Specification of
Iridium Fleet SBD/AIS Terminal

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In General

The iridium fleet SBD/AIS terminal produced by DYPOS Marine Services Ltd. E-Trust Marine Services Co., Ltd.E-Trust Marine Services Co., Ltd. consists of HST-1 & ConBox.

The Homer Satellite Tracking Terminal (hereinafter referred to as HST-1) is a data transmission device based on the iridium satellite system. The Terminal can stably and reliably realize timed transfer of position information and transparent data transfer, and furnish users with a convenient global communication service.

Control box (hereinafter referred to as ConBox) is a device associated to HST-1 terminal, featuring with built-in big capacity lithium battery, AIS module (Optional), cellular communication module (Optional) and WiFi module. It can realize local data upload, AIS vessel information transmitting, satellite information transmitting & receive, alarm information upload as well as 48 hours battery life in emergency case. With related APP, distinct functions such as remote chat, fishery information report and etc. can be achieved.

The terminal can be installed on an offshore platform (fishing boat, floating platform) or land unit (vehicle, data collector). Position information and communication data can be easily obtained even at undeveloped remote areas without cellular coverage.

I. Equipment Composition

Iridium fleet SBD/AIS terminal consists of following components:

⌘ Iridium homer satellite tracking terminal HST-1 (Type A)

⌘ Conbox∧Type A , B or C∨; ⌘ VHF Antenna and Accessories∧Optional∨; ⌘ VHF Cable∧Optional∨- ⌘ Power Cable-

Description of Conbox Type:

Table 1 Conbox Type

Type	Description	Remarks
A	Standard type. With built-in WiFi module and battery.	
B	Function type. With built-in WiFi module AIS module and battery.	VHF cable, VHF antenna and installation accessories
C	Reinforced type. With built-in WiFi module, cellular communication module and battery.	

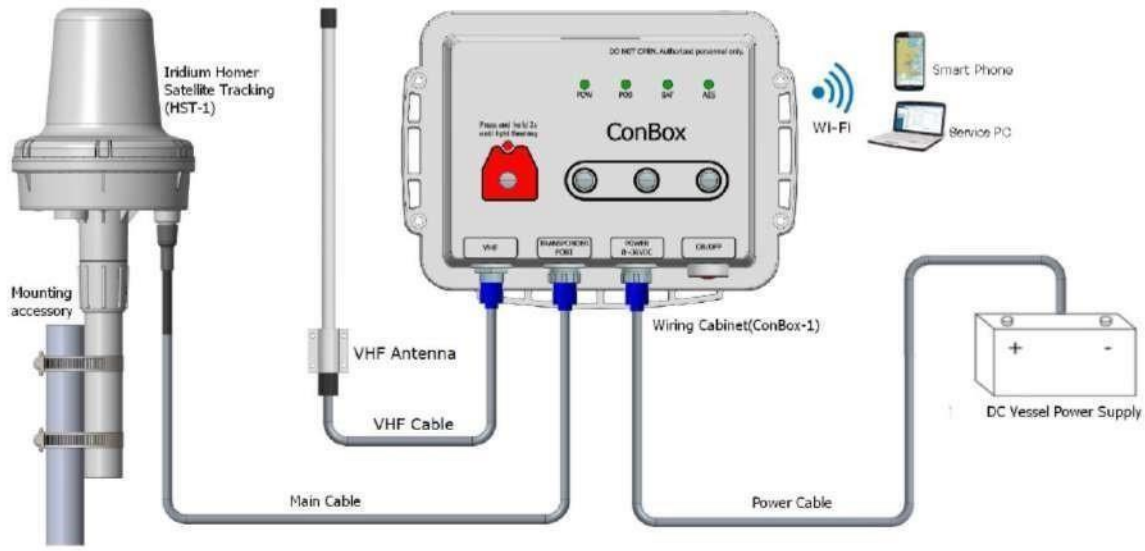

Fig 1 Composition and Application Sketch

II. Functions & Features

2.1 Main Functions

Iridium Homer Satellite Tracking Terminal (HST-1):

GPS positioning, providing position information in real time;

Regular reporting of position information;

Data transfer by Short Burst Data (SBD);

SBD auto cache and auto transfer;

Transparent data transfer;

Custom terminal number, easy to identify;

Remote parameter configuration;

Real-time detection of iridium satellite's signal strength; LED status indication.

Conbox:

Support WiFi function, to achieve wireless access to external devices;

Support WiFi data passthrough, achieve user data transmission;

Support AIS vessel information transmitting; (Optional)

Support cellular communication; (Optional)

Support log information storing and retrieving;

Support power off alarm message automatically reported;

Support button alarm message automatic report circularly (Default to every 5 minutes and can be set);

Supports cancellation of button alarm message;

Support lithium battery with 48 hours lifetime for emergency communication;

Support multi-color LED status indication;

2.2 Characteristics

Iridium Homer Satellite Tracking Terminal (HST-1):

Relying on the iridium satellite system for global coverage (including the south and north poles);

Integrated design, IP67 ingress grade;

Good software practicability and compatibility, appropriate for various communications systems;

Caching up to 100 SBD data (Max. 340Bytes each);

High instantaneity and security for data transfer;

Wide power input, adaptive to various power supplies;

Low power consumption design, suitable for battery supply;

Enclosure and cables resistant against salt fog and solar radiation, suitable for harsh natural environment;

Highly reliable hardware design, fit for complicated application environment;

Improved firmware updating function, convenient for system application expansion;

Multiple installing and securing methods for user selection;

Control Box (Conbox):

Combined with HST-1 for a variety of functions to expand;

With integrated design, IP67 ingress grade;

Practical and compatibility, applicable to a variety of communication needs;

Real-time data transmission with high security;

Adapt to a variety of power conditions;

Low power consumption for battery powered environments;

Shell and cable have salt spray resistance, solar radiation design which is suitable for harsh natural environment;

High hardware design reliability, adapt to complex application environment;

Firmware upgrade function is optimized to expand the scope of application of the system;

Multiple installation methods for user selection.

III. Apperance and Structure

3.1 HST-1

a. Dimension

★ Terminal: φ144×198.2mm;

★ Rack Post: φ44×200mm;

★ Communication Cable Length: ≥5m（Standard Configuration）;

b. Weight

★ Terminal: ≤1.2kg（Incl. communication cable）;

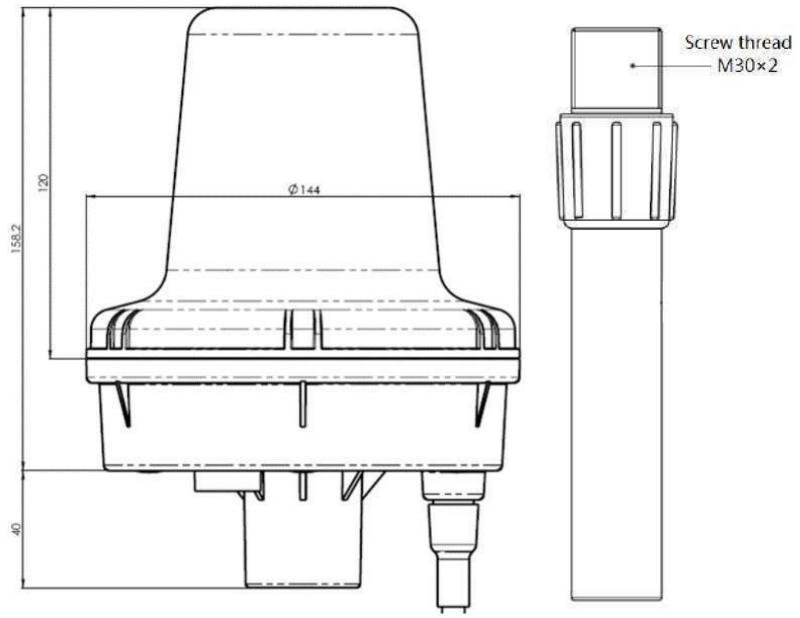

Fig. 1 HST-1 Outline Drawing

Fig. 2 HST-1 Explosion Structure Diagram

c. Interface Description

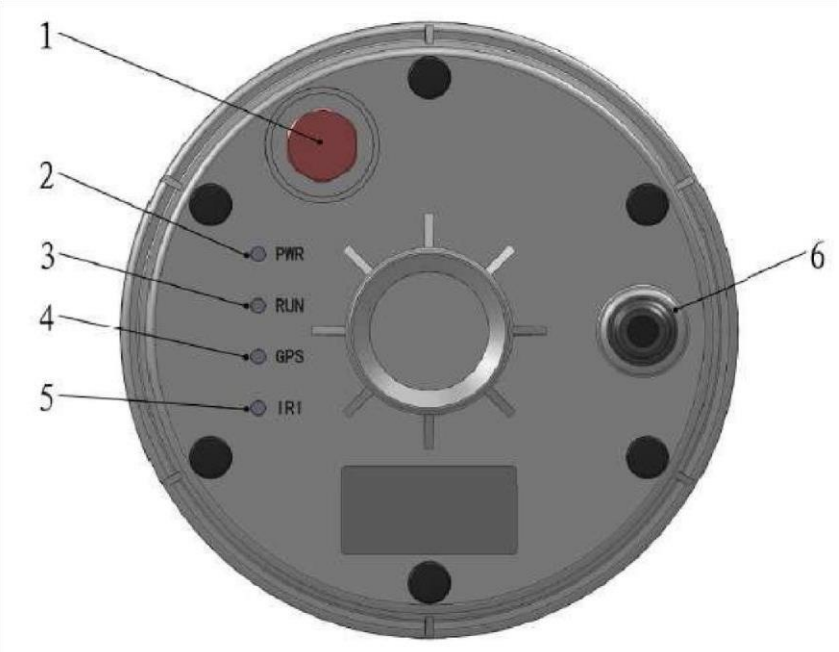

Fig. 3 HST-1 Interface Description

【1：**Waterproof breather valve**】：Waterproof breather valve installation position.

【2：**PWR**】：power indicator (green)

- Green light on: normal power supply
- Green light off: abnormal power supply

【3：**RUN**】：data indicator (red)

- Red light on: data communication with Iridium satellite - Red light off: sleep state

【4：**GPS**】：GPS indicator (red)

- Red light on, success GPS positioning
- Red light off, GPS not yet positioned or positioning unsuccessfully

【5：**IRI**】：Iridium indicator (red)

- Red light on, Iridium satellite signal is strong enough to send the data and carry out data transmission
- Red light off, indicating that Iridium satellite signal strength cannot meet the requirements of sending data or carry out data transmission

【6：**Cable**】：Interface for power cables and communication cables

3.2 Conbox

a. Dimension

★ Terminal: 204.8×159.8×76mm；

★ Power Cable Length: ≥2.5m（Standard Configuration）；

b. Weight ⌘ Terminal、1.5kg-

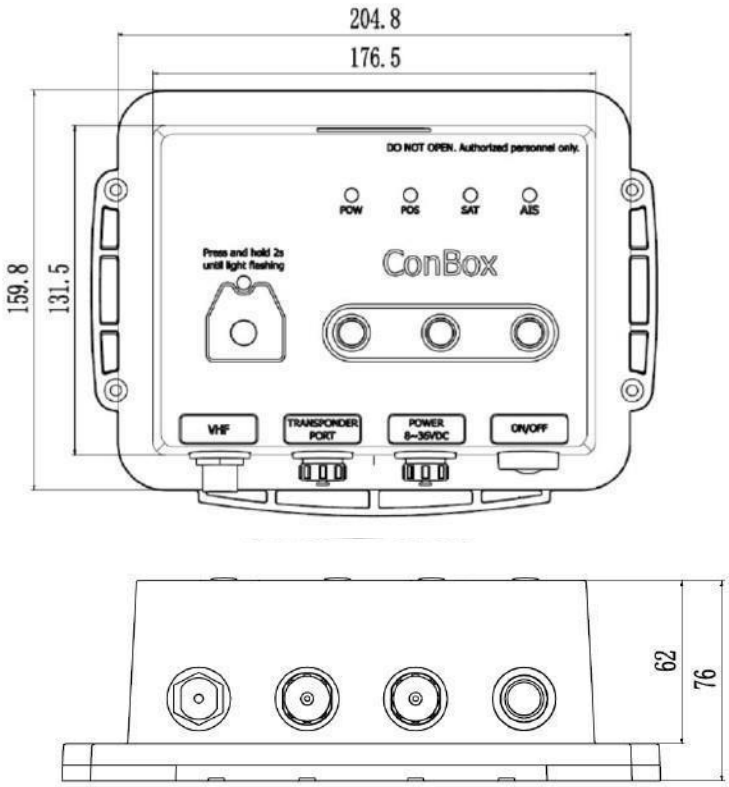

Fig. 4 Conbox Outline Drawing

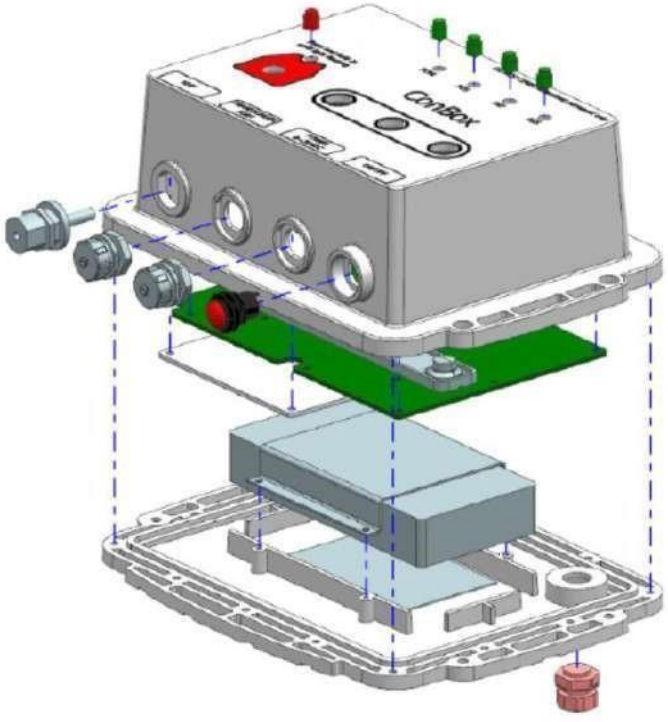

Fig. 5 Conbox Explosion Structure Diagram

c. Interface Description

On the surface of Conbox, there are five LED indicators, which indicate the status of power, position, satellite signal, AIS power and alarm. Besides, one ALERT button and three customized programmable buttons are available. And in the bottom, there are three cable interfaces and one power switch (ON/OFF). In the back side, water-proof breather valve is embedded. For details, please see below figure:

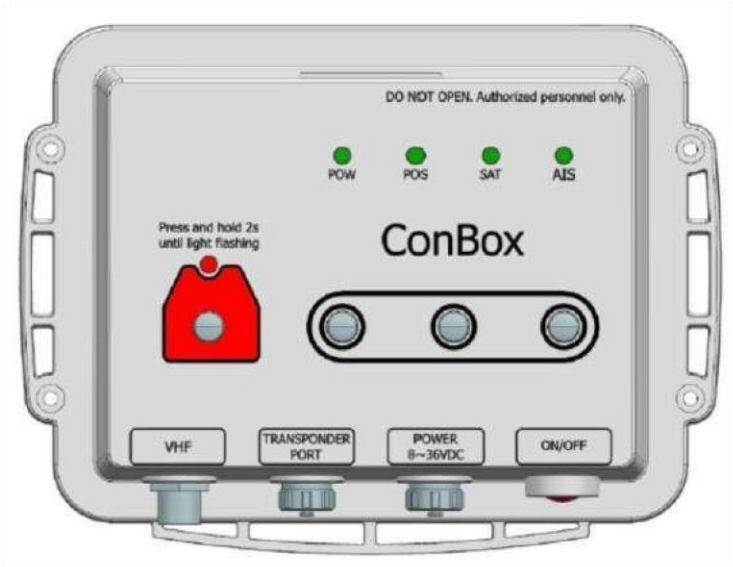

Fig. 6 Front View

【ON/OFF Button】:

Turn on or turn off SPACEON VMS device power.

【ALERT Button】:

- Press and hold the ALERT button for 2s to enter the alarm state. The ALERT indicator turns red and normally on. The device will immediately send an alarm message and subsequently the alarm message will be sent every 5 minutes periodically.
- In alarm state, press the ALERT button for 2s to cancel the alarm and the light will be off.

【ALERT Indicator】:

In alarm state, the red light is on, whereas in normal state, the red light is off.

【POW Indicator】: For power indication

- Green light normally on means the device is switched on, using external power supply and battery charge is accomplished.
- Green light flash means the device is switched on, using external power supply and battery is on charge.
- Red light normally on means the device is switched on, using external power supply and battery is at high level.
- Red light flash means the device is switched on, using external power supply and battery is at low level.

【POS Indicator】: For position indication

- Green light on means GPS positioning successfully
- The light off means GPS positioning unsuccessfully

【SAT Indicator】: For indication of satellite signal -

Green light on means strong satellite signal.

- The light off means weak satellite signal. 【**AIS Indicator**】: For AIS power indication AIS
- Green light on means AIS power on.
- The light off means AIS power off.

【**TRANSPONDER PORT Interface**】: For connecting HST-1 communication cable;

【**POWER Interface**】: For connecting power cable;

【**VHF Interface**】: For connecting VHF RF cable;

【**Programmable Button (3nos.)**】: Customized button.

IV. Technical Index

HST-1	
General Specifications	
Terminal size	φ144×198.2mm±2;
Size of Rack Post	φ44×200mm±2;
Cable length	≥5m;
Weight	≤1.5kg (5m cable);
Timing interval	5min~1440min (adjustable)
Operating frequency	1575.42MHz（GPS）; 1616MHz~1626.5MHz（iridium satellite）
RF output power	≤1.6W
Ambient Conditions	
Operating temperature	-30°C to +70°C
Storage temperature	-40°C to +85°C

Protection Grade	IP67
Applicable Standards	IEC60945-2002
Antenna	
Operating frequency	1575.42MHz（GPS）；1616MHz~1626.5MHz（iridium satellite）
Weighted gain	≥0dBic
Axial ratio	≤2dB
Standing wave	≤1.5
Impedance	50Ω
Polarization mode	RHCP
GPS Receiver	
Frequency	GPS L1
Cold start positioning	26s
Hot start positioning	1s
Sensitivity	-161dBm
Horizontal position accuracy	5m
CONBOX	

General Specification	
Terminal size	150×110×45mm±2；

Weight	≤1.5kg（incl. battery）
Operating voltage	DC +8V~+36V
Rated voltage	DC+14.4V
Peak Power	＜35W
Average Power	＜8W
Battery capacity	≥70WH
Battery voltage	DC11.1V
Battery life	＞48hrs (Alert model, HST-1 Interval time 1 hour)
WIFI Module	
Certification	FCC/CE/ROHS
Standard	IEEE802.11b/g/n
Frequency Range	2.412~2.484 GHz
Encryption mode	WEP64/WEP128/TKIP/CCMP(AES)
Nos of user	Can Support 5 users
AIS Module	
Standard	Class B
Frequency Range	156.025MHz~162.025MHz
Default Frequency Point	161.975MHz、162.025MHz
Transmission Channel	1

Modulation System	GMSK
Transmitting Power	33dBm±1.5
VHF Antenna Index	
Operation Frequency	155MHz~162.025MHz
VSWR	≤2
Impedance	50Ω
Gain	≥0dB
Interface	SL16-K（Female）
Environmental Conditions	
Operating temperature	-20°C to +55°C
Battery charging temperature	0°C to +40°C
Storage temperature	-30°C to +70°C（Excl. battery） -20°C to +45°C（Incl. battery）
Ingress Grade	IP67