Installation Manual
Revision 1.0

For assistance or additional about this Installation Manual, please contact SATLINK S.L. Customer Support at:

Tel: +34 91 327 21 31
Email: techsupport@satlink.es

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CONTENTS:

CERTITICATIONS

FEDERAL COMMUNICATION COMMISSION NOTICE

FCC Identifier: XGW-SLFLTONE

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 1m** 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 Fleet One Satellite Communication System.

EC Declaration of Conformity:

Satlink S.L., Avenida de la Industria N 53, Alcobendas, Madrid, CP 28108,

declares under our sole responsibility that the Product, brand name as Satlink and model: FleetOne, Maritime Communication 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 61000-3-2,

EN 61000-3-3, 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.

CE 1177 ①

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. Jens (CTO on 24th November 2016)

SAFETY INSTRUCTIONS

For the sake of safety and protection, read the manual before attempting to use Fleet One User Equipment (UE).

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 UE.

Satlink S.L., assumes no liability for the customer's failure to comply with these requirements.

Hazard Symbols

Heat Surfaces	Avoid touching those areas of the UE that are being marked with this symbol otherwise it may result in injury.
Antenna Radiation Warning and Distance to other Radiation Equipment	For safety reasons, all personnel must keep at least **ONE meter** from the antenna.
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. If there is no +24V DC power line provided by the vessel, an external AC/DC power supply with an input of 115/230V AC and an 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 UE 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.

Equipment Ventilation

To ensure adequate cooling of the terminal, 5 centimeters of unobstructed space must be maintained around all sides of the unit except the bottom side. The operational 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 Inmarsat 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 Inmarsat 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 that a 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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Warranty

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SYSTEM CONFIGURATION
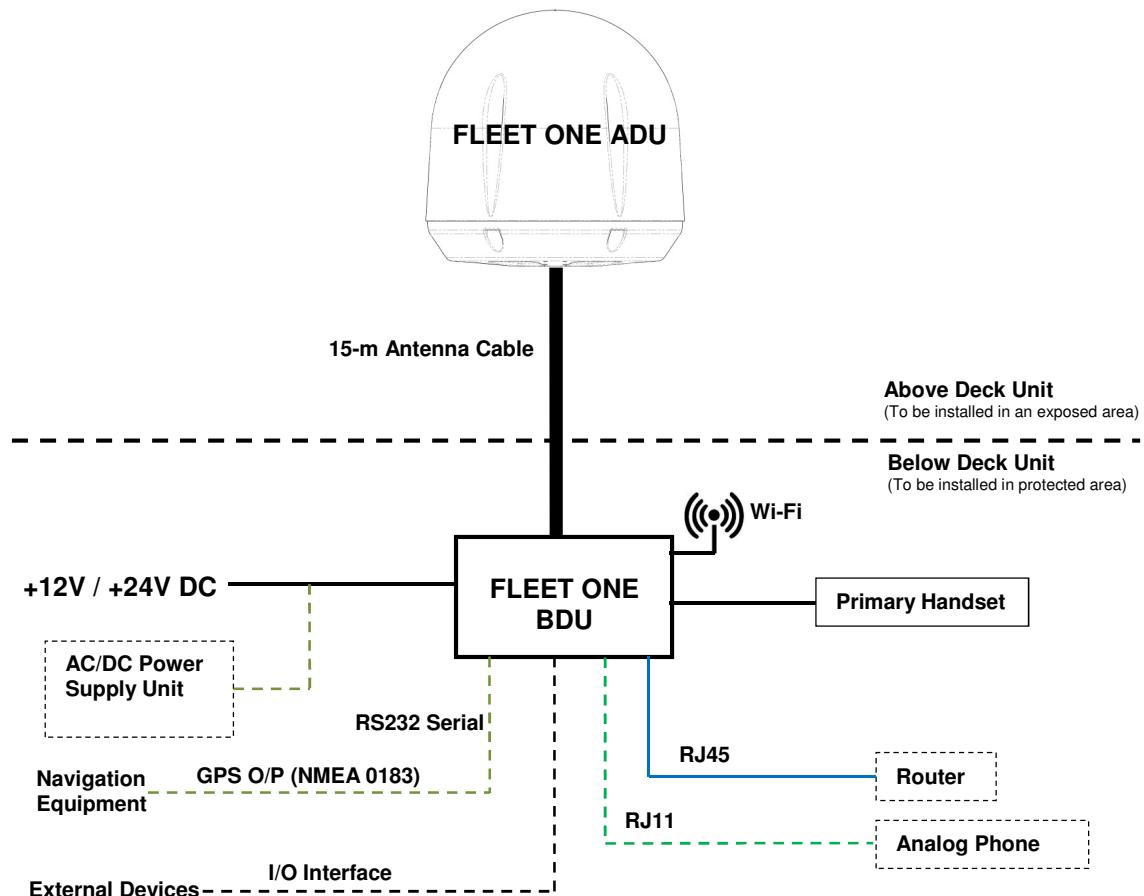
Solid line refers to the basic configuration.

USER EQUIPMENT LISTS

Fleet One Complete Standard Package

Description	Order Code
Satlink Fleet One BDU with Primary Handset	FLV2-9TU00-01
Satlink Fleet One ADU with 15-meter Antenna Cable	FLV2-0AN00-01

Fleet One Accessories

Description	Order Code
Fleet One Primary Handset	FLV2-0PH00-01
Handset Wall Mount Cradle	SG5000/WMC
Power Supply 240W AC/DC DIN Rail 24V DC/10A	SKP150/ADPS
Antenna Pole Mount with Mounting Kit	FX25-0PM00-01

1 FLEET ONE USER EQUIPMENT

1.1   Introduction

The Fleet One UE consists of three units;

- ➲ Below Deck Equipment (BDU) which is a communication unit
- ➲ Above Deck Equipment (ADU) which is an antenna unit
- ➲ Wire Primary Handset with cradle

1.2   Above Deck Equipment

The ADU is a 3-axis controlled antenna unit which is self-tracking.

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 Fleet One UE. It has several interface ports and handles all communication links between the ADU, Primary Handset and the local communication devices such as analogue telephone, computer, network equipment, navigation equipment etc.

The BDU requires +12V or +24V DC power supply input. It supplies power to the ADU via a 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, similar to any mobile phone. The handset is provided with a cradle.

Additionally, it can serve as a remote access device for user to access various configuration parameters supported by the BDU.

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

2 INSTALLATION OF FLEET ONE 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 the 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.

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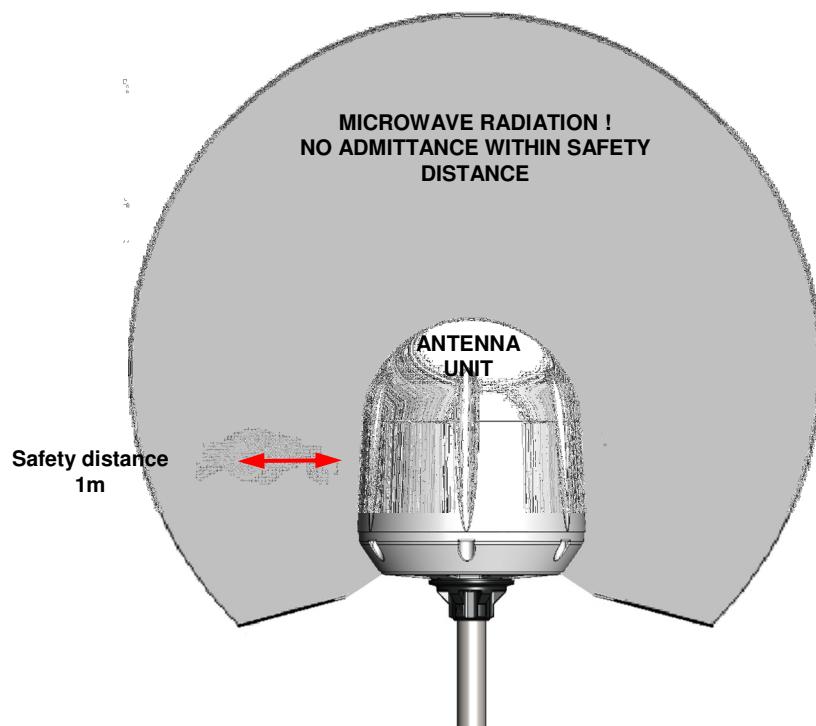
WARNING: Keep away from the antenna radome at the mentioned safe distance when it is transmitting. Microwave radiation can be harmful to human body, particularly the eyes.

2.1.3   Interference

The antenna unit must be mounted as far as possible away from the/HF antennas, communication/navigations, VSAT systems and any high power radio transmitter (including other Inmarsat-based systems).

Radar

It is difficult to provide the exact minimum distance between a radar and the antenna unit due to different type of radars in terms of power, radiation pattern and operating frequency band.

The antenna unit is recommended to be at least $\pm15^0$ from the radar's vertical beam.

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.
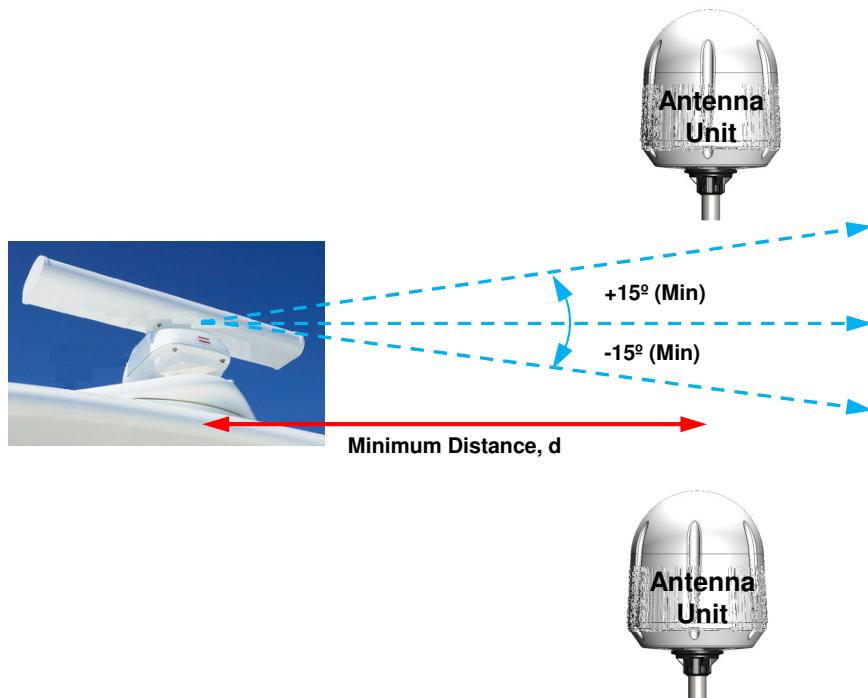
Below is the table gives the recommended minimum distance *d* between X- and S-band radars and the antenna. Antenna damage is normally avoided by applying the distance.

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 Obstruction

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 antenna unit 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 is free of any shock or vibration, its physical size shall support the weight and size of that Fleet One ADU.

An example of the antenna mast is illustrated as below and the recommendations of the antenna mast:

The antenna must be installed using Satlink mounting kit SL40-01937 that includes a flange to be mounted on the antenna.

The antenna must be mounted on a 40mm stainless steel tube and run the coaxial cable inside the tube.

The Satlink mounting kit flange is designed to 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.

[1] Flange
[2] Gasket
[3] Tube cap for 40mm tube
[4] 3 tube fixing bolts
[5] Washer
[6] Cap
[7] 6 Screw bolts DIN912 M6 x 45mm
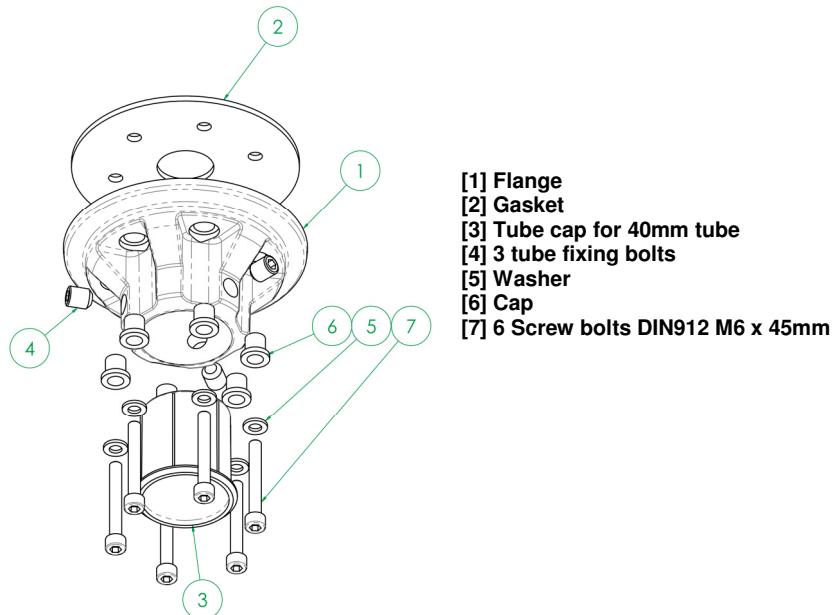
2.1.6   Installing Antenna Unit

The antenna unit should be carefully unpacked and checked for any damage.

The procedure of the installation of the antenna unit is as follow:

➲ Find a suitable place for a stainless steel tube and run cable inside tube

➲ Pass the coaxial cable through the flange and gasket

➲ Attach the coaxial cable to the RF connector on the antenna unit's base.

➲ Ensure the connection of the coaxial cable and wrap it with self-amalgamating tape for water-proofing.

➲ Put the antenna unit on the mounting flange and the 6 screw bolts with flat washers and caps into the threaded holes of the antenna unit's mounting base via the mounting flange's holes.

➲ Position the antenna unit onto the tube by placing the tube inside the tube cap.

➲ Tighten the 3 tube fixing bolts in order to secure it to the tube.

➲ Double check all screws and bolts

2.2   Installation of BDU

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

➲ BDU

➲ 1 x Primary Handset with Cradle

➲ 1 x Ethernet Cable

➲ 1 x DC Power Cable

➲ 1 x Inmarsat 505 laminated card

➲ 1 x Wi-Fi Antenna

➲ Hardcopy Quick Start Guide

➲ CD ROM (Soft User Manual)

➲ Cable Support Kit

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

- ➲ The unit 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 unit's specification.

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

- ➲ The unit shall be kept away from direct sunlight.
- ➲ The unit shall be placed away from any high vibration and shock areas (for example, motor engine and generator) as far as possible.
- ➲ The unit shall be kept away from other electronic equipment.
- ➲ The unit has to follow the recommended compass safe distance of 1m to prevent interference to a magnetic compass
- ➲ For maintenance and checking, the unit's location has sufficient space at its sides and rear.

The BDU comes with a cable support item, which is included in the delivery. The cable support item is to secure the cables from the BDU.
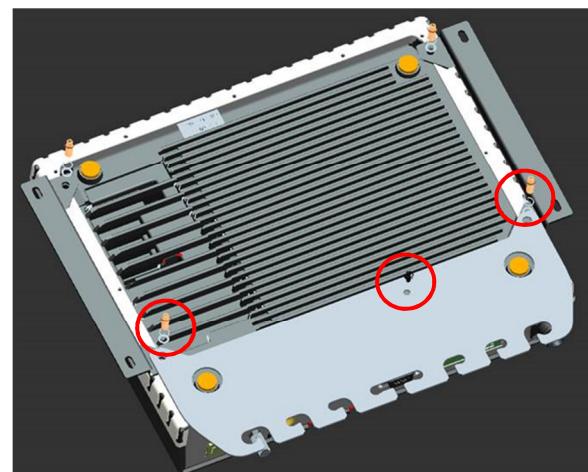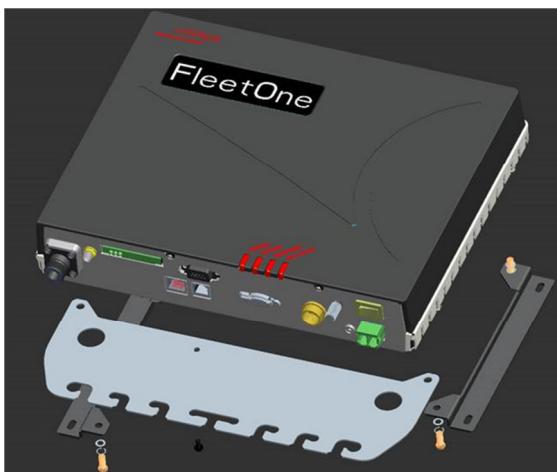
To mount the cable support onto the BDU,

- ➲ Remove the 2 screws of the front mounting bracket
- ➲ Mount the cable support item on the bottom of the BDU.
- ➲ Tighten the same 2 screws to secure the cable support item.

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.

- ⮕ Using the holes of mounting brackets and four M4x12mm self-tapping or machined screws so that the BDU is secured to the selected surface.

2.3   Installation of Primary Handset

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

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.

The primary handset is placed on the cradle and its end connector is plugged securely to the BDU's handset circular port.

3 CONNECTIONS

Below is the interconnection diagram of Fleet One Terminal with the cables.

15-meter Antenna Cable

Antenna Unit (ADU)

1.5m Ethernet LAN
(Category 5) Cable

Computer

Telephone Cable

1m Handset Cable

**Standard
Analog Phone**

**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 GPS and GPIO.

3.1.1   GPS Output Connector

The BDU has a GPS output (RS-232 serial) connector for outputting the GPS data in NMEA0183 format.

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
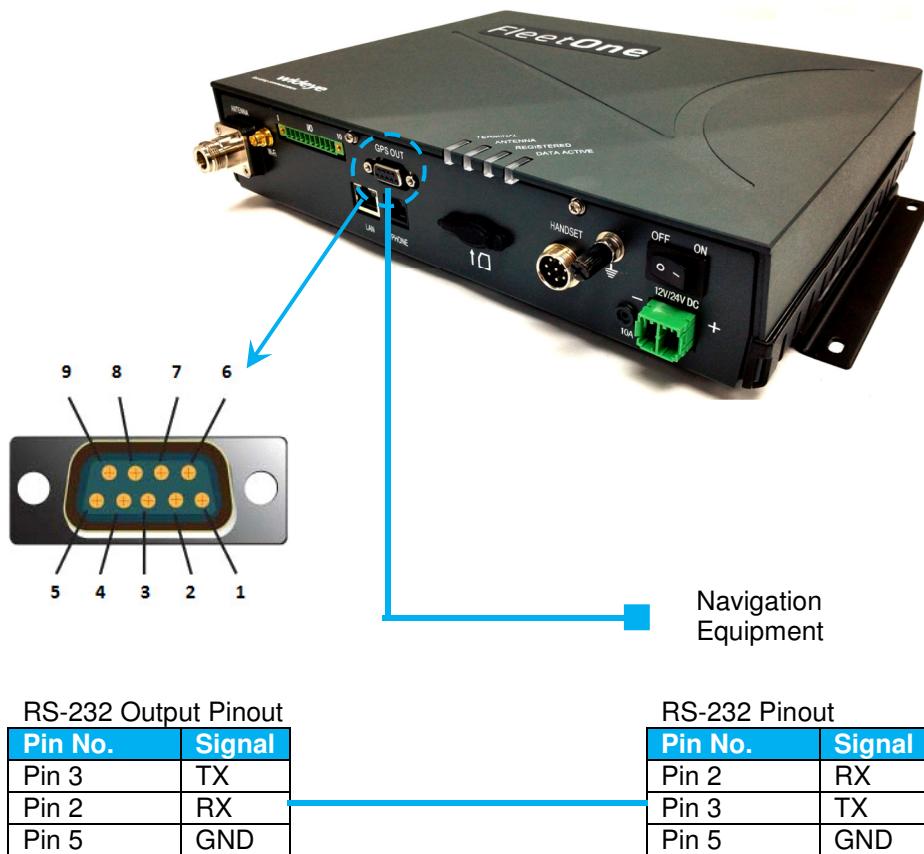
3.1.2 GPIO Port

The BDU has a dedicated 10-pin phoenix connector to provide GPIO (General Purpose Input/Output) interface to the external devices.
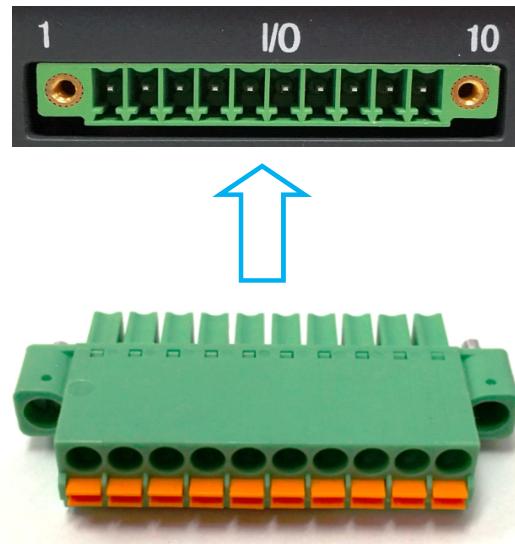
I/O Connector Pinout

NOTE *A matching connector is included in the delivery..*

GPIO Port Pinout

| GPIO Port Pin	Signal Name	Description of Signal
GPIO - 1	6V	To supply 6V DC source.
GPIO - 2	TX_OFF	To disable the antenna unit's transmitter.
GPIO - 3	PDP_ON/OFF	To enable/disable the data connection.
GPIO - 4	BUZZER	To enable external ringer / buzzer for incoming call.
GPIO - 5	GND	To provide grounding for the whole system.
GPIO - 6	REMOTE_ON/OFF_SW	For the connection to Remote ON/ OFF switch away from the BDU.
GPIO - 7	REMOTE_ON/OFF_LED	Power Indicator.
GPIO - 8	Reserve	Not in use.
GPIO – 9	Reserve	Not in use.
GPIO – 10	GND	To provide grounding for the whole system.

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

For the data connection switch, refer to Appendix B - GPIO Port

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.
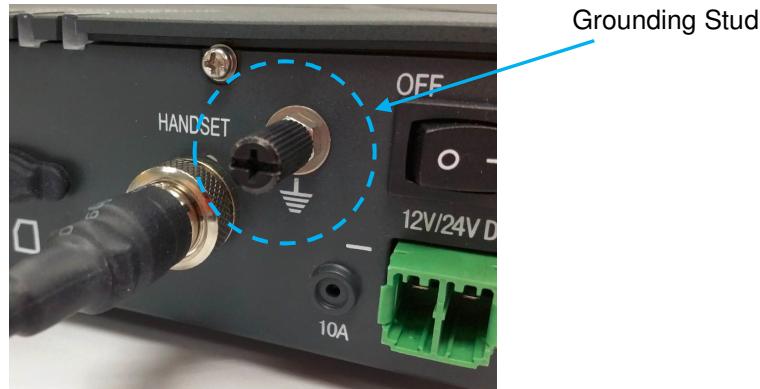

The other end of the earth cable must have good electrical contact to the vessel's hull with the removal of painting, dirt, grease and metal oxide at the mounting holes of the hull.

4   GETTING STARTED ON THE SYSTEM

4.1   Installing the SIM card

The system requires a Fleet One SIM card to access the Inmarsat's 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.
- ➲ 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.)
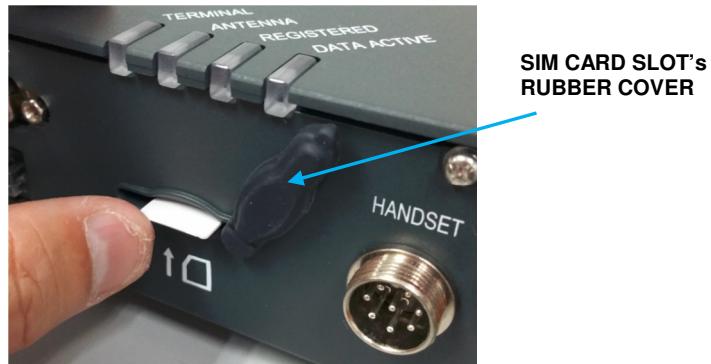
➲ Push the SIM card gently until it is being clicked and locked in place.

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

4.2   Powering up the system

4.2.1   Switching on the BDU

Use the ON/OFF switch on the BDU's front panel. It normally takes about 1.5 to 3 minutes for the whole terminal to be powered up and to register into the satellite network .

Wait for the three LED indicators ("**TERMINAL**", "**ANTENNA**" and "**REGSITERED**") to turn green.

LED Name	Status	Meaning
TERMINAL	Steady Amber	Terminal (BDU) is powering up.
	Steady Green	Terminal (BDU) has powered up successfully.
	Steady Red	Terminal (BDU) detects failure state.
	Off	Terminal (BDU) is in OFF state.
ANTENNA	Steady Amber	ADU is powering up.
	Blinking Amber	ADU is calibrating.
	Blinking Green	System is performing satellite search.
	Steady Green	System has locked on to the satellite.
	Steady Red	ADU detects failure state.
	No light (Off)	ADU is in OFF state.

	Steady Amber	Attempting network registration
REGISTERED	Blinking Amber	Ready for Voice only.
	Blinking Green	Ready for Data only.
	Steady Green	Ready for all (Voice and Data).
	Steady Red	Network failure / Registration error.
	No light (Off)	No network service.
DATA ACTIVE	Steady Amber	Activating data connection.
	Steady Green	Data connection is ready.
	Steady Red	Data activation failure
	No light (Off)	No data connection.

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://192.168.1.35**/ in the Address field.

Username and Password will be prompted.

    Default Username   : **admin**
    Password   : **1234**
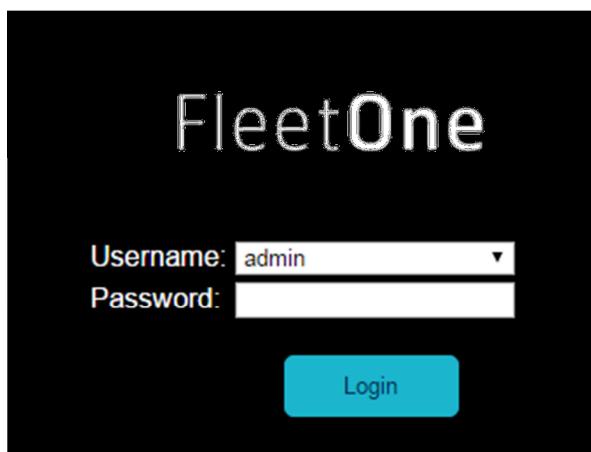
Click "**Login**" after entering the Username and Password.

The Web Console will appear. The terminal will proceed automatically to "**Checking PIN status**" followed by "**Antenna Pointing**" and then registering to the network (upon power on).
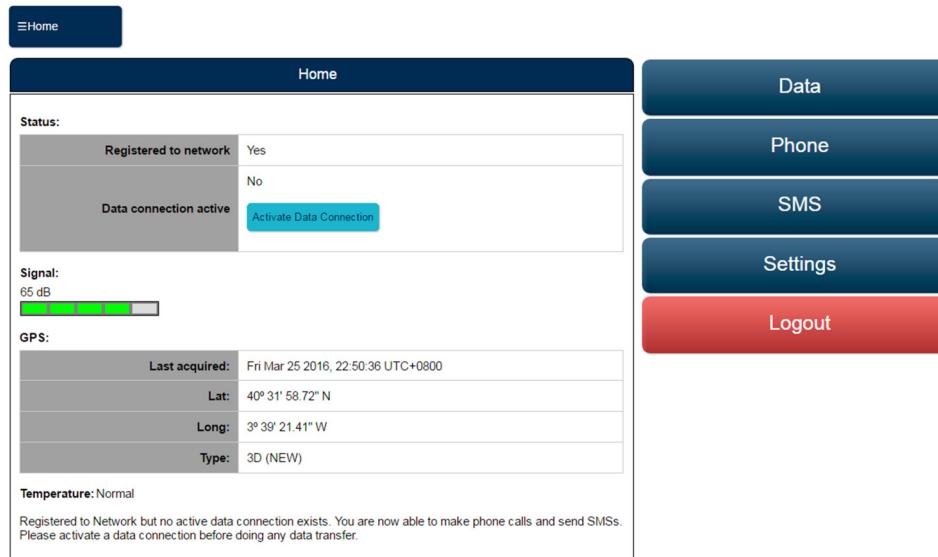
> ⚠️ **WARNING:** *If the signal strength is low (< 50 dB), check any obstruction against the antenna unit or the condition of antenna cable.*

Upon successful registration, with 3 BDU's LED indicators ("**TERMINAL**", "**ANTENNA**" and "**REGSITERED**") which are in green, the terminal will be ready for normal operation.

4.3.2 Activating PDP Context

To activate the PDP context for browsing internet, click "**Activate Data Connection**". The BDU's LED indicator ("**DATA ACTIVE**") will turn green.
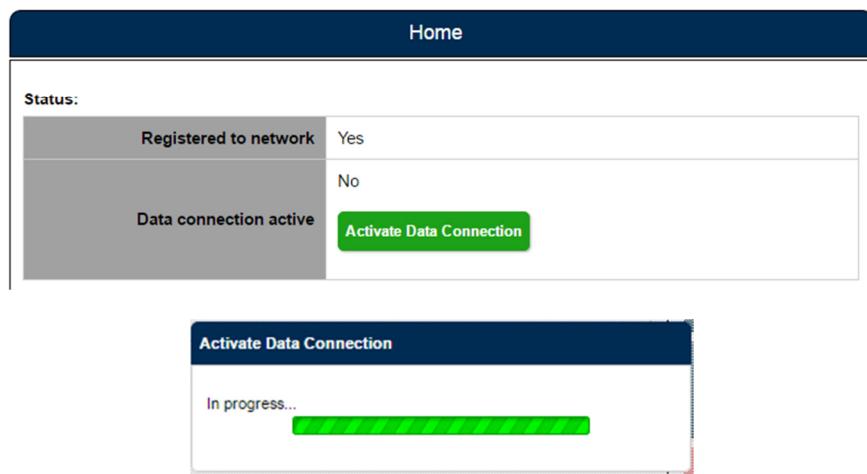
4.3.3   Deactivating PDP Context

To deactivate the PDP context for browsing internet, click "**Deactivate Data Connection**". The BDU's LED indicator ("**DATA ACTIVE**") will turn off.
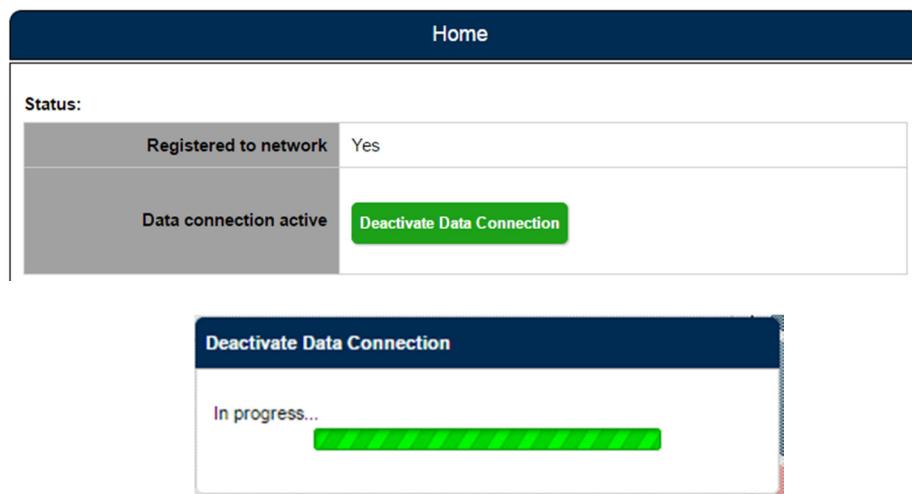
5 GLOSSARY

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
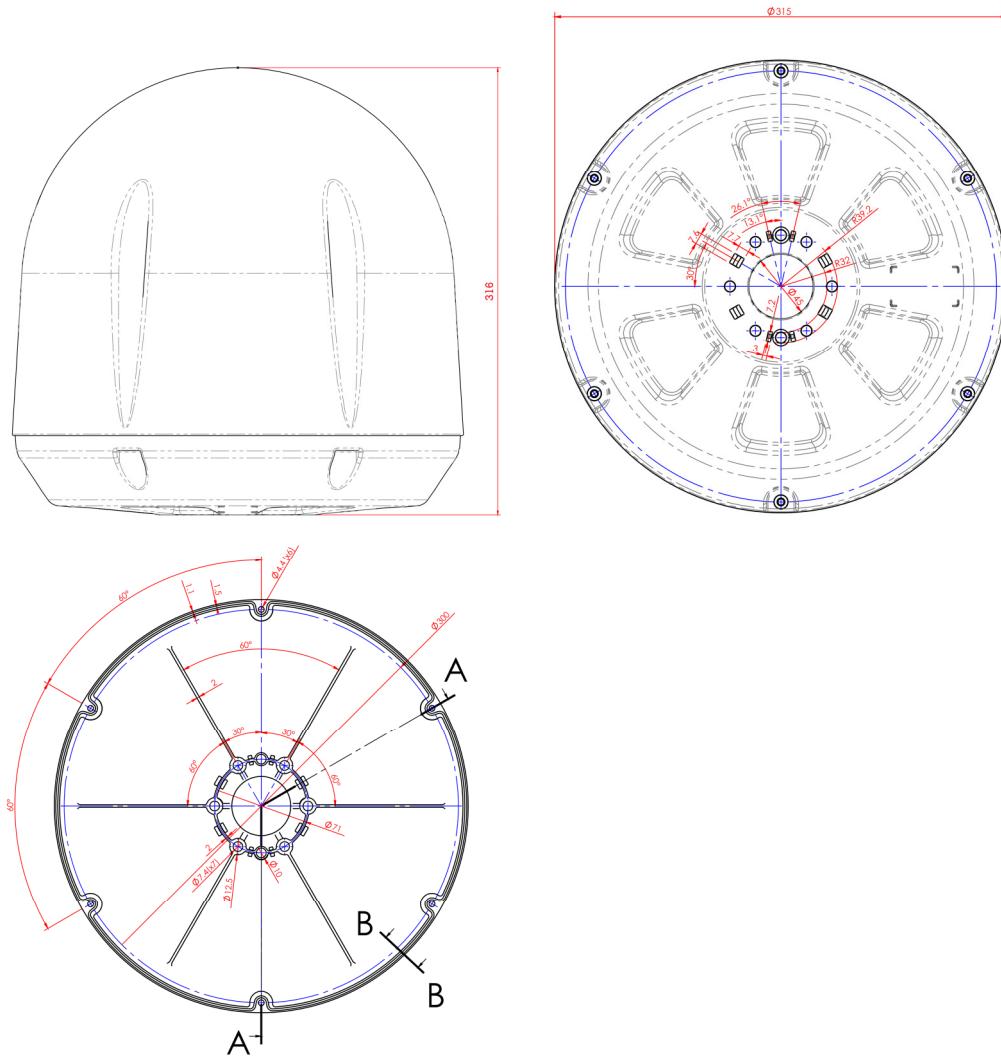
Weight : **3.55 kg**
Dimensions are expressed in terms of mm.

A-2   ADU's Hole Pattern (Cut-out Holes)
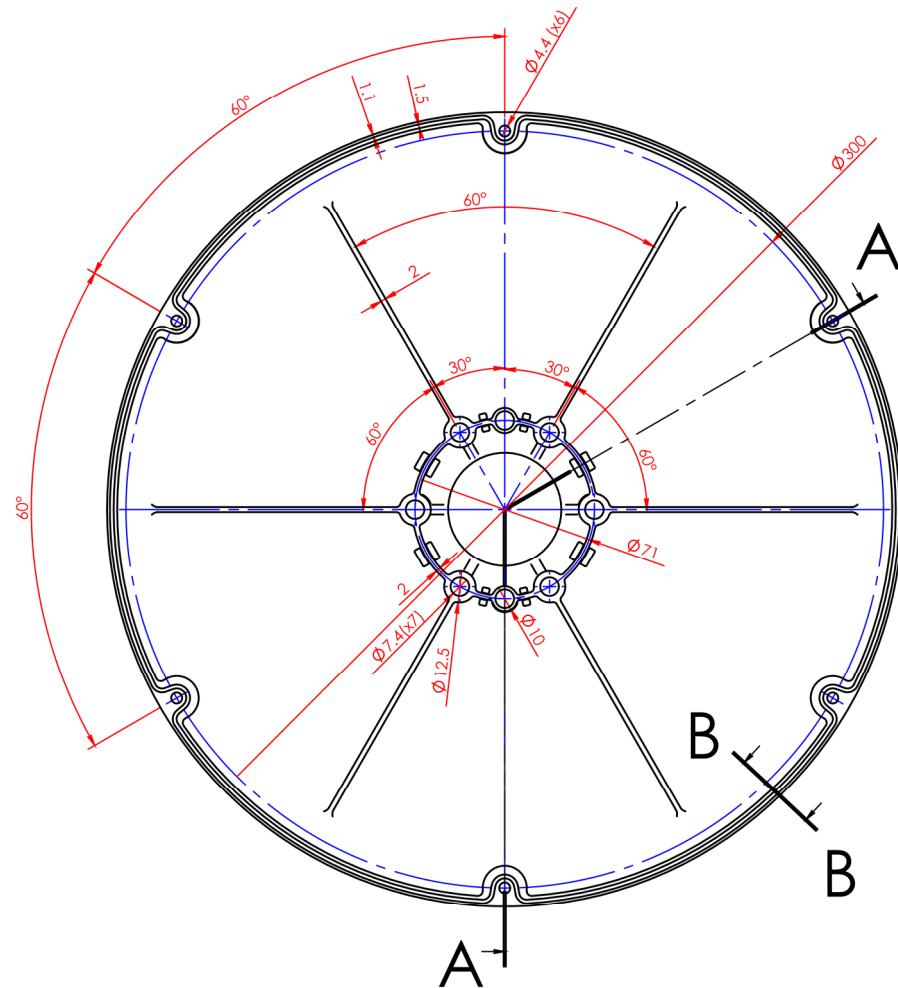

Dimensions are expressed in terms of mm.

Note: Please refer to Satlink document *SL00-01132, New radome screw FB250+* before attempting to open the ADU

A-3   BDU's Outline Dimensions
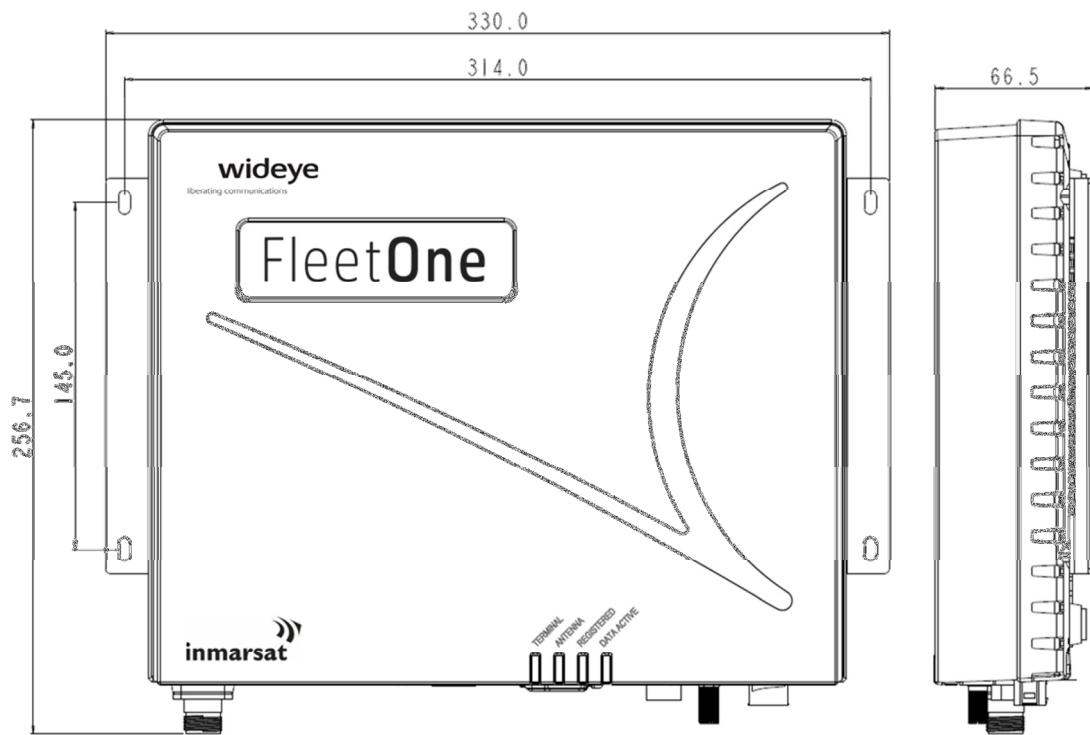
Weight : **3.1kg**
Dimensions are expressed in terms of mm.

A-4   Primary Handset's Outline Dimensions
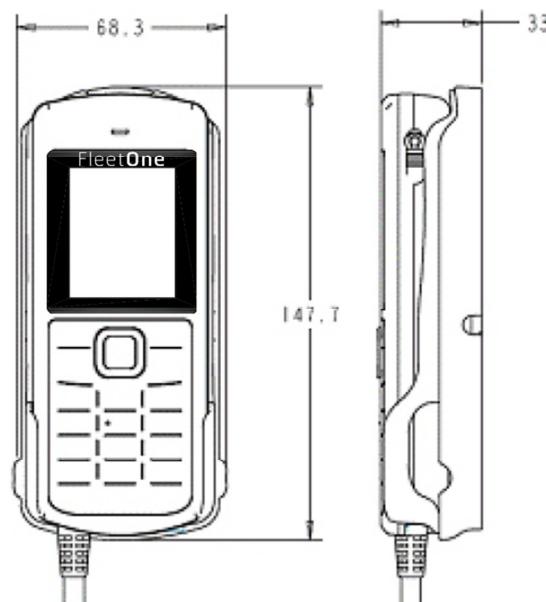
Weight : **430g (including cradle)**
Dimensions are expressed in terms of mm.

APPENDIX B GPIO PORT

B-1　Data Connection Switch

The data connection switch is used for enabling / disabling data connection in the Satlink Fleet One terminal.

The recommended model and part number of the data connection switch is **ACROLECTRIC SWTICH** (**P/N: C1350XBAAA**), which is a non-illuminated rocker switch.

NOTE	*This item is not included in the packaging list.*

The connection diagram is illustrated below:
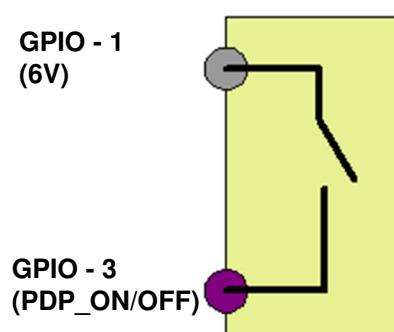
The steps of the connection are as follow:

1. Solder AWG 24 wires between the rocker switch's terminal lugs.

2. Mount the rocker switch on the panel according to its cut-out hole dimension.

3. Connect the other end of these AWG 24 wires to the GPIO Adaptor's Pin 1 and 3 respectively.