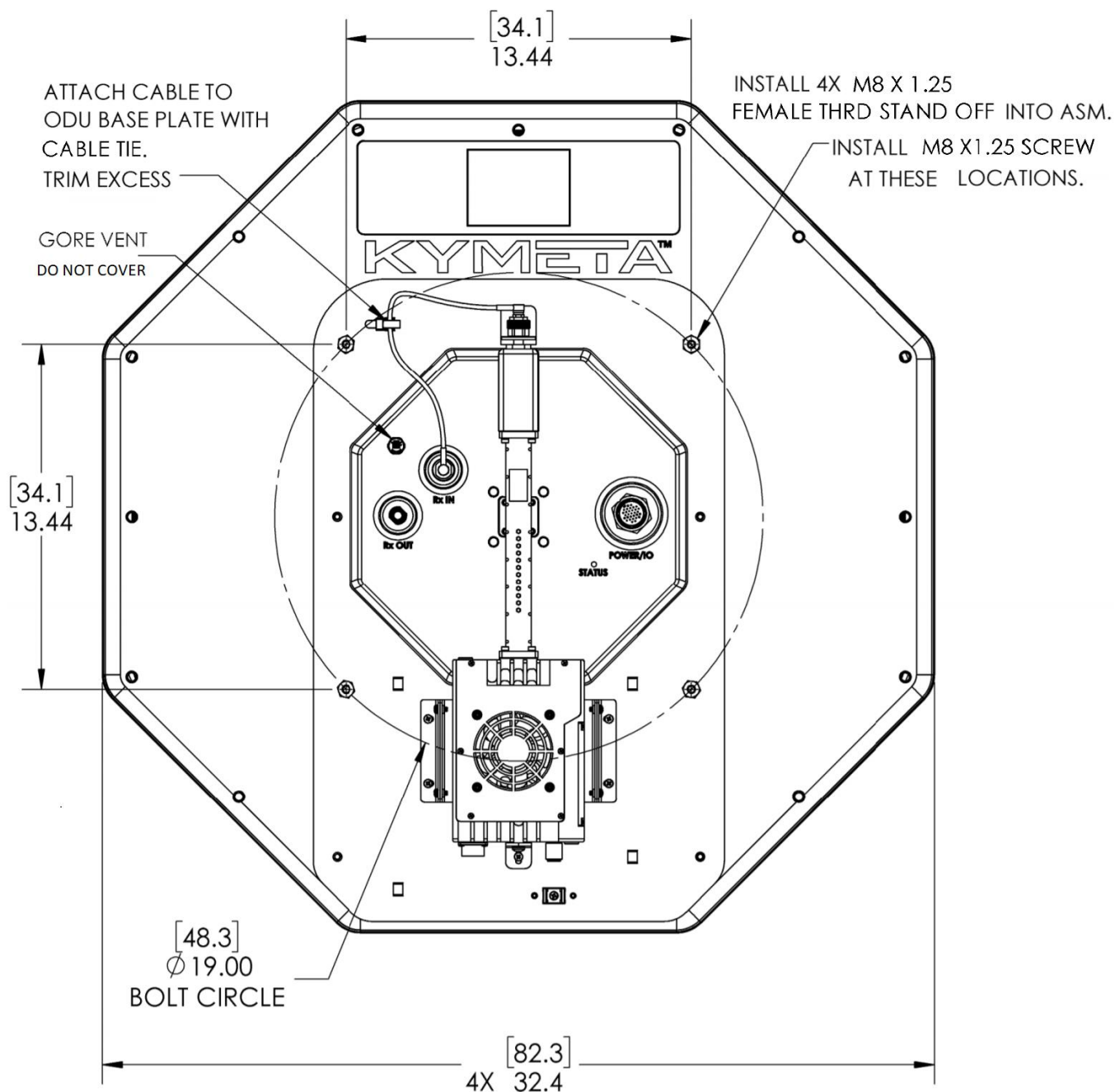
- » 3.66 m (12 ft.)
- » 7.62 m (25 ft.)
- » 15.24 m (50 ft.)

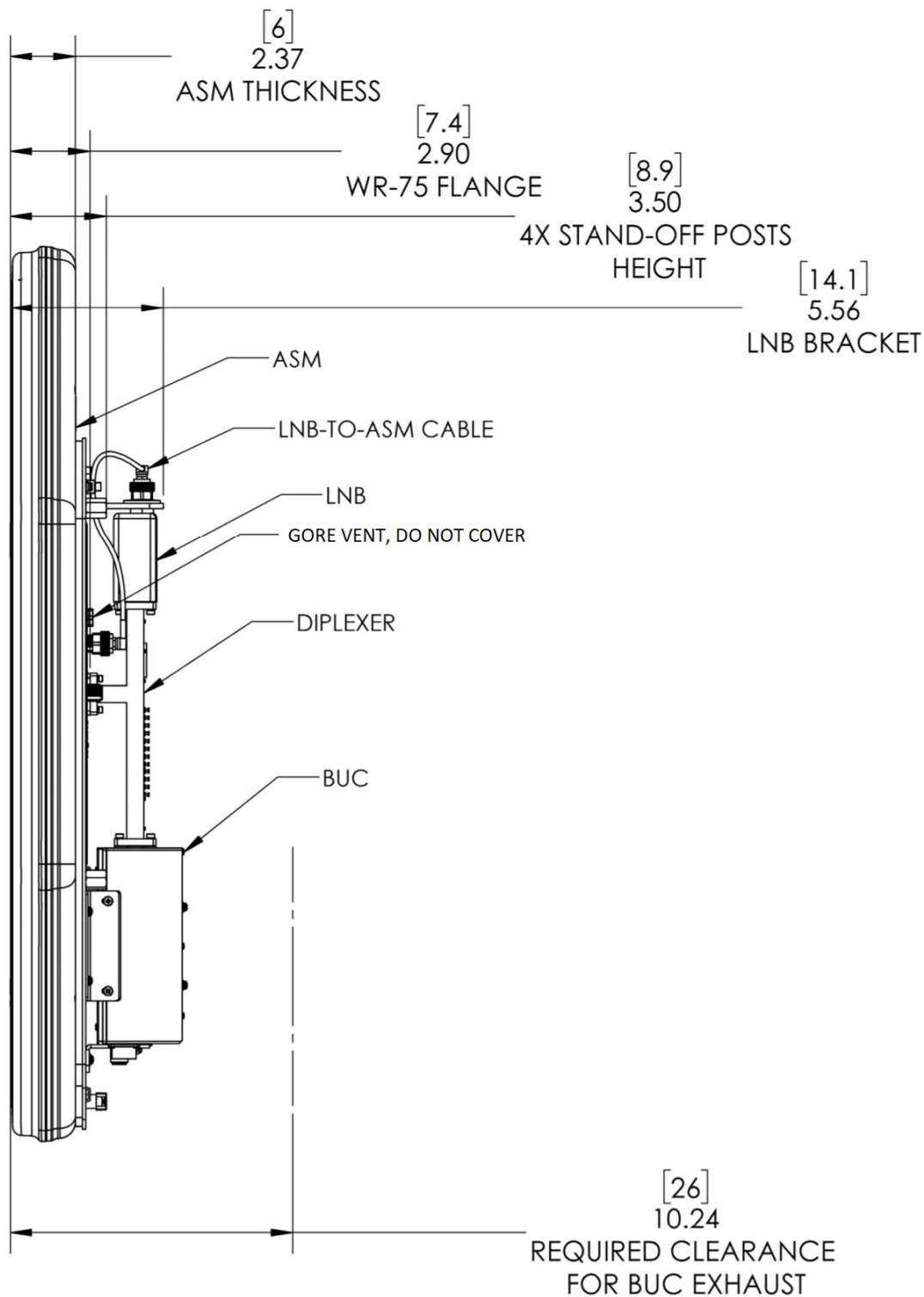
Custom lengths are available upon request. Contact your Kymeta representative for details.

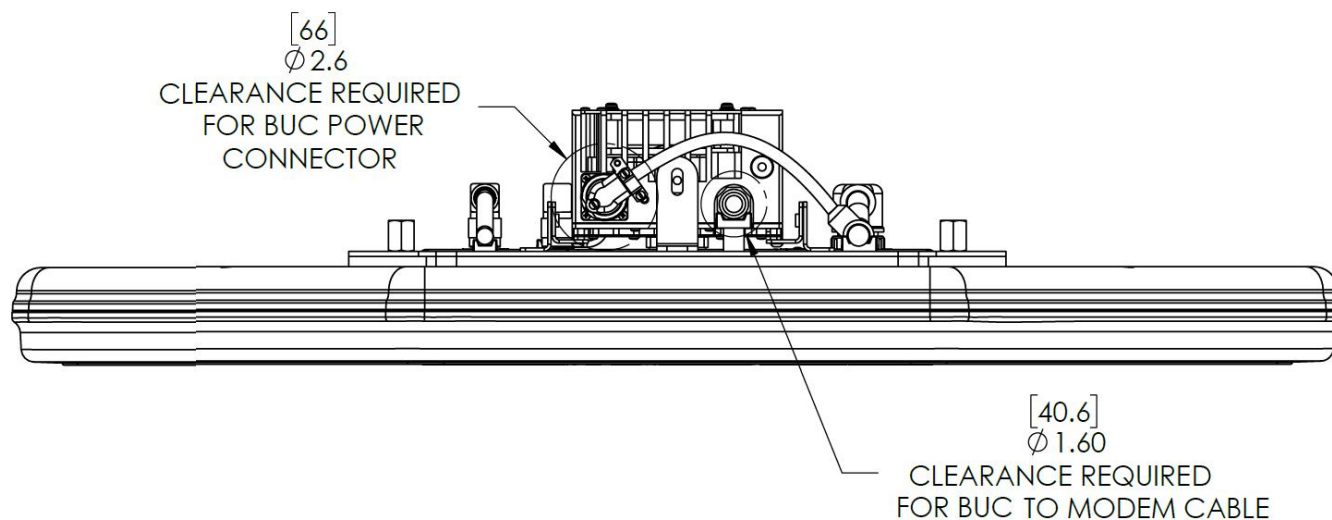
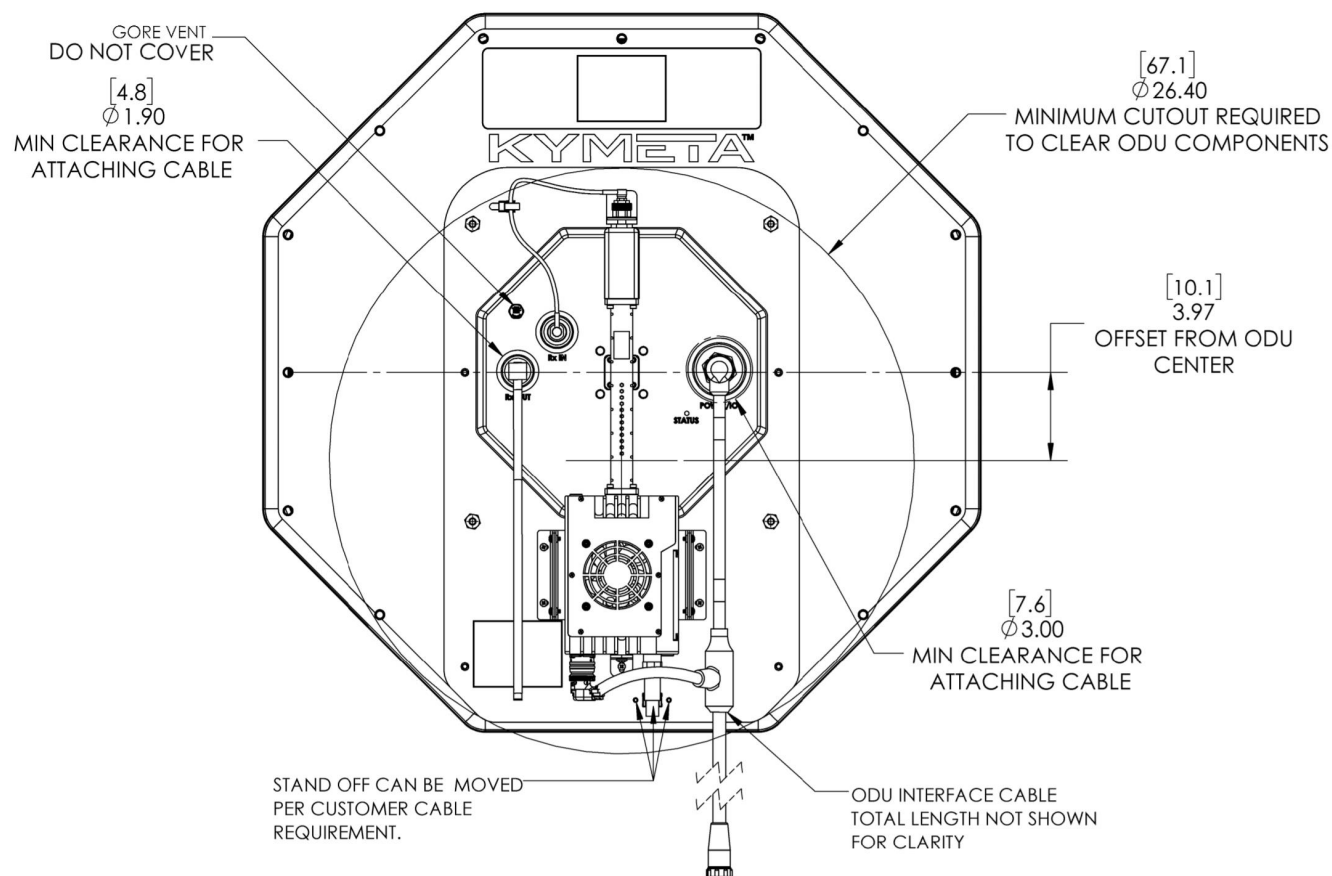
To ensure performance of the system across the full operational range, Kymeta recommends using the following IF cable types for the **RX cable** and **TX cable**. The maximum attenuation levels of the table assumes 4 Ω of DC resistance and an RF attenuation of 10 MHz at 1.5 dB with a maximum value of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

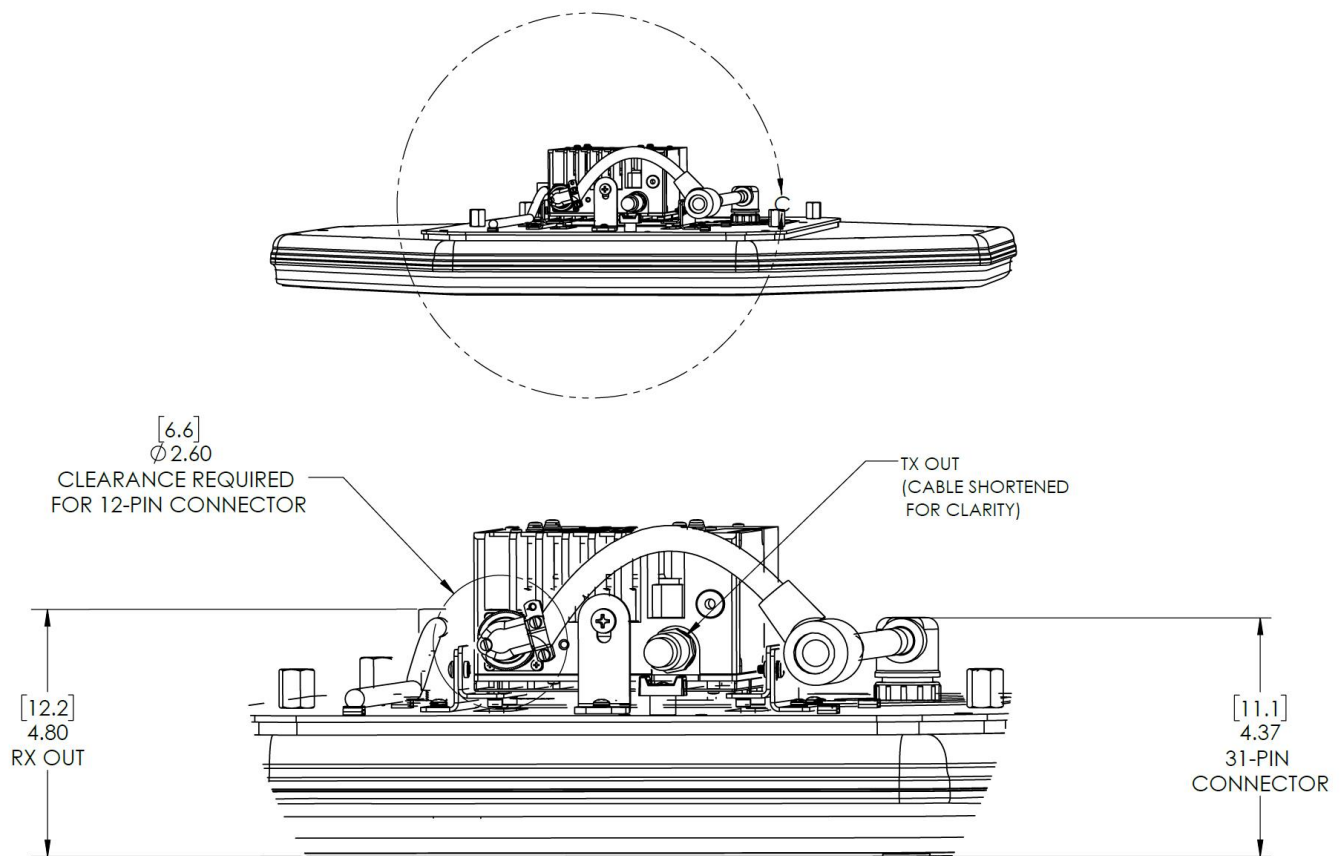
IF cable type	Maximum length
LMR-195	19 m (65 ft.)
LMR-240	28 m (93 ft.)
LMR-400	54 m (179 ft.)
LMR-600	83 m (276 ft.)

Appendix D: ODU dimensions

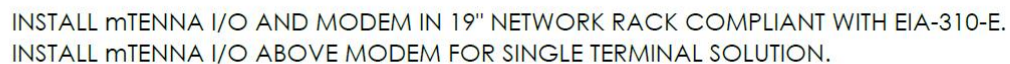


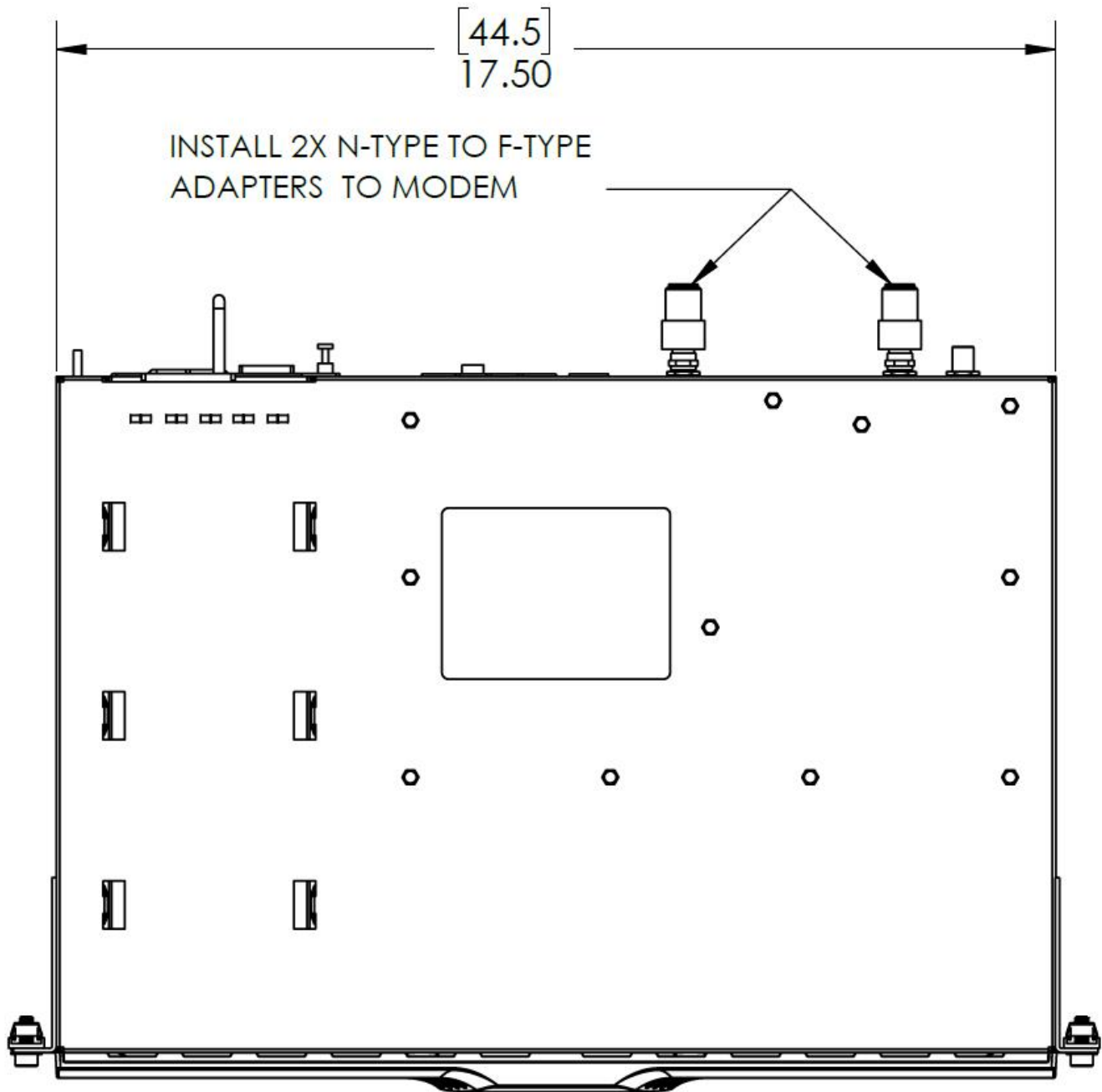






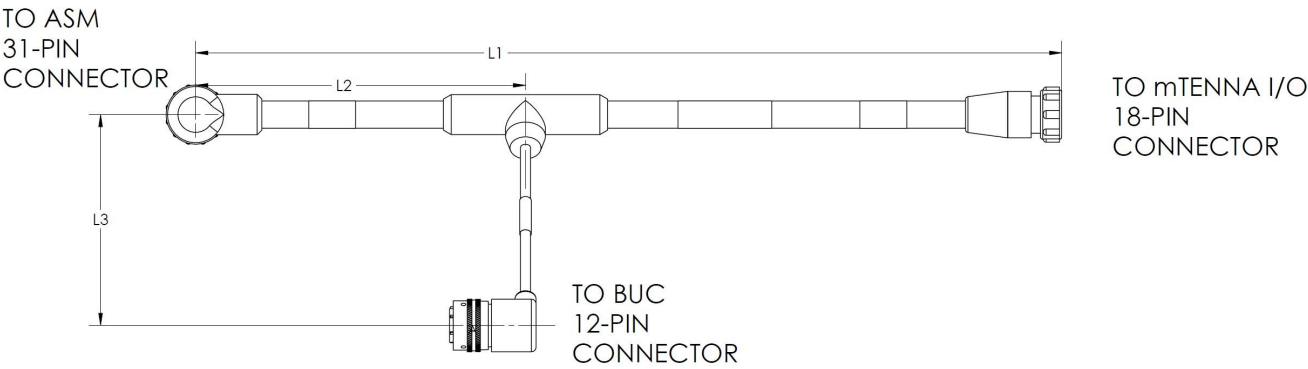
The diagrams below show the modem and the mTenna I/O installed into 19" network rack.



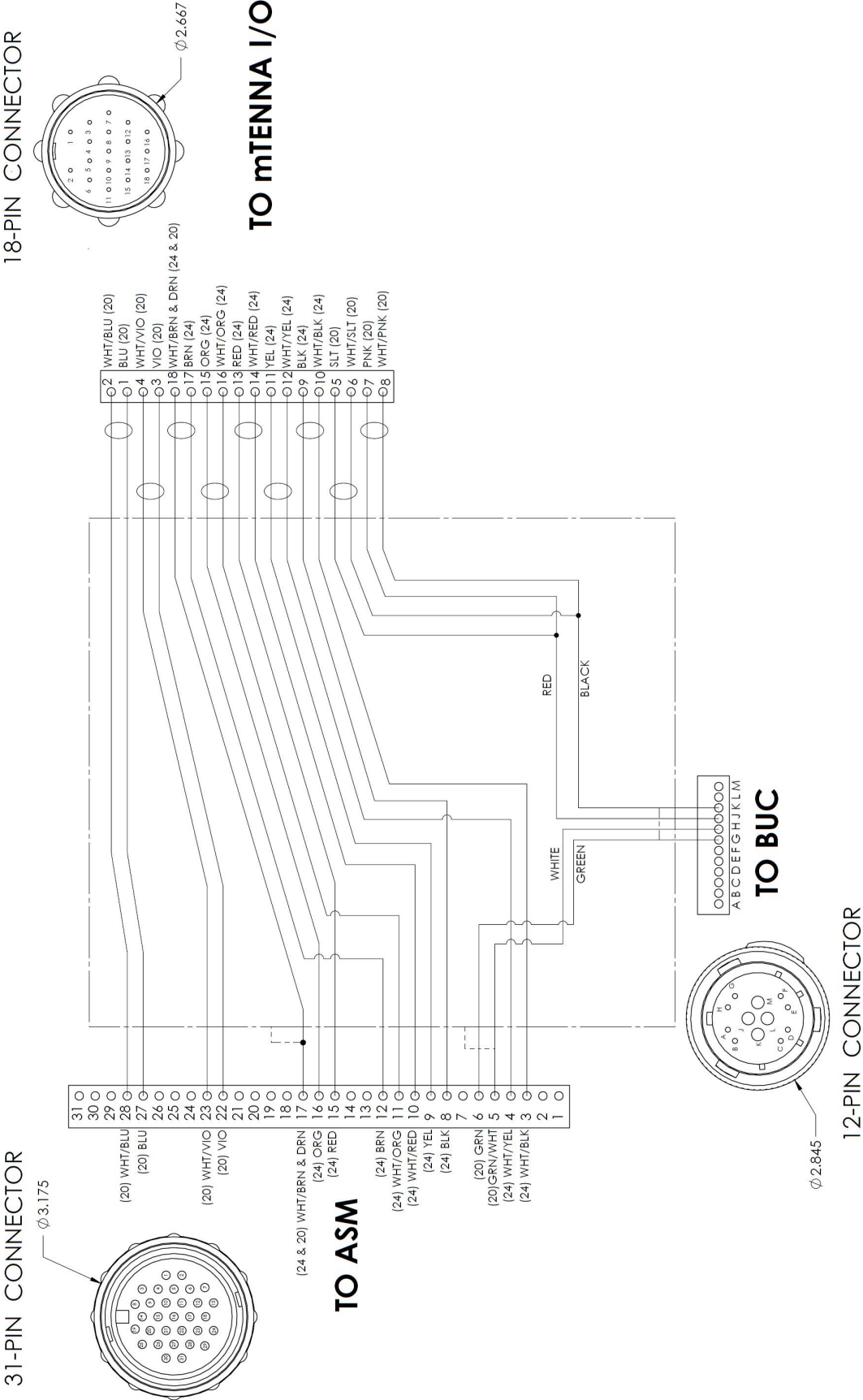


Appendix F: Cable drawings

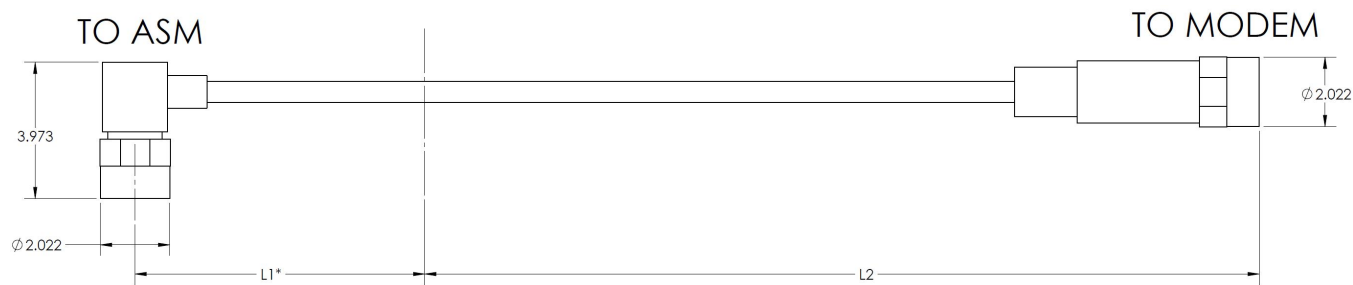
ODU interface cable



CABLE SEGMENT LENGTHS TABLE						
KPN	L1 +/- TOL [CM / IN.]		L2 +/- TOL [CM / IN.]		L3 +/- TOL [CM / IN.]	
115-00238-012	401 +/- 10.16	158 +/- 4	38+/-2.54	15 +/- 1	19+/-1.27	7.5 +/- 0.5
115-00238-025	798+/-15.24	314 +/- 6	38+/-2.54	15 +/- 1	19+/-1.27	7.5 +/- 0.5
115-00238-050	1560+/-15.54	614 +/- 6	38+/-2.54	15 +/-1	19+/-1.27	7.5 +/- 0.5



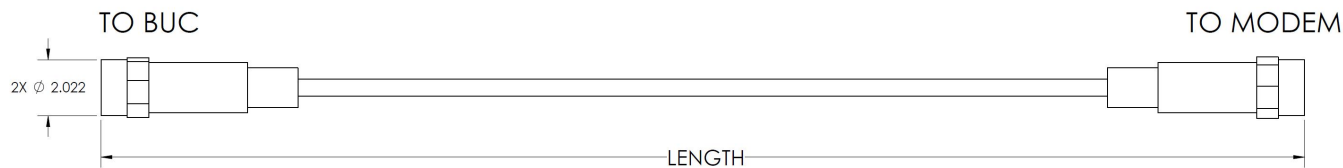
RX cable



CABLE PART NUMBER	L1 [CM / IN.]		L2 +/- TOL [CM / IN.]	
115-00211-012	35	14	366 +/- 1.3	144 +/- 0.5
115-00211-025	35	14	762 +/- 1.3	300 +/- 0.5
115-00211-050	35	14	1524 +/- 1.3	600 +/- 0.5

*L1 = ASM RX OUT PORT TO END OF BUC CONNECTOR

TX cable



CABLE PART NUMBER	LENGTH +/- 1.3 (CM)	LENGTH +/- 0.5 (IN.)
115-00214-012	366	144
115-00214-025	762	300
115-00214-050	1524	600