THURAYA MARINECOMMS

Thuraya ATLAS IP Satellite Terminal

Installation Manual
Revision 2.0

LIST OF CONTENT:

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REGULATORY INFORMATION

FC **FEDERAL COMMUNICATION COMMISSION NOTICE**

FCC Identifier: QO4-AVIATLASIP

USE CONDITIONS:

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

> (1) This device may not cause harmful interference, and
> (2) This device must accept any interference received, including interference that may cause undesired operation.

NOTE:

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

· Reorient or relocate the receiving antenna.
· Increase the separation between the equipment and receiver.
· Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
· Consult the dealer or an experienced radio/TV technician for help.

IMPORTANT NOTE: EXPOSURE TO RADIO FREQUENCY RADIATION

This device complies with FCC radiation exposure limits set forth for an uncontrolled environment. The antenna used for this transmitter must be installed to provide a separation distance of at least 100cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

FCC CAUTION:

Any changes or modifications not expressly approved by the manufacturer could void the user's authority, which is granted by FCC, to operate this Maritime Broadband Satellite Terminal, ATLAS IP.

Declaration of Conformity:

Addvalue Innovation Pte Ltd., 8, Tai Seng Link, Level 5 (Wing 2), Singapore 534158.

declares under our sole responsibility that the Product, brand name as Thuraya and model: ATLAS IP, Maritime Broadband Satellite Terminal to which this declaration relates, is in conformity with the following standards and/or other normative documents:

> **ETSI EN 301 489-1, -17, -19, -20, ETSI EN 301 444, ETSI EN 300 328, EN 60945, IEC 60950 - 1 AND EN 60950-1,**

We hereby declare that all essential radio test suite have been carried out and that the above named product is in conformity to all the essential requirements of Directive 1999/5/EC.

The Conformity Assessment procedure referred to Article 10 and detailed in Annex [III] or [IV] of Directive 1999/5/EC has been followed with involvement of the following notified body(ies):

> **TIMCO ENGINEERING, INC., P.O BOX 370,NEW BERRY, FLORIDA 32669.**
>
> **Identification mark: 1177 (Notified Body number)**

The technical documentation relevant to the above equipment are held at:

· Addvalue Innovation Pte Ltd., 8, Tai Seng Link, Level 5 (Wing 2), Singapore 534158.

· Signed by Mr. Tan Khai Pang (Chief Technology Officer, September 29, 2014) and Mr. Prabakar Kuttaniseeri (Manager- Quality Management, September 29, 2014).

SAFETY INSTRUCTIONS

For the sake of safety and protection, read the manual before attempting to use Thuraya Atlas IP Terminal.

The following general safety precautions must be observed during all phases of operation, service and repair of this equipment. Failure to comply with these precautions or with specific warnings elsewhere in this user guide violates safety standards of intended use of the terminal.

Addvalue Innovation Pte Ltd assumes no liability for the customer's failure to comply with these requirements.

Hazard Symbols

Antenna Radiation Warning and Distance to other Radiation Equipment	For safety reasons, all personnel must keep at least 1 meter from the ADU.
Power Supply	Turn off the power at the mains switchboard before beginning of the installation. Confirm the power voltage is compatible with voltage rating of the equipment. It is highly recommended to use +24V DC power line, provided that it is available on the vessel. In case of unavailability of +24V DC power line provided by the vessel, an external AC/DC power supply of 115/230V AC with its output of +24V DC can be used. **Note:** The requirements of the AC/DC power supply should take care of **high surge current of 25A at 24V DC for 1ms.**

Grounding, cables and connections	The chassis of the equipment must be connected to an electrical ground. This will minimise electric shock and mutual interference. In short, the EQUIPMENT must be grounded to the vessel.
Service	Do not attempt to access to the interior of the equipment. Only qualified personnel authorized by its manufacturer may perform service. Failure to comply with this rule will result in the warranty void. Under certain conditions, dangerous voltages may exist even with the power cable removed. To avoid injuries, always disconnect power before accessing the equipment.

Alert Symbol

Alert Button	For triggering an emergency alert.

Equipment Ventilation

To ensure adequate cooling of the terminal, 5-centimeter of unobstructed space must be maintained around all sides of the unit except the bottom side. The ambient temperature range of the transceiver is: -25°C to +55°C.

Fire Precautions

The equipment shall not be operated in the presence of flammable gases or fumes as well as any explosive atmosphere. Operation of any electrical equipment in such an environment constitutes a definite safety hazard.

Obtaining Licensing For Thuraya Transceivers

Under rights given under ITU Radio Regulations, local telecommunications administrations establish and enforce national rules and regulations governing types of emissions, power levels, and other parameters that affect the purity of signal, which may be radiated in the various frequency bands of the radio spectrum.

To legally operate Thuraya equipment, it is necessary to obtain permission from the local telecommunications regulatory authorities of the country you are operating from. Using your equipment in any country without permission causes you to run the risk of confiscation of the equipment by the local authorities. The normal procedure to bring such equipment into another country is to apply for a license before travel. If a license has not been obtained before travel, the equipment may be put in to storage by local authorities until such time license is obtained.

IMPORTANT INFORMATION TO INSTALLERS AND USERS

General

It is important that the user of this equipment read and observe all safety requirements and operate the terminal according to the descriptions published in this manual.

Failure to comply may result in risk of injury or equipment failure and voids the validity of the warranty provided by equipment manufacturer.

The terminal consists of 2 systems, BDU and ADU and they must be used as provided by the manufacturer or authorized dealer. Do not substitute any one of the system which is not provided by the manufacturer or authorized dealer. Should needs of servicing or replacement is required, always contact the distributor or manufacturer for instructions.

Any modifications or attempts to open up the devices by not authorized personnel will void the warranty.

Contents in this manual are subjected to change without notice and may contain errors or inaccuracies. The manual us periodically revised and updated. To obtain latest version, please enquire it from product manufacturer or distributor.

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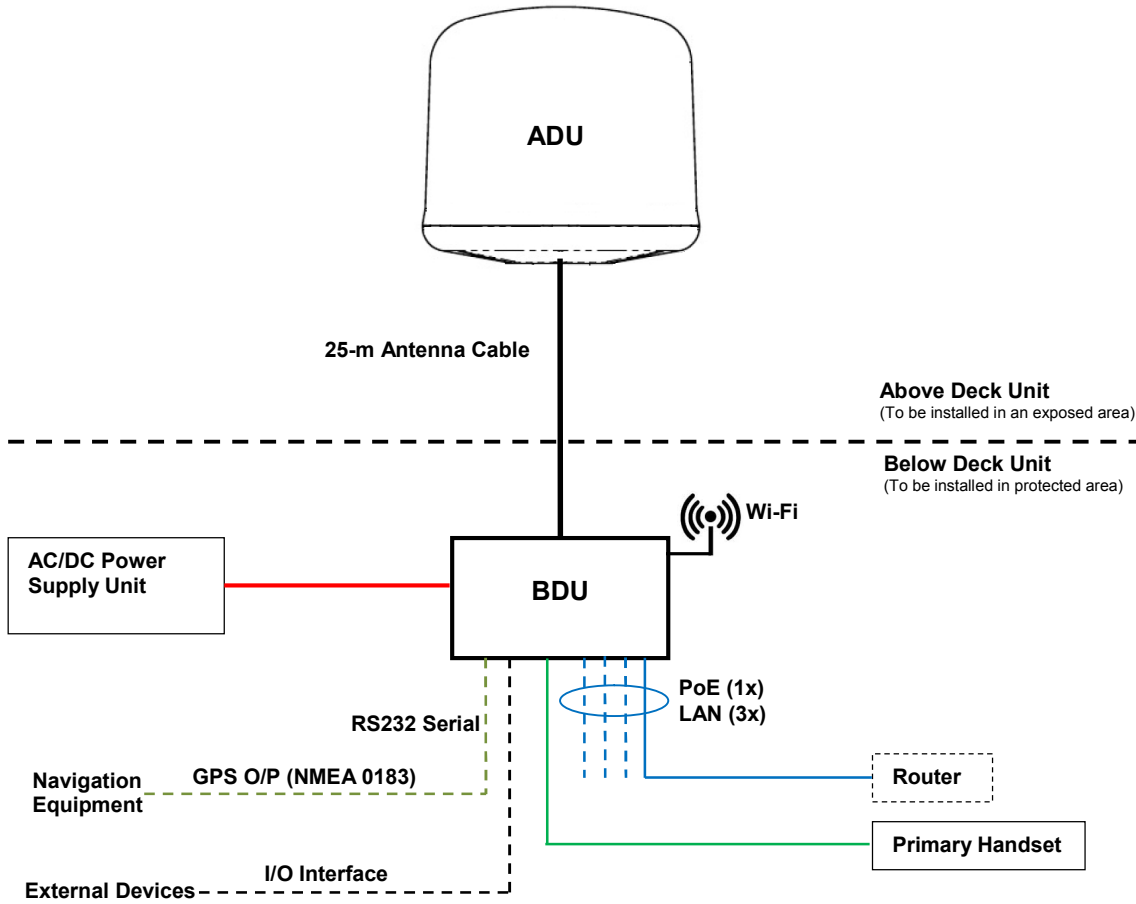
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SYSTEM CONFIGURATION

Solid line refers to the basic configuration of the Atlas IP Terminal which includes the cables of DC power, primary handset, antenna and LAN.

Additionally, the purpose of the above block diagram with the cable routing is to provide assistance to authorised service personnel for the installation of the Atlas IP terminal

1 ATLAS IP TERMINAL

1.1 Introduction

The Atlas IP terminal consists of two units;

- ➲ Below Deck Equipment (BDU) which is a communication unit
- ➲ Above Deck Equipment (ADU) which is an antenna unit

1.2 Above Deck Equipment

The ADU is an active tracking antenna unit.

The radome covers the antenna unit, which is comprised of

- ➲ Antenna Module
- ➲ RF and GPS Module
- ➲ Rotary Joint
- ➲ Antenna Pedestal

The antenna module includes a low noise amplifier (LNA), high power amplifier (HPA), and tracking receiver circuitry. All the signals and power pass through a single coaxial antenna cable, which connects the ADU to the BDU.

1.3 Below Deck Equipment

The BDU is the heart unit of the Atlas IP Terminal. It has several interface ports and handles all communication links between the ADU and the local communication devices such as analog telephone, computer, network equipment, navigation equipment etc.

The BDU requires +12V or +24V DC power supply input. The BDU supplies the ADU via the single RF / coaxial antenna cable.

1.4 Wired Primary Handset with Cradle

The wired Primary Handset has a colour liquid crystal display (LCD) and keypad for making and receiving normal voice calls and sending SMS. The handset is provided with a cradle.

Additionally, it can serve as a remote access to the BDU for the user for a selection of functions.

The Primary Handset's connector is plugged into the BDU's primary handset port. It is powered directly from the BDU.

## 2   INSTALLATION OF ATLAS IP TERMINAL

2.1   Installation of ADU

2.1.1   Overview

In general, any obstructing objects like a mast near the antenna unit can block reception or transmission from a satellite's line of sight. In addition, RF radiation emitting from the antenna will affect the human body. When selecting a mounting location, it is important to ensure that the antenna unit shall be free of severe vibration and shock and heat and smoke from funnel. More guidelines will be detailed in the next sections.

2.1.2   Radiation Hazard

Radio wave can pose hazard to human body. Safe distances are changed, subjected to country and ship construction. There is no standard formula to calculate safe distance. The below guidelines are to be noted.

ADU
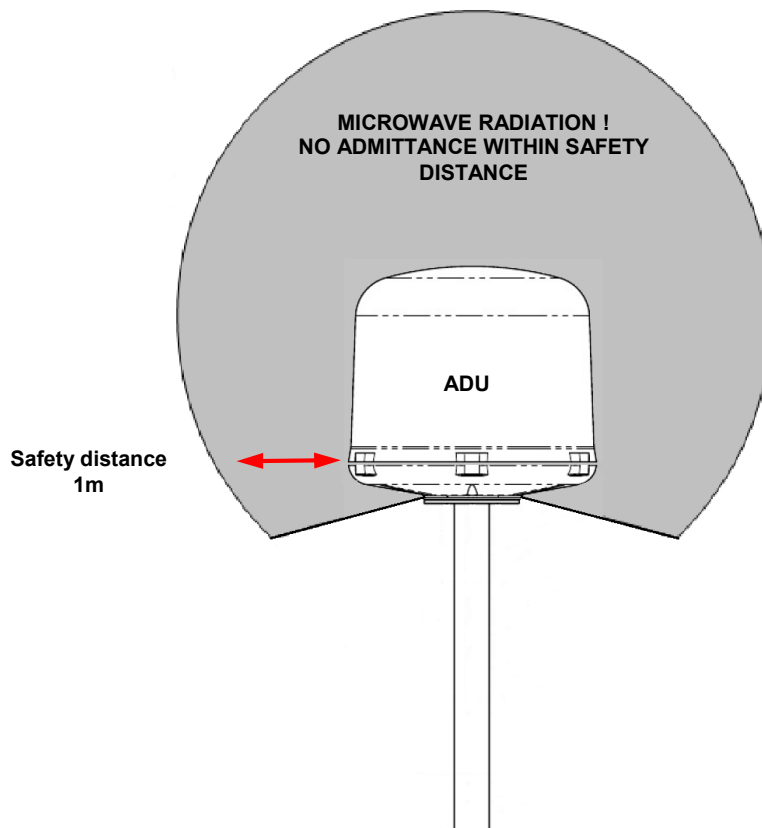
WARNING: Keep away from the antenna radome at the mentioned safe distance when it is transmitting. Microwave radiation can be harmful to human body, particularly the eyes.

2.1.3   Distance to Radar / Radio Equipment

The placement of the antenna should always be chosen so that the distance to other transmitting equipment is as far as possible because these may compromise the antenna performance. This includes the ships radar, high power transmitting radios, and other satellite transceivers. The RF emission from radars may actually damage the antenna.

Radar

To give exact minimum distances between the antenna and radars is difficult due to the fact that radar power, radiation pattern, frequency, and pulse length/shape vary from radar to radar. Further, the antenna is also typically placed in the near field of the radar.

As radar's vertical beam is typically $\pm15^0$, placing the antenna vertically offset from the radar, the worst interference can be avoided. This means that the antenna should be installed at the minimum of 15^0 above or below the radar antenna as below. However, due to near field effects placing the antenna close to the radar antenna, the vertical separation effect decreases. Therefore, it is recommended that when the antenna has to be placed close to the radar the vertical separation should be as large as possible.

The minimum radar distance indicates the minimum distance between the closest point of the radar and the closest surface of the antenna radome. This distance is determined by the radar, transmit frequency and the power.
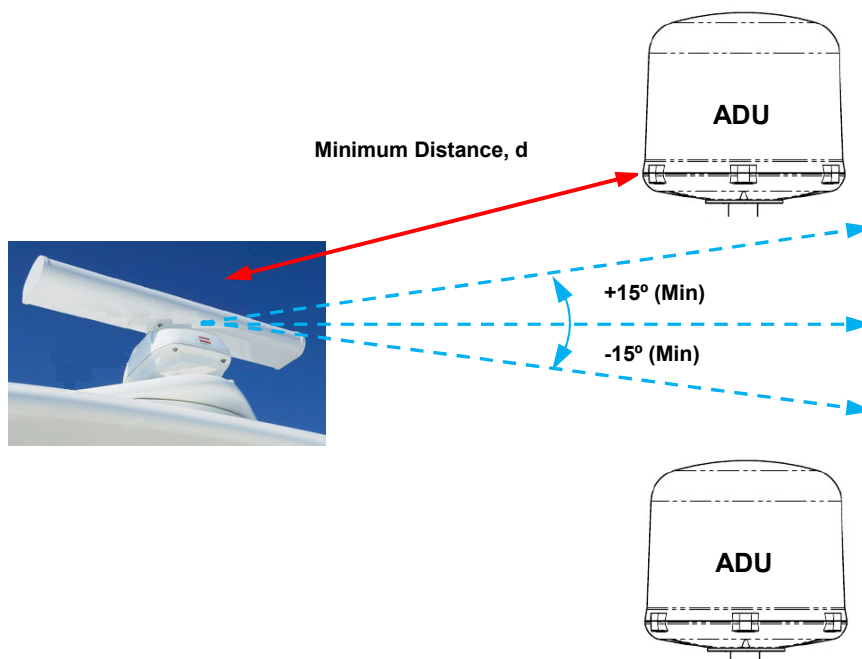
Below is the table gives the recommended minimum distance *d* between X- and S-band radars and the antenna. Antenna damage is normally avoided by applying the distance.

Antenna location at the minimum distance from Radar (S-Band)		
Radar Power	Min distance (d) at ±15º vertical separation	min distance (d) at ±60º vertical separation
0 - 12 kW	0.5 m	0.3 m
30 kW	1.0 m	0.5 m
50 kW	2.0 m	1.0 m

Antenna location at the minimum distance from Radar (X-Band)		
Radar Power	min distance (d) at ±15º vertical separation	min distance (d) at ±60º vertical separation
0 - 12 kW	0.9 m	0.5 m
30 kW	2.4 m	1.2 m
50 kW	4.0 m	2.0 m

Transmitting Equipment < 1GHz

HF and VHF transmitters can also interfere with the performance of the antenna and also damage the antenna if placed close. The table below gives guide lines to the minimum distance between the antenna and HF and VHF transmitters.

Antenna location at the minimum distance from HF / VHF		
Type	Power	Distance
HF < 60MHz	100 W	1.0 m
HF < 60 MHz	500 W	2.5 m
VHF > 60 MHz	25 W	1.5 m

VSAT System

For optimum performance the distance between the antenna and VSAT antennas should be at least 3 meter.

GPS Antenna

As the antenna transmits power close to the GPS receive band, the minimum distance to GPS antennas is typically 5 meter.

Other L-Band Systems

Typical L-Band satellite communication equipment should be able to operate in close proximity without loss of performance (Refer to Section 2.1.4 Distance to obstruction objects). It is to be noticed that such equipment typically includes GPS antennas, and that it can be necessary to use the typical minimum distance of typically 5 meter.

2.1.4   Distance to Obstruction Objects

When locating the antenna, it is very important to ensure that there is a clear line-of-sight to the satellite for all the satellite elevation angles in the region in which the vessel will operate.

The antenna moves in azimuth 360^0 and in roll and pitch down to -25^0 to ensure constant tracking even in heavy sea. Any obstructions within this arc can cause performance degradations on the signal quality. The amount of degradation depends on the size of the obstruction and distance from the antenna. The table below is a guide line on the object size, at a given distance from the antenna that gives limited degradation.

| Object Distance	Object Size
3 m	16 cm
6 m	32 cm
10 m	52 cm
15 m	79 cm

2.1.5   Antenna Mast

The ADU should be located at least 3-meter away from the ship's mast having a diameter of less than 15cm. If the antenna mast is available on the vessel and it must also be able to withstand onboard vibrations and wind forces, its physical size shall support the weight and size of the ADU.

An example of the antenna mast is illustrated as below

and the recommendations of the antenna masts :

   ➲ The flange (known as the top plate) of the mast shall meet the dimensions of the ADU's mounting base, where there are 6 holes.

   ➲ The rubber gasket is required to be inserted between the ADU mounting base and the flange.
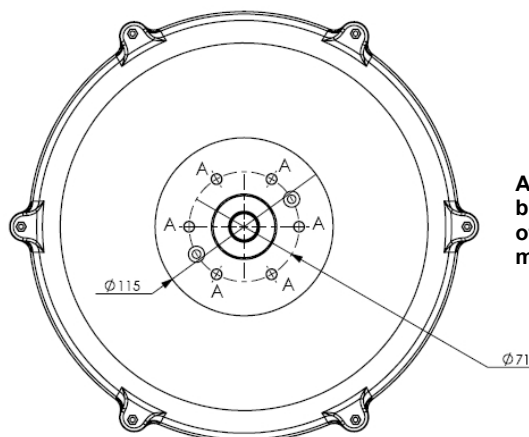
A : Use M6x20 Hex Head Screw bolts (6x) into the threaded holes of ADU Mounting Base for mounting the ADU.

30°

DCD Ø71

Clearance holes for M6 (Recommended >φ6.5mm)

Cut-hole Dimension for
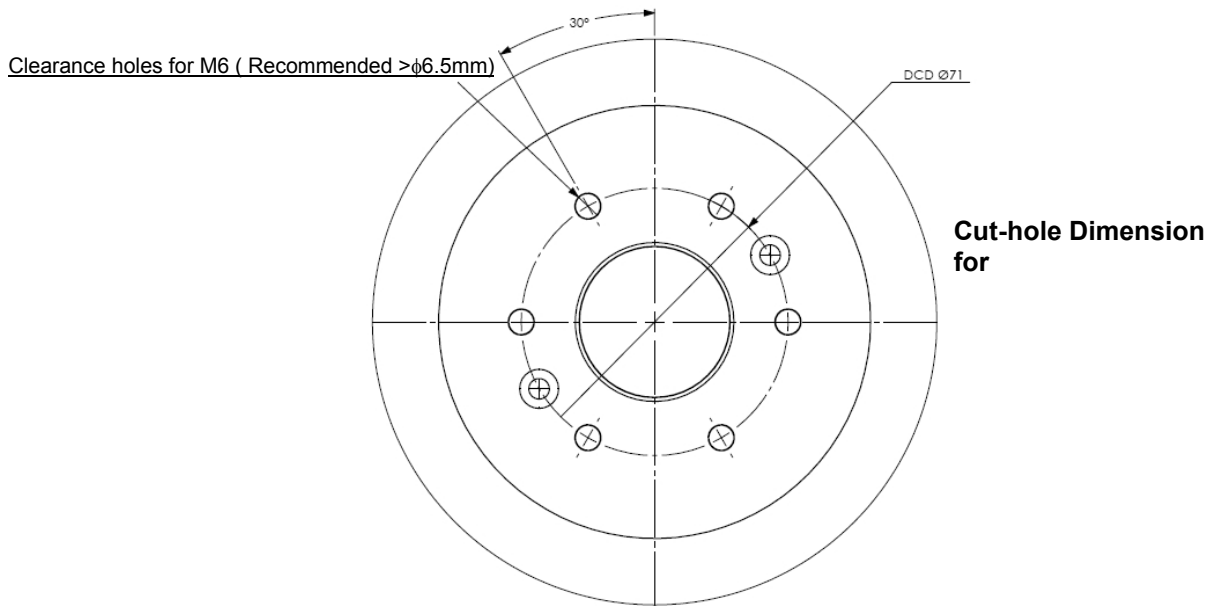
In case of the existing mast's flange in a vessel or ship does not fit the ADU's mounting base's holes, a custom-made mechanical adaptation flange is to be designed and plate, which acts as an interface between the existing mast and the ADU.

Custom-made mechanical adaptation flange

2.1.6 Installing ADU

The ADU is carefully unpacked and checked for any damage. In addition, the 25-m antenna cable, the pole mount kits and the installation guide should be checked.

The procedure of the installing the ADU is as follow:

- ⮑ Attach the coaxial cable to the RF connector (N-Type) of the ADU's bottom
- ⮑ Position the ADU to the mounting location.
- ⮑ Ensure the connection of the coaxial cable and wrap it with self-adhesive tape for water-proofing.

➲ Put the ADU on the mounting flange and use 6 sets of M6 x 20 Hex head screw bolts with flat washers into the threaded holes of ADU mounting base via the mounting flange's holes.

➲ Tighten the flat washers and screw to the antenna unit in order to secure it to the mounting flange.

Alternatively it can be mounted on the long pole. The physical dimension of a long pole shall be preferably at 2 meter height with its diameter ranges from Ø35 to Ø 50mm. In addition, the optional pole mount kit is available for the installation of the ADU onto the long post.

2.2   Installation of BDU

The BDU's box is unpacked and the following items should be checked whether they are present:

➲ BDU

➲ 1.5 meters Ethernet Cable

➲ 1.8 meters DC Power Cable

➲ 1 meter Wired Primary Handset with Cradle

➲ Wi-Fi Antenna

➲ Hardcopy Quick Start Guide

➲ CD Format User Manual

The following important notes are to be followed for the selection of a location before installing the BDU:

➲ The BDU is not water proof and it has to be kept away from water splash.

➲ The ambient temperature and humidity in the selected location must the requirements given in the BDU's specification.

Ambient Temperature	-25ºC to +55ºC
Relative Humidity	Up to 95% at +40ºC.

➲ The BDU shall be kept away from direct sunlight.

➲ The BDU shall be placed away from any high vibration and shock areas (for example, motor engine and generator) as far as possible.

➲ The BDU shall be kept away from any sensitive electronic equipment.

➲ The BDU has to follow the recommended compass safe distance of 1m to prevent interference to a magnetic compass

⮕ For maintenance and checking, the BDU's location has sufficient space at its sides and rear.

The BDU can be installed on a desktop, bulkhead, top ceiling or under captain's console.

The procedure of the installing the BDU is simple as follow:
- ⮕ Place the BDU on the desired installation area.
- ⮕ Look for the holes of the BDU's mounting brackets.

⮕ Fix the holes of mounting brackets with four M4x12mm self-tapping or machined screws so that the BDU is being secured.

2.3   Installation of Primary Handset and Cradle

2.3.1   Connecting Primary Handset with a Cable Holder

The procedure of the installing Primary Handset with the cable holder is simple as follow:

a. Connect the handset to BDU's handset port.

b. Mount the cable holder to secure the handset connector against the BDU's front panel.
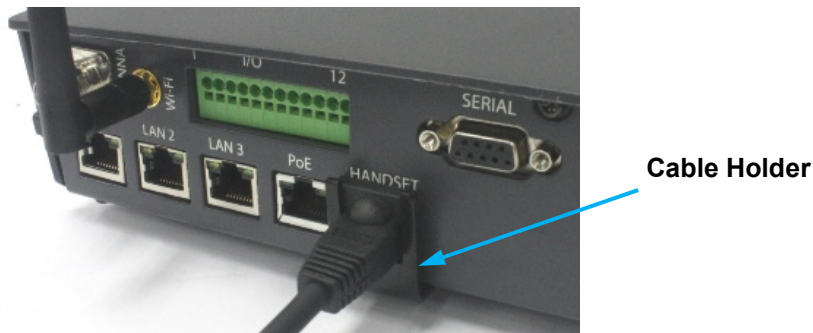
Cable Holder

c. At the bottom of the BDU, use M3 x 8 mm screw (which is supplied) to secure the cable holder and handset's connection to the BDU's handset port. This is important especially when the BDU is being mounted on the wall.

M3 x 8mm Screw

2.3.2   Overview

The primary handset is provided with cradle. It can be mounted on a desktop, bulkhead, top ceiling or under captain's console.

The primary handset is to be separated from its cradle so that the cradle can be fixed with the M5 x 12mm self-tapping screws.

The procedure of the installing the cradle is simple as follow:

    a. Separate the handset from the cradle and remove the plastic cover of the cradle.

    b. Position the cradle on the mounting areas.

    c. Fix the cradle with M5 x 12mm self-tapping screws, which are supplied.

    d. Reattach the plastic cover onto the cradle.

    e. Secure the handset onto the cradle.
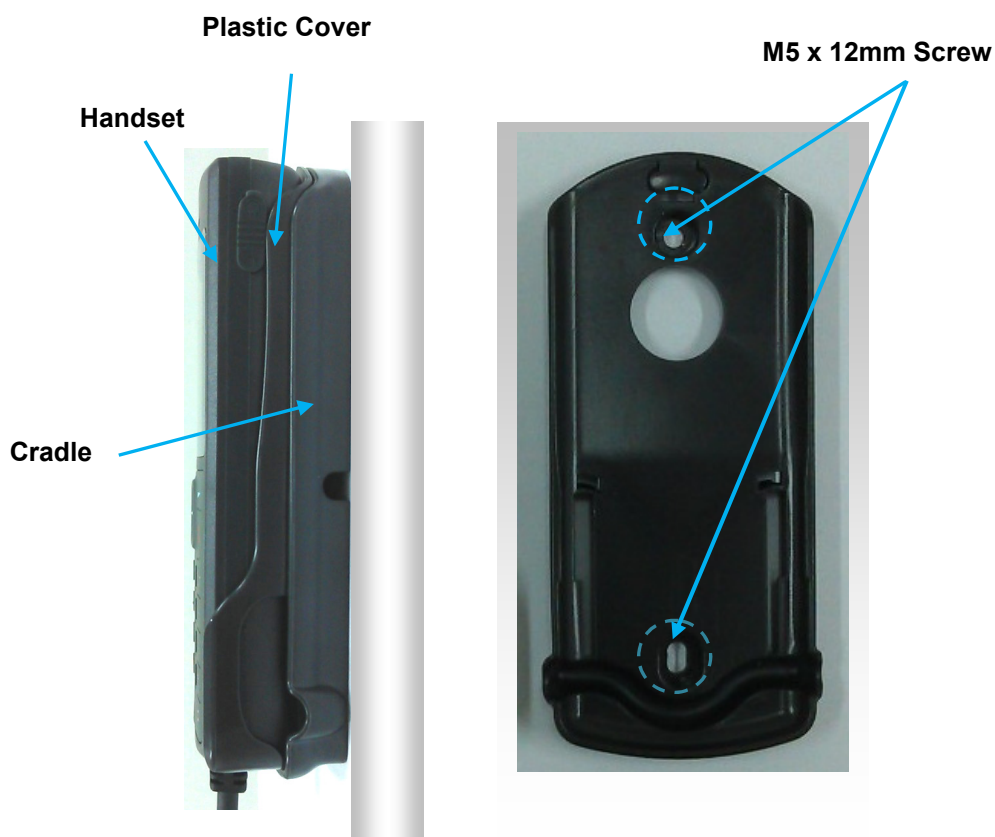
3 CONNECTIONS

Below is the interconnection diagram of Atlas IP Terminal with the cables.

25-meter Antenna Cable

Antenna Unit (ADU)

1.5m Ethernet LAN (Category 5) Cable

Computer

Bolt to vessel's hull

1.8m DC Power

+12V/24V DC Input from Vessel's power distributor

Primary Handset
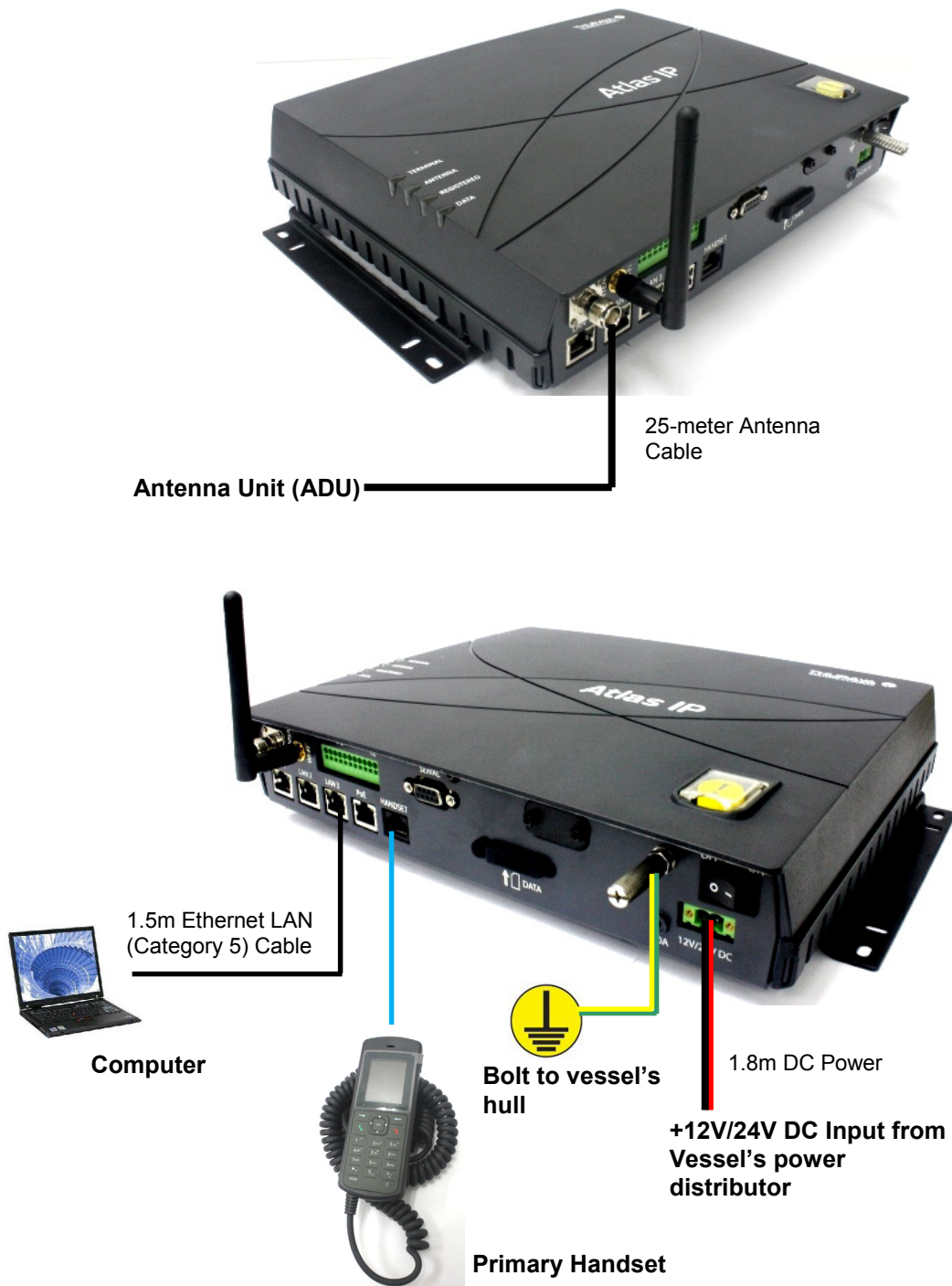
3.1 BDU's Outputs Connection

The additional information of the output ports of Serial and GPIO.

3.1.1 RS-232 Serial Connector

The BDU has a serial connector for outputting the GPS data in NMEA0183

Navigation
Equipment

RS-232 Output Pinout

Pin No.	Signal
Pin 3	TX
Pin 2	RX
Pin 5	GND

RS-232 PINOUT

Pin No.	Signal
Pin 2	RX
Pin 3	TX
Pin 5	GND
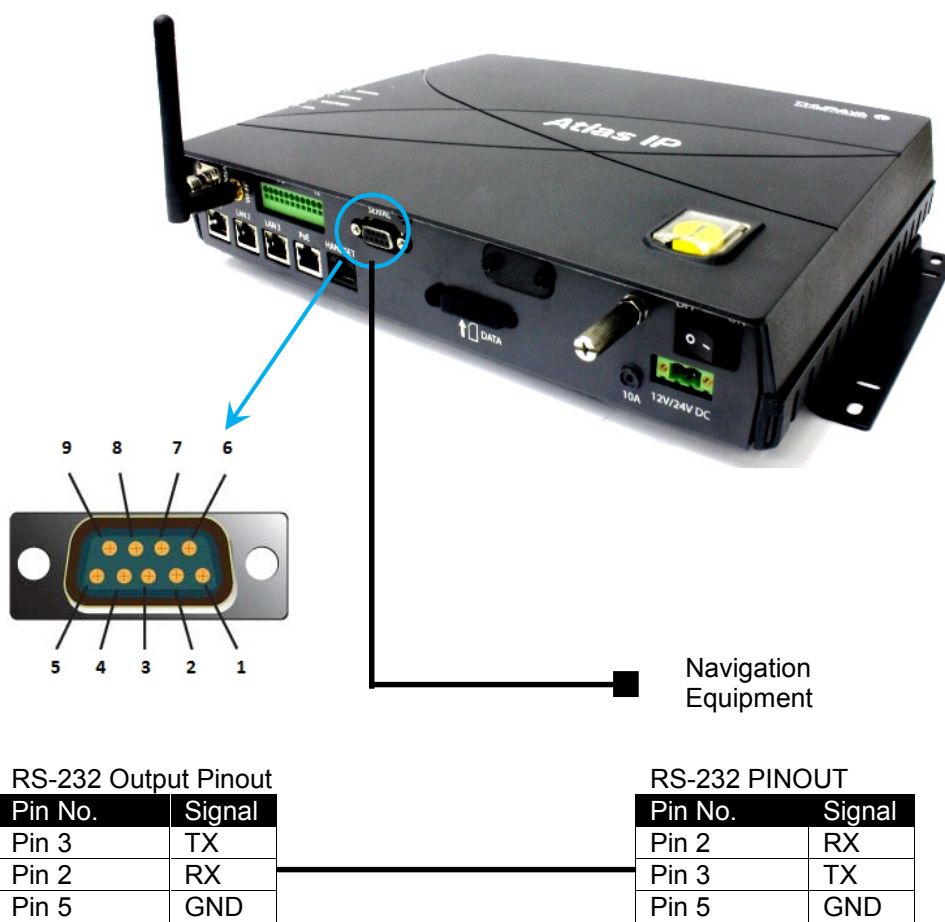
3.1.2 GPIO Output Port

The BDU has a dedicated 12-pin phoenix connector to provide GPIO (General Purpose Input/Output) interface to the external devices.
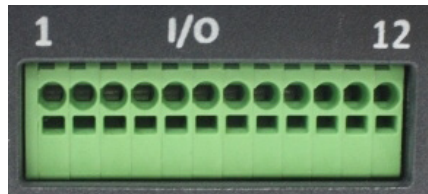
I/O Connector Pinout

GPIO Port Pinout

GPIO Port Pin	Signal Name	Description of Signal
GPIO - 1	IGNITION+	Active high signal of ignition. Input voltage of +10.8 ~ 31.2 V DC.
GPIO - 2	IGNITION-	Return path for "IGNITION+" signal
GPIO - 3	EXT_PANIC+	External Alert Button Input Port.
GPIO - 4	EXT_PANIC-	A momentary pushbutton can be connected across these 2 pins. Pressing the push button at least 4 seconds will trigger an emergency alert and illuminate the BDU's Alert Button.
GPIO - 5	REMOTE+	For the connection to Remote ON/ OFF switch away from the BDU. The BDU main switch must be always remain ON.
GPIO - 6	REMOTE-	A momentary pushbutton can be connected across these 2 pins. Pressing the push button at least 2 seconds will turn on the BDU (if it is already off) or off the BDU (if it is already on).
GPIO - 7	LED+	Power Indicator.
GPIO - 8	LED-	An LED indicator can be connected across these 2 pins. The port is capable of sourcing 25 ~ 30mA current with the LED forward voltage at around +3V DC. It will be on when the BDU is powered on. When the BDU is shutting down, the LED indicator will blink in green and turn off when the BDU is complete off.
GPIO - 9	RELAY1	External Buzzer.
GPIO - 10	RELAY2	It is a relay output port. When there is an incoming call, the internal relay will be energized and these 2 pins will be shorted together.
GPIO - 11	Reserved Line	For future use.
GPIO - 12	Reserved Line	For future use.

All wires for the GPIO connector shall use AWG 24 unscreened wire type.

3.1.3   Grounding Stud

The BDU has a grounding stud with a locking screw for the earth cable (with its colors of green and yellow) with its lug. It is recommended to include spring washers to secure the lug to the grounding stud.

Grounding Stud
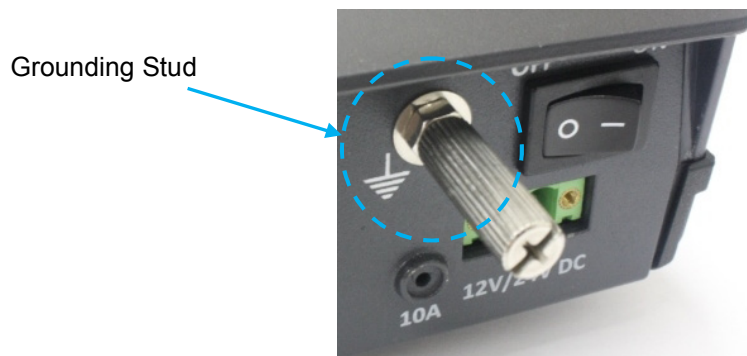
The other end of the earth cable must have good electrical contact to the hull. Ensure to remove painting, dirt, grease, metal-oxide-free etc. at the mounting holes of the hull.

4   GETTING STARTED ON THE SYSTEM

4.1   Installing the SIM card

The system requires a SIM card to access the Thuraya network and it is provided by your Airtime Service Provider. Insert the SIM card to the BDU as follow:

➲ Tilt up the SIM card slot's rubber cover

SIM CARD SLOT's RUBBER COVER
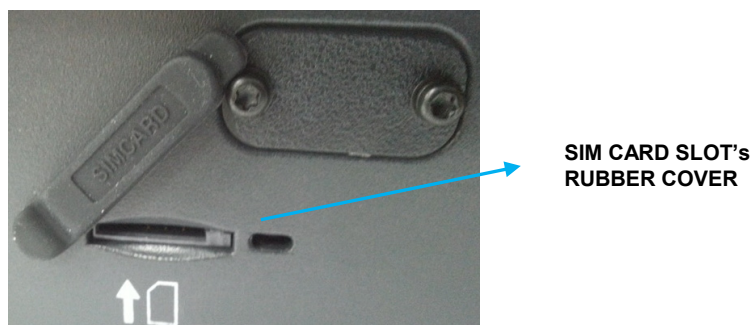
➲ Position the SIM card with its gold-contacts facing down. (There is a symbol of SIM Card with its arrow on the front panel. It will ensure the correct orientation of the SIM Card when it is being inserted.)

SIM CARD

➲ Push the SIM card gently until it is being clicked and locked in place.

➲ Tilt down the SIM card cover to its original position.

4.2   Powering up the system

4.2.1   Switching on the BDU

Use ON/OFF switch on the BDU's front panel. It normally takes about 2 to 3 minutes for the whole terminal to be powered up.

Wait for all LED indicators to turn green.
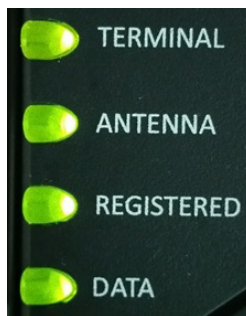
LED Name	Status	Meaning
TERMINAL	Blinking Green	BDU is functioning as the "heartbeat".
	Steady Red	BDU powers up or detects failure.
ANTENNA	Steady Green	ADU is functioning.
	Steady Red	ADU detects failure.
	No Light	ADU is calibrating.
REGISTERED	Steady Amber	Registration to network in progress.
	Steady Green	Registration to network.
	Blinking Green	Voice call in use.
	Steady Red	Network failure/Error
DATA	Steady Green	In **Data** Mode, user can browse internet.
	No light (Off)	In **Data** Mode, user cannot browse internet. In **Voice** Mode, user can make a voice call using Primary Handset.

4.3   Settings on Web Console

4.3.1   Activating on Web Console

Open the web browser (for example: Internet Explorer, Google Chrome or Firefox.)

And type **http://192.168.2.1/** in the **Address** field and press **Enter**.

Username and Password will be prompted.

  Default Username : **admin**
  Password   : **admin**
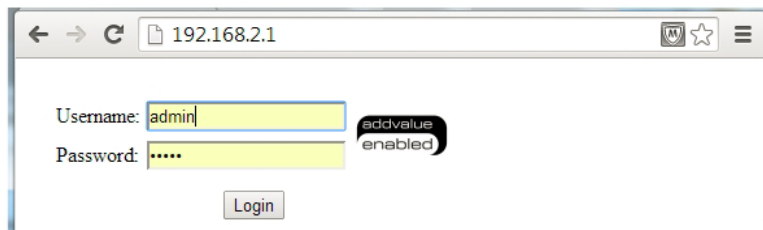
Click "**Login**" after entering the Username and Password.

The Web Console will appear with the information of Thuraya Network identification, satellite signal strength indicator and the GPS information.
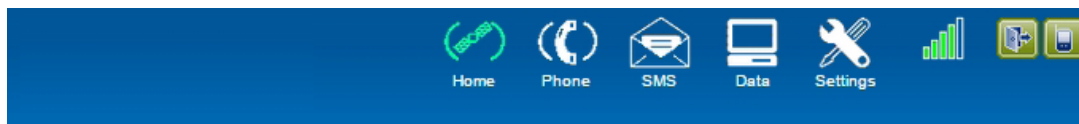
Region: SINGAPORE -V

Signal:

GPS:
  Latitude: 14° 47' 5.38" N (14.78483°)
  Longitude: 80° 0' 2.81" E (80.00078333°)
  Date/Time: 31/12/2019,23:57:09 UTC
  Speed: 0.1 knots
  Course: 65°

⚠️ *WARNING: If the signal strength is low, check any obstruction against the antenna unit or the condition of antenna cable.*

Upon successful registration, with all three BDU's LED indicators (**ANTENNA**, **REGISTERED** and **DATA**) are in green while **TERMINAL** indicator is having blinking green, the terminal will be ready for normal operation.

4.3.2 Data Connection Settings

Click on the web console.
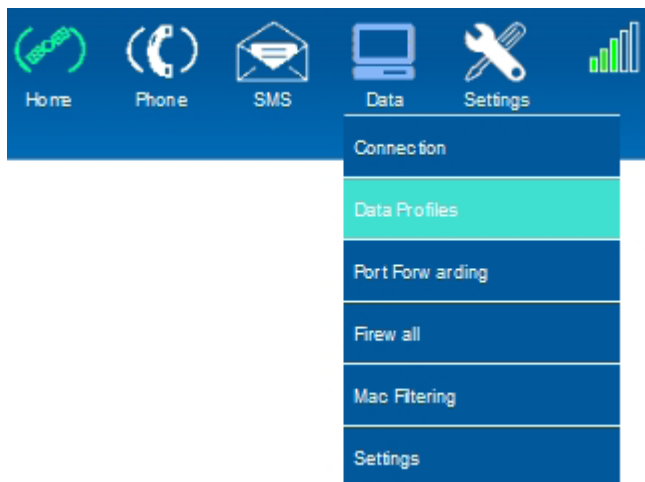
Click **Data Profiles** and set the following:
- ➲ Select "**Standard**" under Profile.
- ➲ Enable radio button of "**Standard**" of Connection Type.
- ➲ Enable checkbox of "**Always On (Auto PDP Context Activation)**"
- ➲ Enable radio button of "**Dynamic IP Address**" of IP configuration.

Profile: *Standard ▼
☑ Set as default
Profile Name: Standard

Connection Type:
● Standard
○ Streaming

☐ Always On (Auto PDP Context Activation)

Access Point Name (APN):
APN   standard-vbr
Username:
Password:

IP Configuration
● Dynamic IP Address
○ Static
IP Address [ ] . [ ] . [ ] . [ ]

[Update Settings] [Refresh] [Activate Profile]

Standard

Using this connection type you will be charged for the **VOLUME** (kilobytes) of data used. Use this connection type for TCP/IP applications, data exchange and transfer such as Email, Internet Browsing, FTP, etc.

⚠ *Note:*

*The **Standard** profile is set as the default primary profile and the default connection type is standard (this is charged by the volume [in kilobytes] of data used).*

*Click "**Always On (Auto PDP Context Actviation)"** checkbox if it is required to get the standard IP Data connection to be reconnected automatically in the event the connection is disconnected without user intervention, i.e. antenna blockage, etc.*
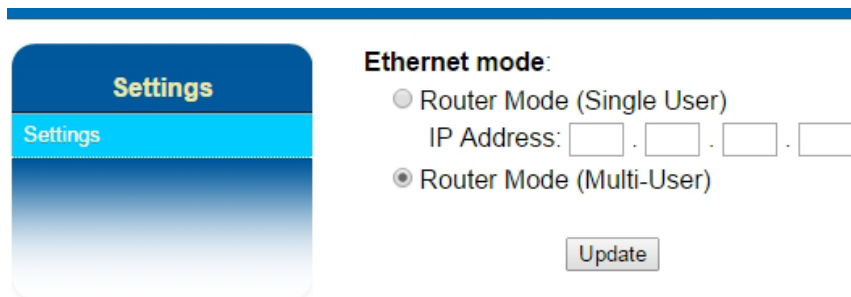
Click on the web console.
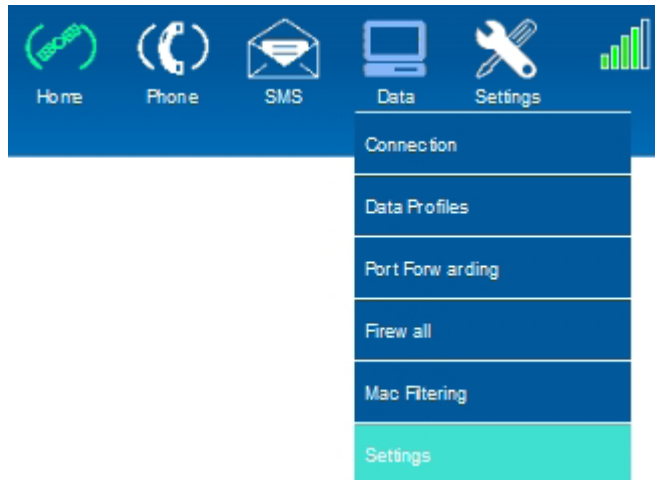
Click **Settings** and set the following:

For the data connection, under the Ethernet mode, enable radio button of "**Router Mode (Multi-User)"** which is with NAT/PAT enabled for multi-user.
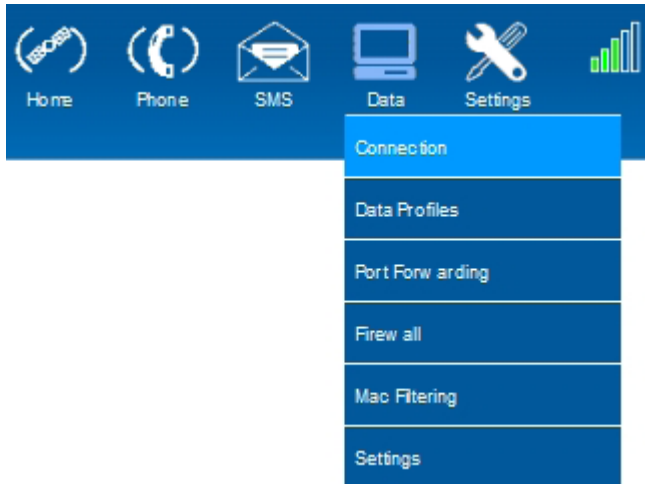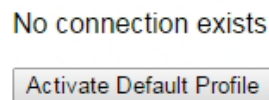

 Note:

The Router settings cannot be changed while the Data connection is active. The Data session must be first disconnected.

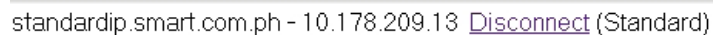Click **Update** to allow the selection to take effect.

Click **Connection**

To activate the PDP context, click "**Activate Default Profile".**

The data connection will be activated with a notification of the public IP address assigned to the active data connection. An user may now browse the internet, do file transfer (FTP) or run any IP-based application services.

To disconnect the data connection, click **Disconnect**.
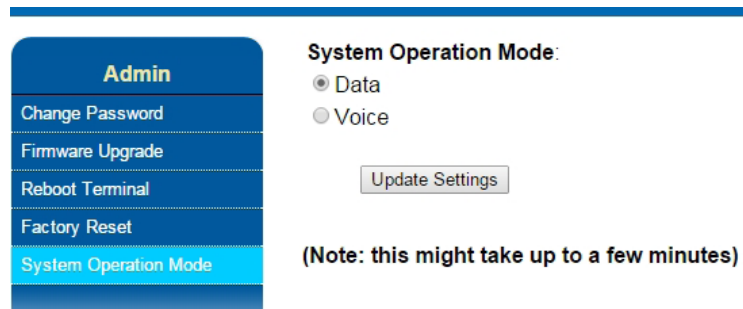The PDP context will be deactivated.

4.4   Selection of Data / CS Voice Mode

The terminal is set as **Data** as the defaulted mode upon powering up the terminal.

The **Data** mode is used for user to browse internet, email, ftp etc.

The **Voice** mode is used for user to make a voice call via Primary Handset. There are 2 ways to switch from **Data** mode to **Voice** mode;

➲ **Web Console***

Select **Settings>Admin>System Operation Mode**, click radio button of "**Voice**" and then **Update Settings.**

For switching back from **Voice** to **Data** mode, click radio button of "**Data**" and then **Update Settings.**

➲ **Primary Handset's Mode Key***

Mode Key

On Primary handset's "**Mode**" key, press it to display the state of operating mode of "**Data**" or "**Voice**" on the handset display. Use Up/Down keypad to select the desired mode and then "**Select**" to activate it.

⚠ ***Note:***

*Setting from "**Data**" to "**Voice**" mode via Web Console or Primary Handset, it will take 2 to 3 minutes to take effect. Likewise for switching from "**Voice**" to "**Data**" mode.*

GLOSSARY

|	
AC	Alternating Current
ADU	Above Decks Unit
APN	Access Point Name
BDU	Below Decks Unit
DC	Direct Current
FTP	File Transfer Protocol
GPS	Global Position System
GPIO	General Purpose Input / Output
IP Data	Internet Protocol Data
NAT	Network Address Translation
PAT	Port Address Translation
PDP	Packet Data Protocol
SIM	Subscriber Identity Module
VSAT	Very Small Aperture Terminal

APPENDIX A OUTLINE DRAWINGS
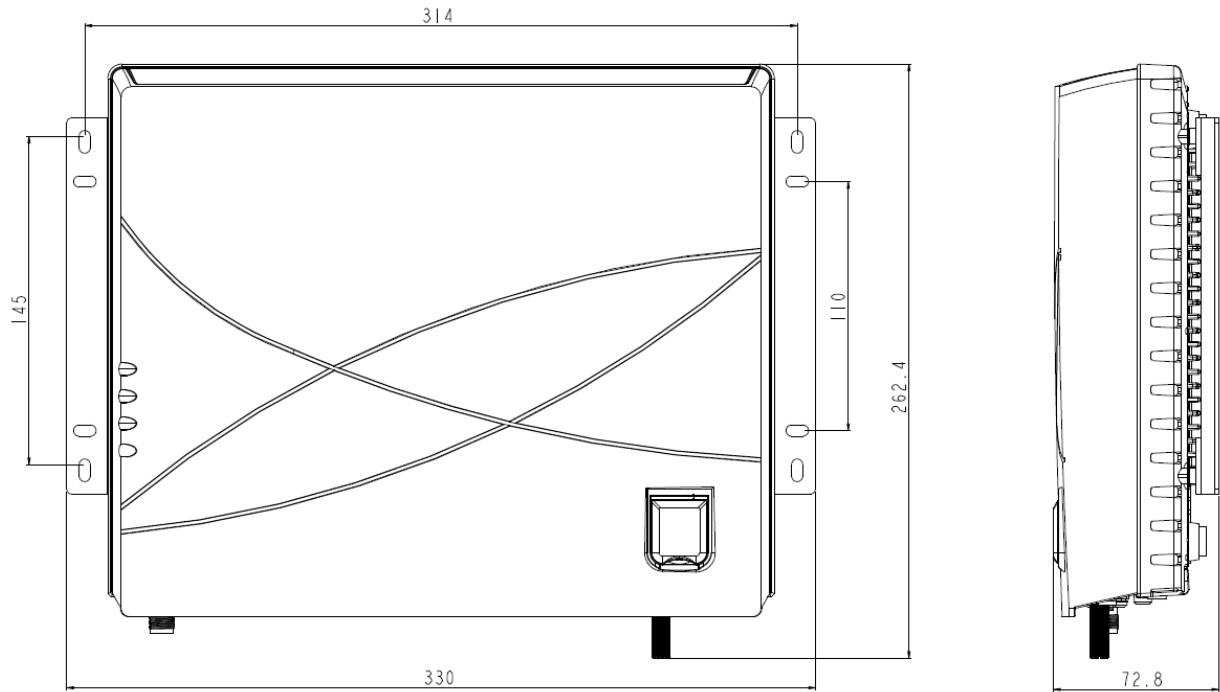
A-1   ADU's Outline Dimensions and Weight
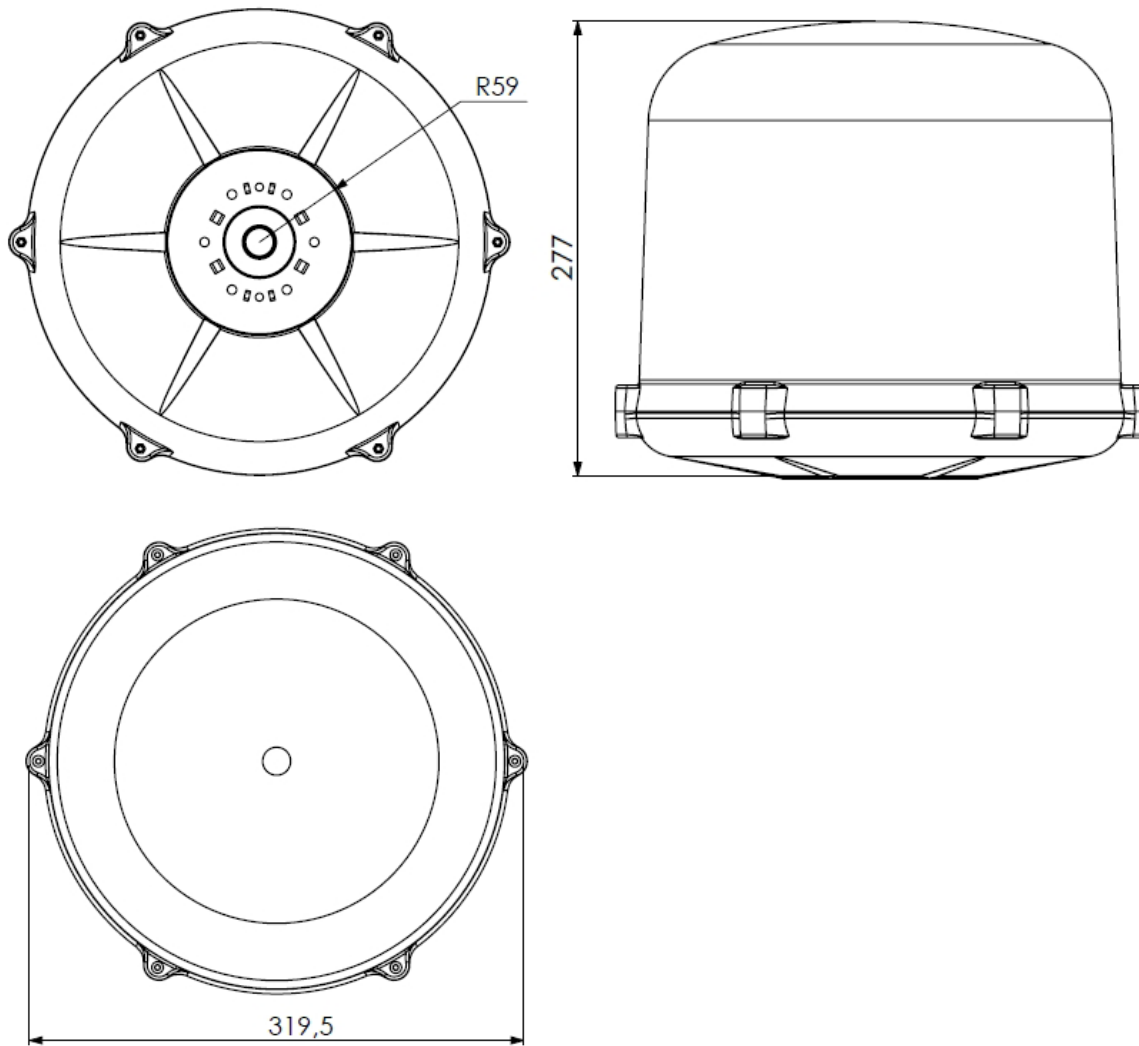
Weight : **3 kg**.
Dimensions are expressed in terms of mm.
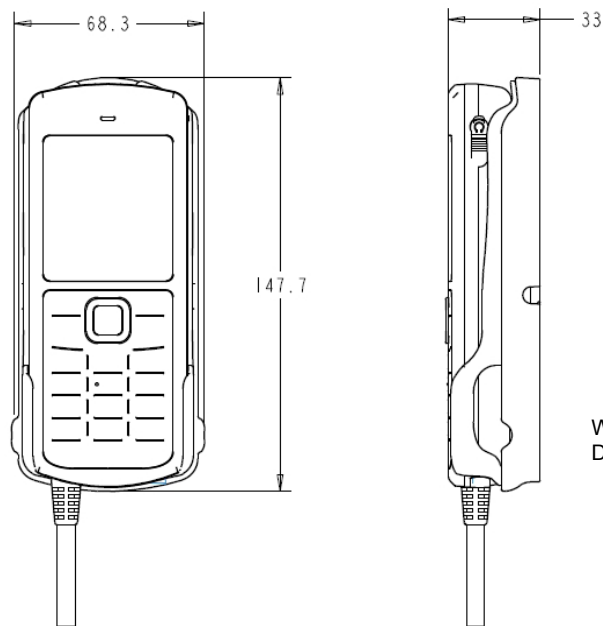
A-2   ADU's Hole Pattern (Cut-out Holes)
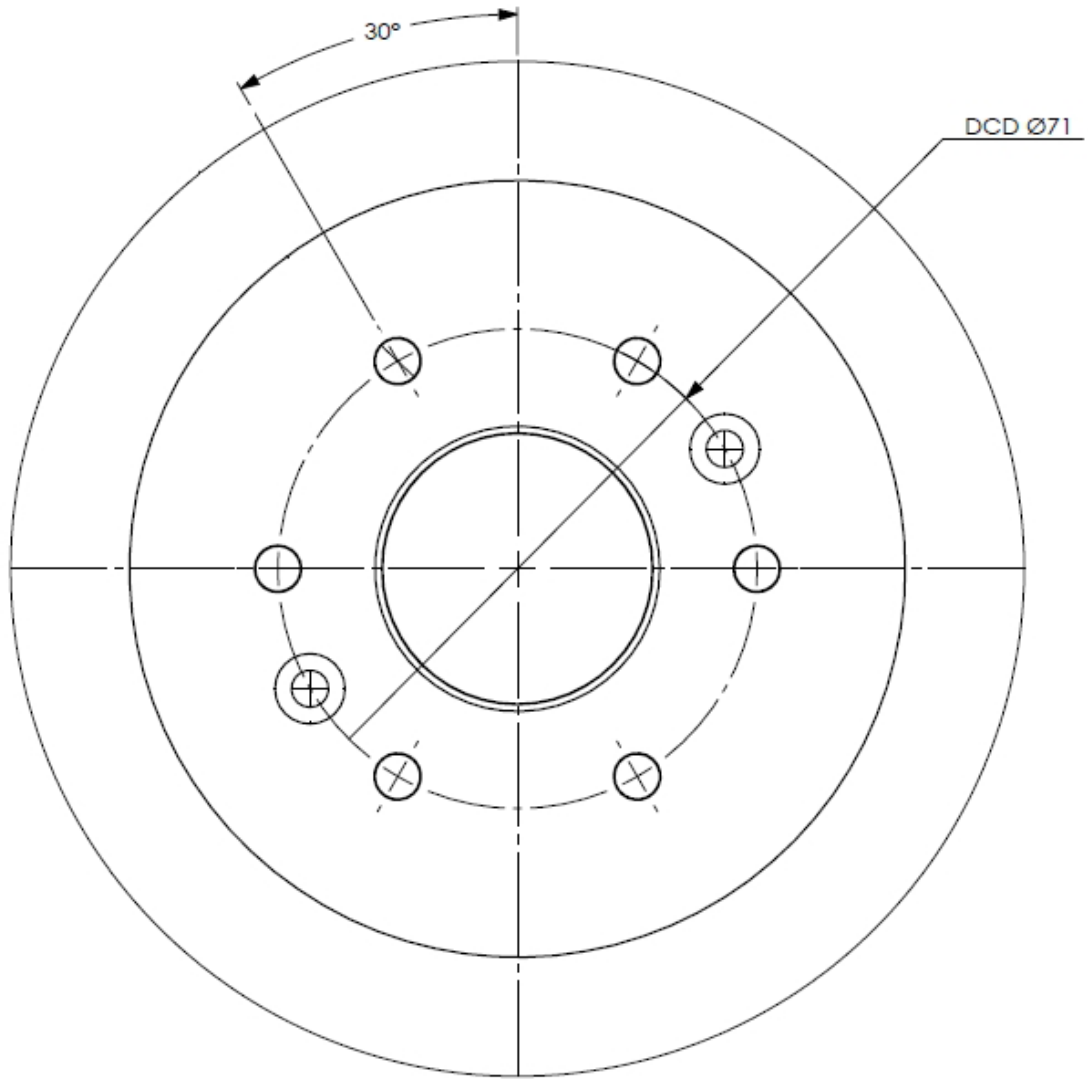
Dimensions are expressed in terms of mm.

A-3   BDU's Outline Dimensions

Weight : **3.1kg**
Dimensions are expressed in terms of mm.

A-4   Primary Handset's Outline Dimensions

Weight : **430g**
Dimensions are expressed in terms of mm.