KACIFIC
the heart of broadband

Installation Guide

Satellite Modem

MDM2010 – ILB3210

with 1.2m JONSA Antenna

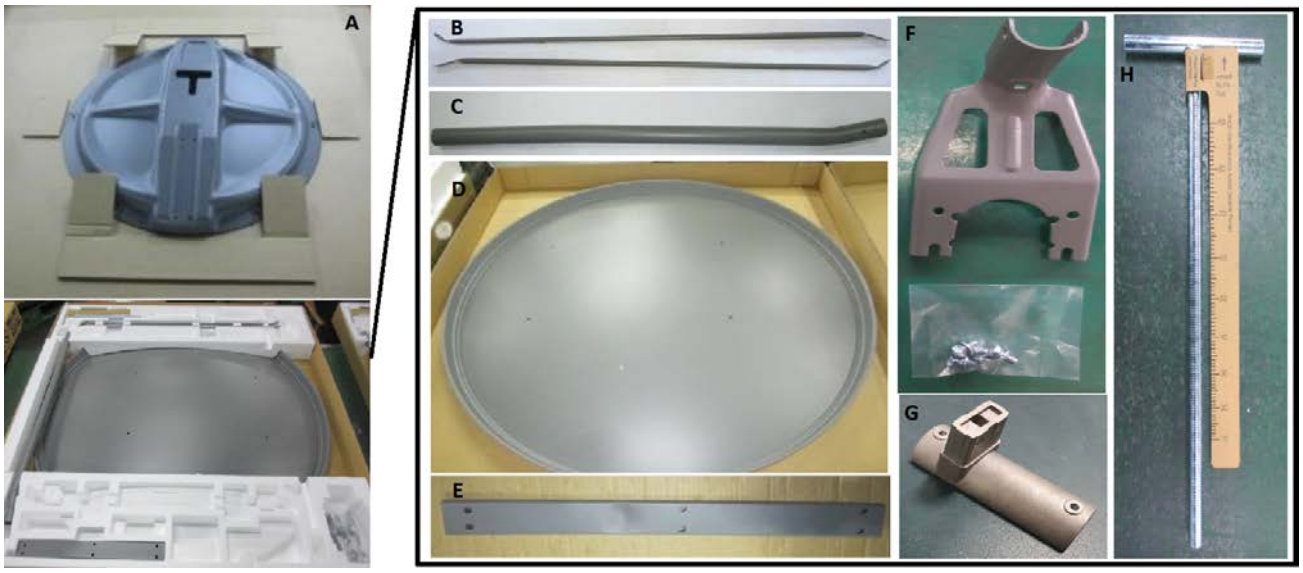
Version 1

Contents

1 Preparation

Check the following components before site installation:

1. Modem: MDM2010 with AC power supply adaptor
2. Transceiver (TRX): ILB3210
3. Cable: Single coaxial cable (RG6 75Ohm) (Length 30m)
4. Antenna: JONSA E1201x (1.2m)

<table>
<tr><td>  </td><td>  </td></tr>
<tr><td>Modem set</td><td>TRX and Coaxial cable</td></tr>
<tr><td colspan="2"> 
</td></tr>
<tr><td colspan="2">Jonsa 1.2m antenna set</td></tr>
</table>

1.1 Modem MDM2010

Manufactured by ST Engineering iDirect (formerly Newtec) and delivered with its AC power adaptor.

Figure 1. Modem MDM2010

Figure 2. AC power adaptor with AC power plug

Note: The modem power adaptor is delivered with a standard Australian power plug. Kacific does not recommend using an adaptor for the power plug.

Instead, users should get a local power plug.

1.2 Transceiver ILB3210

1.2.1 Transceiver ILB3210 Setup

The ILB3210 is a cost-efficient 2W Ka-band interactive LNB with support for polarization selection.

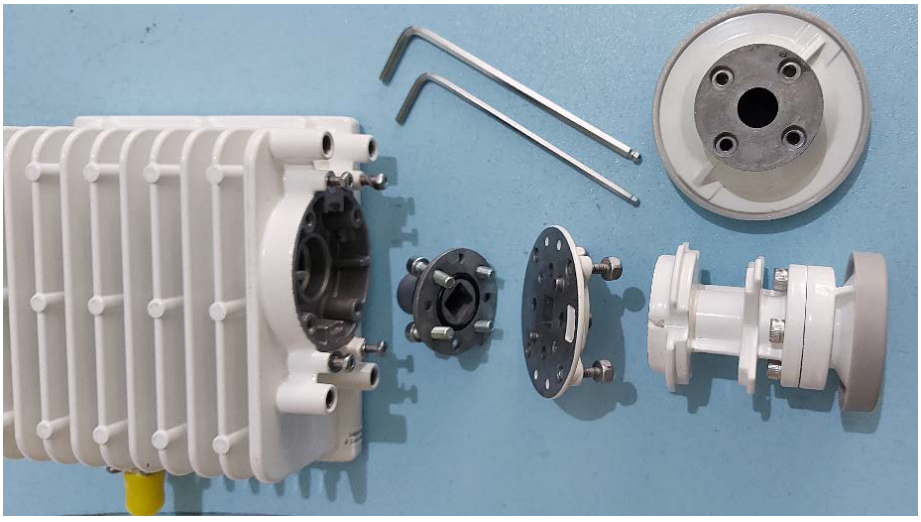
<table>
<tr><td> 
</td><td> 
</td></tr>
<tr><td colspan="2">For Jonsa antenna 1.2m installation, ILB3210 comes with feedhorn adapter part.</td></tr>
</table>

Before mounting the Transceiver to 1.2 m Jonsa antenna, it must be set up as follow:

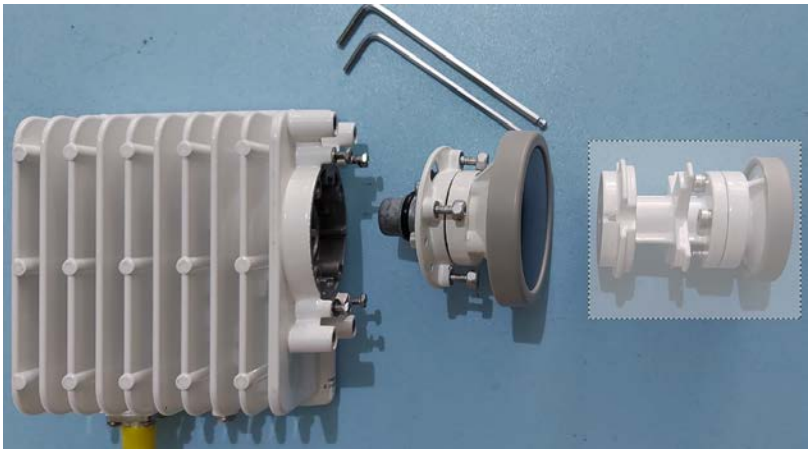
- Replace the original feedhorn with included feedhorn adapter.
- Polarization adjustment (if necessary)

1.2.2 Remove the waveguide part of Transceiver ILB3210

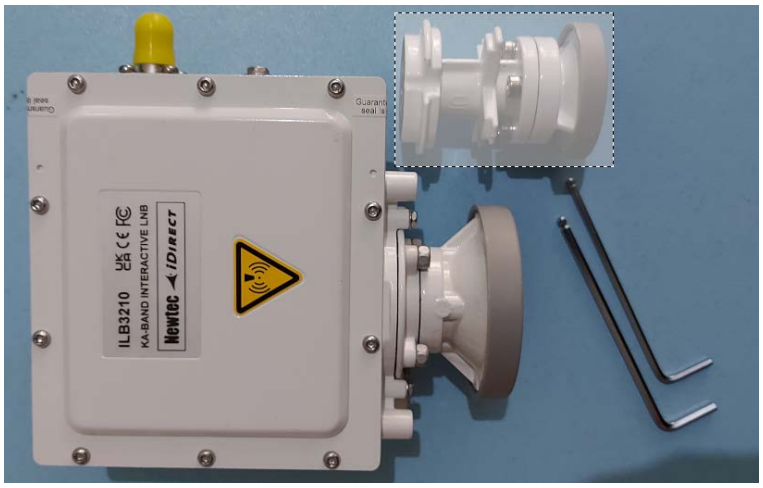
Step 1: Disassemble the polarization set and original feedhorn using allen key:



Step 2: Replace the original feedhorn with feedhorn adapter and assemble the polarization set:

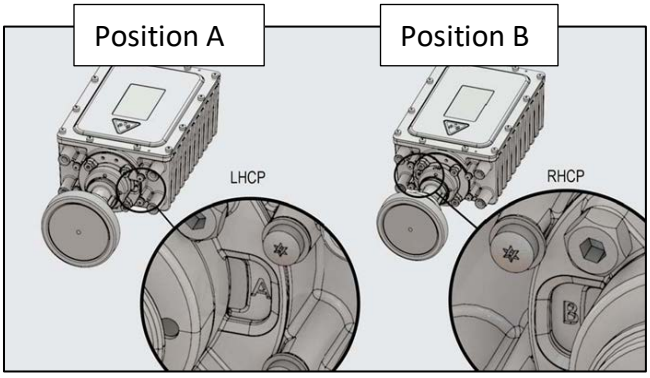


Step 3: Re-assembly back to ILB3210 with new feedhorn, note the polarization are set according to beam table in Annex 1:



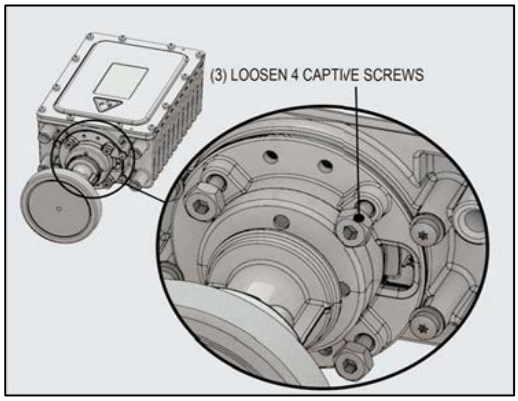
1.2.3 Adjustment of Transceiver Polarization (if needed)

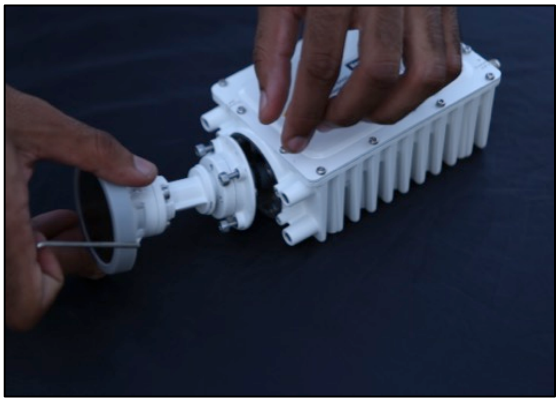
Refer to polarization/beam table in Annex 1. If needed, adjust the transceiver to the right polarization – either position A or B.



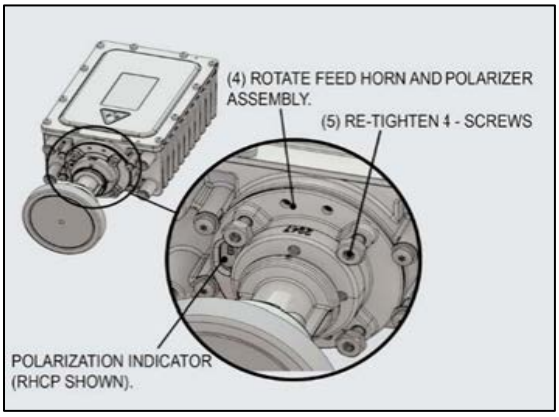
The procedure to convert the transceiver to position A/B is as follows:

1. *Using a 3mm hex wrench, loosen the four captive screws on the polarizer adaptor plate, as shown in the illustrations below. Do not remove these screws; just loosen them until the complete feed horn and polarizer assembly can rotate. There is no need to remove the feed horn and polarizer assembly from the transceiver.*





2. *Rotate the complete feed horn and polarizer assembly 180 degrees until the adaptor plate aligns with the corresponding polarization indicator.*



3. *Using a 3mm hex wrench, re-tighten the four captive screws shown.*

1.3 Coaxial Cable and Connectors

A single 30-meter-long coaxial cable with connectors is provided.

1. 30 m single coaxial cable roll
2. F coaxial connectors (2 + 2 spare connectors)

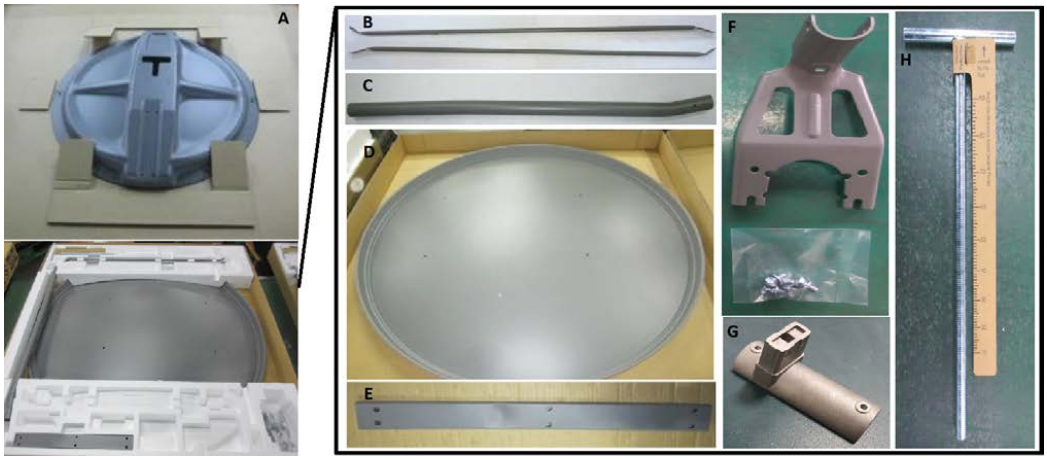
2 Terminal Installation

2.1 Jonsa Antenna E1201x Ka-Band 1.2 m

2.1.1 Antenna Components

Manufactured by Jonsa, it is a metal plate antenna delivered in two box – see pictures below:

- Part 1: Dish/reflector box



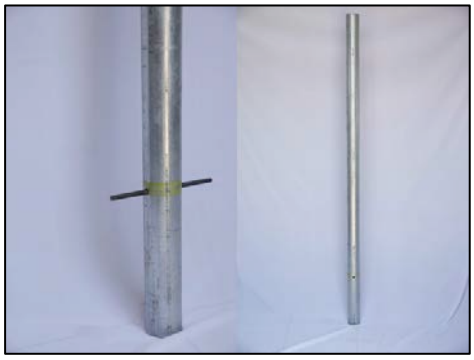
A. Back structure rim
B. Feed horn supporting rod
C. Boom arm
D. Reflector
E. Support arm
F. Transceiver holder
G. LNB arm adapter
H. Elevation adjusting screw

- Part 2: Az/El Mount box
  Consist of AZEL mount and screws.

Picture of detailed antenna components

Ka-band terminals require a rigid antenna fixation so that the antenna remains well pointed to the satellite even during windy conditions. The pipe must not be too long to prevent vibrations or flexibility.

Kacific recommends an easy and cheap ground installation that requires only a hot galvanized pipe and some cement.



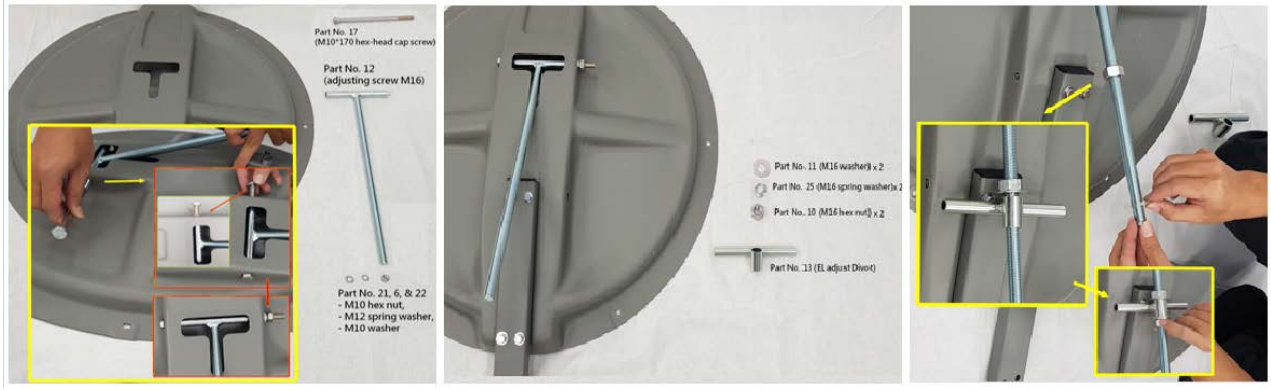
Mast specification:

1. Hot galvanized steel or aluminium
2. Maximum length 180 cm with 90 cm above ground
3. Outer diameter between 60 mm and maximum 70mm
4. Thickness 2mm or greater

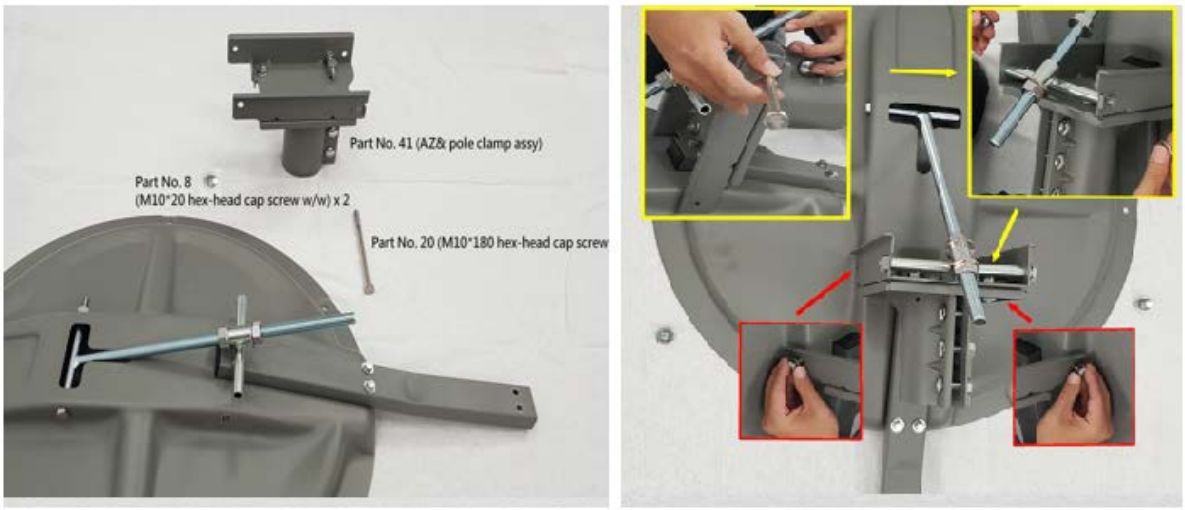
2.1.2 Step-by-Step Antenna Assembly

1. Assemble support arm to the back structure rim.

2. Assemble EL adjusting screw to the back structure rim.

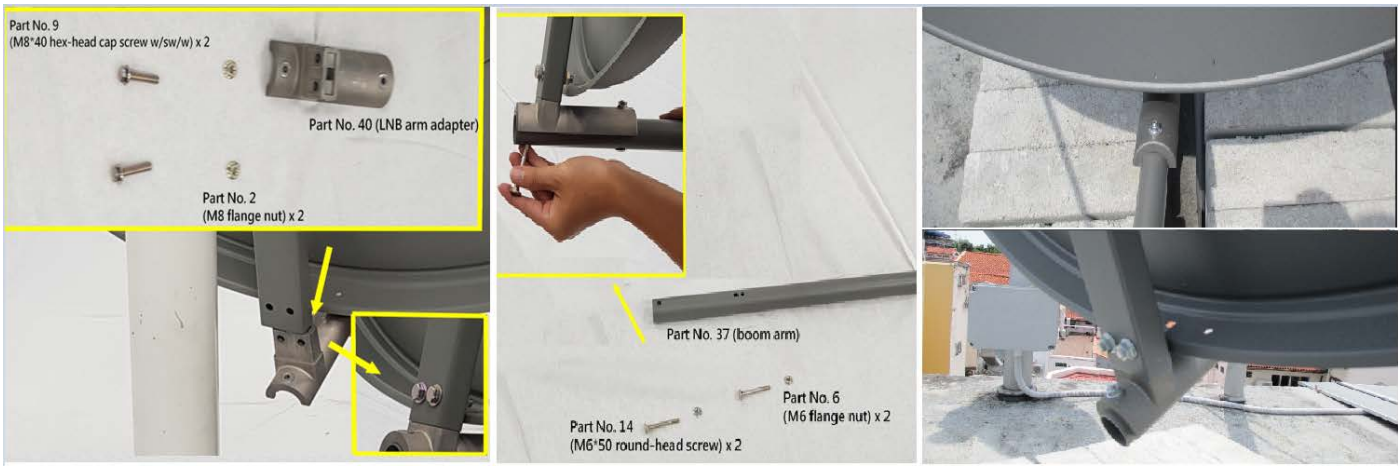


3. Assemble AZEL mount to the back structure rim.



4. Place the AZEL mount (with back structure rim) to the pole then assemble the reflector.

5. Assemble the LNB arm adaptor to support arm.



6. Install the feed horn supporting rod legs by these sequences:
Seq. 1: Attach side feed horn supporting rod to the dish reflector. DO NOT tighten the screws.
Seq. 2: Attach side feed horn supporting rod to the boom. arm DO NOT tighten the screws.

Then, **tighten screws** securing feed horn supporting rod to dish reflector, and **alternately tighten screws** on the boom arm.

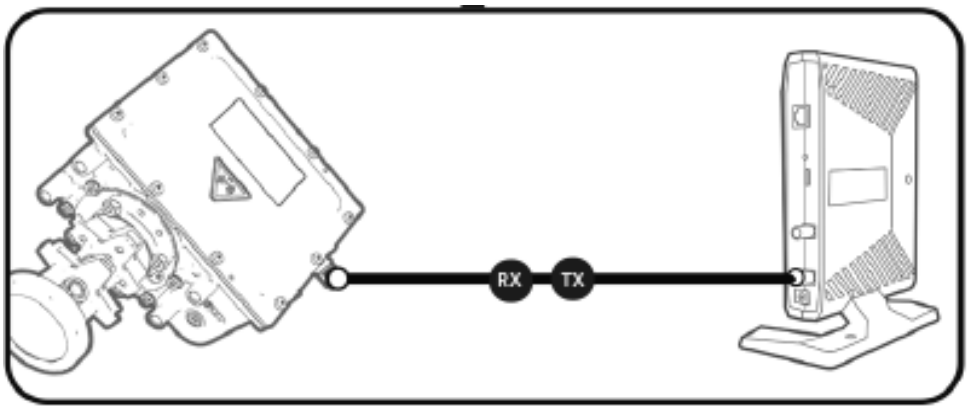
7. Assemble Transceiver holder into boom arm and mount the Transceiver to TRX holder.

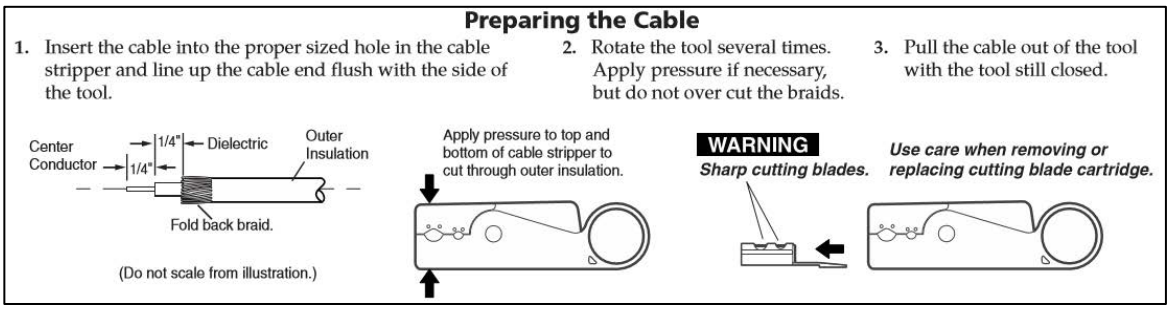
8. Take pictures of the complete installation:

2.2 Coaxial Cable Installation between Modem and Transceiver

2.2.1 Cable Preparation

Tx and Rx of the iLNB are connected by a single coaxial cable.





Cable with F-type connectors

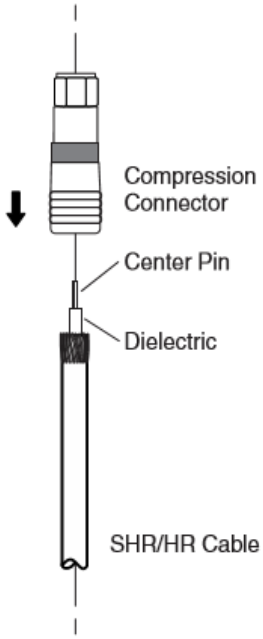
1. Push the compression connector onto the cable until the dielectric is flush with the inner ring of the connector. The center pin should stand out slightly from the front ring.

2. Select and place the correct adapter into the compression tool. **Use the gold adapter for gold connectors and the silver adapter for nickel connectors.**

Cable with F-type connectors

3. Place the cable and connector in the opened compression tool.

4. Compress the cable and connector together.

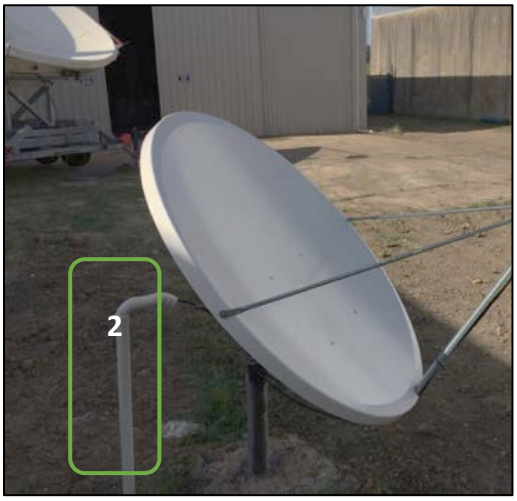


2.2.2 Cable Path

Kacific supplies a single coaxial cable for the Tx/Rx connection between the transceiver and the modem.

This coaxial cable must be protected:

- Inside a covered cable tray (As indicated in (1)) OR
- Within a plastic/metal pipe (As indicated in (2))



Note: *The length of the cable must not be more than 30 meters.*

Kacific does not approve installations with more than 30 meters of L-Band cable.

3 Terminal Commissioning and Qualification

3.1 Power on the Modem

Plug in the power supply. Check that the modem is switched on and modem LED indicators are lit up.

3.2 Antenna Alignment Using Power and Play Apps

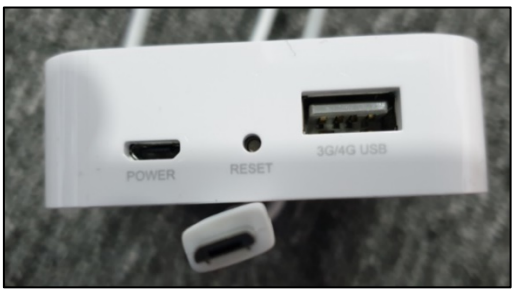
You need to link your smartphone to the modem via a WiFi connection. The WiFi connection is provided by a WiFi router.

3.2.1 WiFi Router Installation

> ***Note:*** *The procedure below is given for a TPLink WiFi router. Any other WiFi router can be used, provided it can be adjusted as an Access Point (AP) and cabled to a RJ45 port.*

Set the router to AP mode (WiFi access point).

Connect the router to the power using the USB cable.



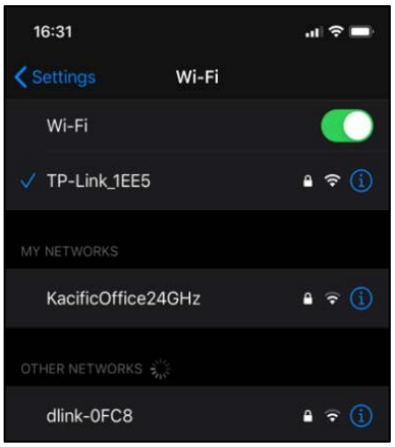
If there is no 110/220V AC available, use a Portable Power supply (for TPLink router) as shown below:

Connect the router to any Ethernet port of the Newtec Modem with the 10-meter Ethernet cable.

A 10m Ethernet cable is recommended to allow you to place the TP link router closer to the antenna, providing a better WiFi signal in case the modem is far from the antenna.

3.2.2 Point&Play Application Connection

Connect your smartphone to the WiFi router (info card provided with TPLink WiFi SSID & password).

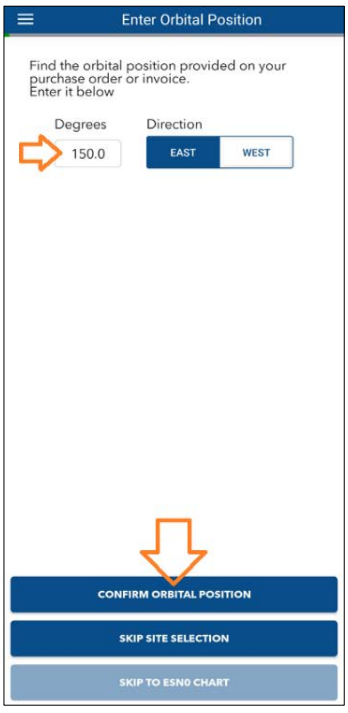


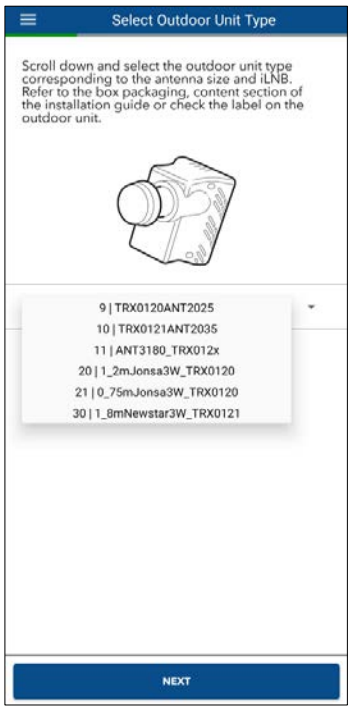
Note: *Ensure you are connected to the WiFi router and not to any other WiFi network.*

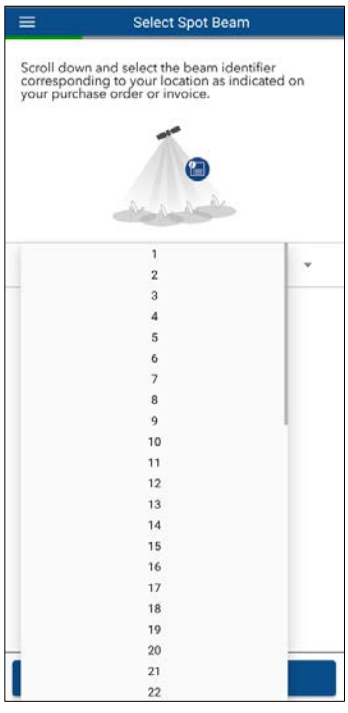
3.2.3 Antenna Pointing

Open Newtec Point&Play® mobile application on your smartphone connected to the modem via the WiFi router (in AP mode).

- *Select "1/1.2 m" antenna.*
- *Select the transceiver type.*
- *Select beam number (see table in Annex 1).*

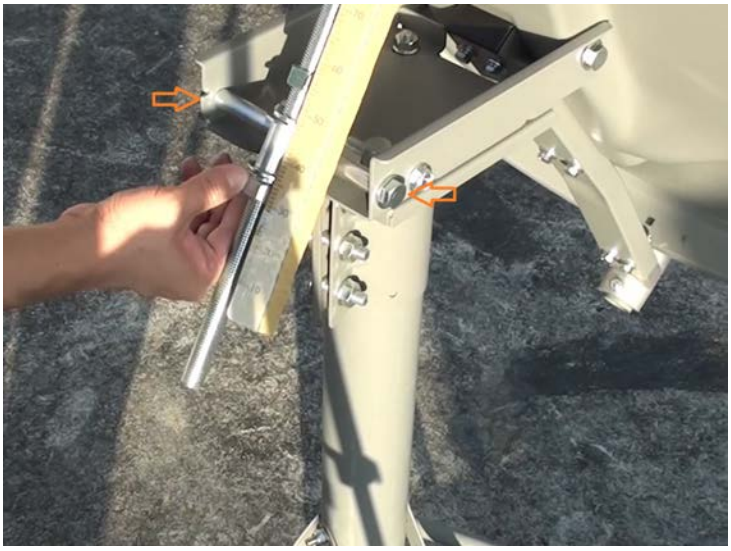






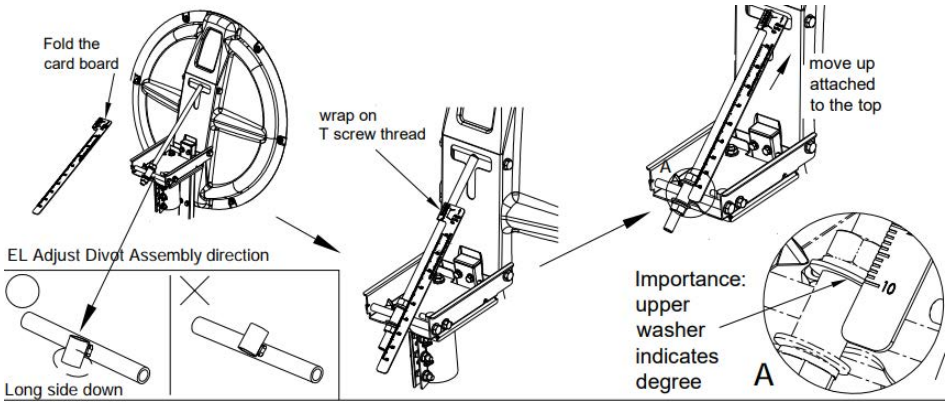
Elevation Adjustment

Loosen the side and T-screw bolts then adjust the elevation to point to the satellite.

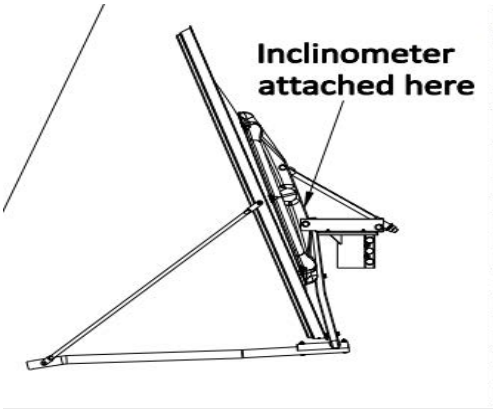


Finding dish elevation can be done in 2 ways:

A. Using single use cardboard in the box as follows



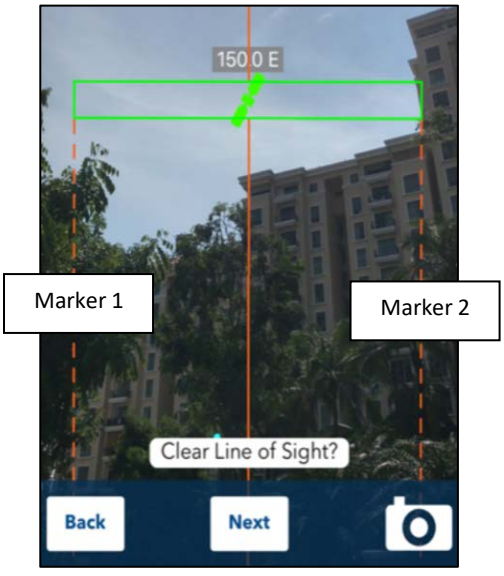
B. Using Inclinometer attached to the centre of back structure rim then note the actual elevation degree according to the table as follows:



WHEN Inclinometer reading	ACTUAL VSAT elevation degree
78	5
83	10
88	15
90	17
87	20
82	25
77	30
72	35
67	40
62	45
57	50
52	55
47	60
42	65
37	70
32	75
27	80
22	85
17	90

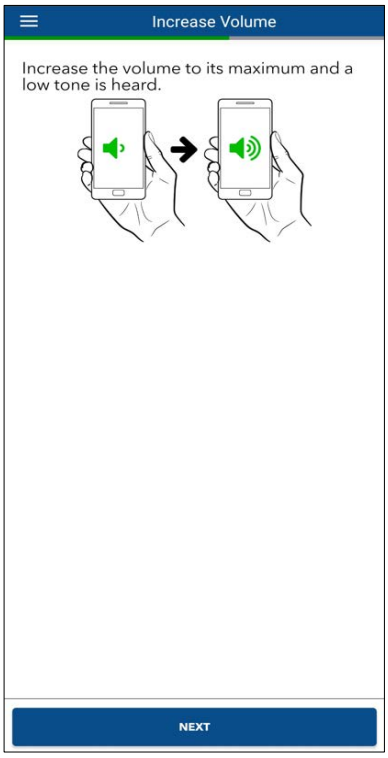
Azimuth Adjustment

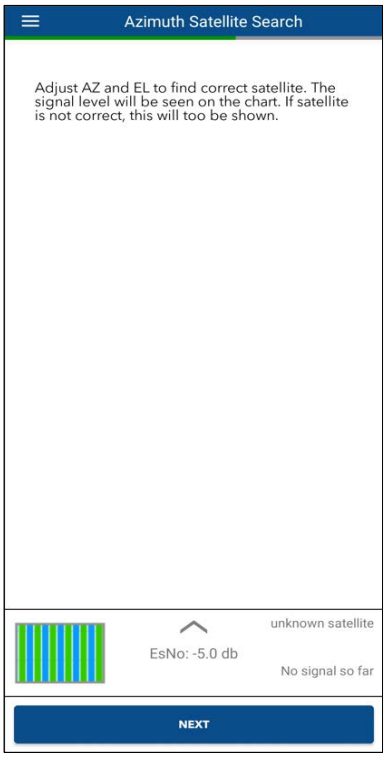
Go behind the antenna, (1) loosen the three azimuth bolts just enough to (2) rotate around the pole.



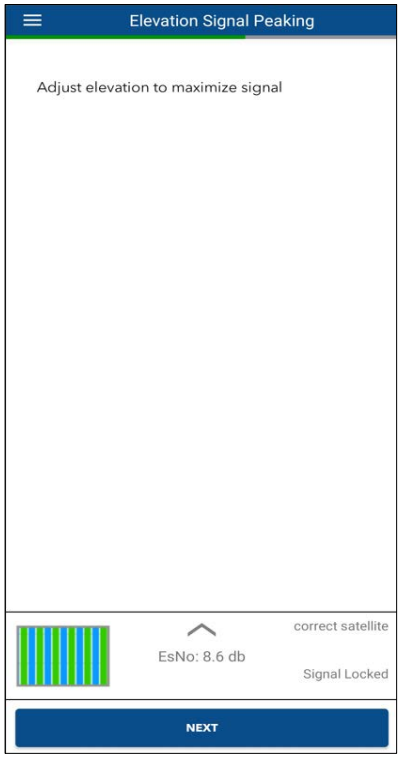
Rotate the dish until it is pointed between Marker 1 and Marker 2.

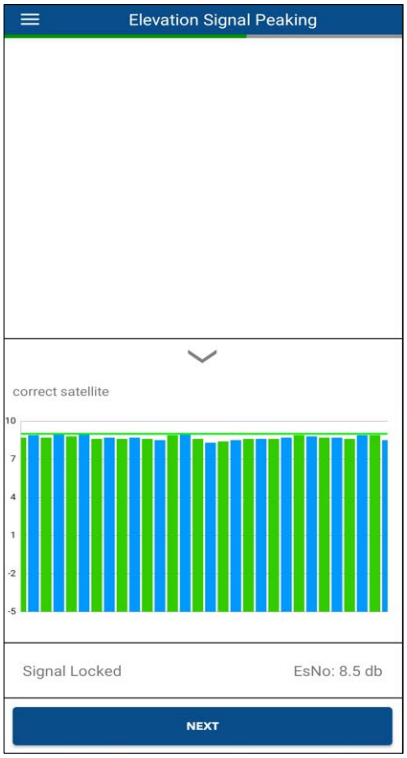
Increase the volume of your smartphone to hear a tone. A low tone indicates there is no signal from the correct satellite; a high-pitched tone indicates the modem has received a signal from the correct satellite (antenna is aligned).





Rotate the dish slowly by hand, in small steps. Stop and wait a few seconds after each step to check the tone and see the satellite indication (EsNo).



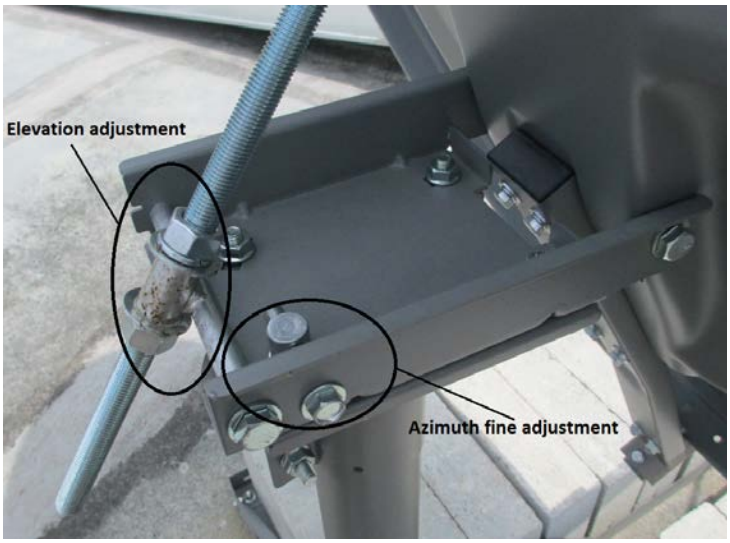


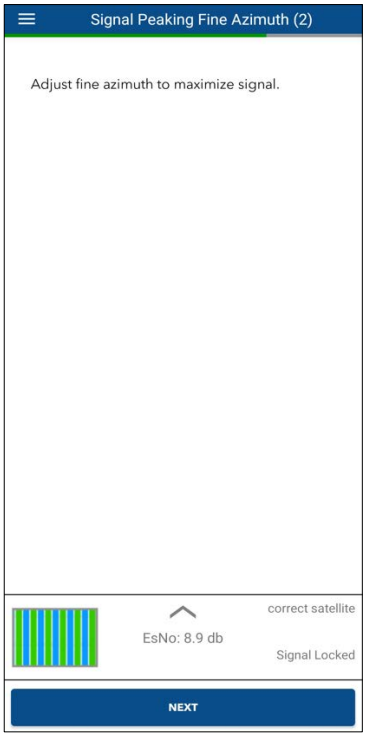
Stop when you hear a high-pitched tone. The satellite signal (EsNo) indicates a correct signal. Click on "*EsNo: xx db*" to open the signal chart.

Tighten the rough azimuth screws.

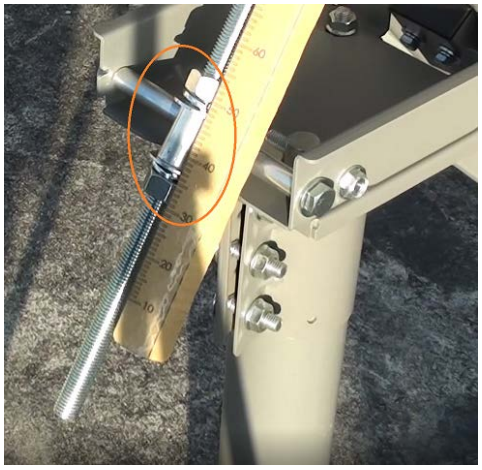
Azimuth and Elevation Fine Adjustment (Signal peaking)

A. Further adjust the dish azimuth by **azimuth fine adjustment**, slowly in small steps, waiting a few seconds at each step to stabilize the received signal while monitoring the satellite signal level. Stop when it reaches maximum EsNo (Azimuth peaking signal).





B. Further adjust the dish elevation by adjusting T-screw elevation very slowly with even smaller steps to maximize the EsNo value displayed on the application. Stop when it reaches maximum EsNo (Elevation peaking signal).



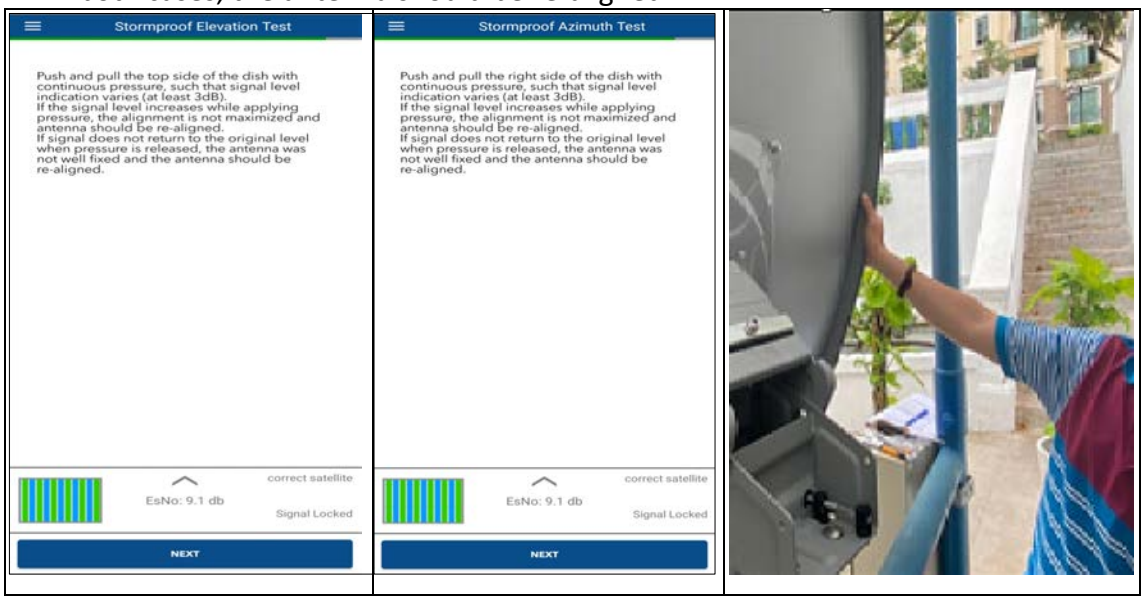
When the maximum signal is reached for both Azimuth and Elevation, tighten the rough elevation bolts alternatively so that the signal stays at its maximum.

3.2.4 Antenna Rigidity Check

Check the rigidity of the fixed antenna by gently pushing and pulling the right and top sides of the dish.

- If the signal level increases while applying pressure, the alignment is not maximized.
- If the signal does not return to its original level, the antenna screws have not been tightened properly.

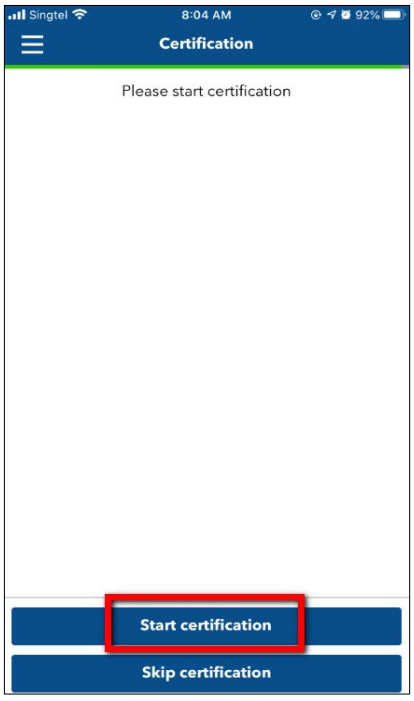
In both cases, the antenna should be re-aligned.



The antenna is now well pointed, and the modem signal is locked in maximum EsNo.

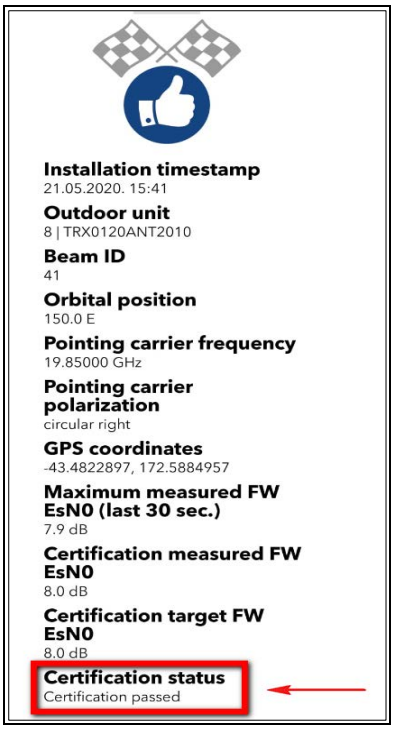
On the Point&Play Apps, click "NEXT" to go to Terminal Certification.

3.3 Terminal Certification



Note: *With effect from 19 October 2020, the certification process has been turned on to ensure that the antenna is properly aligned to the satellite before it can come online.*

Click "Next" and click "Start Certification" to start the certification process. This process will reach completion automatically.



Once the certification is successful, you will see the message "Certification passed".

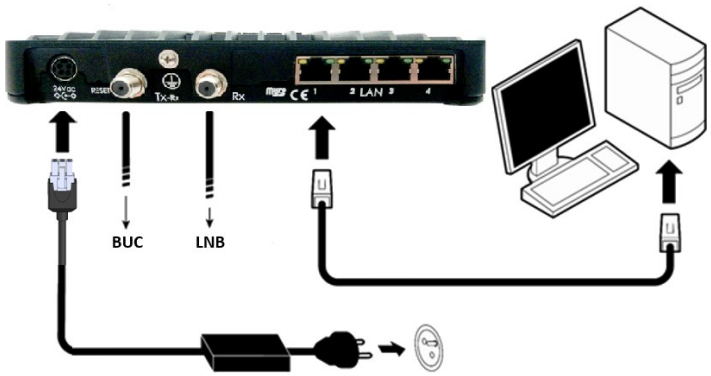
If certification fails, return to Section 3.2.3 above to fine-tune the azimuth and elevation to obtain a better EsNo.

3.4 Terminal Testing

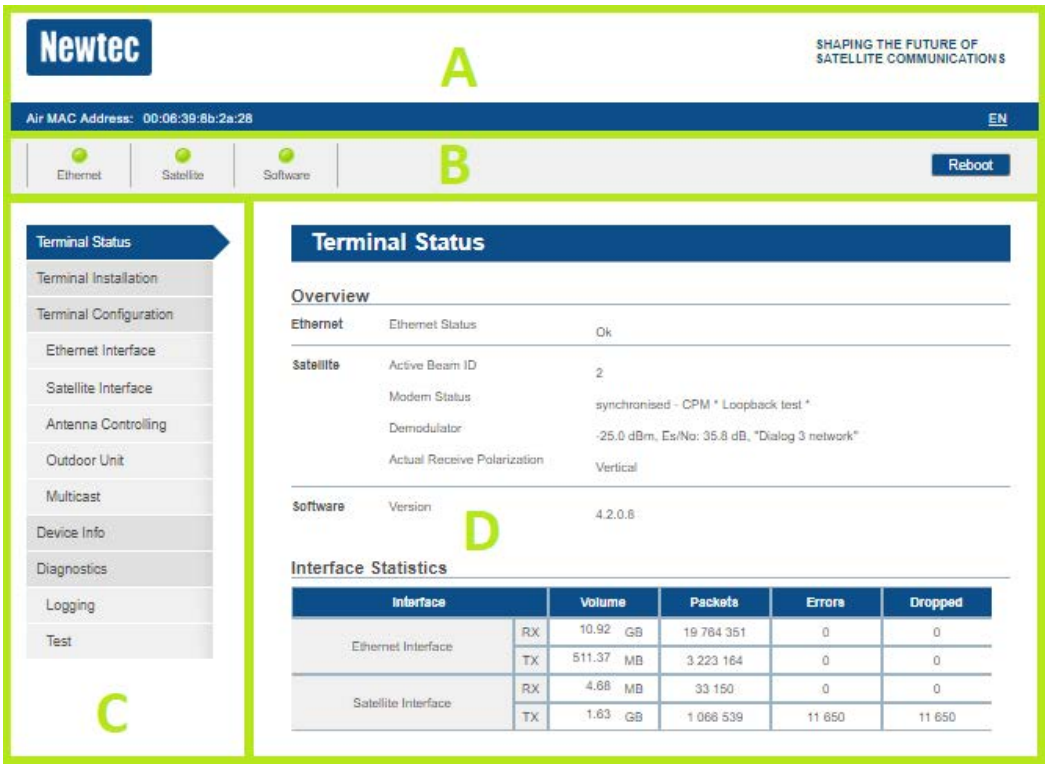
3.4.1 Modem to Laptop Connection

Connect your laptop to the modem with the Ethernet cable.

Check that your laptop IP setting is set to DHCP to be able to receive an IP address from the modem.

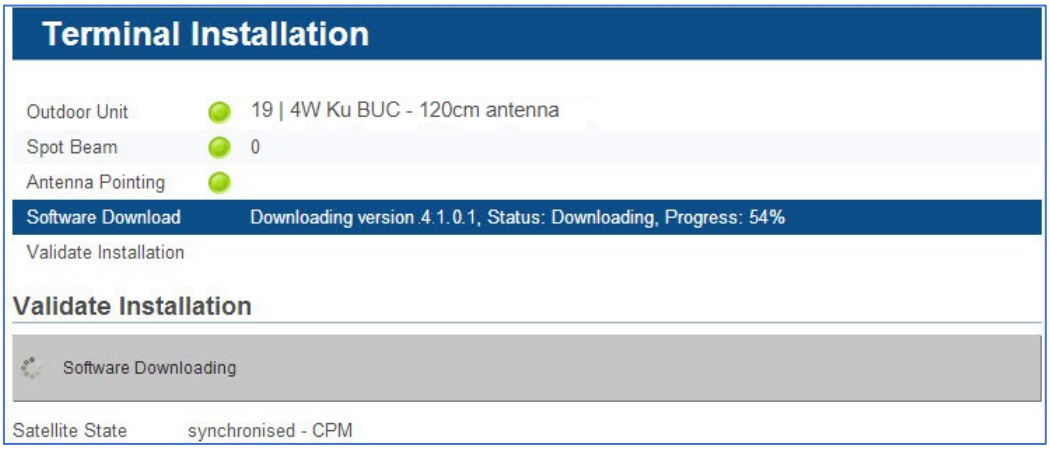


Open the browser, then type the modem address 192.168.1.1 in the browser's address bar to be directed to the terminal status page.



A. Banner: Contains the Air MAC address and the languages in which the GUI can be displayed.
B. Status bar: Always shows the most important status LEDs. This information will be specified in the body of the Status page.
C. Menu structure: Click an item to select it.
D. Body: Contains the actual content of the web interface. It shows the page title and one or more content blocks or forms.

Go to the "Terminal Installation" page. Let the modem confirm it has the latest version or (automatically) download it and reboot to activate the new software.



Otherwise, go to the connection test below.

3.4.2 Satellite Network Connection Test

Launch the Ping Test by typing in "= ping -t 8.8.8.8" in the Command Prompt function.

Test the download and upload speed by connecting your computer to the modem port.

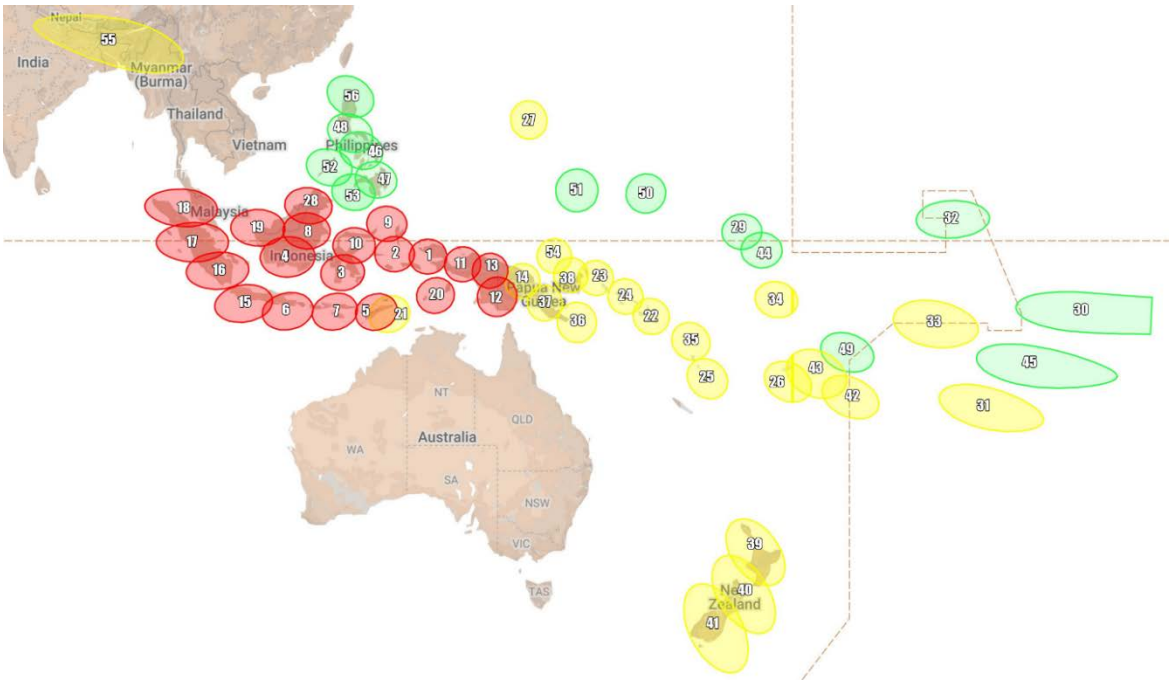
Open a Google Chrome browser and type in "`https://172.18.2.10/speedtest/`" in the address bar.

The site is connected to the Kacific-1 network, and you can start getting Kacific service.

CONGRATULATIONS!

Please take a photo of your installation and upload it to the Gigstarter portal (Active Sites – Pictures).

Annex 1: List of Beams and Polarization



RFP Beam #	Beam Name	Downlink Polarization	TRX012X (2W and 3W)	ILB3210
1	Papua	LHCP	B	A
2	Moluccas	RHCP	A	B
3	Sulawesi	LHCP	B	A
4	East Kalimantan	LHCP	B	A
5	East Nusa Tenggara	RHCP	A	B
6	West NusaTenggara	RHCP	A	B
7	Middle NusaTenggara	RHCP	A	B
8	North Kalimantan	RHCP	A	B
9	North Sulawesi	RHCP	A	B
10	Mid Sulawesi	LHCP	B	A
11	West Papua	RHCP	A	B
12	Highlands	LHCP	B	A
13	Highlands2	LHCP	B	A
14	Highlands3	RHCP	A	B
15	Java + Indonesian Teleport	RHCP	A	B
16	South Sumatra	RHCP	A	B
17	Mid Sumatra	RHCP	A	B
18	North Sumatra	RHCP	A	B
19	Rikit / Borneo	LHCP	B	A
20	Maluku	RHCP	A	B

RFP Beam #	Beam Name	Downlink Polarization	TRX012X (2W and 3W)	ILB3210
21	Timor	LHCP	B	A
22	Solomon	RHCP	A	B
23	Bougainville	RHCP	A	B
24	North Solomon	LHCP	B	A
25	Mid Vanuatu	RHCP	A	B
26	Fiji	RHCP	A	B
27	Marshall1 / CNMI	LHCP	B	A
28	Majuro / Sabah	RHCP	A	B
29	Tarawa	LHCP	B	A
30	Marquisas	LHCP	B	A
31	Tubuai	LHCP	B	A
32	Line Islands	RHCP	A	B
33	Tautua	LHCP	B	A
34	Tuvalu	LHCP	B	A
35	Vanuatu North	LHCP	B	A
36	PNG East	RHCP	A	B
37	PoM	LHCP	B	A
38	New Britain	LHCP	B	A
39	Auckland	LHCP	B	A
40	Christchurch	RHCP	A	B
41	NZ South Island	RHCP	A	B
42	Niue	LHCP	B	A
43	Rotuma	LHCP	B	A
44	Gilbert	RHCP	A	B
45	Papeete	RHCP	A	B
46	Central Philippines	RHCP	A	B
47	Davao	LHCP	B	A
48	Manila	RHCP	A	B
49	Am Samoa	RHCP	A	B
50	Kosae	LHCP	B	A
51	Chuuk	RHCP	A	B
52	Palawan	LHCP	B	A
53	Sulu	LHCP	B	A
54	Manus	RHCP	A	B
55	Bangladesh	LHCP	B	A
56	Batanes	LHCP	B	A