Brdy ®

Konnect Jupiter3 VHTS Installation Guide

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 VHTS 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 Terminal.

Table of Contents

Fig.1 - INSTALLATION KIT

(parts included in the kit)

1.1 - Antenna Reflector (74cm)
- Reflector
- Antenna Arm
- Bolts/Nuts Box

1.2 - Antenna Canister (74cm)
- Tilt Plate
- Reflector Bracket
- AZ/EL Canister

1.3 - Antenna Transceiver (HT3200 - 2W)

**1.4 - TERMINAL Wi-Fi (WR3200)
or without Wi-Fi (WE3100)**
- TERMINAL WR3200/WE3100
- Power Supply
- Ethernet Cable

**1.5 - Coax Cable (30m)
(To verify if available in the ordered kit)**
- RG6 Outdoor 30m Coax Cable
- Waterproof Compression Connector
  (already compressed on the cable)
- Push-On Compression Connector
  (to Terminal, no need of compression tool)

**1.6 – Tri Mast
(To verify if available in the ordered kit)**
- 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 Terminal Connection & Antenna Pointing
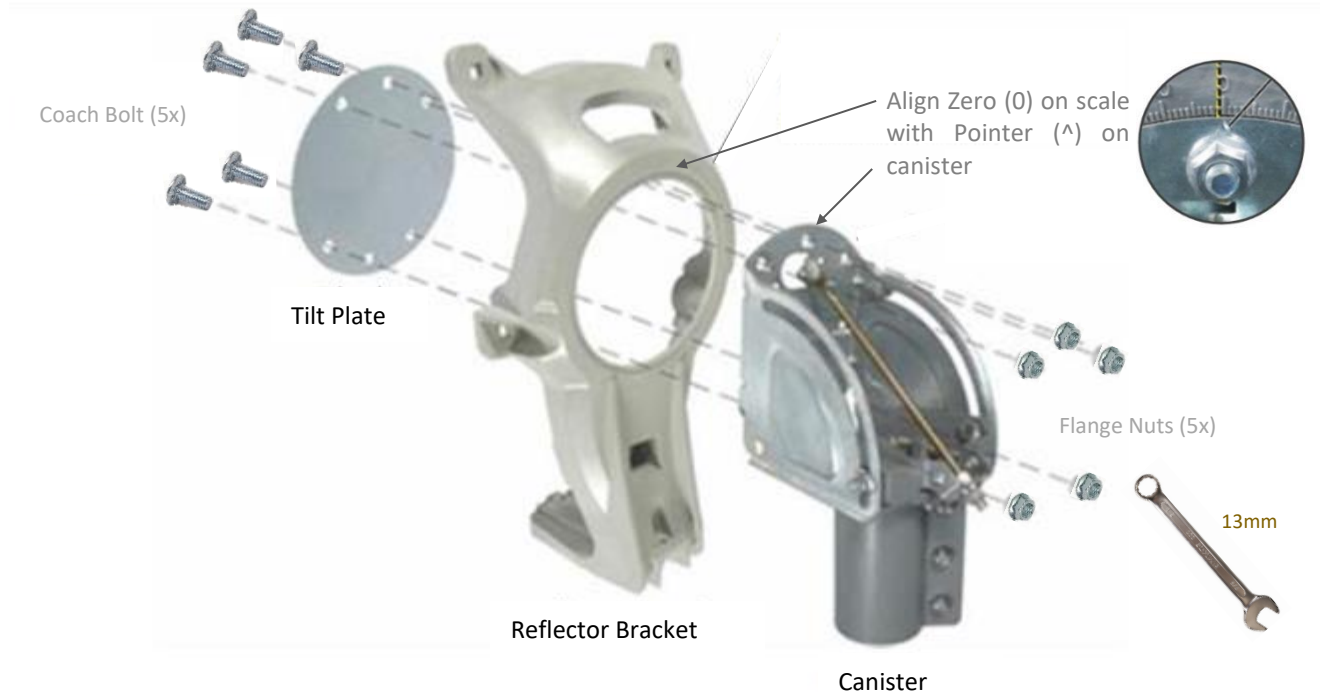
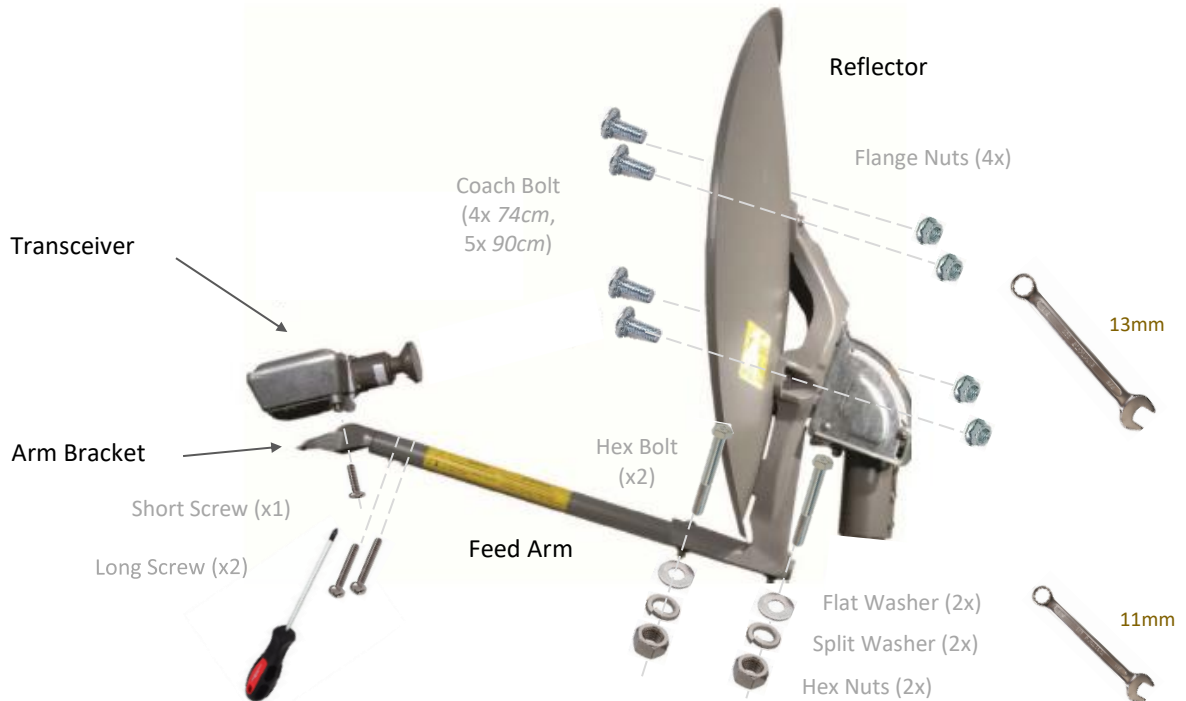| Smartphone | Compass | Laptop |

2.4 Mount Fixation

| Level | M8 Bolts | Driller |

Fig.3 - SYSTEM ASSEMBLY

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

Coach Bolt (5x)

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

Tilt Plate

Flange Nuts (5x)

13mm

Reflector Bracket

Canister

3.2 Antenna Reflector & Transceiver final assembly (74CM)

Reflector

Flange Nuts (4x)

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

Transceiver

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)
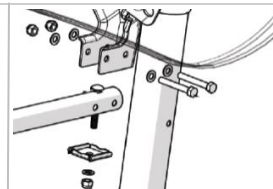- *Arm Bracket* is already fixed on the Feed Arm

Fig.4 - TRANSCEIVER

Figure 4.1: HT3200 radio assembly

Transmitter/Receiver

Polarizer waveguide

Feedhorn

The HT3200 radio assembly includes a block upconverter (BUC), a low-noise block converter (LNB), an orthomode transducer (OMT), a feedhorn, and a Ka-band satellite Modem. The HT3200 VSAT radio assembly has the following features:

- Simple installation using a single IFL / coax cable

- Extended Ka-band frequency range support

- Electronic polarization selection capability (No manual adjustment required – do not unscrew the feed)

ATTENTION: To start Terminal programming/commissioning it is necessary that the HT3200 Transceiver and Wi-Fi Terminal WR3200 (or no Wi-Fi Terminal WE3100) **are connected through the Coax Cable. If the connection is missing the modem GUI will not appear.**

ATTENTION: Poor connectors or fixing of the coaxial cable may lead to **packet loss from 3% to 5%** into the customer equipment. A ping test to measure loss is highly advised following the activation to ensure this condition is not present
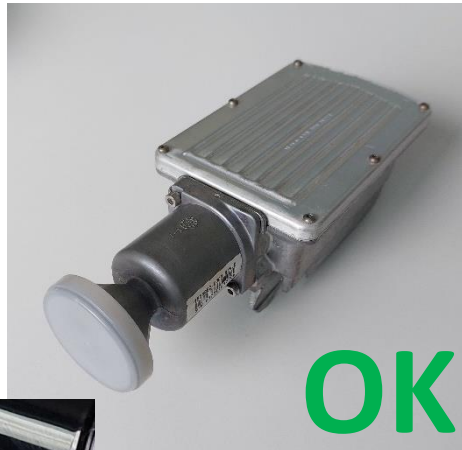
Fig.5 - IDU/ODU ASSOCIATION

ATTENTION: previous generation Jupiter2 electronics shall never be mixed with the new Jupiter3 electronics

HT2000W (IDU)

OLD TRANSCEIVER (ODU)

OK

NEW TRANSCEIVER (ODU)

X

MODEM INSIDE TERMINAL

WR3200 (IDU) with Wi-Fi

OLD TRANSCEIVER (ODU)

X

NEW TRANSCEIVER (ODU)

OK

MODEM INSIDE TRANSCEIVER

WE3100 (IDU) no Wi-Fi

OLD TRANSCEIVER (ODU)

NEW TRANSCEIVER (ODU)

MODEM INSIDE TRANSCEIVER

Fig.6 - ANTENNA CONTROL BOLTS
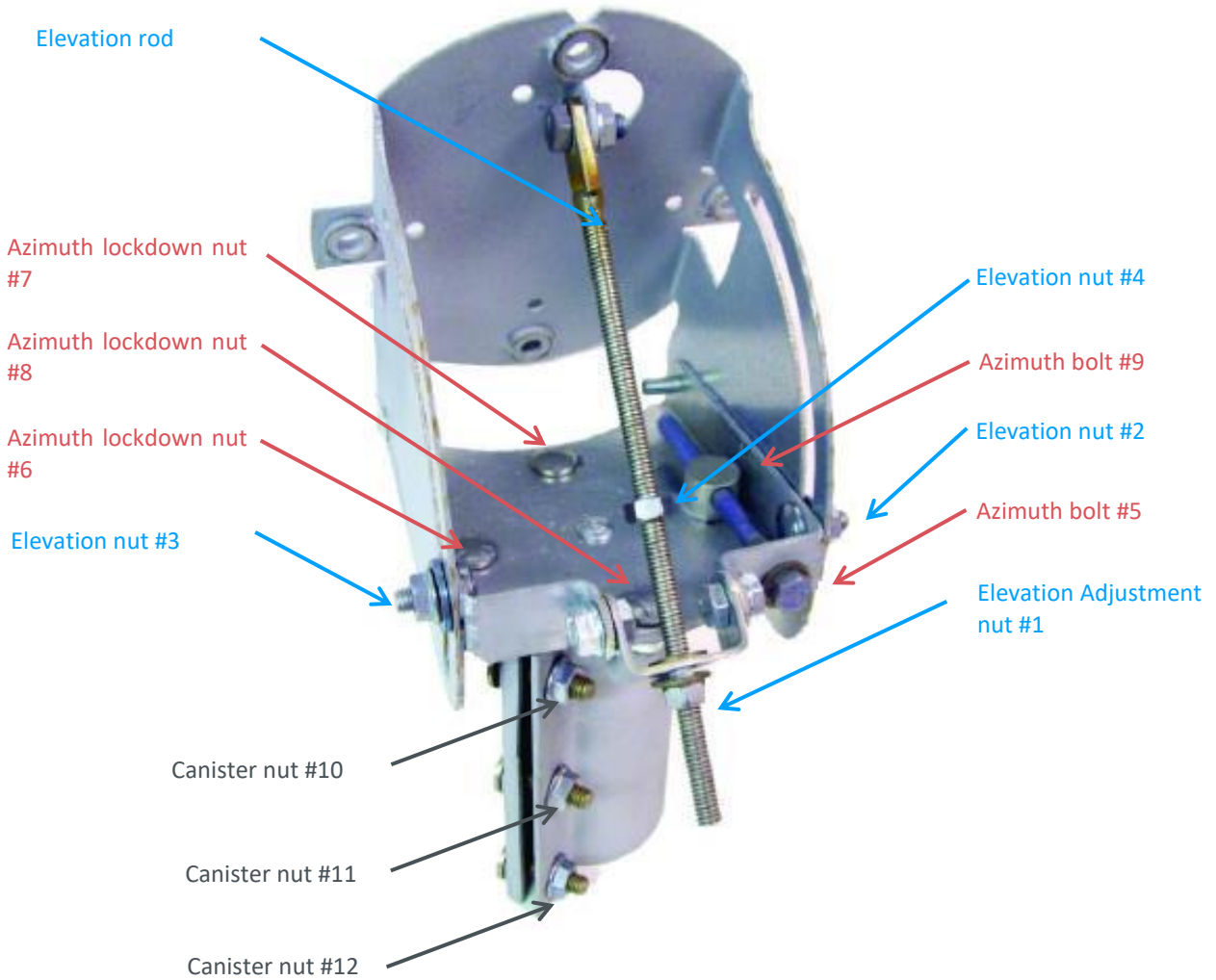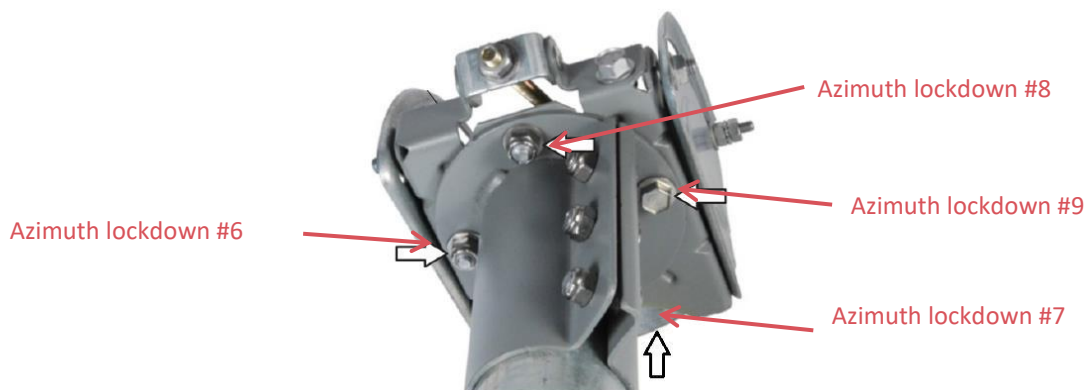
Figure 6.1: Antenna bolts and nuts

Elevation rod

Azimuth lockdown nut #7

Azimuth lockdown nut #8

Azimuth lockdown nut #6

Elevation nut #3

Elevation nut #4

Azimuth bolt #9

Elevation nut #2

Azimuth bolt #5

Elevation Adjustment nut #1

Canister nut #10

Canister nut #11

Canister nut #12

Figure 6.2: Azimuth lockdown nuts

Azimuth lockdown #8

Azimuth lockdown #9

Azimuth lockdown #6

Azimuth lockdown #7

NOTE: The pole for the installation must ensure the following requirements:
- ✓ **Diameter 60 mm**
- ✓ **Thickness 2-3 mm**

INSTALLATION STEPS USING THE PC

PART 1: PREPARING THE INSTALL

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 Terminal to provide the satellite parameters. It can be provided by your field manager

Step 4: Check you have the **Work Order** (fig. 6.3) which provides all the information to perform an install for a specific customer:

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

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

Activation Key => to activate the Terminal

Figure 6.3

Figure 7
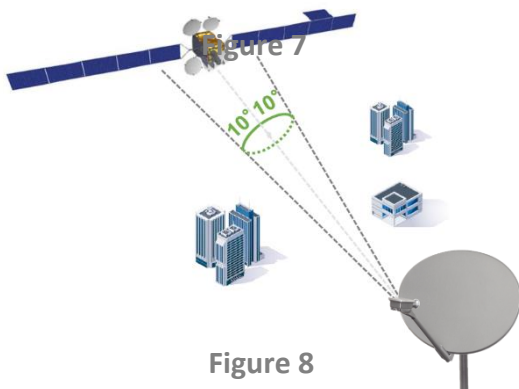

Figure 8

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 VHTS Install** or use a Clinometer & Compass. The orbital position of KONNECT VHTS satellite is **2.7 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

NOTE: If you should fix the trimast on the ground please directly point the central biggest leg in the direction of the satellite, as to make the pointing step easier
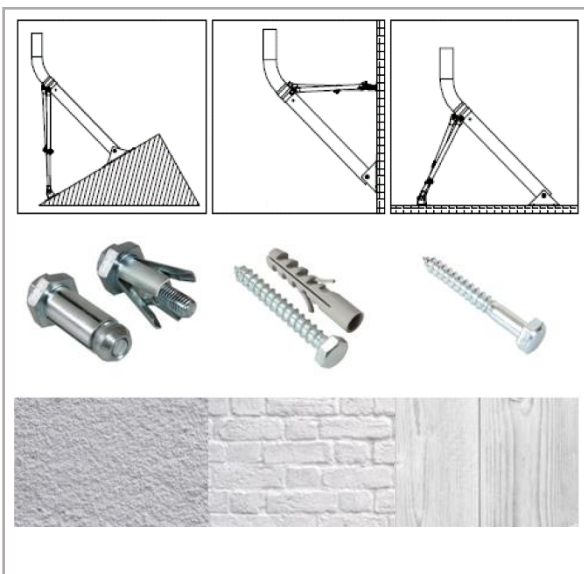
Figure 10

6 mm length

Figure 11

Figure 12

PART 3: ASSEMBLING THE SYSTEM

Step 10: Assemble the Antenna: Reflector, Canister, Arm, Bracket, Transceiver (fig. 3)

Step 11: Install the antenna on the mast and check with a level that it is vertical

Step 12: 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)

PART 4: CONNECTING THE SYSTEM

Step 13: 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 14: Prepare the indoor side of the cable with a cable stripper (fig.11), introduce the Push-On Connector, and connect it to the Terminal (no need of compression tool)

Step 15: Carefully tighten the connector with 11mm spanner (during this process the Push-On connector will compress on the cable)

Step 16: Plug the Terminal to the power supply

Step 17: Connect the Terminal and PC via Wi-Fi using the credentials reported on back panel of the Terminal (fig. 12). You can also connect directly with an ethernet cable
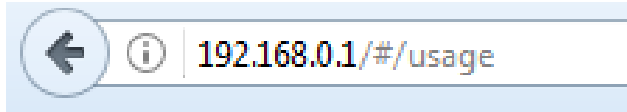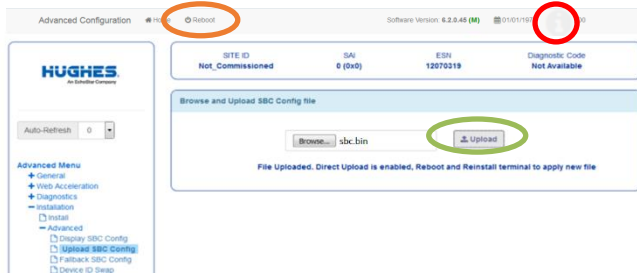
Figure 13

Figure 14

Figure 15

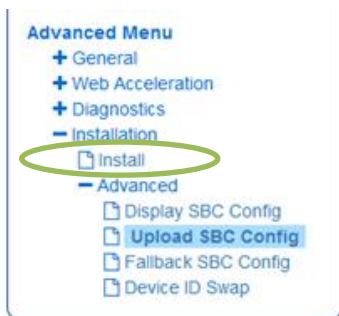**Figure 16**

PART 5: PROGRAMMING THE TERMINAL

Step 18: On your PC Enable *DHCP* (flag *'Obtain an IP address automatically'*) and Disable *Proxy* server (unflag *'Use a proxy server for your LAN'*)

Step 19: Open a Web Browser on the PC and type **192.168.0.1** in the address field and press Enter to visualize the Terminal's homepage (fig. 13)

NOTE: select a Browser among Firefox, Google Chrome, Apple Safari. **DO NOT USE EDGE**

Step 20: Load the Sat Terminal Configuration file *sbc.bin*:
- On the top bar on the right click *'i'* icon to access the Advanced Page (fig. 14)
- On the left panel 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)

Step 21: Click 'INSTALL' on the left side panel (fig. 15) to open the installation page

Step 22: Enter Latitude & Longitude (fig.16) of the installation location from your Work Order (**using Degrees and Decimal Minutes Format**).

NOTE: > If you need to convert Decimal Degrees coordinates (i.e. Google Maps) into Degrees and Decimal Minutes Format you can use **https://www.geoplaner.com/** *or similar coordinates converters (**see details on page 15**)*

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

Step 23: Select the Satellite KVHTS-ETL. Flag Beam Override (fig.16) and check or select the Beam Number corresponding to the one reported in the Work Order (select the which one with "R" letter at the end). **Pay attention**! Sometimes the Beam reported in the work order is not the same as recommended from the User Interface. In this case please choose the one from Work Order. After that click **Submit**

Note: How to use www.geoplaner.com (coordinates conversion to Degrees and Decimal Minutes)

1 - Type the address or the coordinates of the Installation Location

2 - Select the Degrees and Decimal Minutes fomat for the User Interface

Figure 17

Figure 18

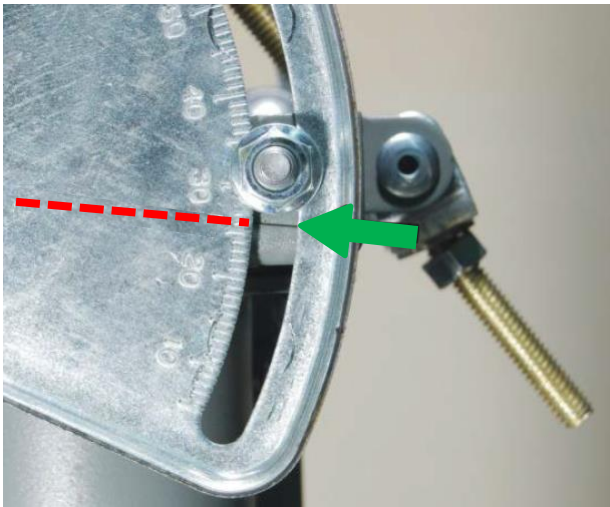NOTE: Please, the value inside the red box are just suggested by the system but are not to be considered given the workorder is the file who provide the exact infos.

Step 24: Identify the correct elevation value (It can be provided by the Work Order or by the Konnect VHTS Install App)

Step 25: Check Elevation nuts #2 and #3 are loose and spin Elevation nut #4 until it is 5 cm up the elevation rod (fig. 6)

Step 26: Set Elevation on the Antenna with Elevation Adjustment nut #1 (fig. 6) using the Scale and Marker (fig. 17) or a digital inclinometer to better the accuracy

Step 27: Check 4 Azimuth nuts #6, 7, 8 and 9 are loose (fig. 6) and move Azimuth Adjuster bolt #5 until the fine azimuth upper bolt is centered (fig. 6)

Step 28: Check the 3 canister nuts #10-12 are loose (fig. 6)

Step 29: Visualize the SQF (Signal Quality Factor) on the Terminal page (fig. 18). 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 30: 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 26 & 30** optimizing the elevation until you find the satellite.

Step 31: Fix the Antenna by tightening the canisters bolts #10-12 (fig. 6) on the pole of your mast as tight as possible
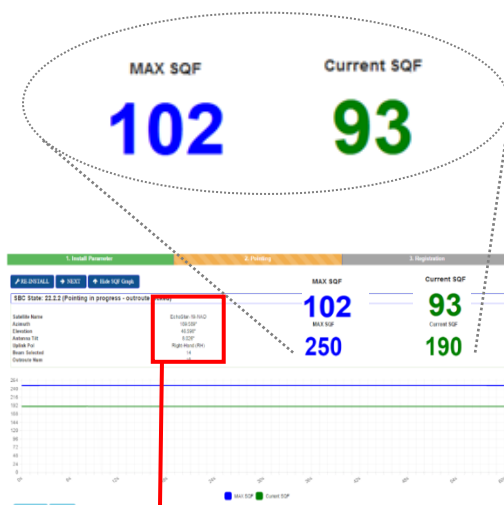
NOTE: In order to help the pointing the antenna is equipped with a **beep sound**. The beep is only an aid and has not to be considered valid to check over the pointing completed. Pointing must always be maximized via user interface on PC or App.
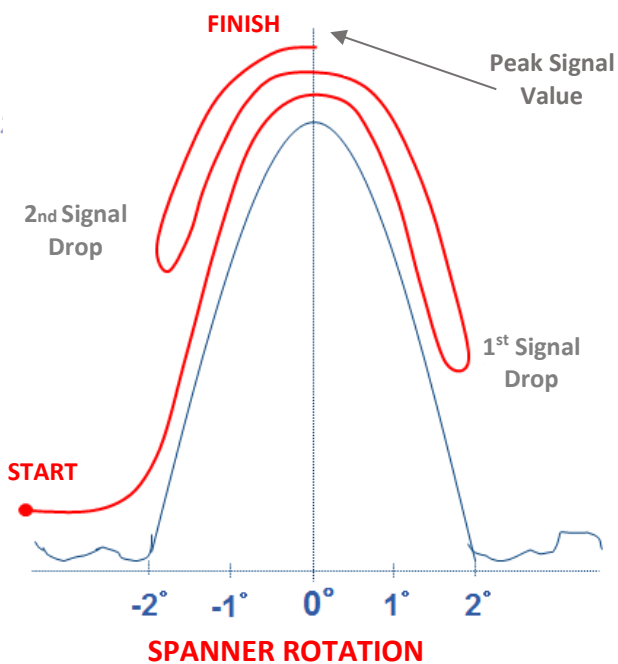
FINISH

Peak Signal Value

2nd Signal Drop

1st Signal Drop

START

-2°   -1°   0°   1°   2°

SPANNER ROTATION

Figure 19

MAX SQF   Current SQF

102   102

Figure 20

#4

Figure 21

1. Install Parameter

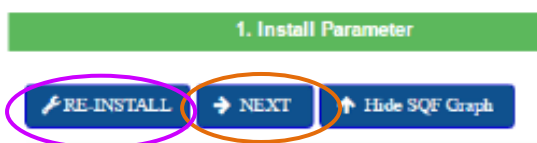RE-INSTALL   → NEXT   ↑ Hide SQF Graph

Figure 22

Step 32: **Fine pointing Azimuth to maximize the signal (fig. 19):**

- Rotate Azimuth bolt #5 (fig. 6) 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 33: **Fine pointing Elevation to maximize the signal (fig. 20):**

Repeat the same procedure as Step 35 using the Elevation Adjustment nut #1 (fig. 6)

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 32 and 33 to improve the accuracy of your pointing. SQF 102 is only an example, since SQF values depends on locations and weather conditions*

Step 34: Lock off the 3 azimuth locking nuts #6-9 (fig. 6)

Step 35: Lock off the 2 elevation locking nuts #2, #3 (fig. 6), and spin the elevation nut #4 until the bottom of the elevation rod (fig. 21)

Step 36: Check the antenna pointing by gently pushing & pulling at the top/left/right

Step 37: Click 'NEXT' on the top left of the Terminal webpage (fig. 22).

*NOTE: If you can't click on NEXT because it is grey, it means your signal level is not sufficient to activate the Terminal and you need to click 'RE-INSTALL' and improve the antenna pointing starting again from **Step 24** [if you don't succeed and if requested by your escalation level, re-pointing should start from **Step 23** trying one by one the listed beams in the Beam Override window, and finally selecting the one with highest SQF]*
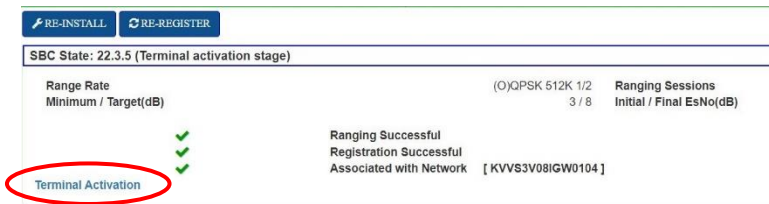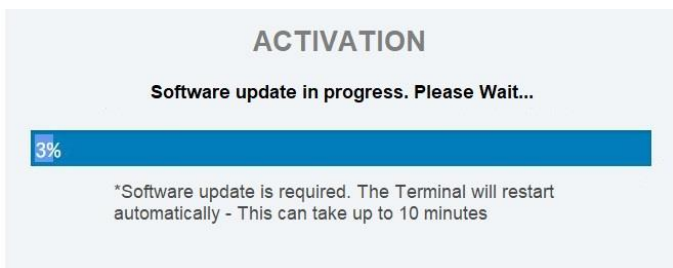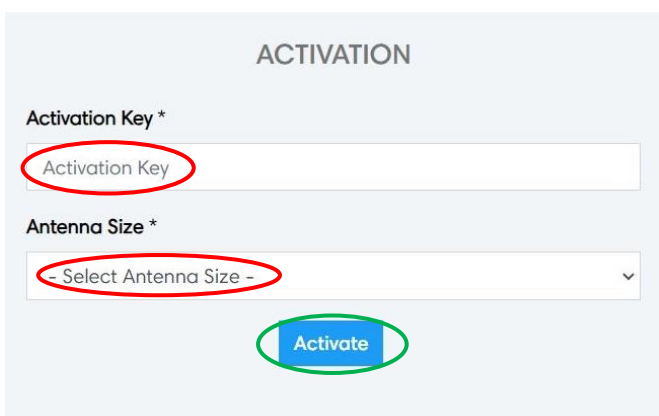
Figure 23

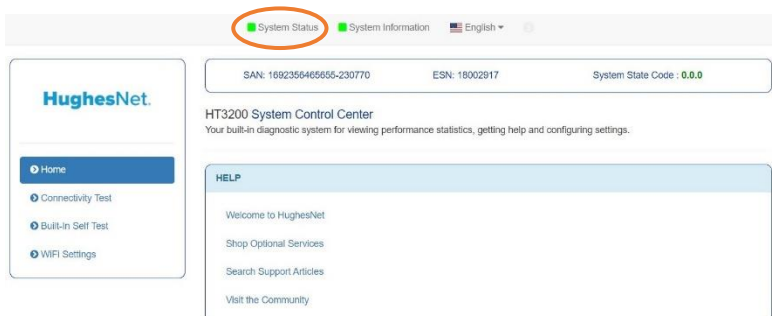**Figure 24**

Figure 25

Figure 26

Figure 27

PART 7: COMMISSIONING THE TERMINAL

Step 38: When the Terminal starts the Registration no action is needed, just verify the 3 steps have green flags (fig. 23)

Step 39: Click 'TERMINAL ACTIVATION and start the Self-Activation phase (fig. 23)

Step 40: The software will be automatically updated (fig. 24)

Step 41: You will now be redirected to the Activation Portal where you can start activation (fig. 25)

NOTE: If you aren't redirected to the Activation Page type on your browser: **activation.eutelsat.com**
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 42: Enter the Activation Key reported in the Work Order, Select Antenna Size and click 'ACTIVATE' (fig. 25)

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

Step 43: Wait for the popup message **Activation Success!** (fig. 26). Repeat Step 41 in case of failure

NOTE: if an error message is displayed related to an insufficient signal level, improve your pointing starting from **Step 22**. *if you can't improve it, please refer to your escalation channel*

Step 44: Go back to the Terminal GUI and check on *System Status*, on the top left bar of the Terminal GUI, is flagged in green – fig. 27)
NOTE: if there were problems with reloading the page restart the terminal (On/Off) and try to reload it

Step 45: Use the following link for a reliable Speed Test via satellite:
https://speedprobe.konnect.com

Figure 28

Figure 29

Step 46: Present to the client how to access the Wi-Fi network, using the parameters shown on the sticker on the back panel of the Terminal (fig. 28):

- The SSIDs and password listed are just one per each (No 2,4 and 5 GHz)

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

- Connect to the network.

- Enter the Password (fig. 28).

NOTE: it is possible to manage Wi-Fi Terminal functionalities, typing 192.168.42.1 into the web browser connected (wirelessly or via LAN cable) to the Terminal, by following the steps below:

- Click the Wi-Fi Settings (fig. 29)
- Enter the default password: "is the password wrote on the back of the terminal. For example store31sing (fig.28)"
- Click the LOGIN button

The Wi-Fi Settings home screen allows optional features like **(a)** Change the SSID Wi-Fi Network Names and Password, **(b)** Change the default login password by selecting on the left panel 'Administration' and 'Password Settings', **(c)** Disable Wi-Fi by unchecking "SSID enable" for each tab **(d)** View which devices are connected, etc.

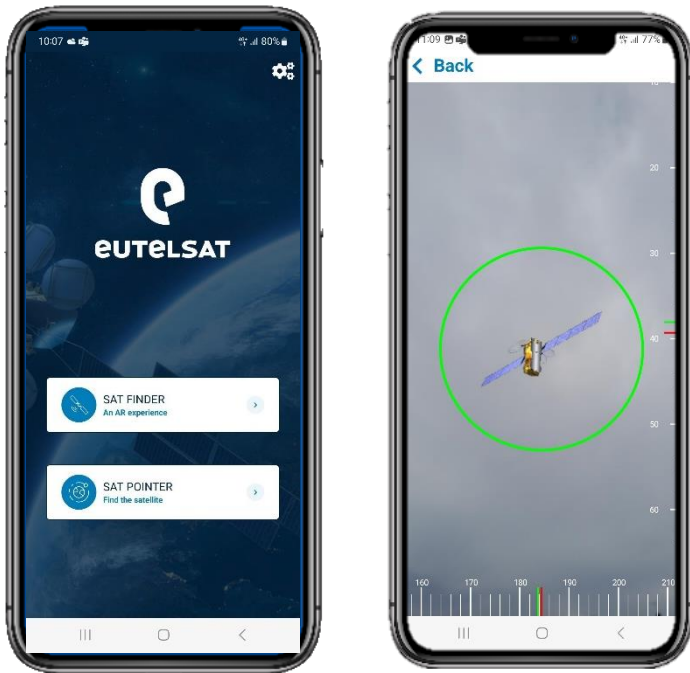# INSTALLATION METHOD USING THE APP

Figure 30, 31

Figure 32, 33

Downloading the App

Konnect VHTS Install is a free-of-charge App that allows installers to Program, Point & Activate a Konnect VHTS 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 WR3200 Terminal 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 Terminal is On (fig. 32)
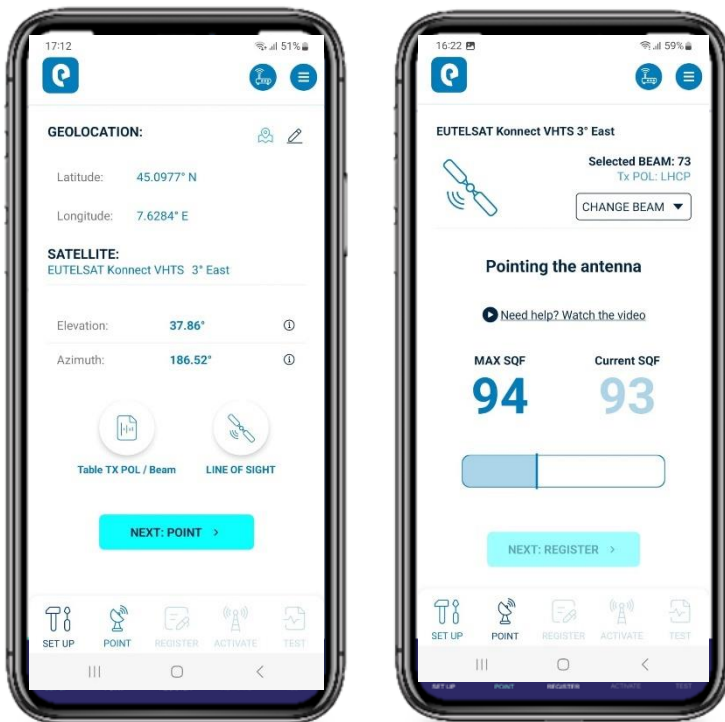
FINDER
Click on the App home page SAT FINDER to check the Satellite Line of Sight with the augmented reality tool (fig. 30, 31). This function is accessible without Wi-Fi connectivity to the Terminal.

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 Terminal Configuration file *sbc.bin* stored in the App, as shown by the confirmation message *'The Terminal SBC file is up to date'*, and will automatically (2) program the Terminal using the Latitude/Longitude data from the GPS (fig. 32).

Figure 33, 34

POINT

Verify 'Selected BEAM' value (fig. 32) 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 24. 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. 32).
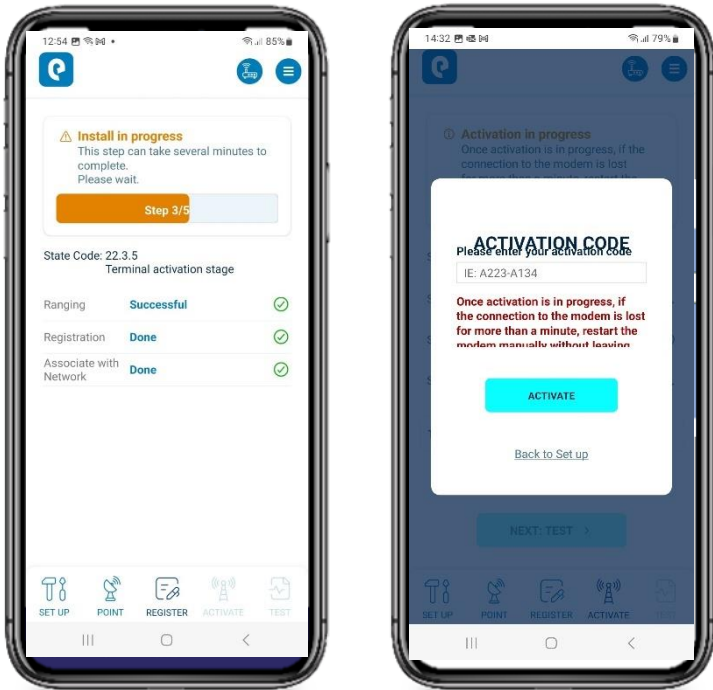
REGISTER

On the REGISTER tab wait a few minutes until the modem completes the 3-step registration phase and 3 green flags appear (fig. 33). Click on 'NEXT: ACTIVATE'
Before to enter the activation key the system will be automatically updated (It can takes until 10 minutes)
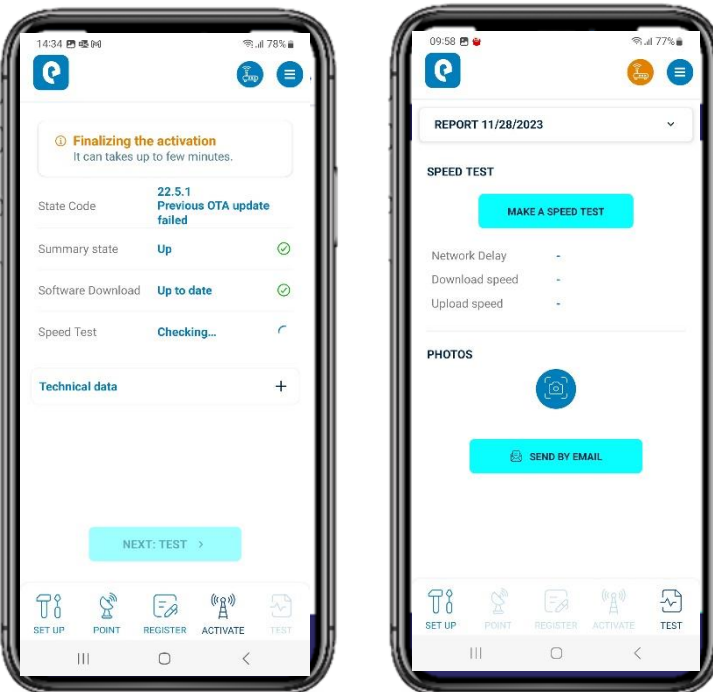
ACTIVATE

Enter the Activation Key reported in the Work Order and select the Antenna Size of your installation (fig. 34). Click 'ACTIVATE' and wait for the message 'Activation Successful'. 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. 35)

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.36) to send via satellite the Installation Report. You can edit your email address on the Settings page on the top right

Figure 35, 36

ANNEX

1. Terminal Swap Procedure

The Terminal Swap Procedure allows the replacement of a faulty Terminal. A Work Order will be issued to provide all the necessary parameters and information, no need for a new Activation Key. The installer shall use the old one. The following process must be implemented:

- Connect the new Terminal (Tria) to the antenna coax cable and plug the Terminal to the power supply.
- Program the Terminal following all the steps of PART 5, including loading the sbc file {NOTE: enter the same Latitude and Longitude data (Step 22) used during the first install and reported in the Work Order}
- Check antenna pointing is correct by visualizing the SQF (Step 31) and click on NEXT (Step 39)
- Commission the Terminal 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

2. 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 41 to 44), since the process stops at the Registration Phase (Step 38) which in the Relocation case is composed of 5 Steps (Fig.23) instead of 3 (Fig.26) and ends with the message *Installation Completed!!!*

SBC State: 0.0.0 (Fully operational)

Range Rate	OGPSK 512K 1/2
Minimum / Target(dB)	5.1 / 5.8
Ranging Sessions	3
Initial / Final EsNo(dB)	18 / 5.8
✔ Ranging Successful	Done
✔ Registration Successful	Done
✔ Associated with Network [ALB14HNSIGW11A001]	Done
✔ Configuration Downloaded	Done
✔ Installation Completed!!! [SAI 12685]	Done

Figure 37

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.

3. 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 Terminal GUI, 192.168.0.1), or during the Pointing and Registration phases (Fig. 17 and Fig. 23), 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 Terminal 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 Terminal front panel	Check if the cable is correctly connected between to Terminal 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 Terminal 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 Terminal already commissioned presents an intermittent terminal issue	Reboot the Terminal until the unit goes back online correctly with a good NMS address resolved
21.2.11	**Associated with Wall Garden IPGW due to Billing suspension**	This message (because has not to be consider as an error) appears during the activation of a Tria that has been already activated at least once.	The message just show that the Tria is ready for the activation. The installer must insert the new Activation Key as to let the system come back online
N/A	**File Upload Rejected – Not more recent**	The terminal has an embedded sbc file that is more recent than the file that the engineer is trying to upload	The Engineer must upload the most recent sbc file available released. The problem is caused by the obsolescence of the previous sbc file