Konnect
Installation Guide

DISCLAIMER: THIS GUIDE IS DESIGNED FOR USE BY TRAINED PROFESSIONALS ONLY. ALL NATIONAL ELECTRICAL CODES AND ALL HEALTH & SAFETY REGULATION PERTAINING TO SATELLITE ANTENNAE INSTALLATION MUST BE RESPECTED. KONNECT AND EUTELSAT GROUP ARE NOT RESPONSIBLE FOR ANY HARM OR DAMAGE THAT MAY RESULT FROM THE USE OF THIS GUIDE WITHOUT PROPER TRAINING AND DUE CARE.

GLOSSARY

Pointing   Finding the correct position of the antenna towards the service satellite in the sky in order to receive broadband signals

Line of sight   Direction of the antenna to the satellite

Beam   A spot beam is a satellite signal that is specially concentrated in power, allowing to transmit different data signals using the same frequency for different geographical locations. Konnect is a multi-beam satellite, with each beam serving a specific area on the earth's surface

Elevation   Vertical angle between the pointing direction towards the satellite and the local horizontal plane

Azimuth   Horizontal angle measured in the local horizontal plane in a clockwise direction from north. It refers to the rotation of the whole antenna to the vertical axis of the pole

Polarization   The way a radio electric frequency propagates. The system uses circular polarisation where electromagnetic waves rotate around the propagation direction either right (RHCP) or left (LHCP)

Transceiver   Unit at the end of the antenna that converts the signal frequency between the satellite signal and the modem. Modem and transceiver are connected via a single coaxial cable. The Polarizer of the Transceiver can be set in RHCP or LHCP (default configuration is LHCP)

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ANNEX

Fig.1 - INSTALLATION KIT

(parts included in the kit)

1.1 - Antenna Reflector (74cm or 90cm)

- Reflector
- Antenna Arm
- Bolts/Nuts Box

1.2 - Antenna Canister (74cm or 90cm)

- Tilt Plate
- Reflector Bracket
- AZ/EL Canister

1.3 - Antenna Transceiver (1W)

1.4 - Modem Wi-Fi (HT2000W)

- Modem HT2000W
- Power Supply
- Ethernet Cable

1.5 - Coax Cable (30m)

- RG6 Outdoor 30m Coax Cable
- Waterproof Compression Connector *(already compressed on the cable)*
- Push-On Compression Connector *(to modem, no need of compression tool)*

1.6 – Tri Mast

- 6 Anchor Bolts
- 60mm Mast
- Mounting Kit

Fig.2 - INSTALLATION TOOLS

(not included in the kit)

2.1 Antenna Assembly

| 11mm spanner | 13mm spanner | 3mm L-key | Cross screwdriver |

2.2 Cables & Connectors

| Cable Cutter | Cable Stripper |

2.3 Modem Connection & Antenna Pointing
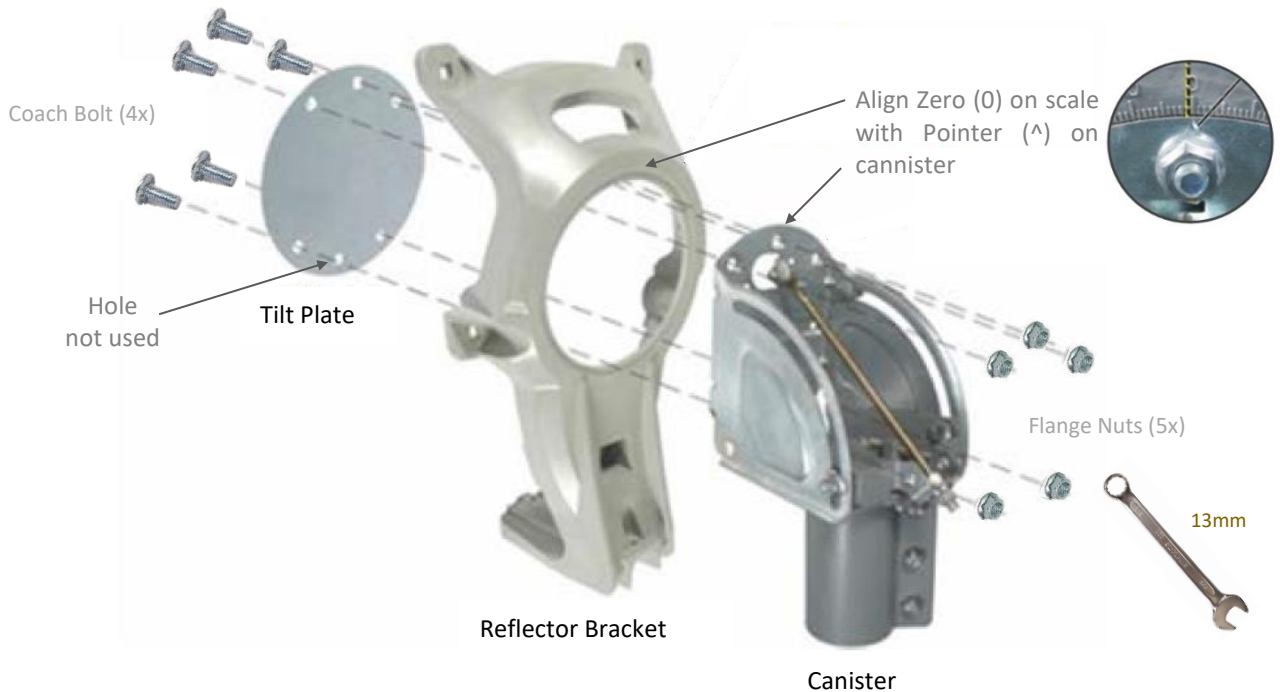
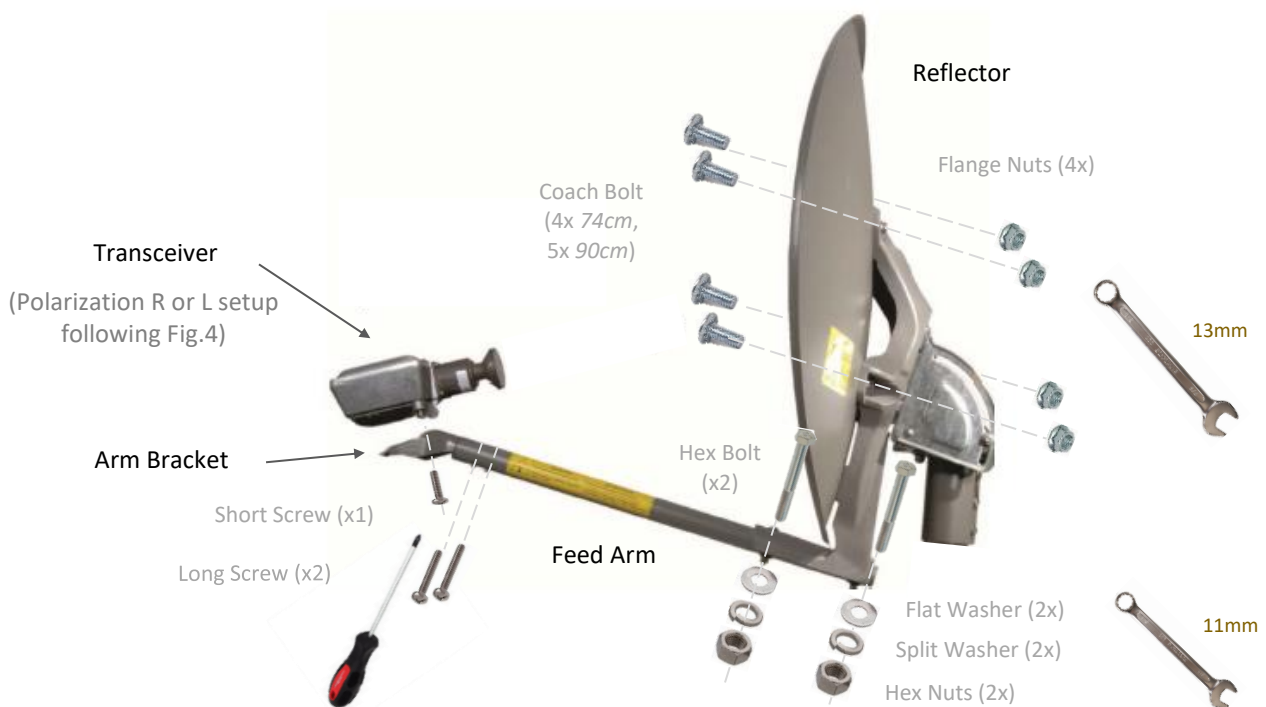| Smartphone | Compass | Laptop |

2.4 Mount Fixation

| Level | M8 Bolts | Driller |

Fig.3 - SYSTEM ASSEMBLY

3.1 Reflector Bracket and AZ/EL Canister assembly (74/90CM)

Coach Bolt (4x)

Align Zero (0) on scale with Pointer (^) on cannister

Hole not used

Tilt Plate

Flange Nuts (5x)

13mm

Reflector Bracket

Canister

3.2 Antenna Reflector & Transceiver final assembly (74/90CM)

Reflector

Flange Nuts (4x)

Coach Bolt (4x *74cm*, 5x *90cm*)

Transceiver

(Polarization R or L setup following Fig.4)

13mm

Arm Bracket

Hex Bolt (x2)

Short Screw (x1)

Long Screw (x2)

Feed Arm

Flat Washer (2x)

Split Washer (2x)

Hex Nuts (2x)

11mm

NOTE: 90cm antenna has an identical design of 74CM, except for:

- *5 Coach Bolts* - instead of 4 - to fix the Reflector on its Bracket
- *Arm* is attached to the antenna with 2 horizontal Hex Bolts – instead of vertical – and 1 vertical Bolt with arm plate (fig 3.3)
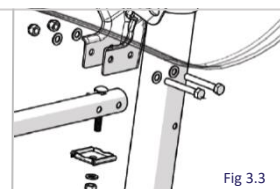- *Arm Bracket* is already fixed on the Feed Arm

Fig 3.3

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Fig.4 - TRANSCEIVER SETUP
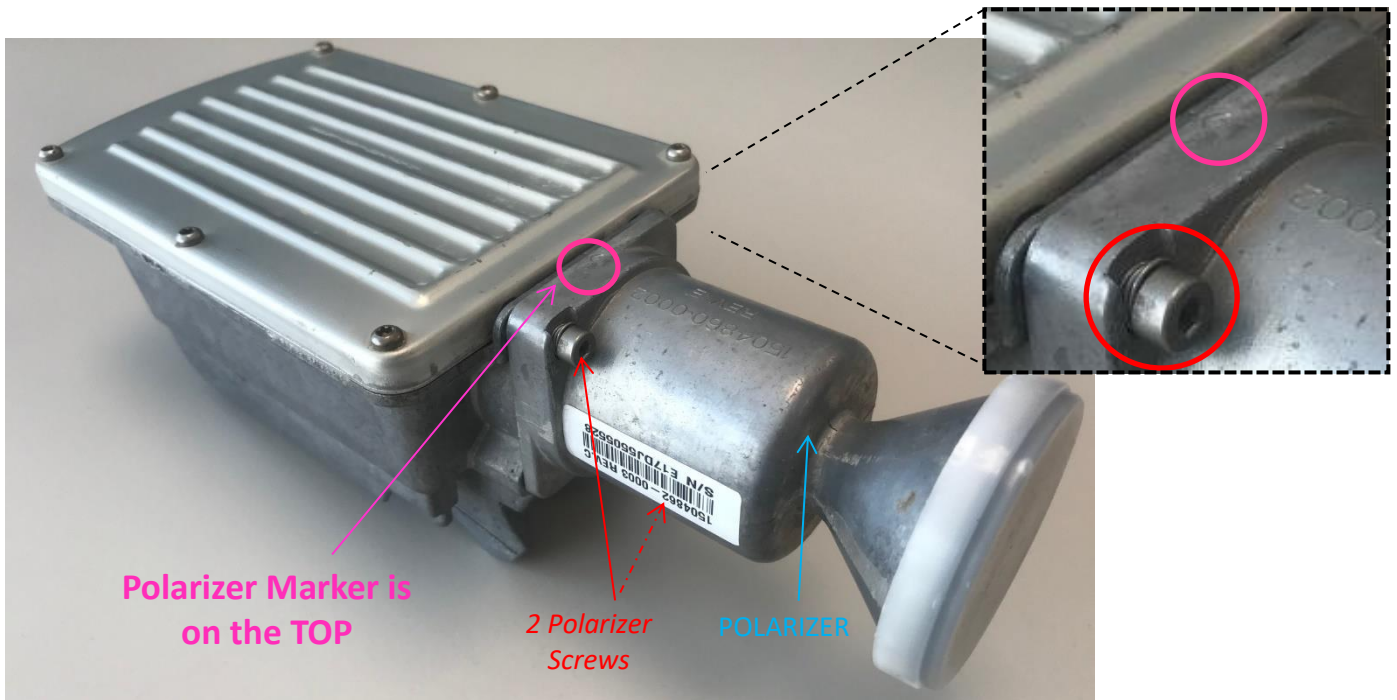
Figure 4.1: Transceiver with Polarization RHCP - Right

Polarizer Marker is on the TOP

2 Polarizer Screws

POLARIZER

Figure 4.2: Transceiver with Polarization LHCP - Left

Polarizer Marker is on the LEFT

2 Polarizer Screws

POLARIZER

Default Polarization of any new Transceiver out of the box is always Left (lhcp)
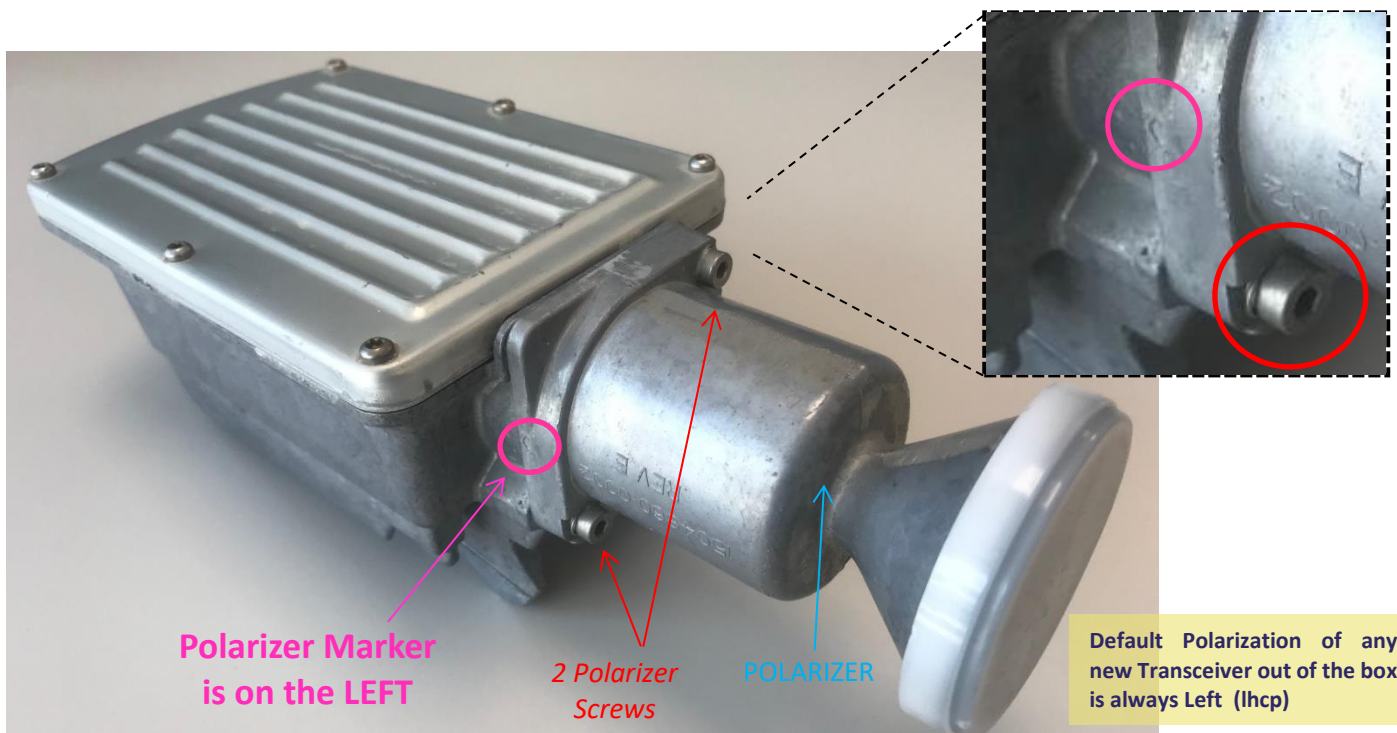
Fig.5 - ANTENNA CONTROL BOLTS

Figure 5.1: Antenna bolts and nuts

Elevation rod

Azimuth lockdown nut #7

Azimuth lockdown nut #8

Azimuth lockdown nut #6

Elevation nut #3

Canister nut #10

Canister nut #11

Canister nut #12

Elevation nut #4

Elevation nut #2

Azimuth bolt #5

Elevation Adjustment nut #1
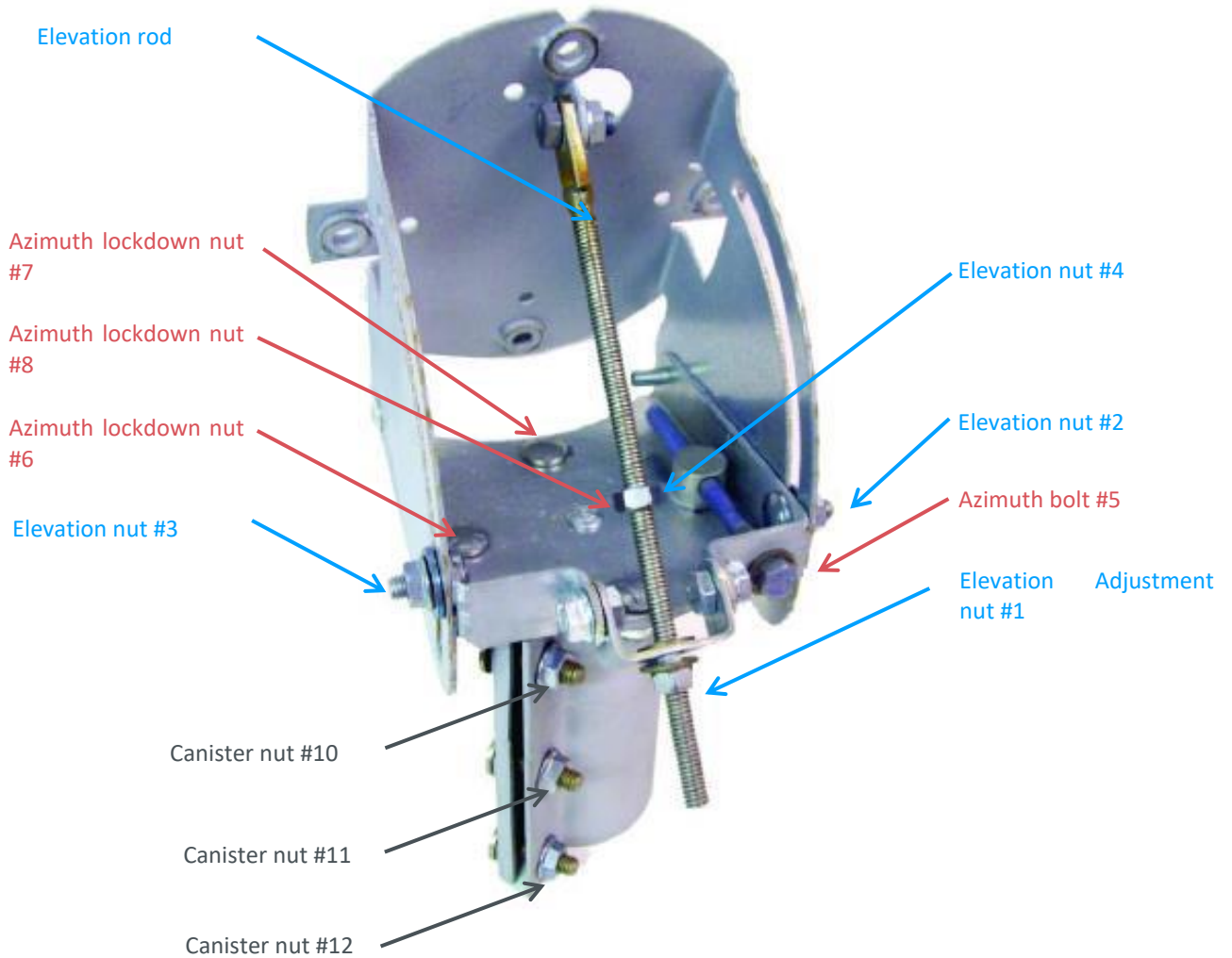
Figure 5.2: Azimuth lockdown nuts

Azimuth lockdown #7

Azimuth lockdown #8

Azimuth lockdown #6

INSTALLATION STEPS USING THE PC

Figure 6
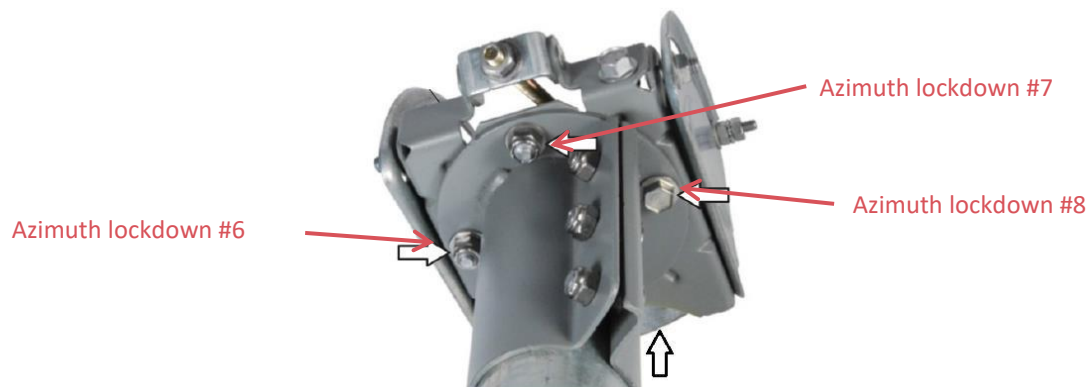
Step 1: Check you have all the kit parts (fig. 1)

Step 2: Check you have all your tools to perform the installation (fig. 2)

Step 3: Check you have the **sbc** file in your PC before you go on site to perform the install

NOTE: the sbc configuration file is the same for all users and must be uploaded on the modem to provide the satellite parameters. It can be provided by your field manager

Step 4: Check you have the **Work Order** (fig. 2) which provides all the information to perform an install for a specific customer:

TX Polarization => to assemble the antenna transceiver with right (R) or left (L) setting,

Latitude/Longitude & Beam Number of Customer Site => to program the modem,

Azimuth/Elevation & Sat Orbital Position => to point the antenna,

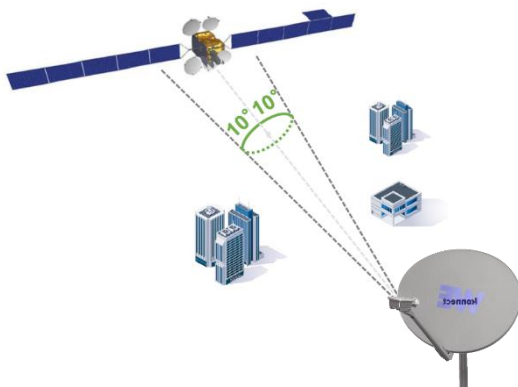*Activation Key* => to activate the modem

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Figure 7

Figure 8

Figure 9

PART 2: SELECTING THE LOCATION

Step 5: Select the installation location (accessible flat rooftop or side wall south-oriented) following 5 rules:

- Clear Satellite Line of Sight,
- Solid surface for fixing the mast,
- Feasible cable route & distance (max 30m),
- Position authorized by client and easily accessible,
- Safety of the Installer

Step 6: To check the Line of Sight open the free Android or iOS App **Konnect Install** or use a Clinometer & Compass. The orbital position of KONNECT satellite is **7.2 East**

Step 7: Select the augmented-reality function 'Sat Finder'. Move the smartphone until the red circle becomes green (fig. 7) and make sure no obstruction appears within the green circle (consider even future obstructions as growing trees)

NOTE: if use the Clinometer & Compass, get the Azimuth & Elevation values from the Work Order, and make sure the direction of the satellite is free of obstructions with an opening angle of at least 10° (fig. 8)

Step 8: Fix the mast using 5CM M8-Bolts adapted to the wall type (fig. 9). Example: Expansion / Anchor Bolts (Concrete), Rawplugs (Brick), Screws (wood).

NOTE: the Trimast allows horizontal, vertical and sloped configurations (fig. 9)

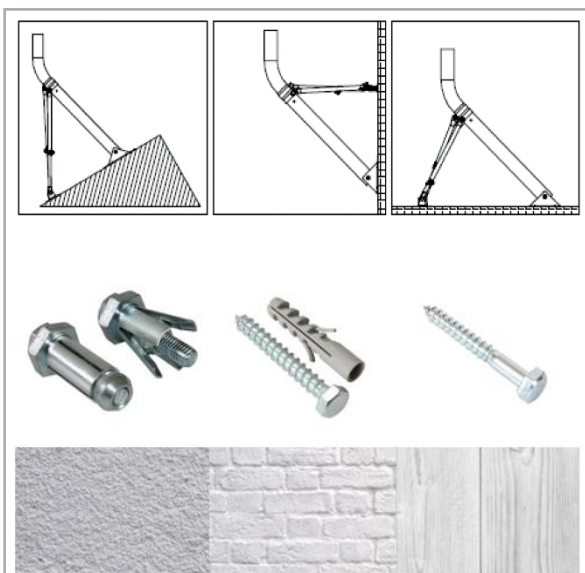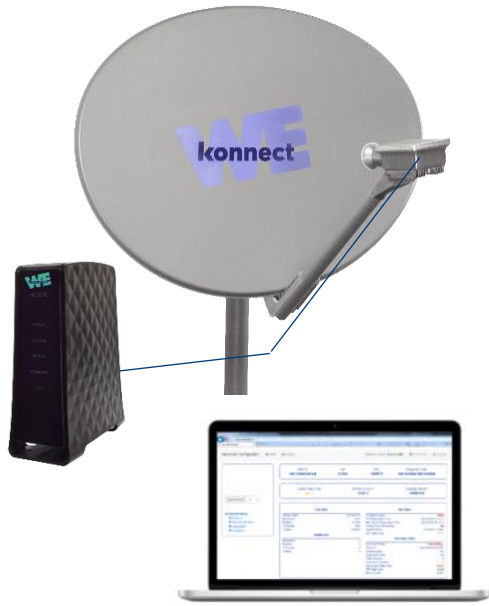**Step 9:** Check with a level that it is vertical

Figure 10

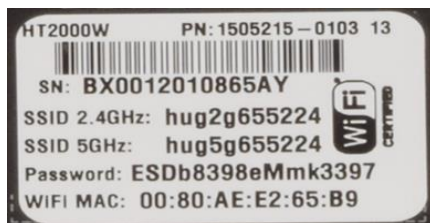*6 mm length*

Figure 11

Figure 12

PART 3: ASSEMBLING THE SYSTEM

Step 10: Identify on the Work Order the Polarization value for your installation, which can be LEFT (**l**hcp) or RIGHT (**r**hcp):

- If LEFT (**l**hcp) there is nothing to do on the Transceiver, since the default Polarization of any new unit is always Left (lhcp). Check your transceiver corresponds to fig. 4.2. and the triangular marker is oriented on the **LEFT**

- If RIGHT (rhcp) remove the two polarizer screws with a 3 mm hex L-key, separate the polarizer, rotate it 90 degrees and reposition it so that the triangular marker is oriented on the **TOP**. Then tighten the 2 screws

PART 4: CONNECTING THE SYSTEM

Step 11: Assemble the Antenna: Reflector, Canister, Arm, Bracket, Transceiver (fig. 3)

Step 12: Install the antenna on the mast and check with a level that it is vertical

Step 13: Pose the coax cable form the outdoor to the indoor of the building, preferably reusing existing cable routes (if you drill a hole, set the right sloping angle to avoid water ingress in house, and then seal it)

Step 14: Connect the Waterproof Connector (already compressed on the cable) to the Transceiver, and gently tighten it until fixed

NOTE: Under-tightening doesn't guarantee waterproofing, Over-tightening may damage the cable

Step 15: Prepare the indoor side of the cable with a cable stripper (fig.11), introduce the Push-On Connector, and connect it to the Modem (no need of compression tool)

Step 16: Carefully tighten the connector with 11mm spanner (during this process the Push-On connector will compress on the cable)

Step 17: Plug the modem to the power supply

Step 18: Connect the modem and PC via Wi-Fi using the credentials reported on back panel of the modem (fig. 12). You can also connect directly with an ethernet cable
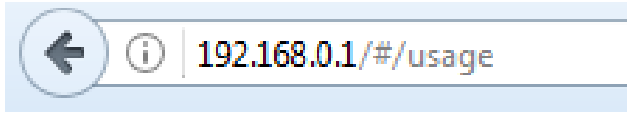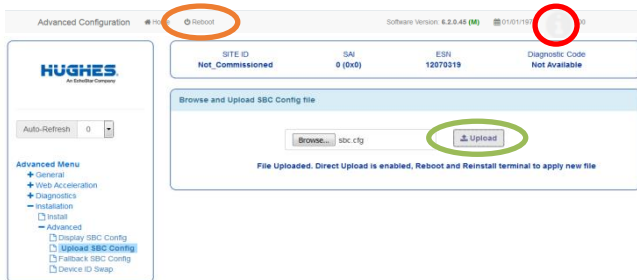
PART 5: PROGRAMMING THE MODEM
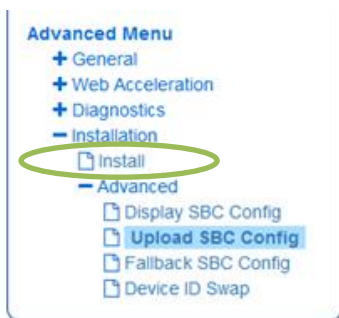
Step 19: On your PC Enable *DHCP* (flag *'Obtain an IP address automatically'*) and Disable *Proxy* server (unflag *'Use a proxy server for your LAN'*)

Step 20: Open a Web Browser on the PC and type **192.168.0.1** in the address field and press Enter to visualize the modem homepage (fig. 13)

NOTE: select a Browser among Firefox, Google Chrome, Apple Safari

Figure 13

Step 21: Load the Sat Modem Configuration file *sbc.bin*:
- On the top bar on the right click *'i' icon* to access the Advanced Page (fig. 14)
- On the left pannel click 'Installation', 'Advanced', 'Upload SBC Config' (fig. 15)
- On the main page browse your files, select the *sbc.bin* file, click on 'UPLOAD' (fig. 14)
- Click 'Reboot' on the top (fig. 14)

Figure 14

Step 22: Click 'INSTALL' on the left side panel (fig. 15) to open the installation page

Step 23: Flag on the bottom left the box 'Enter Latitude and Longitude Info' , select Decimal Degrees format, and enter Latitude & Longitude (fig.16) of the installation location from your Work Order

Figure 15

NOTE: >0 Lat is North,   <0 Lat is South
>0 Long is East,   <0 Long is West

Figure 16

Step 24: Select the Satellite KONNECT. Flag Beam Override and check or select the Beam Number corresponding to the one reported in the Work Order

NOTE: Rx-Pol is the opposite of Tx-Pol

Step 25: Select the Antenna Size (74 CM, 90CM, 120CM) corresponding to your kit (fig. 17)

Step 26: Click 'SUBMIT' (fig. 17)
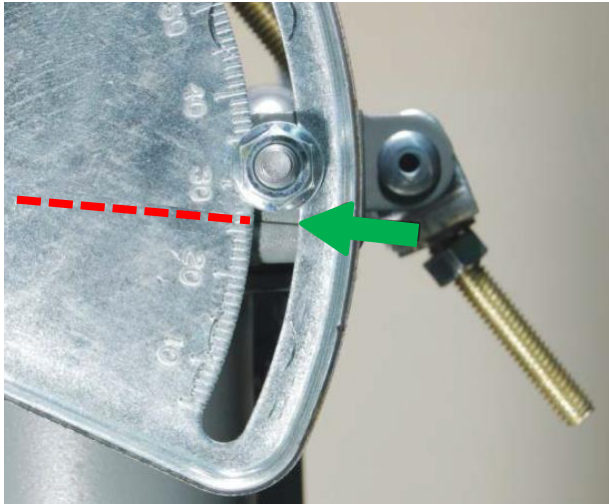

Figure 17

Figure 18

Figure 19

PART 6: POINTING THE ANTENNA

Step 27: Identify the correct elevation value (It can be provided by the Work Order or by the Konnect Install App)

Step 28: Check Elevation nuts #2 and #3 are loose and spin Elevation nut #4 until it is 5 cm up the elevation rod (fig. 5)

Step 29: Set Elevation on the Antenna with Elevation Adjustment nut #1 (fig. 5) using the Scale and Marker (fig. 18) or a digital inclinometer to better the accuracy

Step 30: Check 3 Azimuth nuts #6-8 are loose (fig. 5) and move Azimuth Adjuster bolt #5 untill the fine azimuth upper bolt #9 is centered (fig. 5)

Step 31: Check the 3 canister nuts #10-12 are loose (fig. 5)

Step 32: Visualize the SQF (Signal Quality Factor) on the modem page (fig. 19). The **green** number on the right is the current value, the **blue** number on the left is the max value achieved during your past measurements

Step 33: Scan the Azimuth by slowly swinging the antenna from left to right and stop when the level **SQF > 40 or higher**

*NOTE: If you can't find the satellite repeat **Step 29 & 33** optimizing the elevation until you find the satellite. If you still can't find the signal, check that the Polarization of the transceiver corresponds to your Beam (see Annex with the Beam/Pol mapping)*

Step 34: Fix the Antenna by tightening the canisters bolts #10-12 (fig. 5) on the pole of your mast as tight as possible
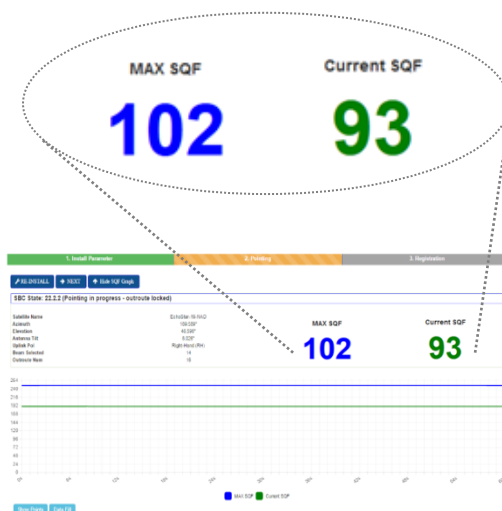
FINISH

Peak Signal Value

2nd Signal Drop

1st Signal Drop

START

SPANNER ROTATION

Figure 20

MAX SQF   Current SQF

102   **102**

Figure 21

#4

Figure 22

1. Install Parameter

RE-INSTALL   NEXT   Hide SQF Graph

Figure 23

Step 35: Fine pointing Azimuth to maximize the signal (fig. 20):

- Rotate Azimuth bolt #5 (fig. 5) in any direction until you see on the PC the **Current SQF** value marked in green drop a first time

- Reverse the direction until you see the signal level drop a second time

- Identify the **Max SQF** value marked in blue on the PC (Peak value)

- Reverse the direction again until you reach the maximum signal level, when the current signal marked in green is equal to the max signal marked in blue (fig. 21)

Step 36: Fine pointing Elevation to maximize the signal (fig. 20):

Repeat the same procedure as Step 35 using the Elevation Adjustment nut #1 (fig. 5)

*NOTE: the scope of Fine-Pointing the antenna is to **discover the maximum value that can be achieved, and not to reach a minimum signal level.** You can repeat steps 35 and 36 to improve the accuracy of your pointing. SQF 102 is only an example, since SQF values depends on locations and weather conditions*

Step 37: Lock off the 3 azimuth locking nuts #6-8 (fig. 5)

Step 38: Lock off the 2 elevation locking nuts #2, #3 (fig. 5), and spin the elevation nut #4 until the bottom of the elevation rod (fig. 22)

Step 39: Check the antenna pointing by gently pushing & pulling at the top/left/right

Step 40: Click 'NEXT' on the top left of the modem webpage (fig. 23).

*NOTE: If you can't click on NEXT because it is grey, it means your signal level is not sufficient to activate the modem and you need to click 'RE-INSTALL' and improve the antenna pointing starting again from **Step 29** [if you don't succeed and if requested by your escalation level, re-pointing should start from **Step 24** trying one by one the listed beams in the Beam Override window, setting the corresponding TX-Pol on the transceiver, and finally selecting the one with highest SQF]*
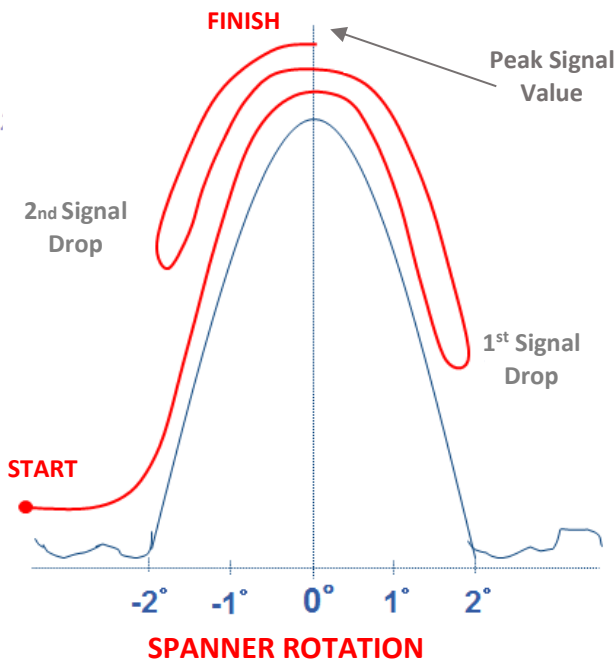
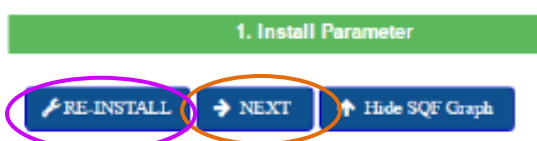**Figure 24**

Figure 25

Figure 26

Figure 27

PART 7: COMMISSIONING THE MODEM

Step 41: When the Modem starts the Registration no actions is needed, just verify the 3 steps have green flags (fig. 24)

Step 42: Click 'CLICK HERE TO COMPLETE INSTALLATION' and start the Self-Activation phase (fig. 24)

Step 43: You will now be redirected to the Self-Activation Portal where you can click on 'START ACTIVATION' (fig. 25)

NOTE: If you aren't redirected to the Activation Page type on your browser: **https://client.konnect.com/activation**
*If you are still not able to access it reboot your PC, and/or go to Start, type **CMD**, then type the commands: **ipconfig /release** and then **ipconfig /renew.** Then type again the Activation Page URL in your browser*

Step 44: Enter the Activation Key reported in the Work Order, and click 'ACTIVATE' (fig. 25)

NOTE: if the antenna size is not displayed, select the Antenna Size of your installation

Step 45: Wait for the popup message **Activation Successful** (fig. 26). Repeat Step 44 in case of failure

*NOTE: if an error message is displayed related to an insufficient signal level, improve your pointing starting from **Step 24**. if you can't improve it, please refer to your escalation channel*

Step 46: Wait 5-10 minutes to allow the update of the modem software version over-the-air (check on *System Status,* on the top right bar of the modem GUI, that **Software Download Status** is flagged in green and is *'Up to date'* – fig. 27)

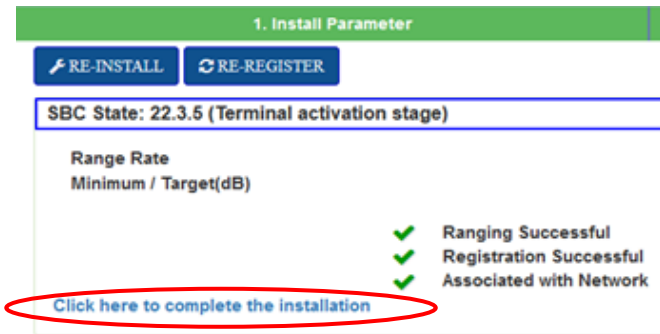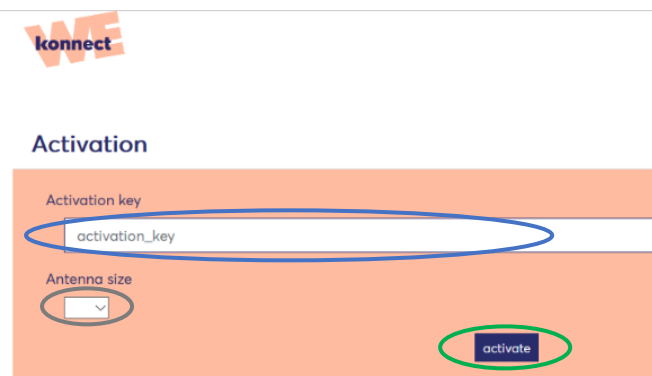**Step 47:** Use the following link for a reliable Speed Test via satellite: **https://speedprobe.konnect.com**
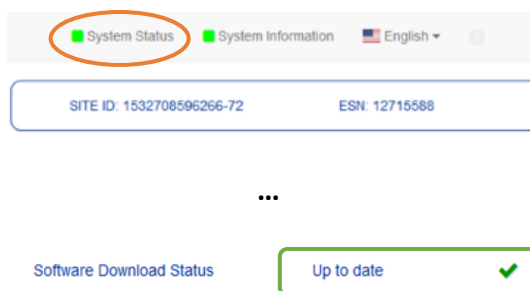
Figure 28

Figure 29

Figure 30

PART 8: CUSTOMER PORTAL

Step 48: Present to the client the Customer Portal (fig. 28) at the link: **https://client.konnect.com**

NOTE: the Customer Portal allows the customer to manage their account, and check invoices and data consumption. Credentials are sent to customer via email at the end of the order process

PART 9: WI-FI CONNECTIVITY

Step 49: Present to the client how to access the Wi-Fi network, using the parameters shown on the sticker on the back panel of the modem (fig. 29):

- The SSIDs for both 2.4GHz and 5GHz networks are listed. The password listed is the same for both networks.

- Using the customer device to pair, search for either wireless network matching these SSID.

- Connect to the network.

- Enter the Password (fig. 29).

NOTE: it is possible to manage Wi-Fi modem functionalities, typing 192.168.0.1 into the web browser connected (wirelessly or via LAN cable) to the modem, by following the steps below:

- Click the Wi-Fi Settings (fig. 31)
- Enter the default password: "admin"
- Click the LOGIN button

The Wi-Fi Settings home screen allows optional features like **(a)** Change the SSID WI-Fi Network Names and Password both for 2.4 & 5 GHz, **(b)** Change the default login password 'admin' by selecting on the left panel 'Administration' and 'Password Settings', **(c)** Disable Wi-Fi by unchecking "SSID enable" for each tab 2.4GHz, 2.4GHz Guest, 5GHz, and 5GHz Guest, **(d)** View which devices are connected, etc.
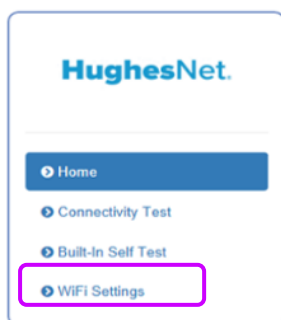
INSTALLATION METHOD USING THE APP

Figure 28, 29

Downloading the App

Konnect Install is a free-of-charge App that allows installers to Program, Point & Activate a Konnect system simply using a smartphone or tablet instead of a PC

Connecting to Wi-Fi

To use the SAT POINTER, activate the Wi-Fi on the device settings and choose the Wi-Fi network of the HT2000W modem using the credentials reported on back panel (fig. 12). A small router symbol on the top right of the App will become green to indicate the connection with the modem is On (fig. 30)

FINDER

Click on the App home page SAT FINDER to check the Satellite Line of Sight with the augmented reality tool (fig. 28, 29). This function is accessible without Wi-Fi connectivity to the modem.

SETUP

Click on the App home page SAT POINTER, note the antenna Elevation Value, then click 'NEXT: POINT' to enter the pointing mode to visualize the SQF (Signal Quality Factor) in real time. Concurrently the App will automatically (1) load the Modem Configuration file *sbc.bin* stored in the App, as shown by the confirmation message *'The Modem SBC file is up to date'*, and will automatically (2) program the modem using the Latitude/Longitude data from the GPS (fig. 30, 31).
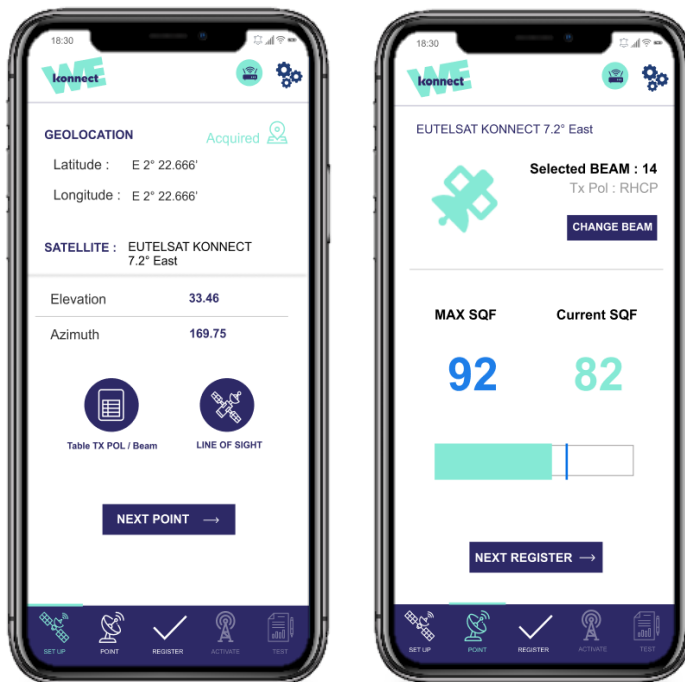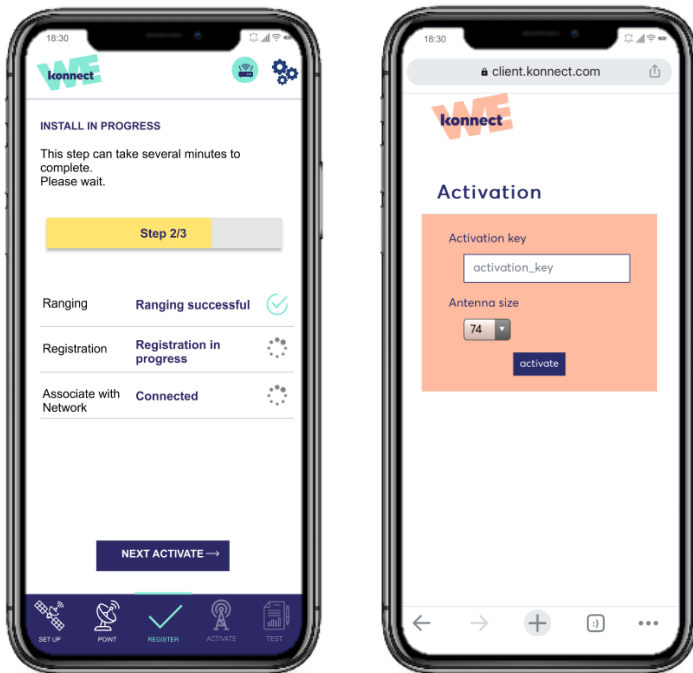

Figure 30, 31

Figure 32, 33

Figure 34, 35

POINT

Verify 'Selected BEAM' value (fig. 31) corresponds to the Beam reported in the Work Order, in case you need to change it click on 'CHANGE BEAM'. You can now point the antenna following the same process described in PART 6: POINTING THE ANTENNA, starting from STEP 27. The App will display the Current and MAX signals level SQF in real time to allow an optimal pointing process. Once you have finished pointing, click on 'NEXT: REGISTER' (fig. 31).

REGISTER

On the REGISTER tab wait a few minutes until the modem completes the 3-step registration phase and 3 green flags appear (fig. 32). Click on 'NEXT: ACTIVATE'

ACTIVATE

Enter the Activation Key reported in the Work Order and select the Antenna Size of your installation (fig. 33). Click 'ACTIVATE' and wait for the message 'Activation Successful' (fig. 34). Repeat this step in case of failure. Wait 5-10 minutes and check 'Software Download Status' is flagged in green and is 'Up to date' (fig. 34)

TEST

To perform a Speed Test via satellite click 'MAKE A SPEED TEST'. You can also upload your install photos on the PHOTO section of the TEST tab to allow the generation of an automatic Installation Report which includes the technical parameters of your install as well. Click on 'SEND BY EMAIL' (fig.35) to send via satellite the Installation Report. You can edit your email address on the Settings page on the top right
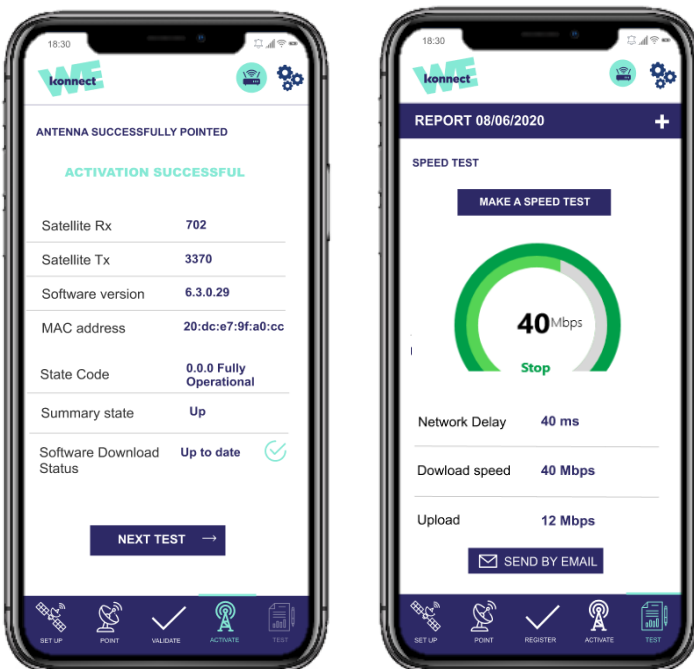
KONNECT Beams and TX Polarization values (Europe Beams)

Satellite	Beam	TX Pol
KONNECT 7.2 East	201	R
	202	L
	203	L
	204	L
	205	R
	206	R
	207	L
	208	R
	209	L
	210	L
	211	L
	212	L
	213	L
	214	L
	215	R
	216	L
	217	R
	218	R
	219	R
	220	L
	221	R
	222	R
	223	L
	224	L
	225	R
	226	L
	227	R
	228	L

2. Terminal Swap Procedure

The Terminal Swap Procedure allows the replacement of a faulty Modem. A Work Order will be issued to provide all the necessary parameters and information, with the new Activation Key that must be entered in the Self-Activation page. The following process must be implemented:

- Connect the new modem to the antenna coax cable and plug it to the power supply
- Program the Modem following all the steps of PART 5, including loading the sbc file {NOTE: enter the same Latitude and Longitude data (Step 23) used during the first install and reported in the Work Order}
- Check antenna pointing is correct by visualizing the SQF (Step 32) and click on NEXT (Step 40)
- Commission the Modem following all the steps of PART 7

NOTE: generally, there is no need to repoint the antenna, but if the SQF signal check shows an insufficient level, it is recommended to improve the pointing according to the steps of PART 6

3. Relocation Procedure

The Terminal Relocation Procedure allows to relocate a terminal (within one Beam or from one Beam to another) in case a customer changes address. A Work Order will be issued to provide all the necessary parameters and information. The installation process remains the same, with the exception that there is no need to start the Self-Activation phase and enter the Activation Key (Steps 42 to 45), since the process stops at the Registration Phase (Step 41) which in the Relocation case is composed of 5 Steps (Fig.36) instead of 3 (Fig.24) and ends with the message *Installation Completed!!!*

Figure 36

NOTE: Terminal Swap and Relocation are operations that cannot be concurrently performed. It is necessary to complete them in two separate steps: or perform the swap of the Terminal and then proceed with the Relocation or complete the Relocation with the old terminal and after that proceed with the Terminal swap.

4. Troubleshooting Table

The Jupiter terminal state code provides a concise indicator of error or marginal conditions (states) when the terminal is not operating in a fully operational and healthy state. Check it on System Status (click on the top right bar of the modem GUI, 192.168.0.1), or during the Pointing and Registration phases (Fig. 19 and Fig. 24), following the table below:

ERROR CODE & MESSAGE		PROBLEM	RESOLUTION
22.3.11	Unable to transmit successfully to the Gateway	This problem occurs generally when the BUC of the Transceiver doesn't work properly	Replace the Transceiver
30.1.1	Web Acceleration in backoff state	When this issue occurs, the ping reply time increase and you can also observe repeated micro cuts of the connection	Go to the modem GUI click on 'i' on the top right next to flag (fig.14), then on the left page click on 'Web Acceleration', click on 'Control' and finally click on 'Resetting' on MBX Reset window
3.1.1	Satellite cable appears to be unplugged or broken	You can see that the receiver led is off on the modem front panel	Check if the cable is correctly connected between to modem and the transceiver. Check if the cable or connector isn't damaged and replace them if necessary. Start investigation on the installation integrity, possibly requiring to repoint your antenna
22.3.24	Registration failed because terminal move not allowed	The terminal is attempting to Re-Register with a different terminal location, but a 'Move Allowed' has not been configured on the platform. This problem can also occur if are changed the Lat/Long coordinates (Step 24) of a modem already activated.	Either correct the terminal location to match the original values or escalate to determine why a move is not allowed
22.3.14	Registration failed because terminal failed to resolve NMS address	This problem occurs when the modem already commissioned presents an intermittent terminal issue	Reboot the modem until the unit goes back online correctly with a good NMS address resolved