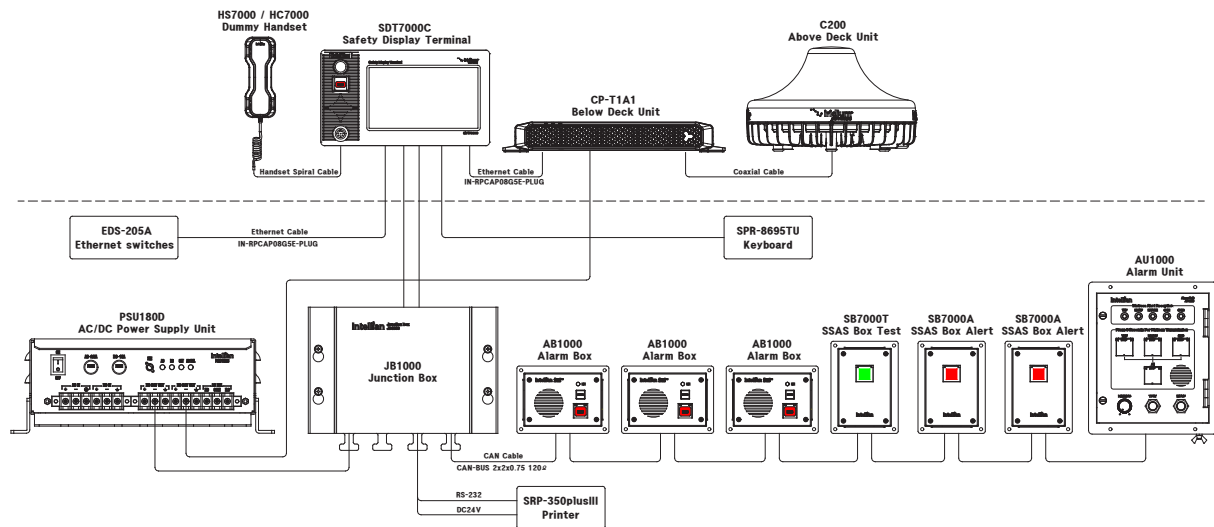


7.4.2 Optional Configuration



NOTE

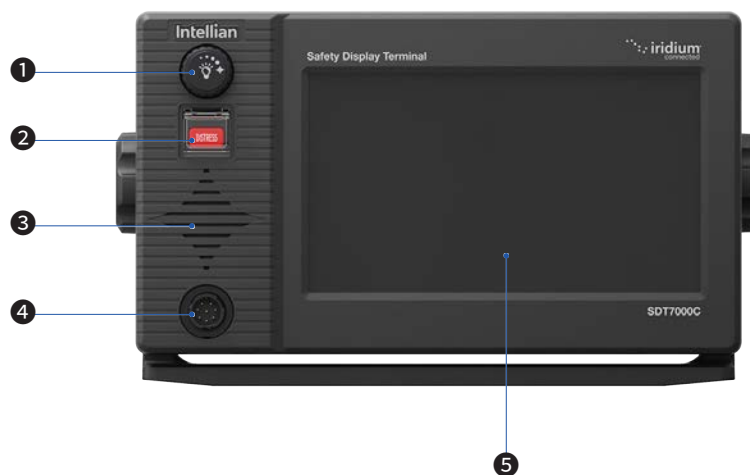
- CAM-HMI Installation Location:
 - At least one Central Alert Management HMI (CAM-HMI) device must be installed at the navigation and maneuvering workstation.
 - If necessary, it can also be additionally installed at the monitoring workstation.
- Attention:
 - If an Integrated Navigation System (INS) is already installed and operational on-board, installing an additional, separate Central Alert Management (CAM) system alongside this equipment is not permitted. The INS system must include or integrate the CAM functionality.

7.5 SDT Cable Connection

7.5.1 SDT Front/Back Panel

The following figures show the SDT front and back panels.

Front



No.	Key	Function
①	Dimmer knob	Control the LCD screen brightness by the dimmer knob.
②	DISTRESS key	Press and hold the button for three seconds to transmit the Distress Alert. Note: DISTRESS button is covered by transparent cover to prevent user from accidental operation.
③	Front speaker	Front speaker is located inside the housing.
④	Handset port	Connect the provided handset (HS7000). (It can also be connected to the rear 8P port.)
⑤	7" LCD screen	Displays the user interface including menu, function, message, etc.

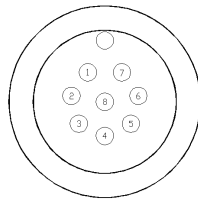
Rear



No.	Port	Function
①	LAN	Enter the APTUS web UI by connecting the LAN port to the EDS-205A (LAN switch) or a PC/LAPTOP. • The web UI displays information such as the C200M link state.
②	USB	Connect the optionally provided SPR-8695TU (keyboard). Connect the USB flash drive. (only supports FAT32).
③	DATA	Connect the provided IN-CCCAF14FCC-03H cable to the JB1000. This cable supports RS-422, CAN, and RS-232 (printer) communications.
④	GND	It enhances robustness against electromagnetic interference, including ESD, bursts, noise, etc. • If possible, connect the shield to the earth using the cable.
⑤	BDU	Connect the BDU using an Ethernet cable.
⑥	HANDSET	Connect the provided handset. (It can also be connected to the front 8P connector.)
⑦	DC24V	Connect the provided IN-CCBAF12FBB-03H cable to the JB1000. • This cable supplies DC power from the PSU180D and supports RS-422 communication.

7.5.2 SDT Connector Pinout Guide

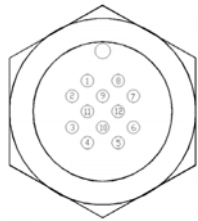
Handset (Front/Rear) Connector



IEC 320 C14 Plug Male

Pin	Signal
1	MIC+BIAS
2	Det_Key_ADC
3	Speaker +
4	Speaker -
5	Hook_ADC
6	AF_1.8V
7	Shield
8	GND

Power Connector (DC Power)

Font view, Panel lock,
12 pin male

Pin	Signal	Wire color
1	BATT- (DC 24V -)	Black
2	BATT- (DC 24V -)	Brown
3	BATT+ (DC 24V +)	Red
4	BATT+ (DC 24V +)	Orange
5	EARTH (Isolation, GND)	Yellow
6	EARTH (Isolation, GND)	Green
7	Not Connect	Blue
8	EXT1_RX A (Input, IEC61162-1/2)	Purple
9	EXT1_RX B (Input, IEC61162-1/2)	Gray
10	EXT1_GND	White
11	EXT1_TX Z (Output, IEC61162-1/2)	Pink
12	EXT1_TX Y(Output, IEC61162-1/2)	Light Green

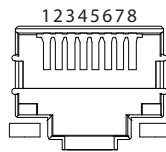
DATA Connector (DC Power)



Front view, Panel lock,
14 pin male

Pin	Signal	Wire color
1	EXT2_RX A (Input, IEC61162-1/2)	Black
2	EXT2_RX B (Input, IEC61162-1/2)	Brown
3	EXT1_GND	Red
4	EXT2_TX Z (Output, IEC61162-1/2)	Orange
5	EXT2_TX Y (Output, IEC61162-1/2)	Yellow
6	DC_OUT + (DC 24V+ Out)	Green
7	DC_OUT - (DC 24V- Out)	Blue
8	CAN_H (IEC61162-3)	Purple
9	CAN_L (IEC61162-3)	Gray
10	EXT_EARTH (Isolation, GND)	White
11	RS-232 RX (Output, IEC61162-1/2)	Pink
12	RS-232_GND	Light Green
13	RS-232 TX (Output, IEC61162-1/2)	Black/White
14	Not Connect	Black/White

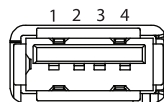
BDU / LAN Connector (LAN)



RJ-45 Female

Pin	Signal
1	Tx+
2	Tx-
3	Rx+
4	N/C
5	N/C
6	Rx-
7	N/C
8	N/C

USB Connector



USB A Female

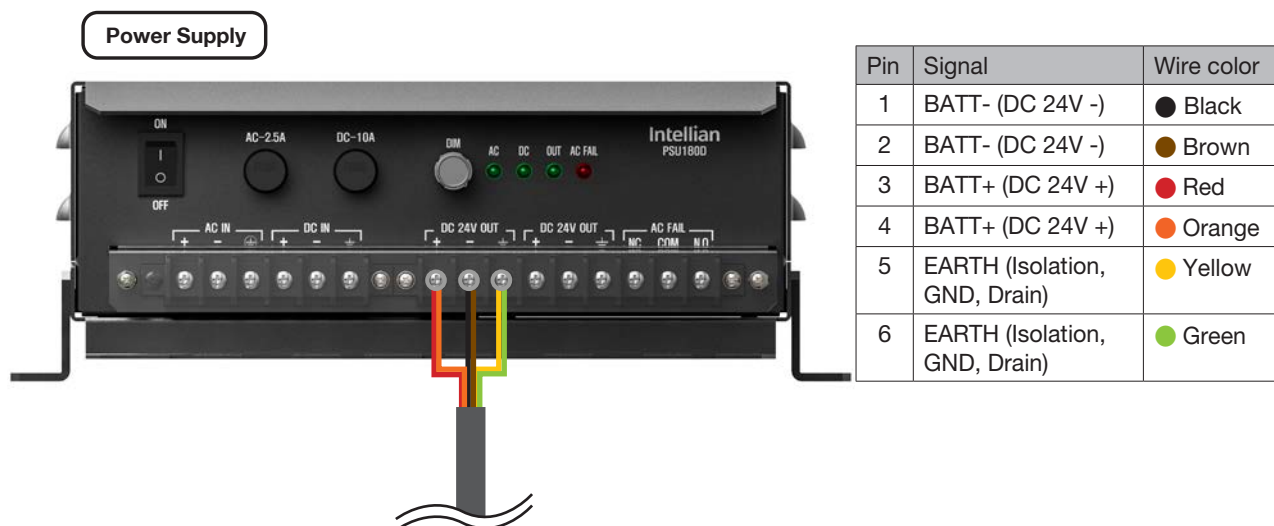
Pin	Signal
1	VBUS
2	USB DM(-)
3	USB DP(+)
4	GND

7.6 Establishing SDT Connections

7.6.1 Connecting DC Power to the SDT

Directly Connecting Power Cable to the SDT

1. The wire should be terminated with a ring connector (Optional) as shown below:
 - Positive (BATT + / DC 24 +): Red and Orange wires
 - Negative (BATT - / DC 24 -): Black and Brown wires
 - Earth: Yellow and Green wires
2. Remove the safety protection cover of the Power Supply.
3. Unscrew the “+” terminal on DC 24V OUT using a Phillips screwdriver. Insert the ring connector of the Red and Orange (positive) wires into the terminal and tighten the screw back into the terminal.
4. Unscrew the “-” terminal on DC 24V OUT using a Phillips screwdriver. Insert the ring connector of the Black and Brown (negative) wires into the terminal and tighten the screw back into the terminal.
5. Unscrew the “ $\perp$ ” terminal on DC 24V OUT using a Phillips screwdriver. Insert the ring connector of the Yellow and Green (earth) wires into the terminal and tighten the screw back into the terminal.



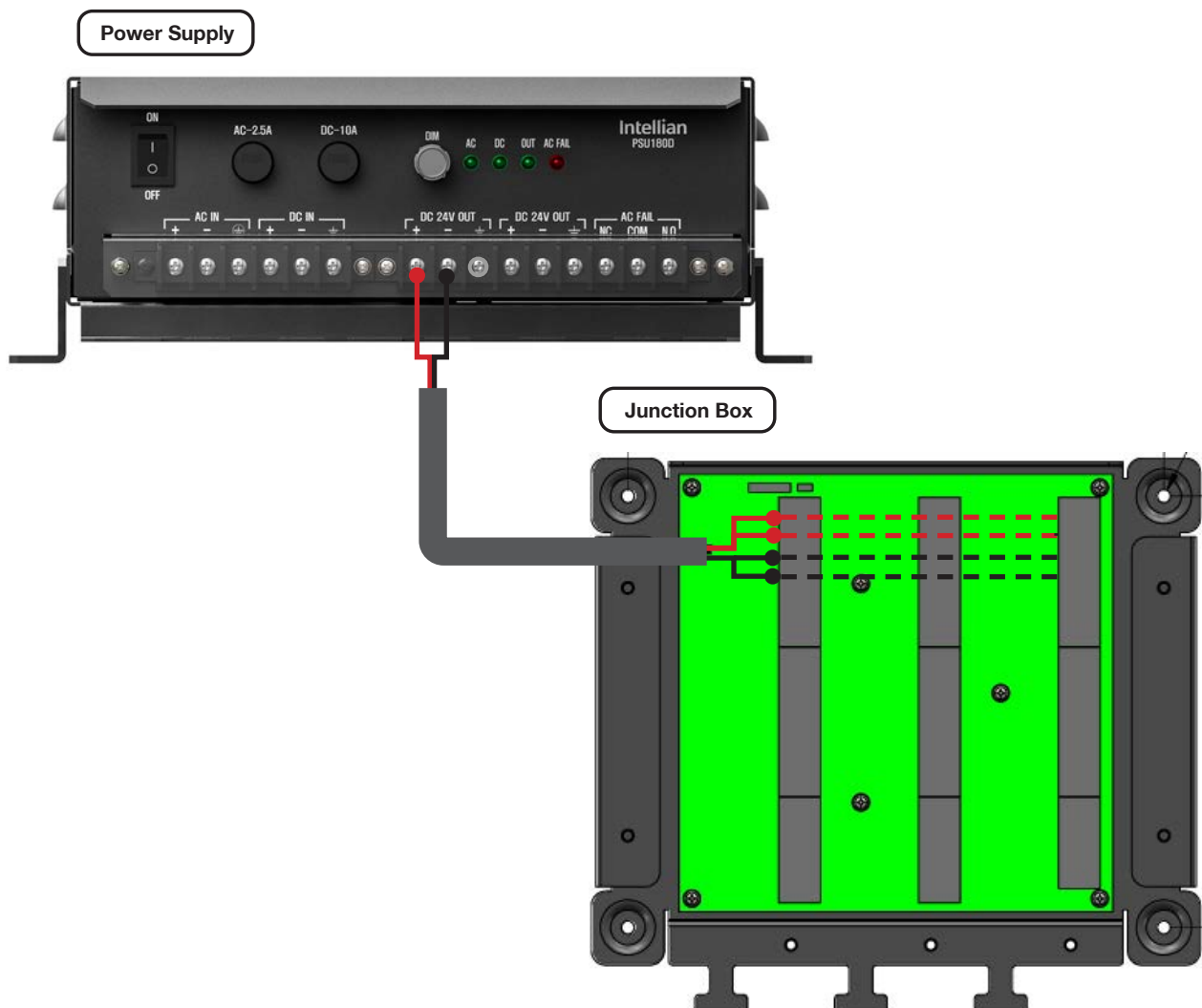
6. Replace the safety protection cover of the Power Supply.
7. Connect the 12-pin power connector to the DC 24V port on the back of the SDT.
8. Finger-tighten the lock ring on the waterproof housing connector to ensure a secure and waterproof connection.



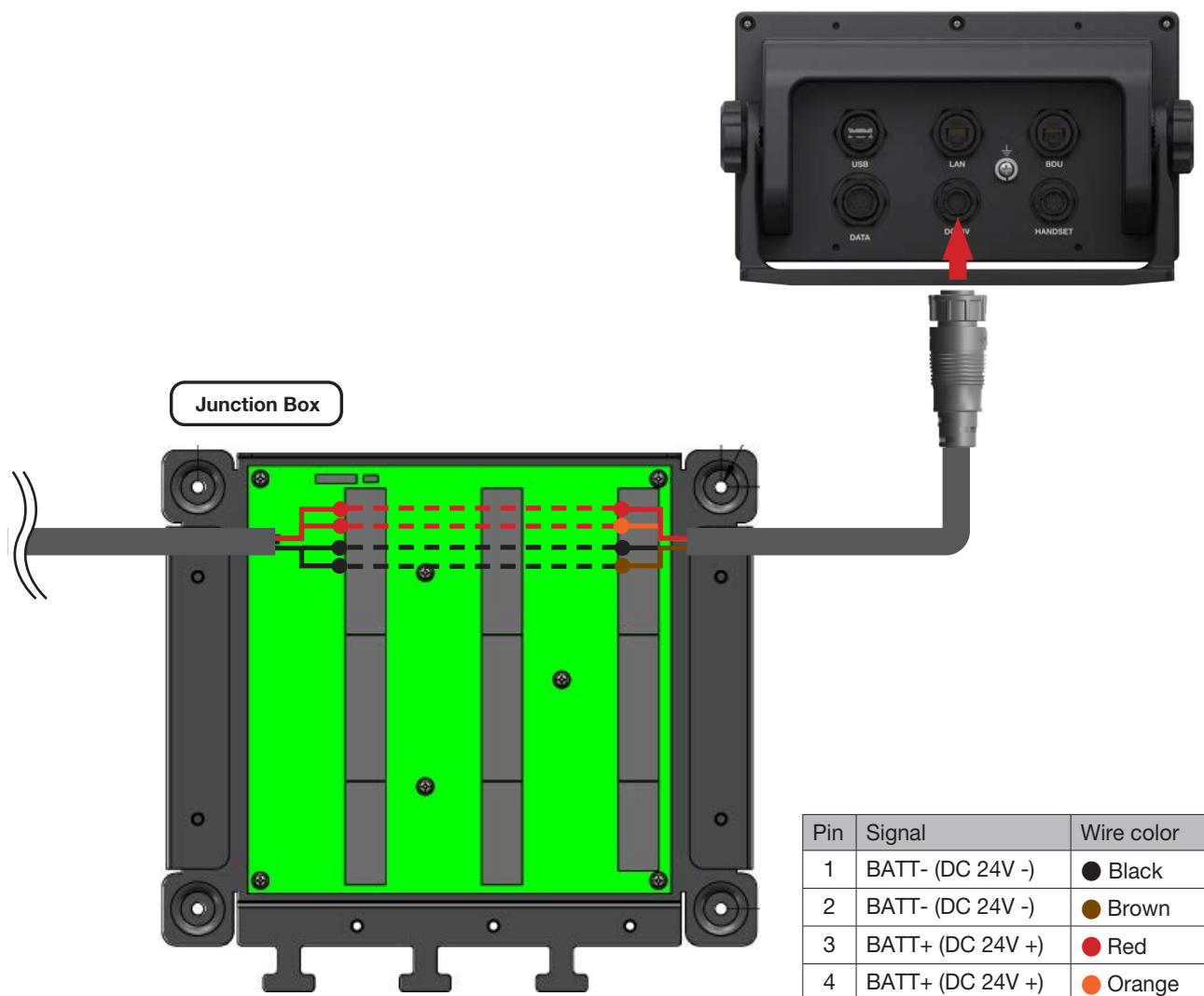
Connecting Power Cable to SDT Junction Box Power Supply

To connect the power to the junction box, you will need to purchase the Junction Box and Power Supply (PSU-18D) separately. These items are provided in a separate box when supplied.

1. Connect the PSU-18D to the junction box using the power cable:
 - a. Unscrew the “+” terminal on DC 24V OUT using a Phillips screwdriver. Insert the ring connector of the Red (positive) wire into the terminal and tighten the screw back into the terminal.
 - b. Unscrew the “-” terminal on DC 24V OUT using a Phillips screwdriver. Insert the ring connector of the Black (negative) wire into the terminal and tighten the screw back into the terminal.
 - c. Connect the Red wire to both the terminals labeled “+” on the junction box.
 - d. Connect the Black wire to both the terminals labeled “-” on the junction box.



2. Connect the Power Supply (PSU-18D) to the junction box with the power cable:
 - a. Connect the 12-pin power connector to the DC 24V port on the back of the SDT.
 - b. Finger-tighten the lock ring on the waterproof housing connector to ensure a secure and waterproof connection.
 - c. Thread the red and orange wires into the cable groove in the junction box, aligning them with the '+' pin. Then, fully tighten the screws using a Phillips screwdriver.
 - d. Thread the red and orange wires into the cable groove of the junction box, aligning them with the '-' pin. Then, fully tighten the screws using a Phillips screwdriver.

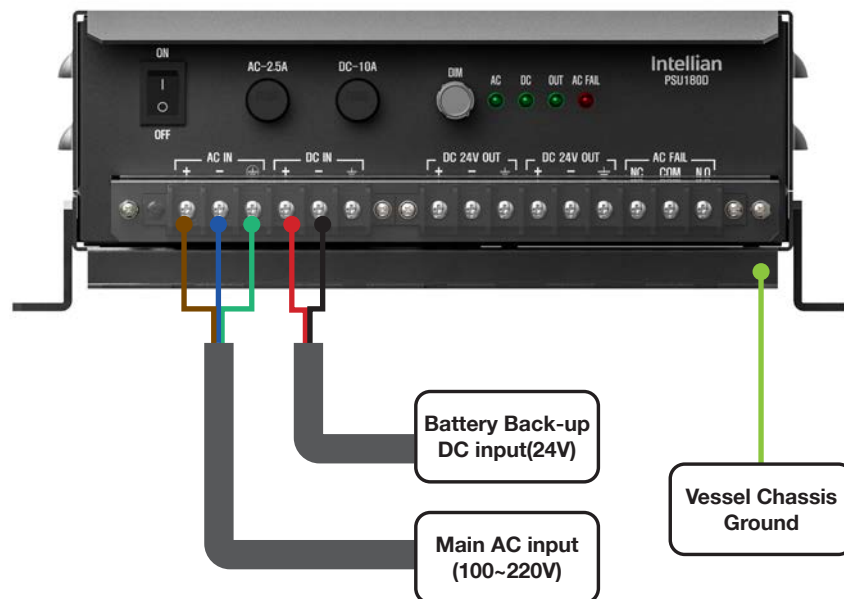


7.6.2 Connecting Main/ Emergency and Reserve Power Source

The C200M GMDSS system can be connected to main/emergency (VAC input) and reserve (VDC input) power sources through the PSU180D (Power Supply Unit).

When both main/emergency (VAC input) and reserve (VDC input) power sources are connected simultaneously, the PSU 180D (Power Supply Unit) delivers DC output using the main/emergency VAC input. In case of a failure on the VAC supply, it automatically switches over to the reserve VDC input.

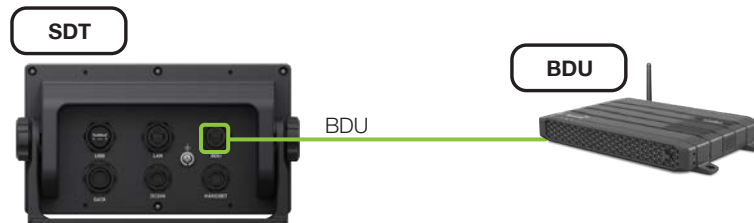
If the VAC input, such as the main power, disconnects or experiences irregularities, it automatically switches to the VDC input and outputs DC voltage.



7.6.3 Connecting SDT to BDU using the BDU Port

Intellian provides an Ethernet cable.

1. Connect one end of the Ethernet cable to the BDU port on the back of the SDT and the other end to the LAN port on the BDU.
2. Finger-tighten the cable locker on the water housing connector to ensure a secure and waterproof connection.



7.6.4 Connecting SDT to Devices using the LAN Port

Intellian provides an Ethernet cable. To access the APTUS web UI, connect the SDT's LAN port to a LAN switch (HUB) or a PC/Laptop.

1. Connect one end of the Ethernet cable to the LAN port on the back of the SDT and the other end to a LAN switch (HUB) or a PC/Laptop.
2. Finger-tighten the cable locker on the water housing connector to ensure a secure and waterproof connection.



7.6.5 Connecting SDT to a Keyboard using the USB Port

Intellian provides a USB A male to A female extension cable. This allows a keyboard to be connected for entering safety messages and controlling the mouse pointer within the GMDSS SDT user interface.

1. Connect the USB A connector of the keyboard's cable to the USB A female end of the provided extension cable.
2. Connect the USB A male end of the extension cable to the USB port on the back of the SDT.
3. Finger-tighten the cable locker on the water housing connector to ensure a secure and waterproof connection.



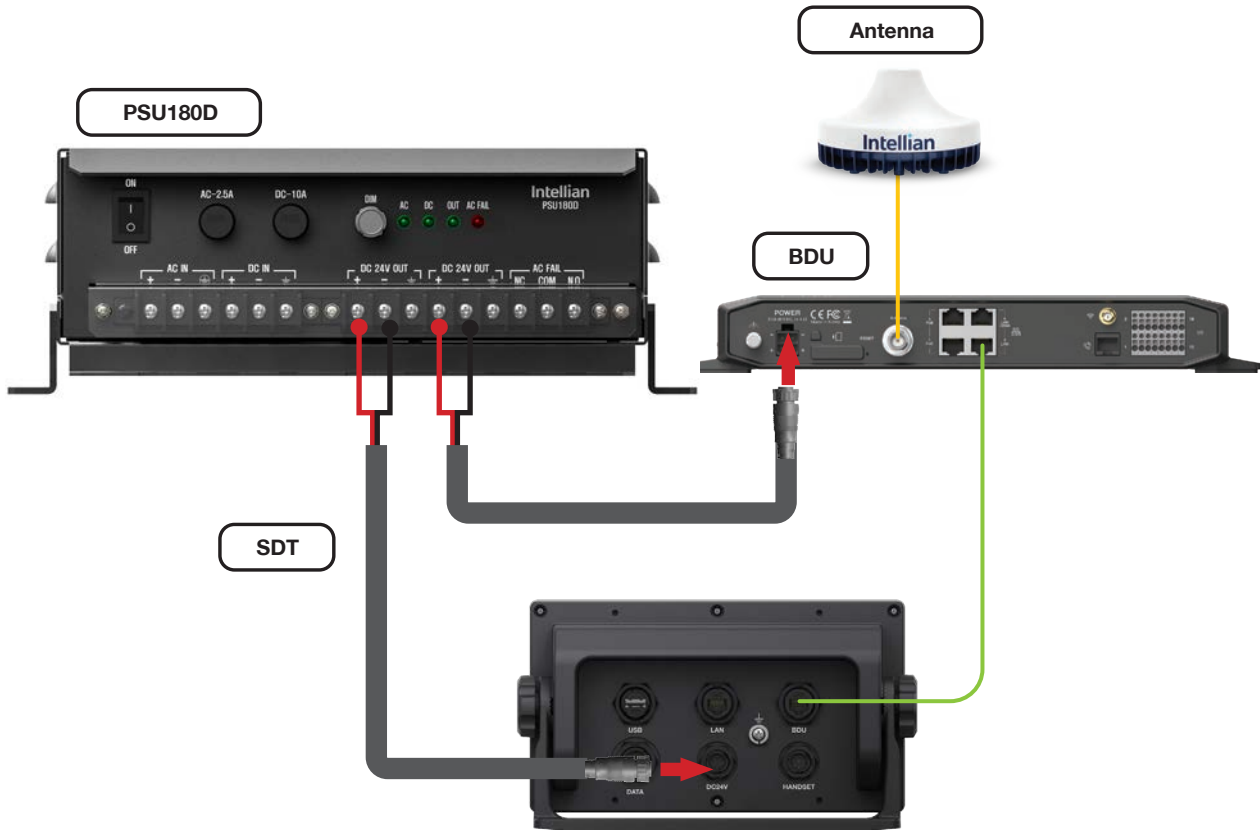
7.6.6 Connecting the SDT to the Ship's Grounding System

The grounding stud is located on the back of the SDT. To properly ground the SDT to the ship's grounding system, follow these steps:

1. Unscrew the ground screw on the GND terminal using a Phillips screwdriver.
2. Attach a grounding cable as short as possible with a minimum cross-section area of 5 mm² to the grounding stud and secure it with a bolt.
3. Connect the other end of the grounding cable to the ship's grounding system.

7.7 Power Consumption

The SDT and BDU (including ADU) of the main basic configuration for the C200M GMDSS system are powered by a 24 VDC power source. This section provides the maximum power consumption and typical average power consumption. This information can be used for calculating the back-up battery capacity, a requirement for GMDSS equipment onboard SOLAS vessels.



If you installed the C200M GMDSS system using the PSU180D (customer-supplied) as shown in the image, the maximum power consumption is listed in the table below.

Maximum 24V DC Output Power Consumption (W) - PSU180D	
System Unit	Power [W]
SDT (SDT7000C)	20W
BDU (with ADU Usage)	120W
Total Power (maximum)	140W



NOTE

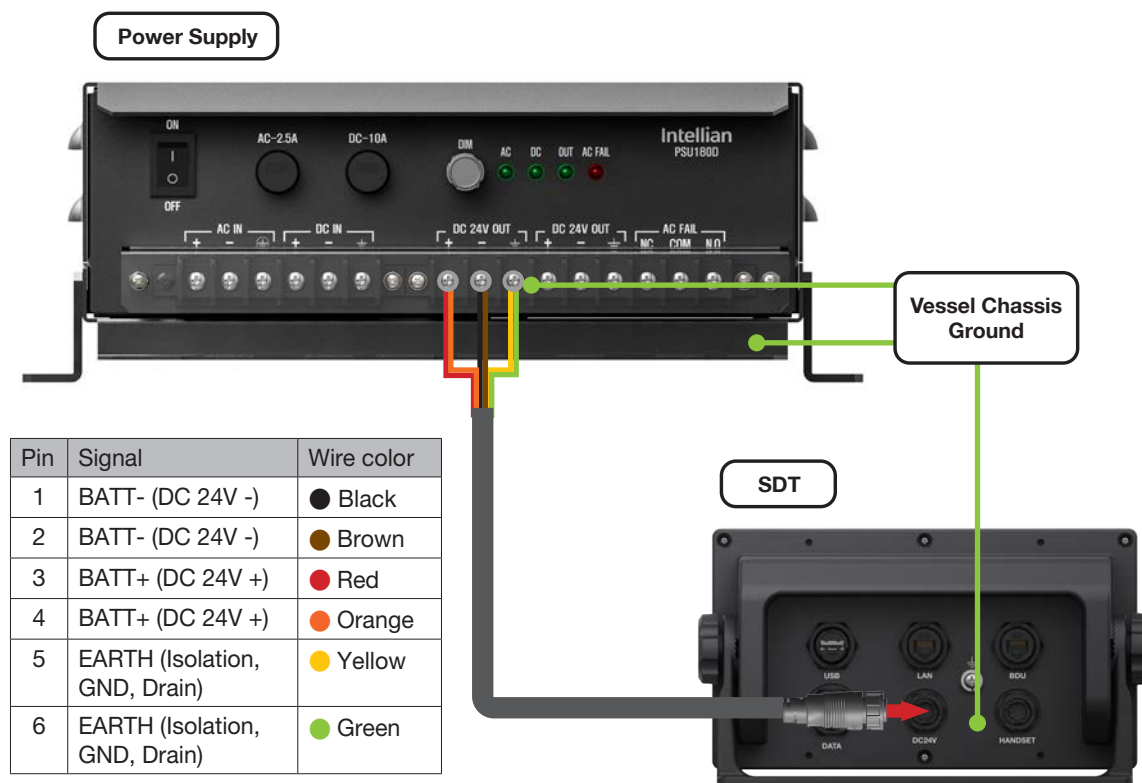
The maximum power consumption is calculated based on the operation of all interfaces.

7.8 DC Isolation Resistance & Grounding

7.8.1 Connecting SDT Chassis Ground/ DC Power cable/ Isolation resistance

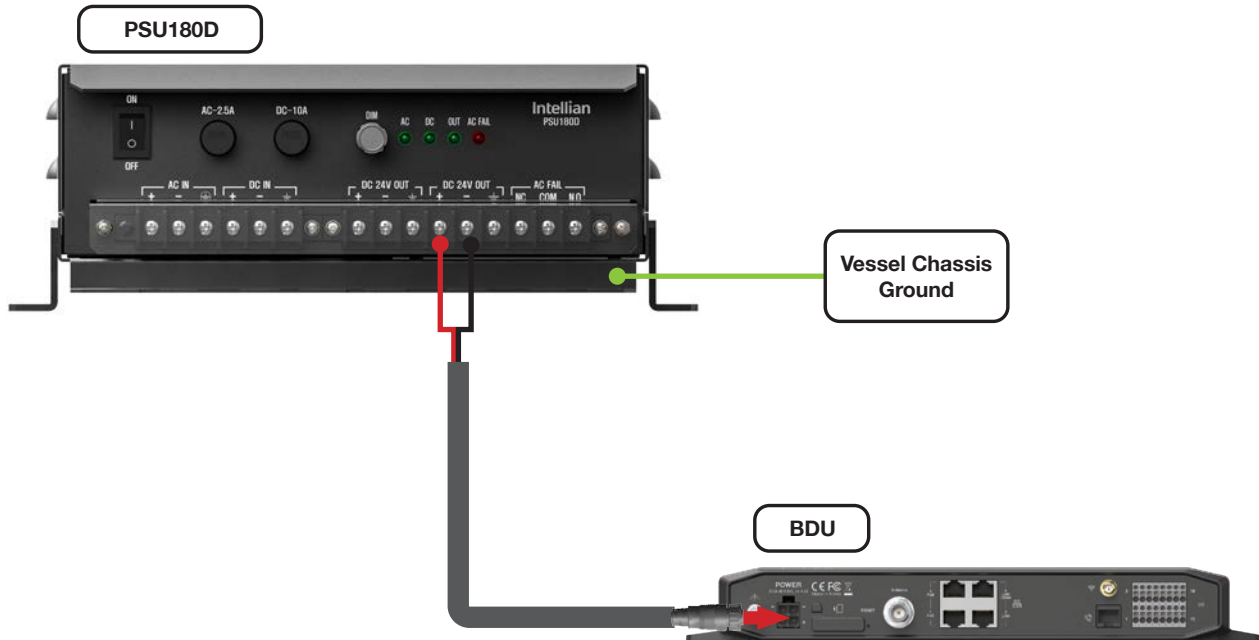
SDT Unit

- Chassis Ground (GND) must be connected to Vessel GND.
- VDC (+) and VDC (-) connected Power Cable must be connected to the Vessel 24 VDC power supply.
- Isolation resistance, measured between GND and VDC (-), is $> 10 \text{ M}\Omega$.
- Galvanic isolation between VDC (-) and GND must be maintained.



7.8.2 Connecting BDU Chassis Ground/ DC Power cable/ Isolation resistance

The Chassis Ground must be connected only to the Galvanic Ground of the power supply (PSU-180D). Connect the VDC (+) and VDC (-) from the DC 24V OUT port on the power supply to the POWER port on the BDU using a power cable. Do not use the ground connection on the BDU.



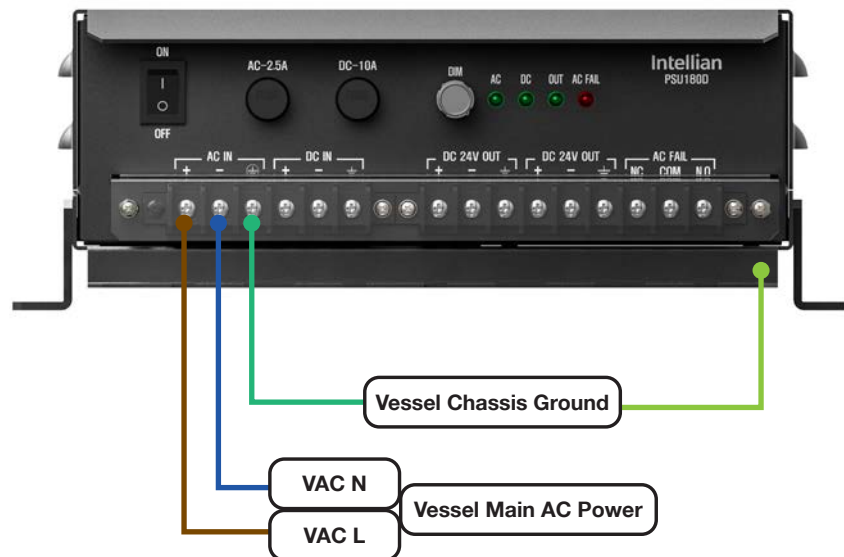
7.9 Galvanic Isolated Power Supply

Use an IEC 60945 approved AC/DC or DC/DC galvanic isolated power supply for the C200M GMDSS system (SDT and BDU etc..). The galvanic isolated power supply must be used to protect the C200M GMDSS. It is also possible to use a Battery as a power supply, but it must be connected to a galvanic isolated Power Supply.

7.9.1 Connecting VAC IN & Chassis Ground

PSU-180D Power Unit

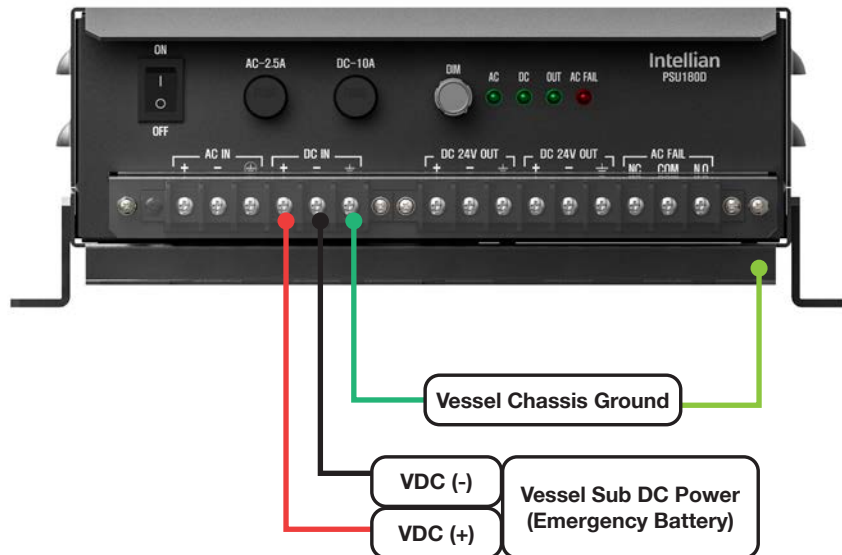
- Chassis Ground (GND) must be connected to Vessel GND.
- AC Power Cable must be connected to Vessel VAC.
- Isolation resistance, measured between GND and VAC (L or N), is $> 10 \text{ M}\Omega$.
- Galvanic isolation between VAC (L or N) and GND must be maintained.



7.9.2 Connecting VDC IN & Chassis Ground

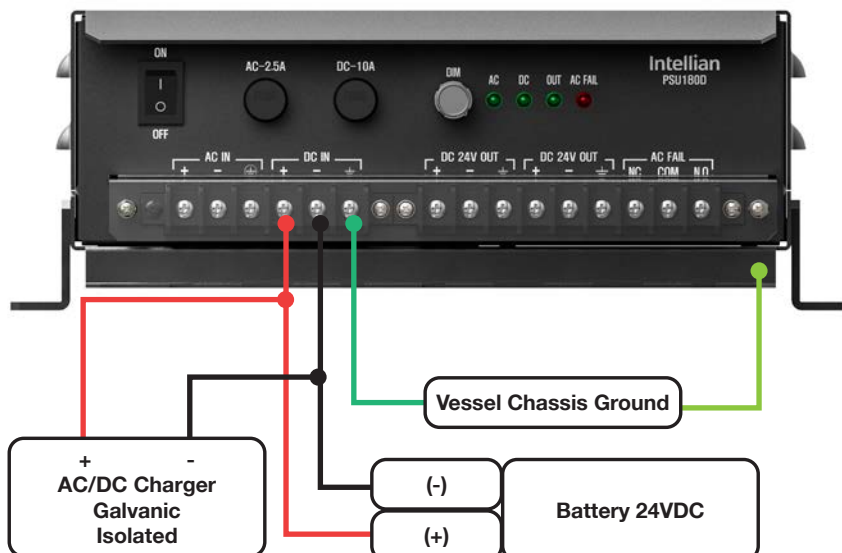
PSU-180D Power Unit

- Chassis Ground (GND) must be connected to Vessel GND.
- DC Power Cable must be connected to Vessel VDC (Emergency Battery or VDC).
- Isolation resistance, measured between GND and VDC (-), is $> 10\text{ M}\Omega$.
- Galvanic isolation between VDC (-) and GND must be maintained.



7.9.3 Connecting Battery Power Supply with AC/DC Galvanic isolated Charger

Connection of 24 VDC Battery to a Galvanically Isolated AC/DC Charger



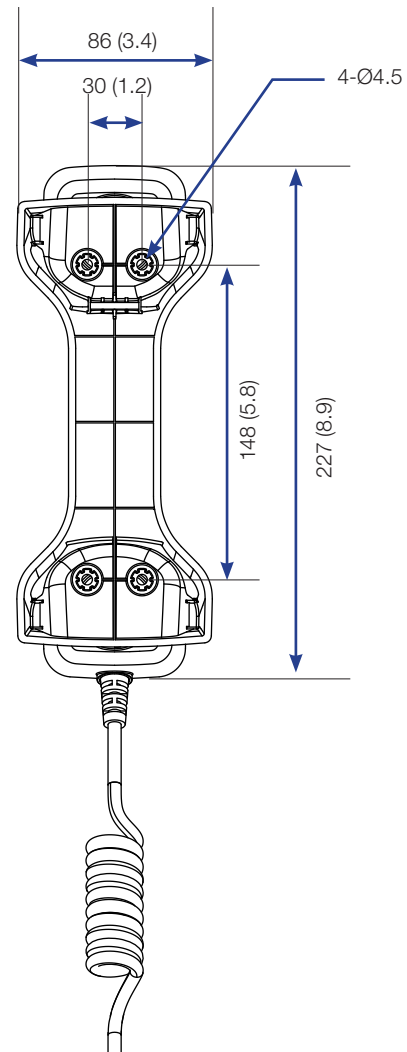
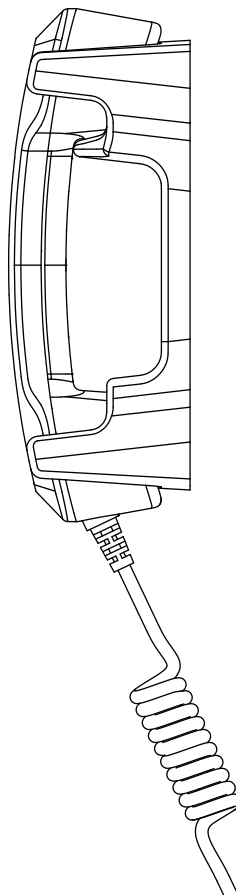
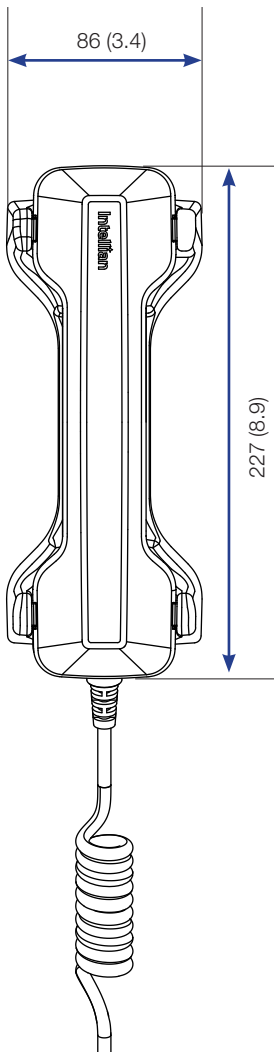
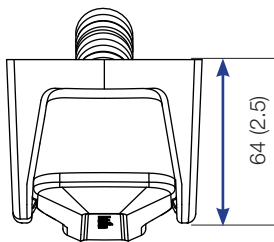
Chapter 8. Installing Handset

8.1 Selecting Handset Installation Site

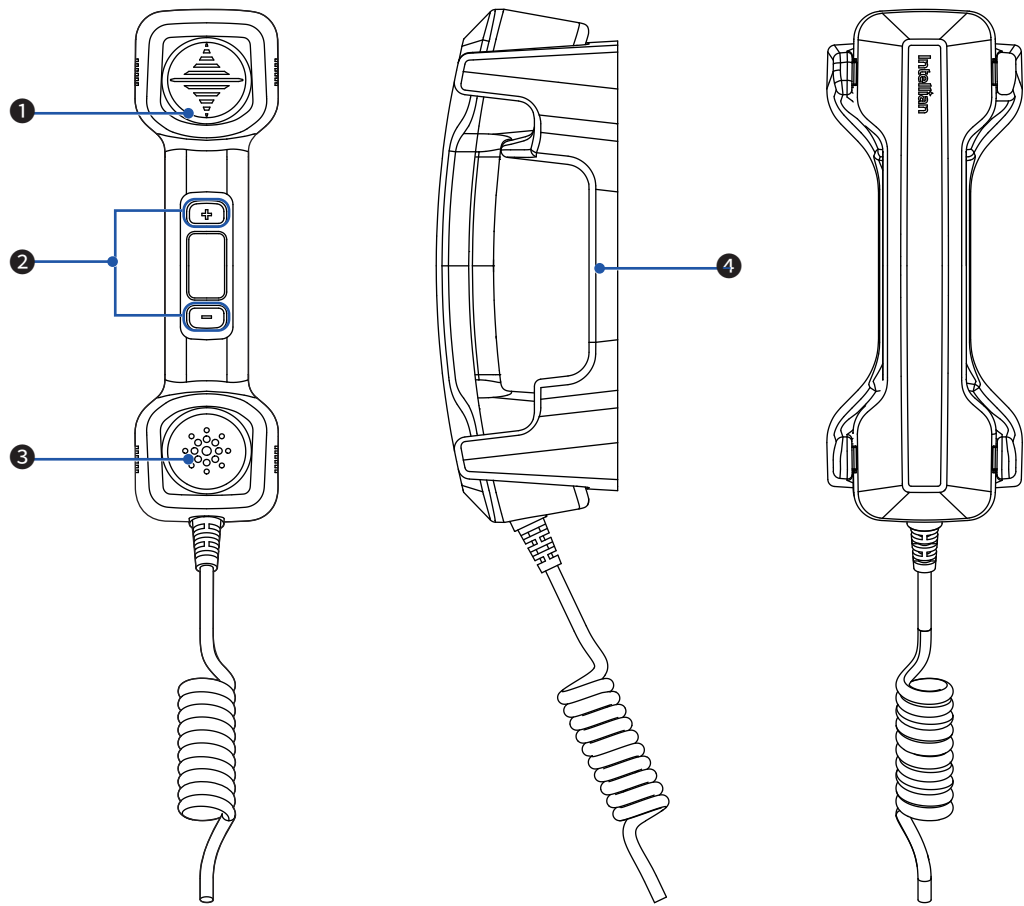
The handset should be installed below the deck in a location that is dry, cool, and ventilated. The front panel of handset should be easily accessible to users.

8.2 Dimensions

Unit: mm (inch)



8.3 Overview



No.	Part	Function
①	Speaker	The opposite user's voice output is generated.
②	Volume button	Adjust the volume by pressing the button.
③	MIC	The microphone (MIC) allows the user to transmit their voice by converting sound into an electrical signal.
④	Cradle	The object used to place the handset. P/N: HC7000

8.4 Connecting the Handset Cable to the SDT

There are two ways to connect the handset to the SDT:

- Connect it to the 8-pin connector on the front panel of the SDT.
- Connect it to the 8-pin connector on the back panel of the SDT.

The appropriate method can be chosen depending on the installation conditions.

8.4.1 Connecting the Handset to the Front Panel of the SDT

1. Connect the 8-pin handset connector on the handset cable to the 8-pin port on the front of the SDT.
2. Finger-tighten the cable lock on the waterproof housing connector to ensure a secure and watertight connection.



8.4.2 Connecting the Handset to the Back Panel of the SDT (Optional)

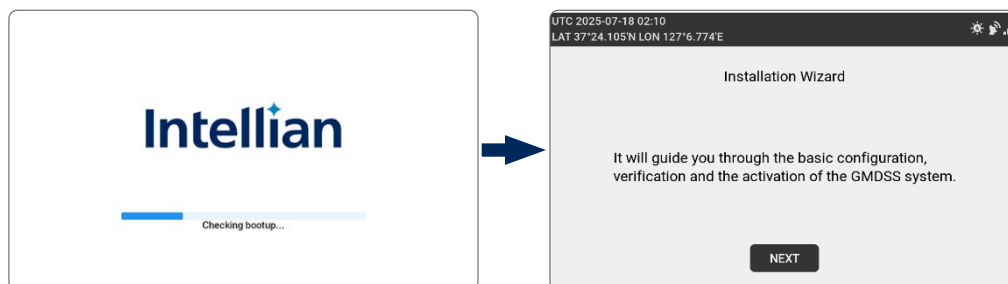
1. Connect the 8-pin handset connector on the handset cable to the HANDSET port on the back of the SDT.
2. Finger-tighten the cable lock on the waterproof housing connector to ensure a secure and watertight connection.



Chapter 9. Operating Install Wizard

9.1 Turning On System

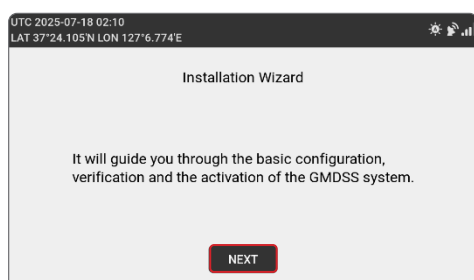
When the system starts up for the first time, connect the SDT and BDU to the PSU180D, then switch on the power switch on the front of the PSU180D. The equipment and accessories will then power on. (For the BDU, press the power button on the front of the BDU to turn it on.) The bootplash (logo) screen will appear, followed by the home screen.



9.2 Installation Wizard

When installing the SDT and switching it on for the first time, the Installation Wizard will start automatically. Afterward, the Installation Wizard can be manually executed through a separate menu. The Installation Wizard guides you through essential system setup tasks, such as commissioning and network configuration, to ensure the SDT operates normally. Once the setup is complete, a test of the main functions will be executed, and the SDT will activate after connecting to the Iridium GMDSS network.

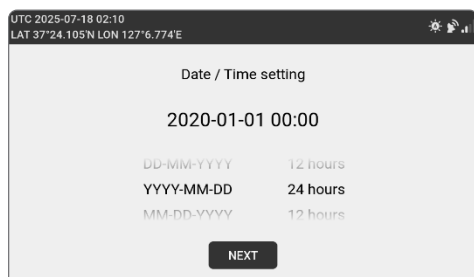
The Installation Wizard must be completed successfully for the GMDSS system to function properly.

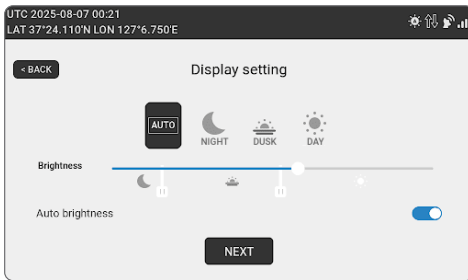


The Installation Wizard will be displayed when powering up the system for the first time or after a factory reset.

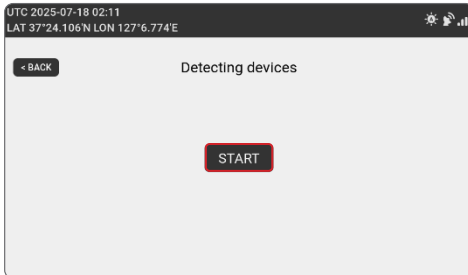
It proceeds in the following order: Date/Time Setting → Display Setting → Select SES #1/2 → OTA Commissioning → GMDSS Test.

1. Click the **Next** button to start the installation wizard.
2. Select the date format (**YYYY-MM-DD**, **MM-DD-YYYY**, **DD-MM-YYYY**) and the time format (**12**, **24 hour**).

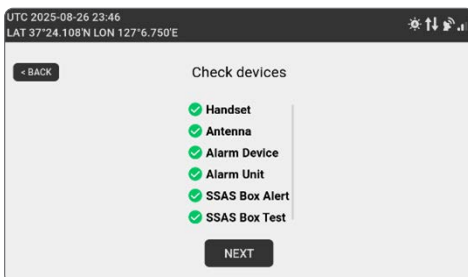




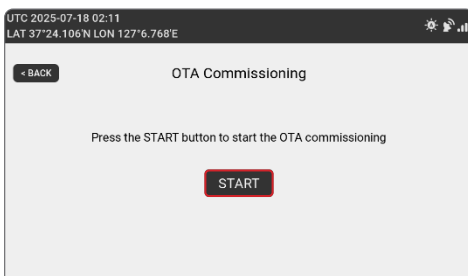
3. Select the display theme (**Auto**, **Day**, **Night**).



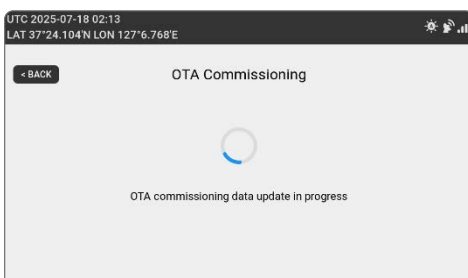
4. Press the **Start** button to verify the connected devices.



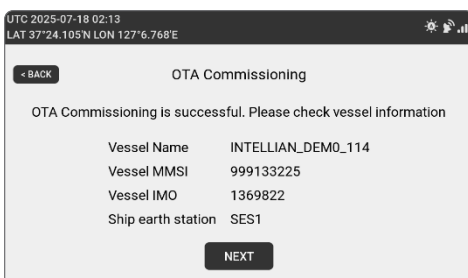
Connected devices will be indicated with a check mark and displayed.



5. Proceed with OTA Commissioning to activate the GMDSS function. Press the **Start** button.



This will take a few seconds. The information in the SIM will be registered to the server via satellite.

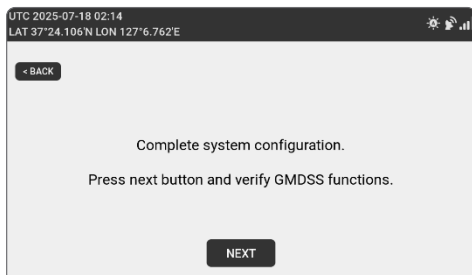


If OTA Commissioning is successful, the screen will display as shown in the image.



6. Select the Default RCC (**Automatic or Manual**).

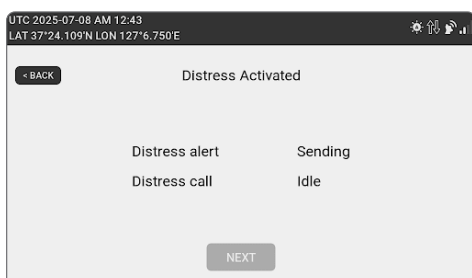
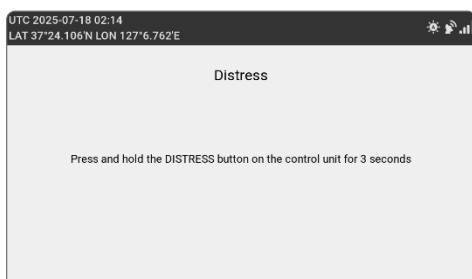
If Automatic is selected, the RCC will be sent based on the current position.



7. After completing the system configuration, enter GMDSS Test Mode to verify the GMDSS functions. The terminal enters the configured GMDSS mode. The GMDSS functions will be tested to ensure they are working correctly. In Test Mode, verify that the Iridium GMDSS server interaction is functioning properly.

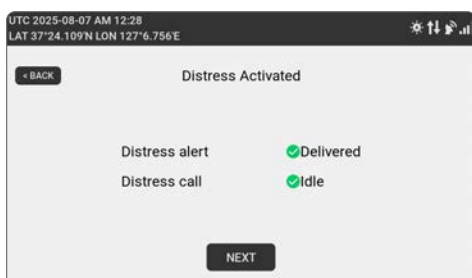
Note: In Distress Test mode, Distress messages and Distress Calls attempt to connect to a Test RCC, not an actual RCC.

- a. Press and hold the **Distress** button for 3 seconds.

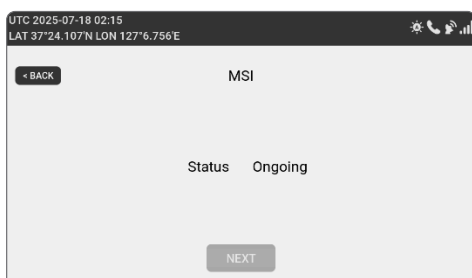


- b. Verify the Distress status. When the alert is successfully transmitted to the IGS (Change order for Distress alert status: Sending → Sent → Delivered), a Distress Call will be received.

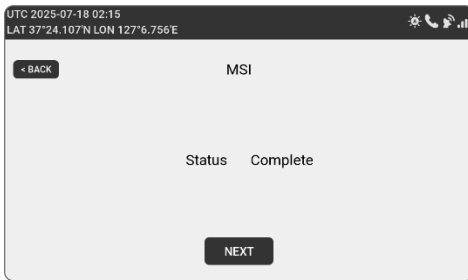
When the Distress alert status is “Delivered,” a Distress call will attempt to connect to the Test RCC. If a Distress call successfully connects to the Test RCC, a voice call will sound from the Test RCC.



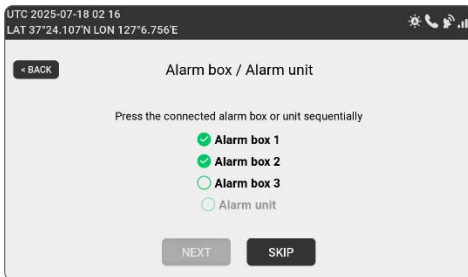
- c. Wait for a few minutes until the communication is finished. If communication is completed automatically, the **Next** button will activate.



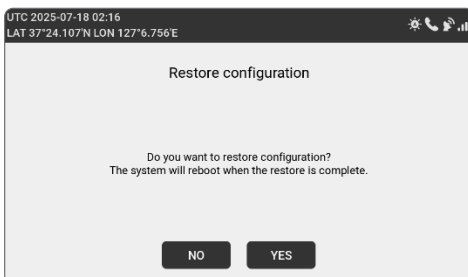
- d. Receives a Test MSI message.



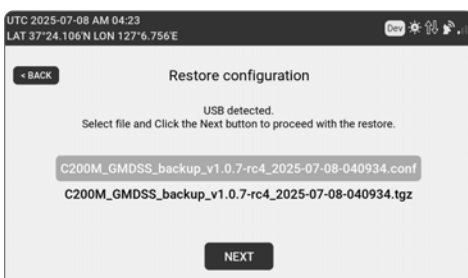
- e. If the MSI message is received normally, the **Next** button will activate.



- f. If an Alarm Box and Alarm Unit are connected to the system, press the Distress button for each accessory and verify them.

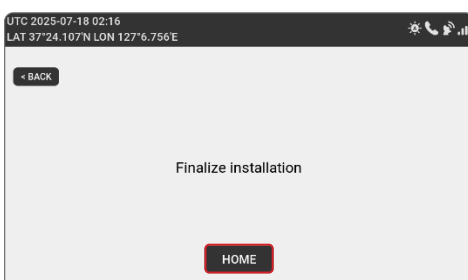


- g. The system can be restored to the previous configuration.



- h. Connect a USB containing a Config backup file* to restore the system. When the restore is completed, the system will start rebooting automatically.

* Config backup file: This file contains the SDT settings from a previous backup. It is backed up using the Web UI or a USB drive in advance.



9. The Installation Wizard has now been successfully completed, and the GMDSS System is ready for use. Press the **Home** button to return to the home screen.

Chapter 10. Specification

10.1 Applicable Equipment Standards

Standards
IEC 60945:2002 incl. IEC 60945 Corr. 1:2008
IEC 61162-1:2016
IEC 61162-2 Ed.1.0:1998-09
IEC 61162-3 Ed.1.2 Consol. with A1 Ed. 1.0:2010-11 and A2 Ed. 1.0:2014-07
IEC 61162-450:2018
IEC 61097-16:2019
IEC 62923-1:2018
IEC 62923-2:2018
ETSI EN 301 444 V2.2.1:2021. And additionally, for Iridium equipment

10.2 C200M GMDSS Specification

10.2.1 SDT7000C

Item	Specification
Input Voltage	24Vdc
Power Consumption	15W
Weight	1.0 kg (2.2 lbs)
Dimensions	255 x 148 x 86 mm (10.0" x 5.8" x 3.4")
Temperature, operational	-15°C to +55°C (+5°F to +131°F)
IP rating, dust and water	IP34
Interfaces	2 x Ethernet, 2 x RS-422, 2 x RS-232, USB, CAN
Interface Input	ACK, ACNI, CRQ, GGA, GLL, GNS, HBT, NRM, RMC VBW, VHW, VTG, ZDA
Interface Output	ALC, ALF, ALR, ARC, HBT, NRM, NRX
LCD	7 inch
CPU	800MHz
Brilliance control	10 steps
Compass Safe Distance, standard	1.3 m (4.3 ft)
Compass Safe Distance, steer	0.9 m (3.0 ft)
Response time(Backlight on)	25ms(Max 35ms)

10.2.2 Handset(HS7000) w/o PTT button for SDT

HandSet(HS7000)	
Item	Specification
Weight	0.4 kg (0.9 lbs)
Dimensions	60 x 236 x 63 mm (2.4" x 9.3" x 2.5")
Temperature, operational	-15°C to +55°C (+5°F to +131°F)
IP rating, dust and water	IP56
Compass Safe Distance, standard	1.5m (4.9 ft)
Compass Safe Distance, steer.	1.2m (3.9 ft)
Cradle(HC1000)	
Item	Specification
Weight	0.2 kg (0.4 lbs)
Dimensions	82 x 189 x 69 mm (3.2" x 7.4" x 2.7")
Compass Safe Distance, standard	1.5m (4.9 ft)
Compass Safe Distance, steer.	1.2m (3.9 ft)

10.2.3 Above Deck Unit (C200)

ADU Specification		
Item		Specification
Vessel Motions	Roll	±20°
	Pitch	±20°
	Yaw	±20°
Tx Module	Frequency Range	1616 ~ 1626 MHz
	Output Power level	41 dBm (12.6 W) nominal
	Normal signal Gain	42 dB typ.
ADU Input Voltage		48 V DC supplied from BDU over Coax Cable
Radome Height		145 mm (5.7")
Radome Diameter		Ø240 mm (9.5")
ADU Weight		3.5 kg (7.7 lb)
GNSS		GPS, GLONASS
Compass Safe Distance, standard		0.50 m (1.6 ft)
Compass Safe Distance, steer.		0.30 m (1.0 ft)
Coaxial cable		
Item		Specification
BDU connector		TNC (male)
ADU connector		TNC (male)
Max cable RF loss (@900 MHz)		13.4 dB (including connectors)
Maximum DC resistance		1.3 Ohm

RF Specification		
Item		Specification
Frequency	Rx	1616 MHz ~ 1626.5 MHz
	Tx	1616 MHz ~ 1626 MHz
Antenna Gain (Peak)		1.5dBi
Coverage	Minimum Elevation where TX and RX performance is fully met	8.2° above horizon
G/T (average over azimuth angles)		8.2° < 12°: -32 dB/K to -31 dB/K 12° < 50° : better than -31 dB/K 50° < 80° : -31 dB/K to -34 dB/K >80° : better than -34 dB/K
EIRP (average over azimuth angles)		8.2° < 12°: 11 dBW to 12 dBW 12° < 50° : better than 12 dBW 50° < 80° : 12 dBW to 9 dBW >80° : better than 9 dBW
Antenna Polarization		RHCP

10.2.4 Below Deck Unit (CP-T1A1)

Item		Specification
Size (W x D x H)		315 x 190 x 42 mm (12.4" x 7.5" x 1.7")
Weight		1.5 kg (3.3 lbs) (Stand-alone Type)
LED Indicator		3 LEDs for Power, Tracking, Event
SIM		1 ea, 2FF Push-Push type with locking structure User Authentication
Ethernet		4x RJ45 female TCP/ IP connection 2 port PoE
RF Interface		1 ea, TNC Female Sub-System Connection to ADU
Analog		1 ea, RJ14 Female Analog Phone
GPIO		1 ea, (16 pins) General Purpose I/O
Wi-Fi		1 ea, SMA Female (802.11 b/g) External Wi-Fi Antenna
On/Off switch		1 ea., power switch or toggle type System Power Switch
Reset		1 ea System Reset
Grounding stud		1 ea Grounding
BDU Input Voltage		10.8 ~ 30 V DC, 120 W max
Power consumption	Tx Max	58W
	Rx only	33W
	Rating	110W (for power supply)
Web Interface		Embedded in BDU, available by Ethernet or Wi-Fi
Compass Safe Distance, std.		0.20 m (0.7 ft)
Compass Safe Distance, steer.		0.20 m (0.7 ft)

10.3 Accessory Specification (Optional)

10.3.1 Alarm Box(AB1000)

Item	Specification
Input Voltage	24Vdc
Power Consumption	2.5W
Weight	0.5 kg (1.1 lbs)
Dimensions	104 x 139 x 94 mm (4.1" x 5.5" x 3.7")
Temperature, operational	-15°C to +55°C (+5°F to +131°F)
IP rating, dust and water	IP10
Interfaces	CAN
Compass Safe Distance, standard	0.80 m (2.6 ft)
Compass Safe Distance, steer.	0.60 m (2.0 ft)

10.3.2 SSAS Box (SB7000T/SB7000A)

Item	Specification
Input Voltage	24Vdc
Power Consumption	0.2W
Weight	0.4 kg (0.9 lbs)
Dimensions	104 x 139 x 57 mm (4.1" x 5.5" x 2.2")
Temperature, operational	-15°C to +55°C (+5°F to +131°F)
IP rating, dust and water	IP10
Interfaces	CAN
Compass Safe Distance, standard	0.50 m (1.6 ft)
Compass Safe Distance, steer.	0.30 m (1.0 ft)

10.3.3 Alarm Unit (AU1000)

Item	Specification
Input Voltage	24Vdc
Power Consumption	3.6W
Weight	2.3 kg (5.1 lbs)
Dimensions	215 x 240 x 103 mm (8.5" x 9.4" x 4.1")
Temperature, operational	-15°C to +55°C (+5°F to +131°F)
IP rating, dust and water	IP20
Interfaces	CAN
Compass Safe Distance, std.	0.90 m (3.0 ft)
Compass Safe Distance, steer.	0.60 m (2.0 ft)

10.3.4 Junction Box (JB1000)

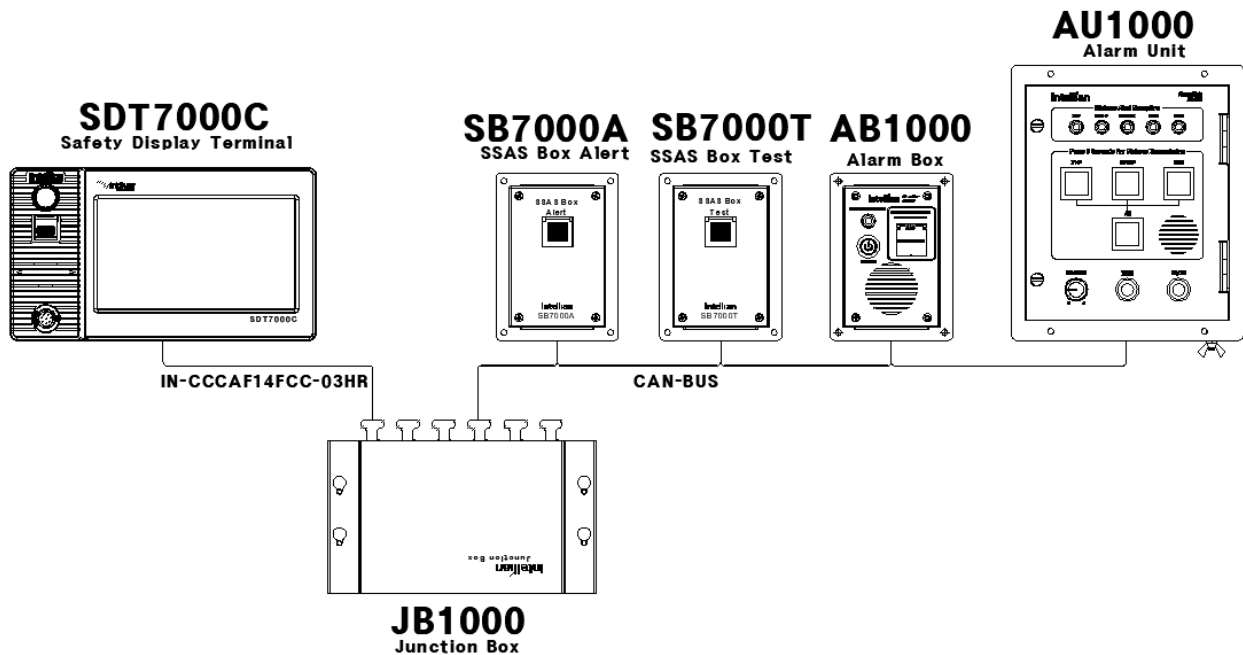
Item	Specification
Weight	1.1 kg (2.4 lbs)
Dimensions	210 x 190 x 34 mm (8.3" x 7.5" x 1.3")
IP rating, dust and water	IP10
Interfaces	2 x RS-422, RS-232, CAN
Compass Safe Distance, std.	0.40 m (1.3 ft)
Compass Safe Distance, steer.	0.30 m (1.0 ft)

10.4 Environmental Specification

Test	Intellian Standard	
Operation temperature	Antenna	IEC-60945 (-25°C to +55°C / power on)
	Other	-15°C to +55°C
Storage temperature	IEC-60945 (-40°C to +85°C / power off)	
Relative humidity	95% at 40°C (without dew condensation)	
Vibration	IEC 60945	
Shock	IEC-60068-2-27	

Chapter 11. Optional products CAN Bus communication connection guide

The optional products for the C200M GMDSS system include the Junction Box (JB1000), Alarm Box (AB1000), Alarm Unit (AU1000), and SSAS Box (SB7000A/T). All of these units are connected in parallel using CAN Bus communication, which facilitates installation and enables their respective functions. Since multiple devices communicate via one CAN bus, the number of wires can be reduced, and cost savings can be achieved through efficient system layout.



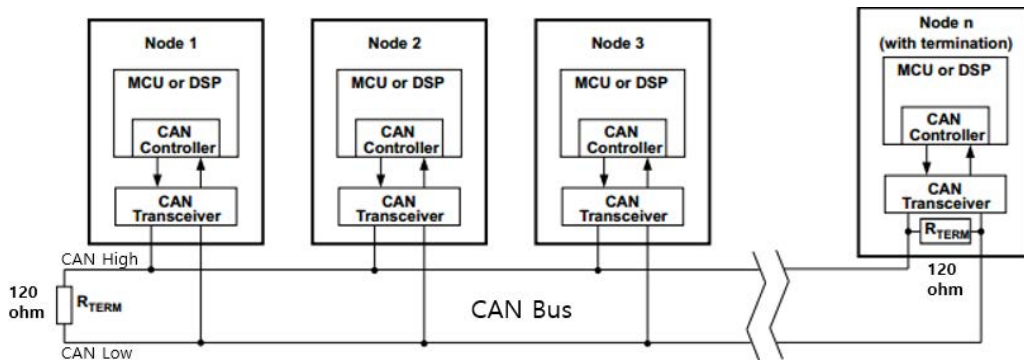
Each optional device (NODE) on the CAN bus, such as the Junction Box (JB1000), Alarm Box (AB1000), Alarm Unit (AU1000), and SSAS Box (SB7000), can be added according to the user system requirements.

Device Specifics:

- Junction Box (JB1000):
 - This is not an ID identification device target for CAN communication.
 - It is connected directly to the SDT (SDT7000C) and includes the Bus termination resistor (120 ohm) for the SDT device.
- Alarm Box (AB1000):
 - There can be a total of 4 Alarm Boxes (AB1000s), and each device has a unique identification ID.
- SSAS Box (SB7000A):
 - There can be a total of 3 SSAS Alert devices.
- SSAS Box (SB7000T):
 - There can be 1 SSAS Test device, and each device can have a unique identification ID.
- Alarm Unit (AU1000):
 - This is a single device and has a unique identification ID.

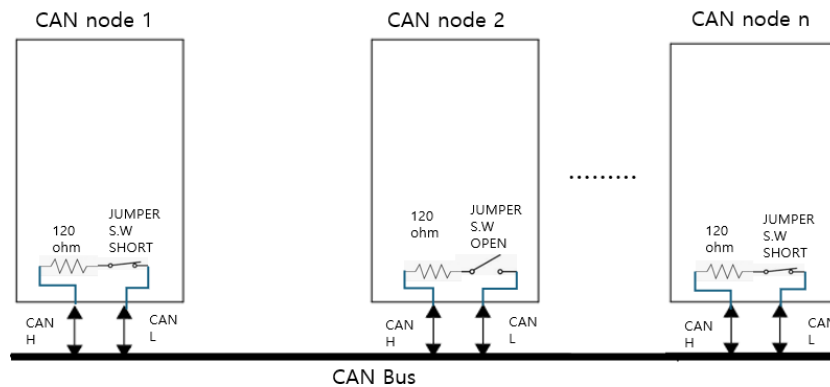
Termination Resistor Connection Guide:

The CAN data bus system consists of at least two nodes, CAN-low wiring, CAN-high wiring, and termination resistors at each end of the Bus.



In each optional device (JUNCTION BOX, ALARM BOX, SSAS BOX, ALARM UNIT), there is a PCB mounted jumper pin that connects the 120 ohm termination resistor, which can be shorted or connected depending on the Bus location.

(※ The termination resistor jumper location is shown in the photo of each optional device.)



Jumper Configuration Rules:

- Depending on the device selection, the JUMPER is SHORT by using the starting termination resistor at SDT + JUNCTION BOX (Node 1).
- Additional devices (Node 2, 3, 4...) do not use the termination resistor, and their JUMPERs are OPEN.
- The JUMPER shall be set to SHORT to use the termination resistor at the optional device (Node n) connected to the last CAN bus device.

Chapter 12. Appendix

12.1 Tightening Torque Specification

This table shows the recommended values of tightening torques.

Bolt Size	Hex Key (Hex Socket Bolt)	Wrench (Hex Bolt)	Tightening Torque (N m)
M2			1
M2.5			1
M3	M2.5	M5.5	1
M3.5		6	2
M4	3	7	3
M5	4	8	5
M6	5	10	7
M8	6	13	17
M10	8	16	34
M12	10	19	59
M14	12	22	95
M16	14	24	147
M20	17	30	288
M24	19	36	497

12.2 Accessory Connections (Optional)

12.2.1 Selection of BDU Installation Site

Select a location inside the cabin where the device is highly visible in emergency situations and easy to wire, then install it in that position.

12.2.2 Junction Box

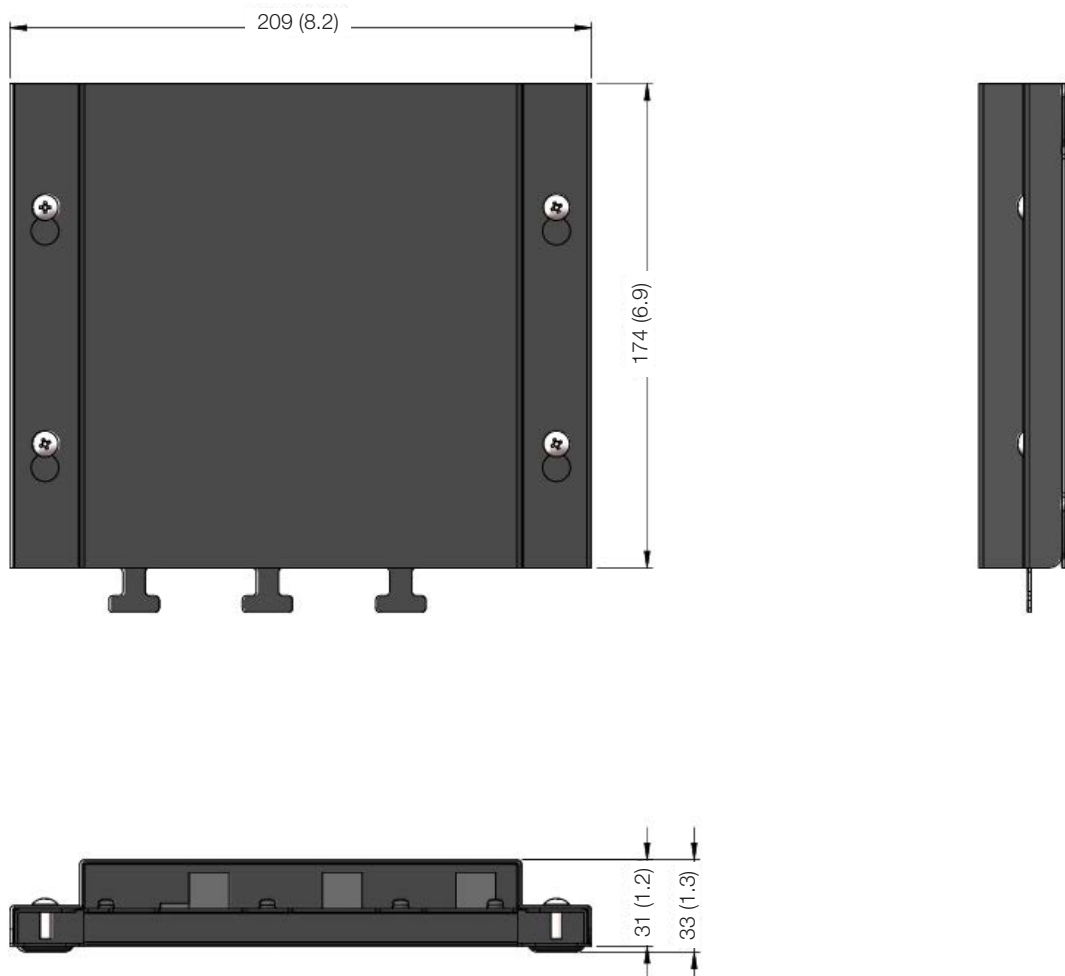
The Junction Box is an extension board that connects to the C200S and interface connector in an indoor environment. It is necessary to use the Junction Box to connect accessories. The Junction Box connects to the SDT via a 14-pin connector. The accessories that can be connected to the Junction Box are listed below:

- Alarm Box (max. 3ea)
- SSAS Box (including Test Box, max. 4ea)
- BAM network (rs232, rs422)
- Printer

The cover of the Junction Box is secured with bolts, which can be loosened to open.

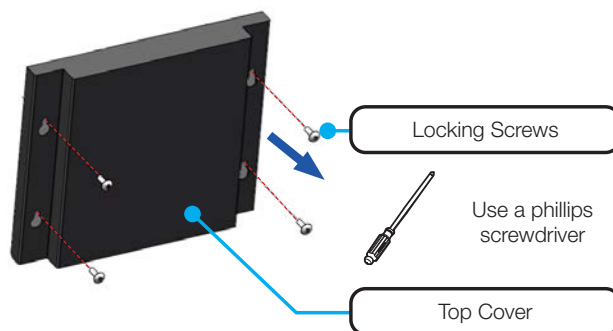
Dimensions

Unit: mm (inch)

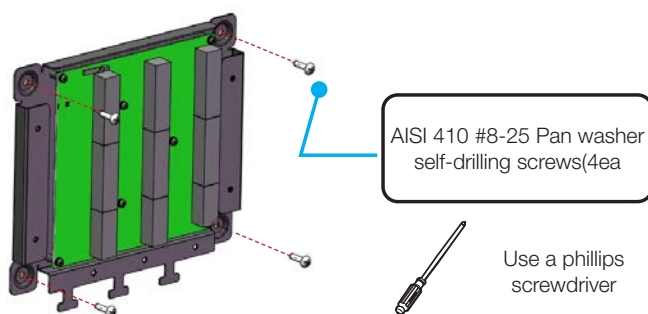


Mounting Junction Box

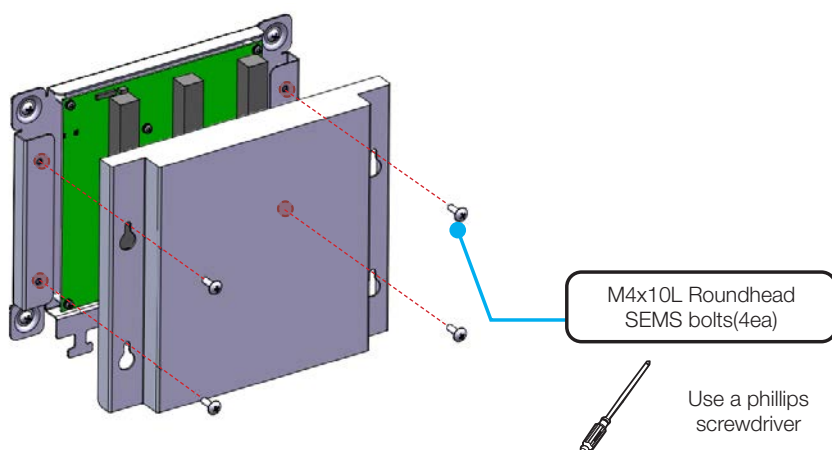
1. Loosen the locking screws on the top cover of the junction box using a Phillips screwdriver, then open the cover.



2. Place the detached rear panel on the wall or desk.
3. Insert the AISI 410 #8-25 Pan washer self-drilling screws(4ea) into the built-in nuts on the rear panel, then tighten them using a Phillips screwdriver.

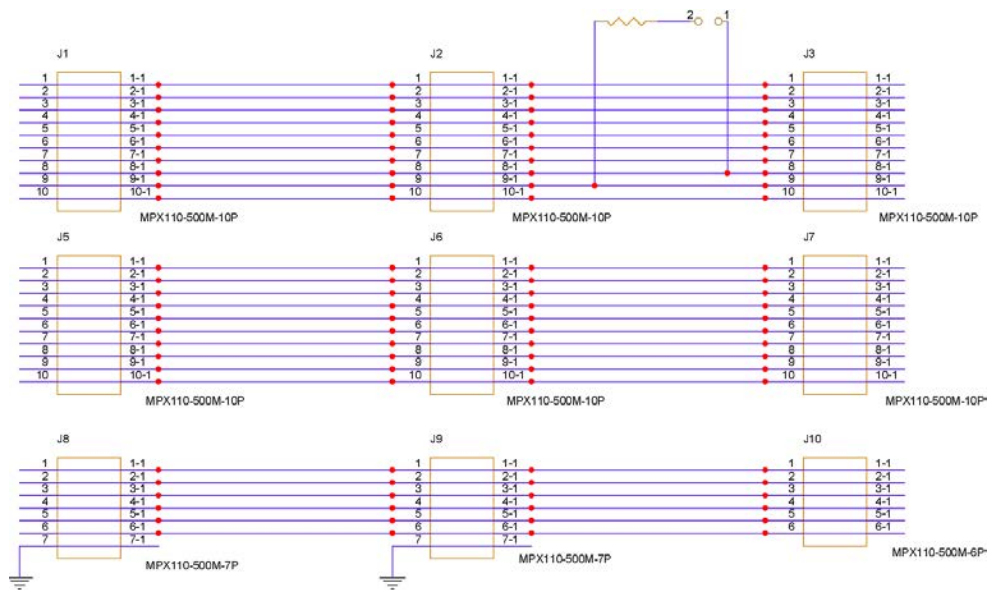


4. Position the top cover of the junction box, then secure it by installing the locking screws using a Phillips screwdriver.



Junction Box Cable Connection

The terminal block inside the junction box is arranged in three rows, with each row containing a total of 27 pins. All three rows (1 to 3) are interconnected in a circuit, as shown in Figure XX.

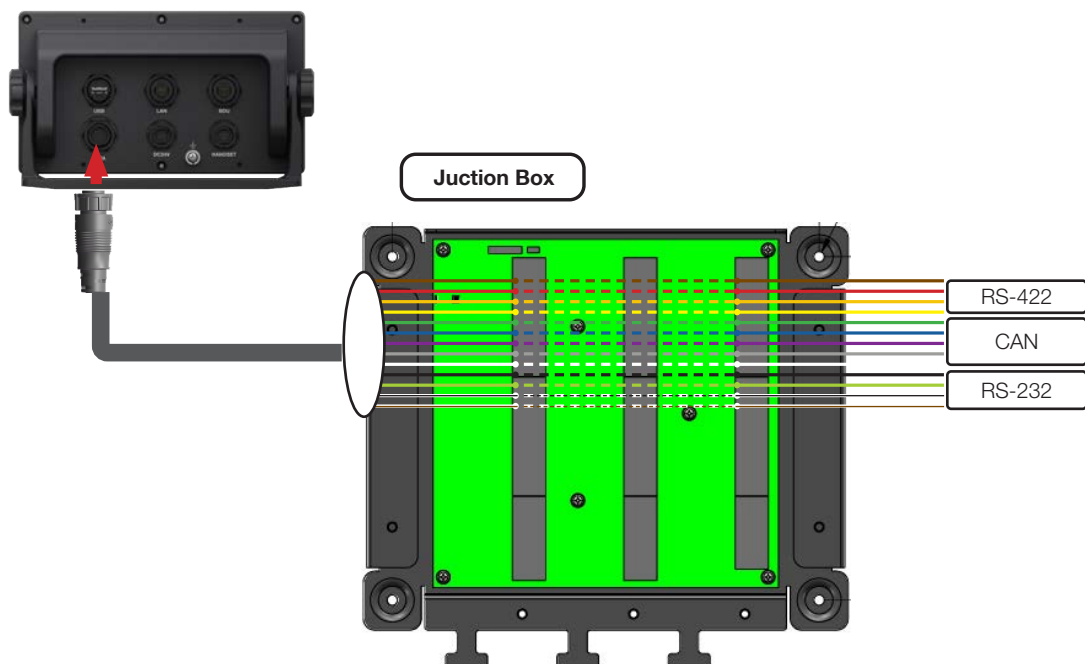


However, pins 8 and 9 in rows 1 to 3 are designated for connecting the termination resistor for CAN (NMEA 2000) communication. Therefore, pins 8 and 9 are exclusively reserved for CAN communication.

Connecting Data cable to SDT-Junction Box- Data in/out Device

The DATA cable connection using Junction Box in SDT is as follows.

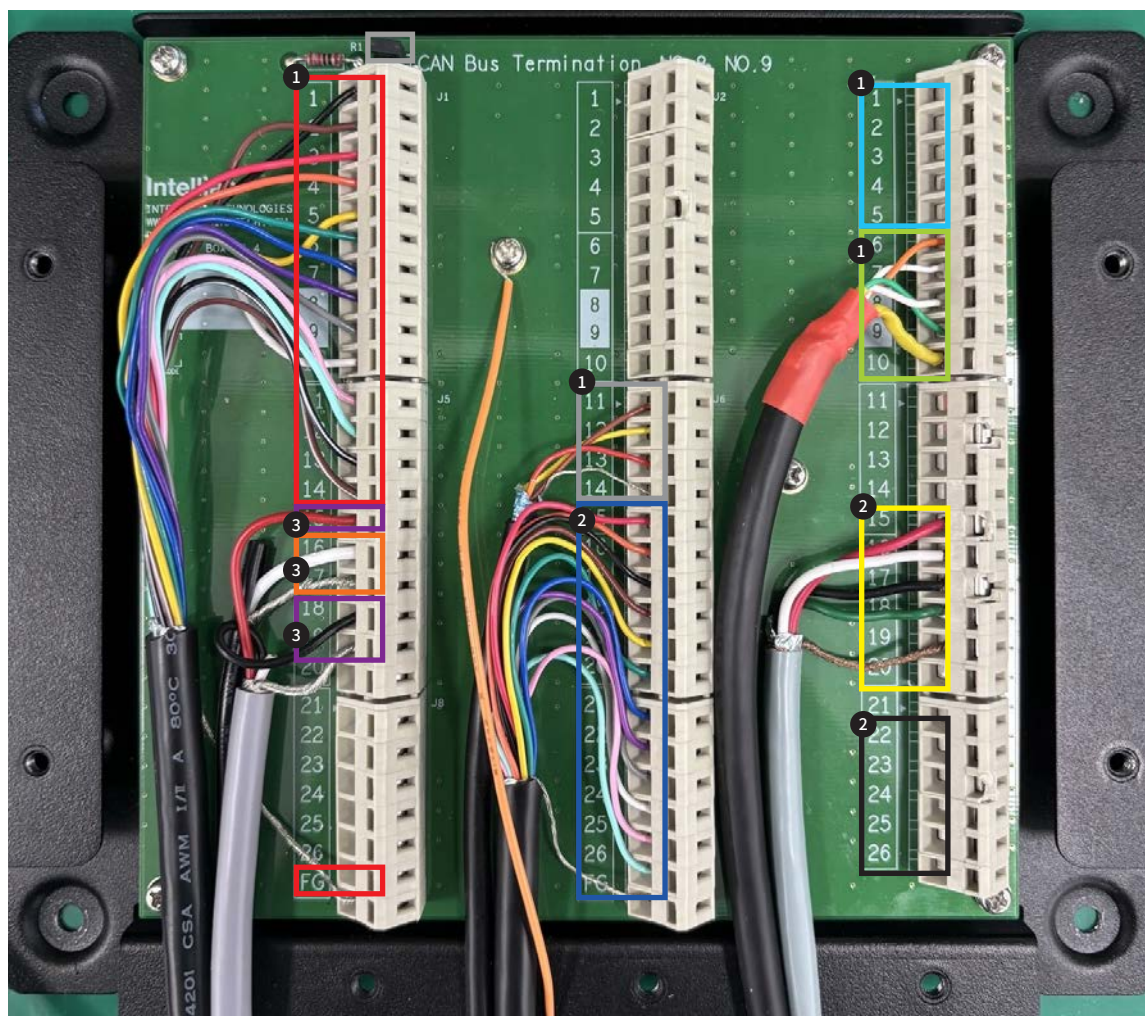
1. Connect the Data Cable (14pin Plug) supplied to SDT, and connect pins 1 to 14 to the terminal in the junction box in order and color arrangement. (Only use pins 8 and 9 for Can communication.)
2. When connecting to a device using data in the junction box, connect to the terminal according to the pin number defined in another column. After that, connect the power cable to the power connector of the SDT.



Junction Box (JB1000) Connections

This section details the cable connections for the JB1000 Junction Box.

(Actual installation image of JB1000 with connected cables.)



* In the case that SDT is located at the end(terminal) of the CAN network, the jumper should be short.(Gray Box)

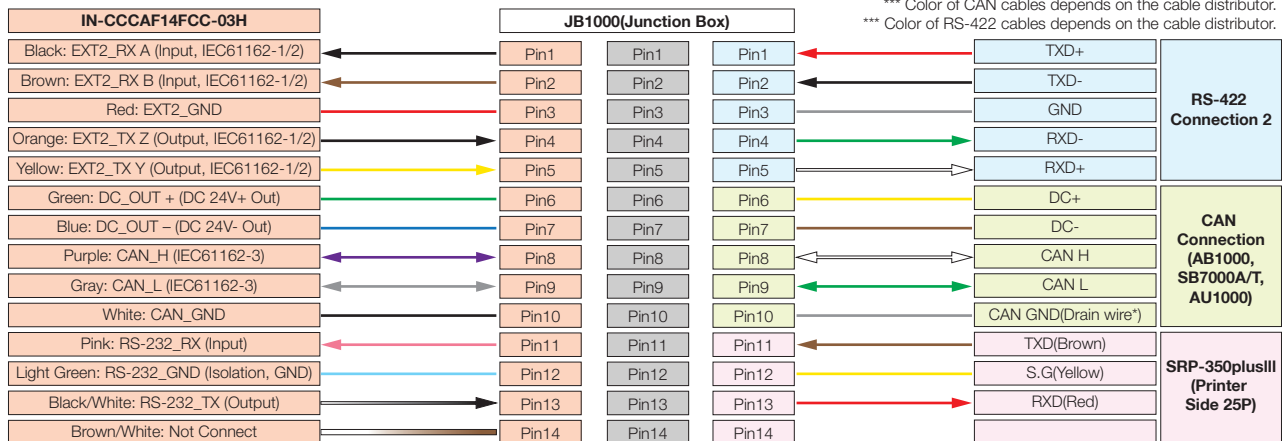


NOTE

The image is for information. The actual installation might be different from the image.

① Cable connection diagram(Red Box, Pink Box, Sky Blue Box, and Light Green Box)

※ Before cabling, CAN Termination Jumper(J4) should be **short**.



* Drain wire : Cable Shield

** Cable Shield is connected to the Junction Box Shield(FGND or Bolt)

Red Box:

- 14p cable is connected with SDT7000C by 14p cable.
- Drain wire : FG
- P/N : IN-CCCAF14FCC-03H

Pink Box:

- SRP-350plus III(Printer) signal cable is connected
 - TXD(Brown,11), S.G(Yellow,12), RXD(Red,13) →Opposite side pin
- P/N : TBD(Before customizing)

Sky Blue Box:

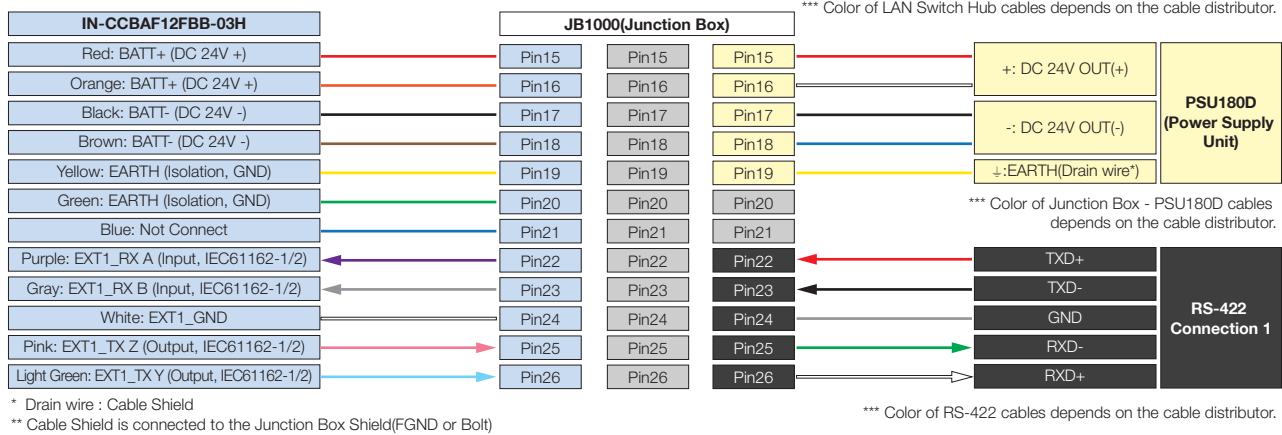
- RS-422 2 cable is connected
 - TXD+(1), TXD-(2), GND(Drain wire,3), RXD-(4), RXD+(5) → Opposite side pin
- P/N : Non provision, *It depends on the cable distributor so that it isn't attached in the image below.

Light Green Box:

- CAN cable is connected:
 - DC +(Yellow,6), DC -(Brown,7), CAN H(White,8), CAN L(Green,9), CAN GND(Drain wire*,10)
- JB1000 pin 8,9 are fixed.(CAN H,L)
 - P/N : 29995, (CAN BUS 2x2x0.75 120Ω)
 - The image of the above actual installation cable is not 29995 CAN cable(Different color). Please refer to the pin number only.
- P/N: Non provision // *Designating the cable color depends on the cable distributor.

② Cable connection diagram(Blue Box, Yellow Box and Black Box)

※ Before cabling, CAN Termination Jumper(J4) should be **short**.



Blue Box:

- 12p cable is connected with SDT7000C by 12p cable.
- Drain wire : FG
- P/N : IN-CCBAF12FBB-03H

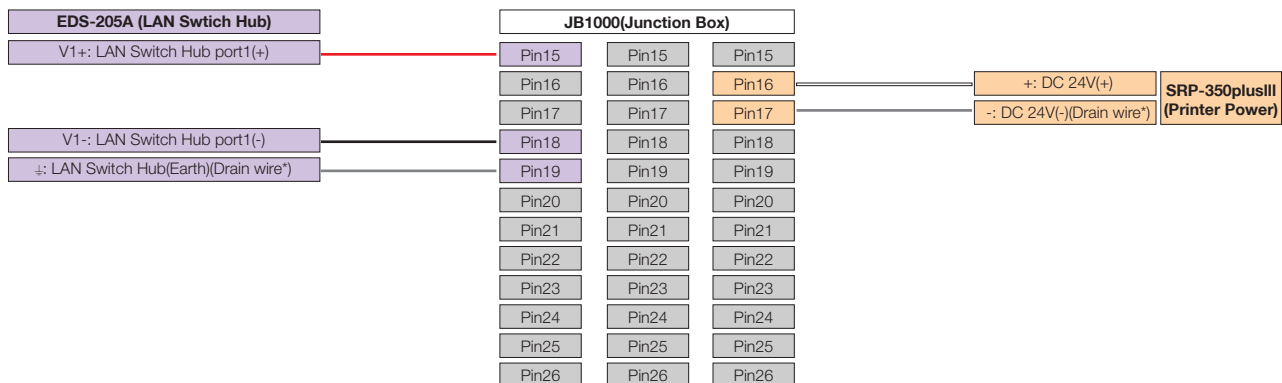
Yellow Box:

- PSU180D power cable is connected:
 - BATT+(Red,White,15,16), BATT-(Black,Green,17,18), EARTH(Drain wire,19)
- P/N : Non providable(But essential for turning on power of SDT, CAN units)

Black Box:

- RS-422 1 cable is connected
 - TXD+(22), TXD-(23), GND(Drain wire,24), RXD-(25), RXD+(26) → Opposite side pin

③ Cable connection diagram(Purple Box and Orange Box)



Purple Box:

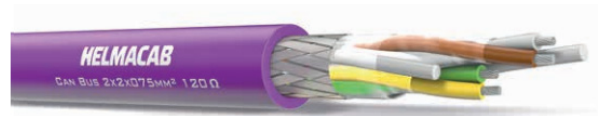
- EDS-205A(LAN Switch Hub) power cable is connected:
 - V1+(Red,15), V1-(Black,18), EARTH(Drain wire*,19)

Orange Box:

- SRP-350plus III(Printer) power cable is connected:
 - DC 24V(+)(White,16), DC 24V(-)(Drain wire,17)
- P/N: TBD(Before customizing)

CAN Bus Cable Requirements

The image on the right shows our optional components for C200M GMDSS, used with CAN cables. (Product Codes: LG5422, LG5423, LG5424, corresponding to 25m, 50m, and 100m lengths, respectively)



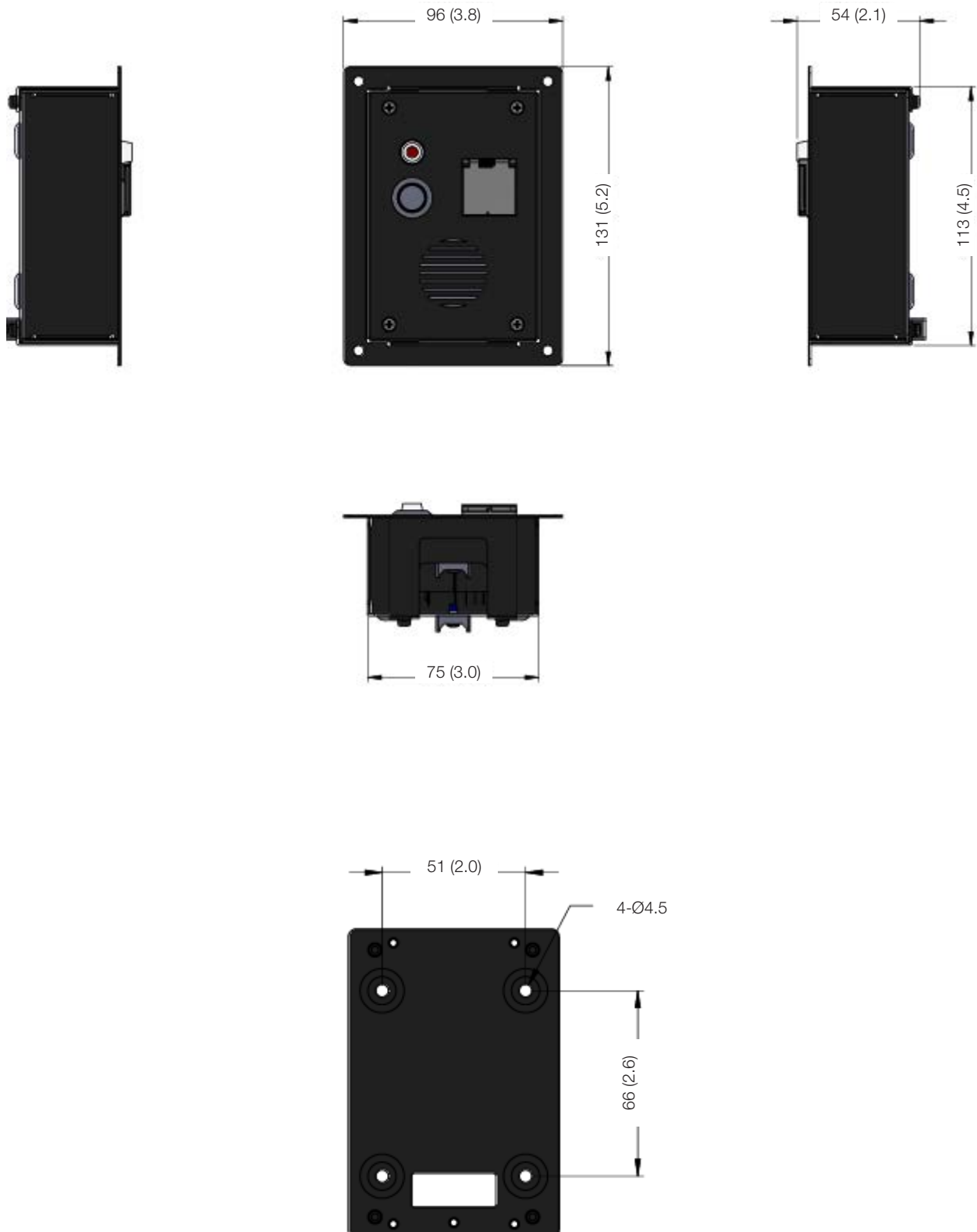
Item	Description
Number of wires	4 (Shield cable not included) The shield cable covers the 4 wires.
Number of conductors	2 (Each conductor consists of 2 wires.)
Shield	Present (The product includes a shield cable.)
Cable type	Twisted pair (To reduce EMI and noise)
Wire size	0.75 mm ²

12.2.3 Alarm Box

The Alarm Box is an accessory that transmits a distress alert to the SDT via remote control in distress situations.

Dimensions

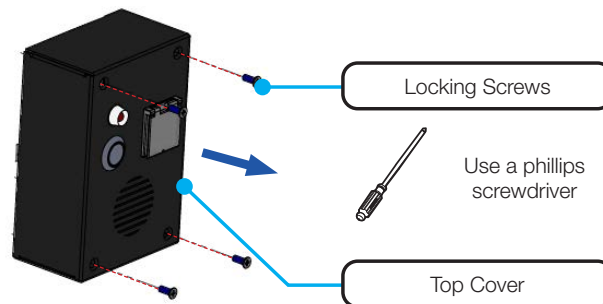
Unit: mm (inch)



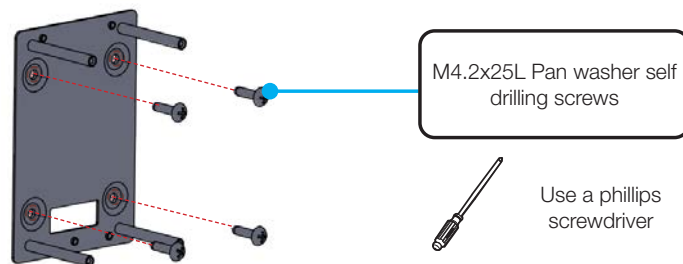
Mounting Alarm Box

• Bracket Mounting Type

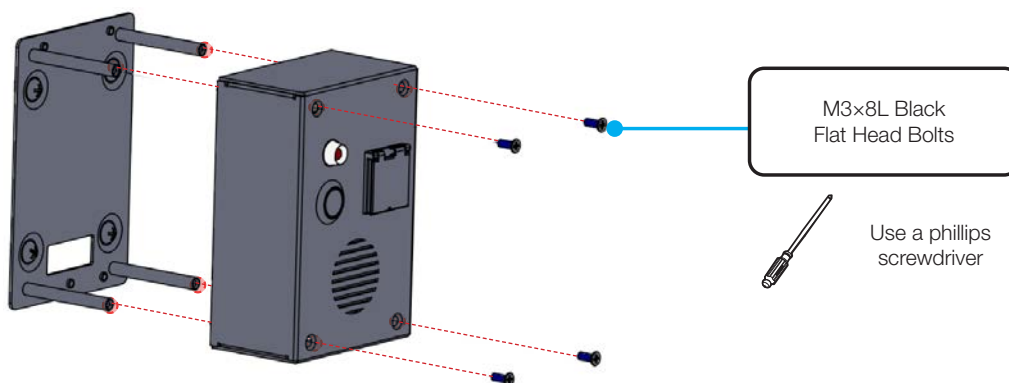
1. Bring the AISI 410 #8-25 Pan washer self-drilling screws(4ea) , M3x8L black phosphate flat head bolts (4ea) from the install kit box.
2. Loosen the locking screws on the top cover of the SSAS box using a Phillips screwdriver, then open the cover.



3. Place the detached rear panel on the wall or desk .
4. Insert the AISI 410 #8-25 Pan washer self-drilling screws(4ea) into the built-in nuts on the rear panel, then tighten them using a Phillips screwdriver.

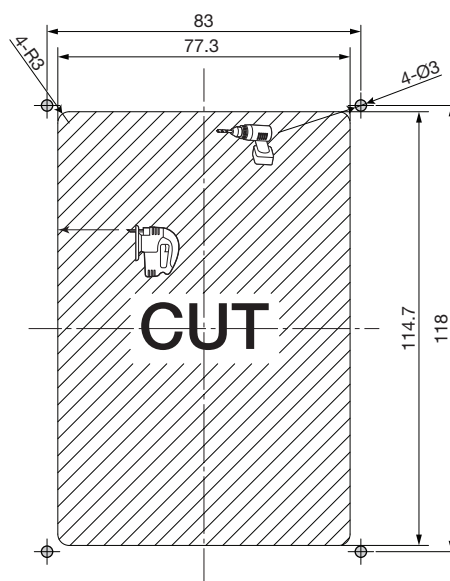


5. Position the top cover of the SSAS box, then secure it by installing the M3x8L black flat head bolts (4ea) using a Phillips screwdriver.

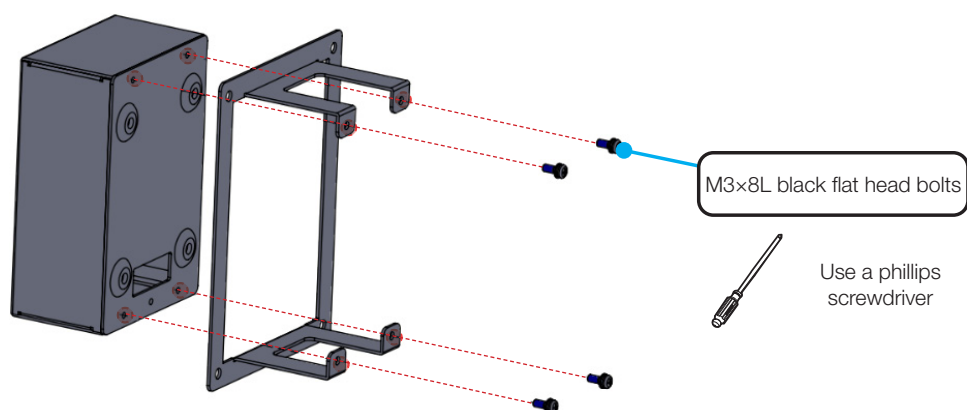


- Flush Mounting Type

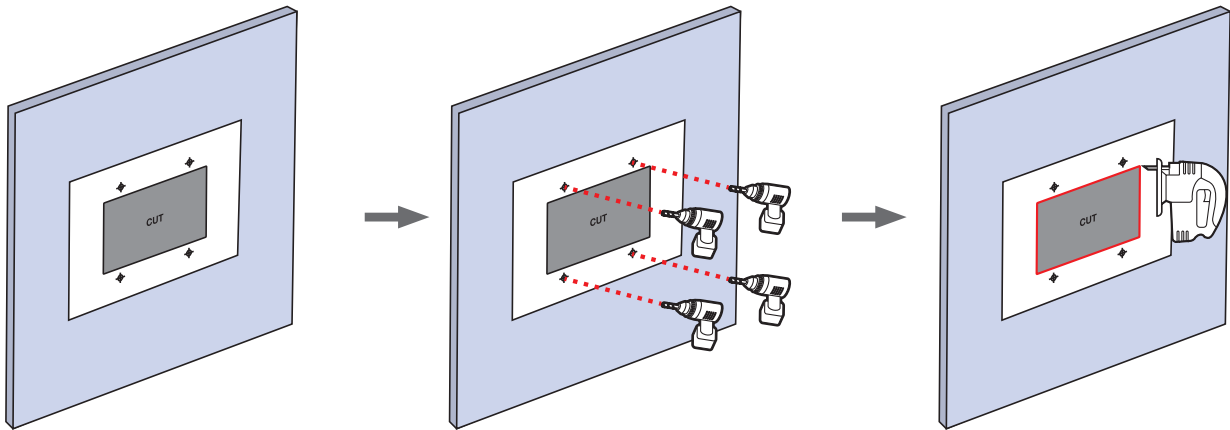
1. Print out the mount template. When printing the mount template, set the print scale to 200% in the print setup.



2. Bring the AISI 410 #8-25 Pan washer self-drilling screws(4ea), M3×8L black flat head bolts(4ea) and mount bracket for flush mounting from the install kit box.
3. To assemble the mount bracket to the Alarm box, insert the Alarm box into the mount bracket and secure it using four M3 × 8L black phosphate flat head bolts, as shown in the image below. Fully tighten the bolts using a Phillips screwdriver.



4. Secure the template to the ship panel.
5. Drill four 4.5mm holes using a 6mm drill bit.
6. Using a jigsaw or rotary cutting tool, cut along the inside of the solid line indicated on the template.

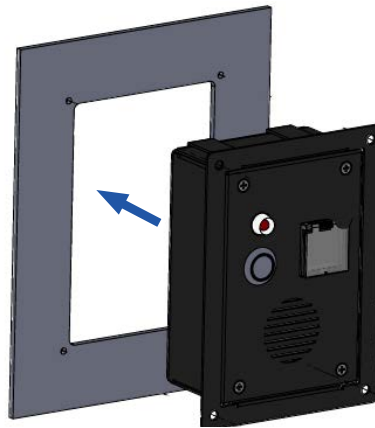


7. Insert the alarm box into the cutout to check the fit.

Note: If necessary, use a file or sandpaper to adjust the hole size.

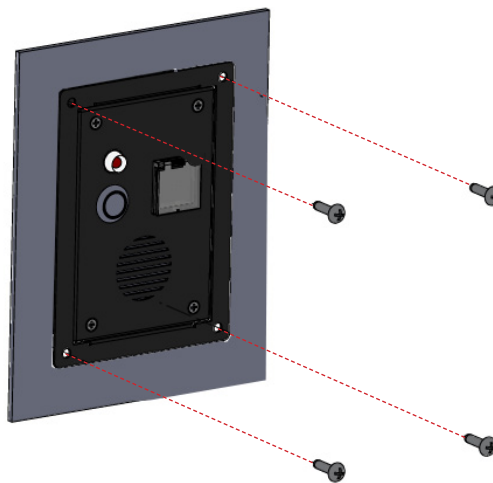
8. Remove the template from the mounting surface.

9. Insert the alarm box into the cutout.



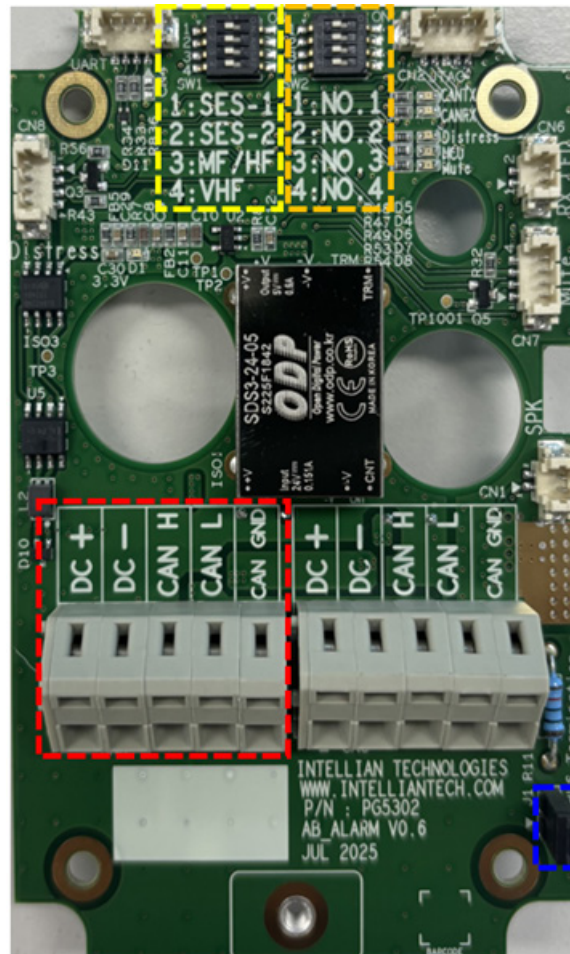
Note: If access to the back of the alarm box will be restricted after installation, connect all necessary cables to the cradle and secure them with the locking bracket or locking rings before inserting the device.

10. Secure the device to the mounting surface using the included screws.



AB1000 (Alarm Box) CAN Cable Connection

This section details the CAN cable connection procedure for the AB1000 Alarm Box (AB1000) with the JB1000 Junction Box.



• CAN Network Configuration:

This connection scenario assumes the CAN network starts with the following sequence: SES1 → JB1000 → AB1000 → etc.

• Jumper Configuration (Blue Marking):

- End of CAN Chain (No further units connected after AB1000): The installer must short the blue marked jumper. (e.g., JB1000 → AB1000: Short the jumper.)
- Intermediate Unit in CAN Chain (Further units connected after AB1000): The installer must leave the blue marked jumper open. (e.g., JB1000 → AB1000 → SB7000A: Leave the jumper open.) (Reference: The jumper is shown in the short position in the image above.)

• Connector Connectivity (Red Marking and Another Connector):

The connectors marked in red and the other specified connector, each containing 5 ports, are electrically connected internally. For example, CAN H on Connector 1 is electrically connected to CAN H on Connector 2.

• Cable Connection:

The installation engineer can connect the cables to either of the 2 available connectors.

Important: Ensure that the entire CAN unit is connected in a serial (daisy-chain) configuration.

- **GMDSS Equipment Configuration (Yellow Marked Switch):**

To distinguish which GMDSS equipment is connected to the AB1000, about the yellow marked one, set the ID by moving one switch to the right that corresponds with the desired ID, while ensuring the other switches are in the left position.

- 1: SES-1
- 2: SES-2
- 3: MF/HF
- 4: VHF

- **AB1000 Unit Number Configuration (Orange Marked Switch):**

To distinguish the number of the AB1000 unit itself (in case of multiple AB1000 units connected within the CAN network), about the orange marked one, set the ID by moving one switch to the right that corresponds with the desired ID, while ensuring the other switches are in the left position. If multiple AB1000 units are included in the CAN network, differentiate their numbers.

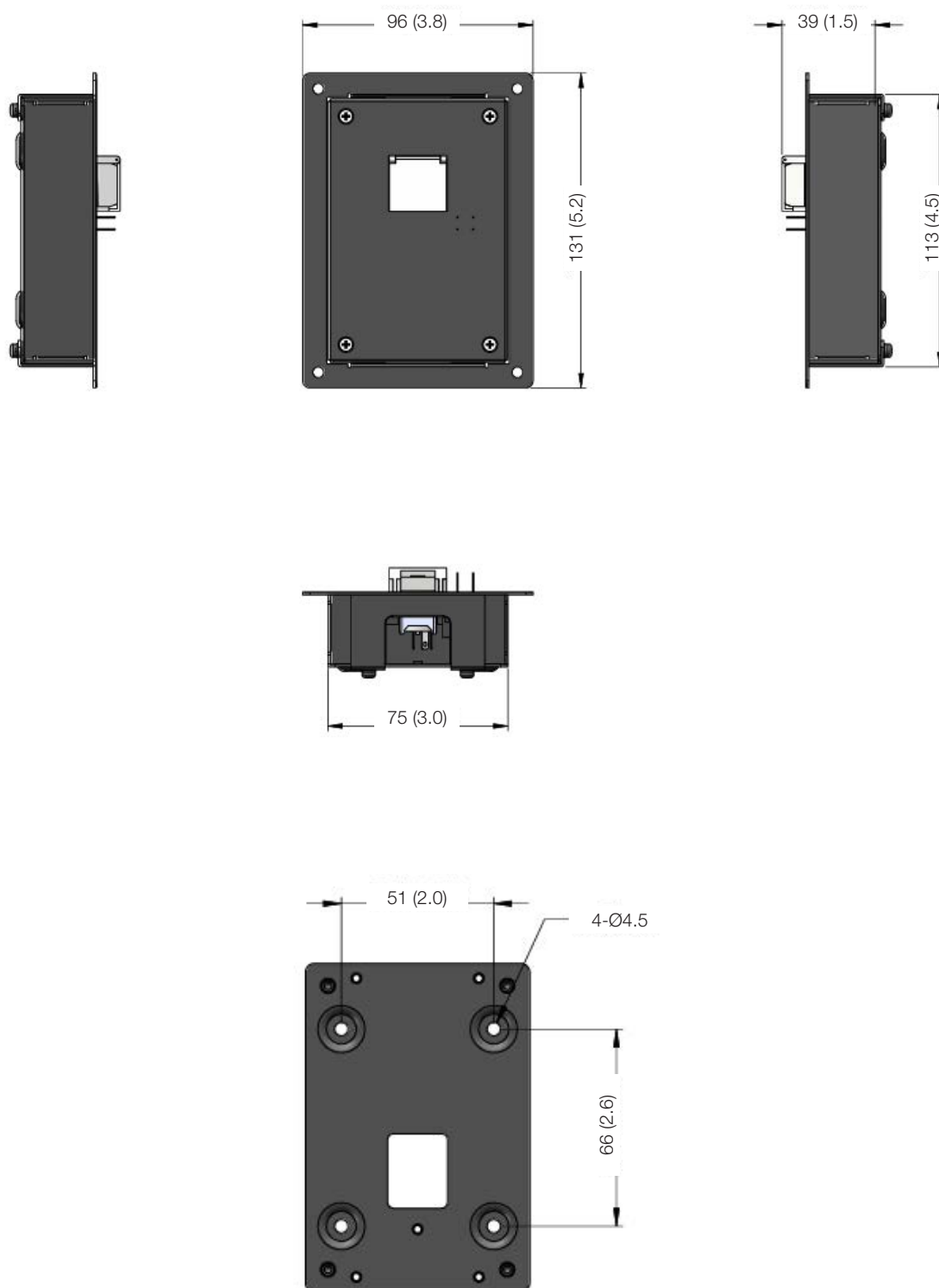
- 1: NO.1
- 2: NO.2
- 3: NO.3
- 4: NO.4

12.2.4 SSAS Box

This accessory is used to execute the SSAS (Ship Security Alert System) function. It has two types of boxes: a SSAS Box Alert for sending SSAS alerts and a SSAS Box Test to check if the system is operating normally. The C200S can connect to a total of 4 SSAS boxes (3 SSAS Box Alerts and 1 SSAS Box Test).

Dimensions

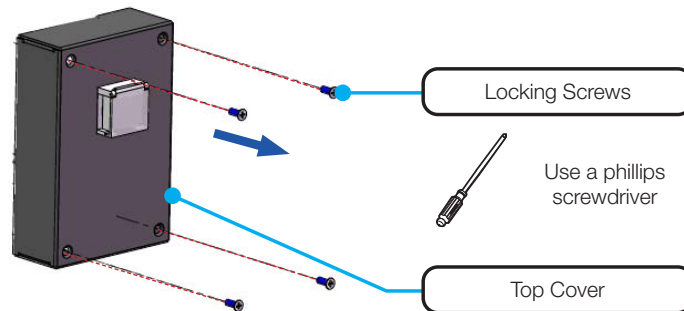
Unit: mm



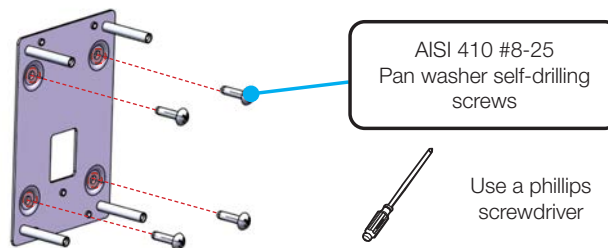
Mounting SSAS Box

• Bracket Mounting Type

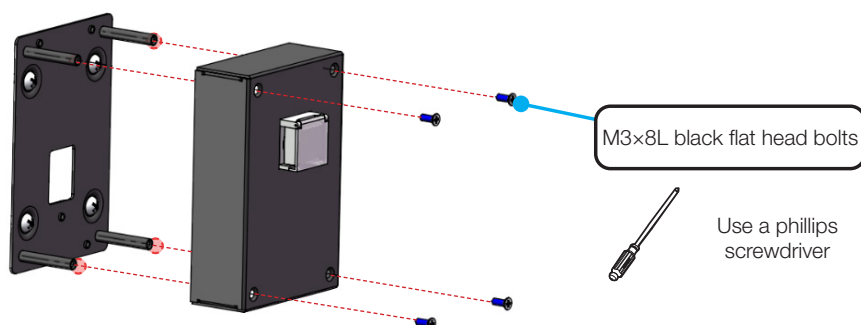
1. Bring the AISI 410 #8-25 Pan washer self-drilling screws(4ea) , M3x8L black phosphate flat head bolts (4ea) from the install kit box.
2. Loosen the locking screws on the top cover of the SSAS box using a Phillips screwdriver, then open the cover.



3. Place the detached rear panel on the wall or desk
4. Insert the AISI 410 #8-25 Pan washer self-drilling screws(4ea) into the built-in nuts on the rear panel, then tighten them using a Phillips screwdriver.

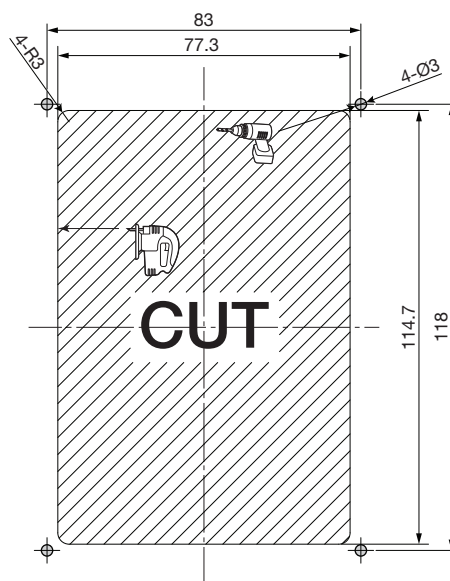


5. Position the top cover of the SSAS box, then secure it by installing the M3x8L black flat head bolts (4ea) using a Phillips screwdriver.

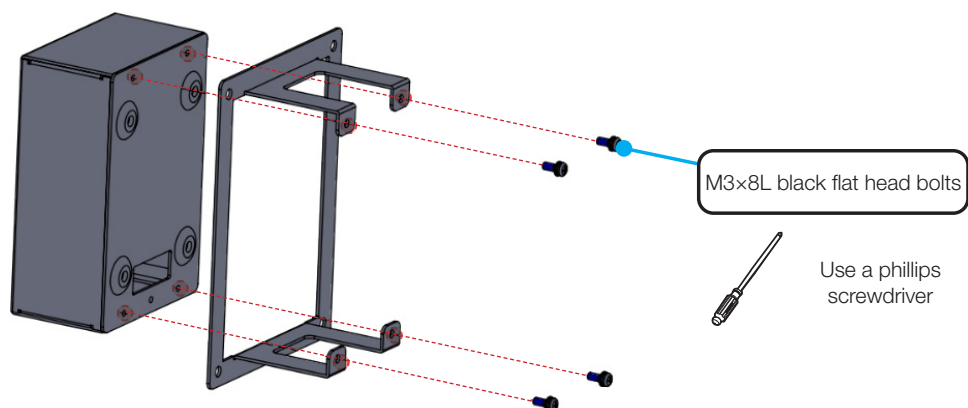


• Flush Mounting Type

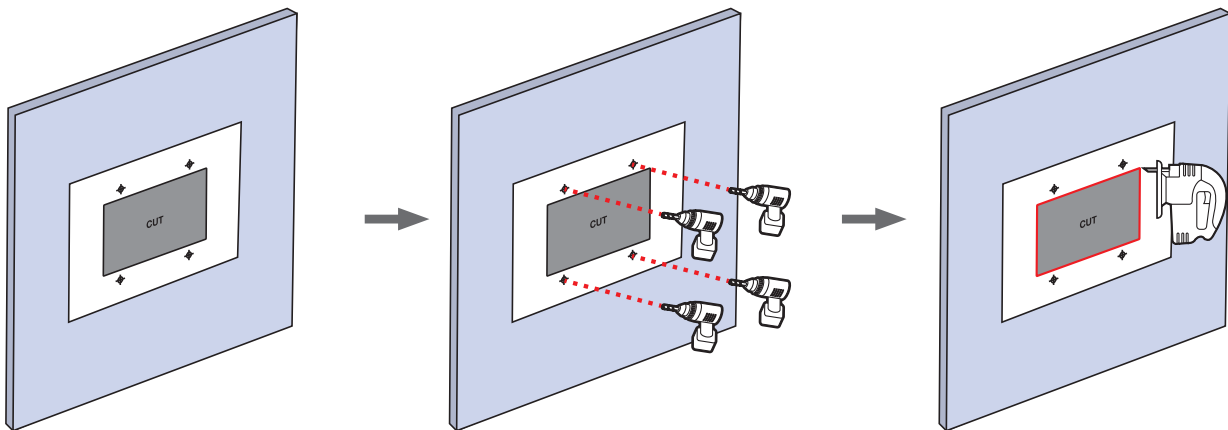
1. Print out the mount template. When printing the mount template, set the print scale to 200% in the print setup.



2. Bring the AISI 410 #8-25 Pan washer self-drilling screws(4ea), M3×8L black flat head bolts (4ea) and mount bracket for flush mounting from the install kit box.
3. To assemble the mount bracket to the SSAS box, insert the SSAS box into the mount bracket and secure it using four M3 × 8L black phosphate flat head bolts, as shown in the image below. Fully tighten the bolts using a Phillips screwdriver.



4. Secure the template to the ship panel.
5. Drill four 4.5mm holes using a 6mm drill bit.
6. Using a jigsaw or rotary cutting tool, cut along the inside of the solid line indicated on the template.

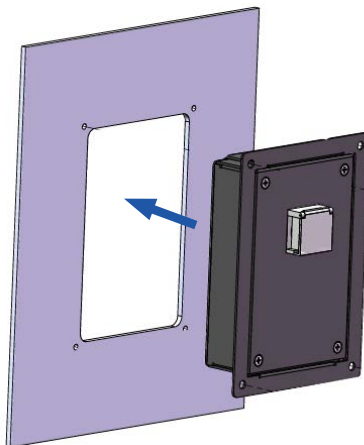


7. Insert the SSAS box into the cutout to check the fit.

Note: If necessary, use a file or sandpaper to adjust the hole size.

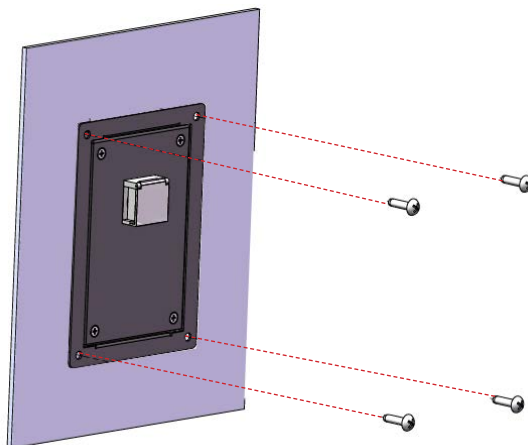
8. Remove the template from the mounting surface.

9. Insert the SSAS box into the cutout.



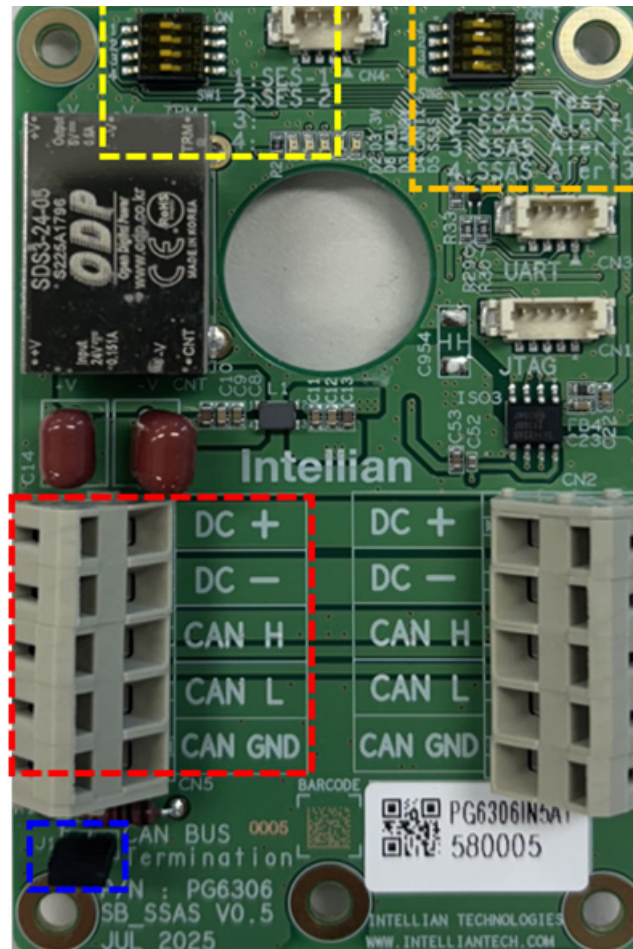
Note: If access to the back of the SSAS box will be restricted after installation, connect all necessary cables to the cradle and secure them with the locking bracket or locking rings before inserting the device.

10. Secure the device to the mounting surface using the included screws.



SB7000A/T (SSAS Box) CAN Cable Connection

This section details the CAN cable connection procedure for the SB7000A/T (SSAS Box) with the JB1000 Junction Box.



• CAN Network Configuration:

This connection scenario assumes the CAN network consists of the following sequence: SES1 → JB1000 → SB7000A/T → etc.

• Jumper Configuration (Blue Marking):

- End of CAN Chain (No further units connected after SB7000A/T): The installer must short the blue marked jumper. (e.g., JB1000 → SB7000A/T: Short the jumper.)
- Intermediate Unit in CAN Chain (Further units connected after SB7000A/T): The installer must leave the blue marked jumper open. (e.g., JB1000 → SB7000A/T → AB1000: Leave the jumper open.) (Reference: The jumper is shown in the short position in the image above.)

• Connector Connectivity (Red Marking and Another Connector):

The connectors marked in red and the other specified connector, each containing 5 ports, are electrically connected internally. For example, CAN H on Connector 1 is electrically connected to CAN H on Connector 2.

• Cable Connection:

The installation engineer can connect the cables to either of the 2 available connectors.

Important: Ensure that the entire CAN unit is connected in a serial (daisy-chain) configuration.

- **SDT7000C Number Configuration (Yellow Marked Switch):**

To distinguish the number of the SDT7000C units connected to the SB7000A/T, about the yellow marked one, set the ID by moving one switch to the right that corresponds with the desired ID, while ensuring the other switches are in the left position.

- 1: SES-1
- 2: SES-2

- **SB7000A/T Unit Number Configuration (Orange Marked Switch):**

To distinguish the number of the SB7000A/T unit itself (in case of multiple SB7000A/T units connected within the CAN network), about the orange marked one, set the ID by moving one switch to the right that corresponds with the desired ID, while ensuring the other switches are in the left position. If multiple SB7000A/T units are included in the CAN network, differentiate their numbers.

✓Button Identification:

- SB7000A: Uses a red Alert button.
- SB7000T: Uses a green Test button.

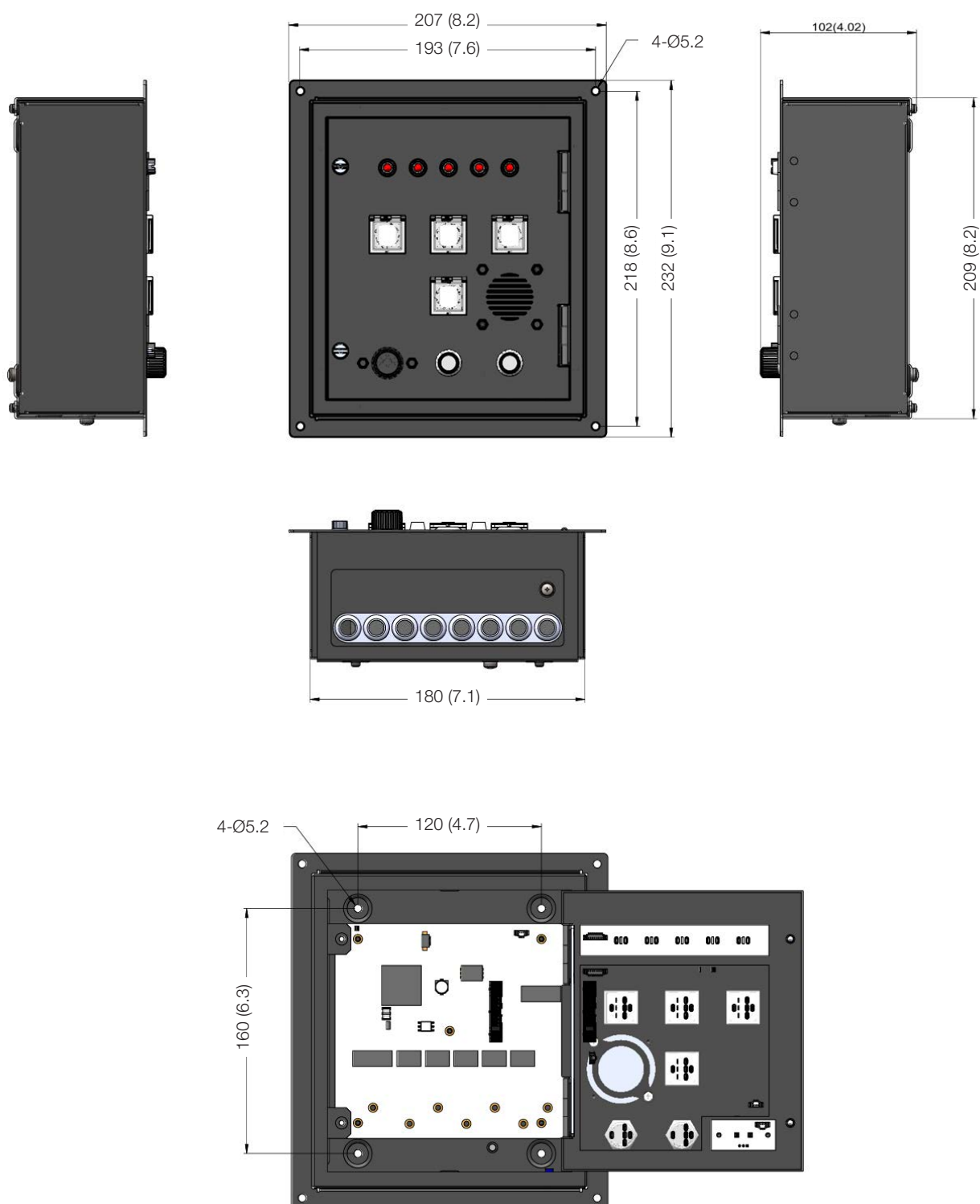
✓Switch Positions:

- 1: SSAS Test
- 2: SSAS Alert 1
- 3: SSAS Alert 2
- 4: SSAS Alert 3

12.2.5 Alarm Unit

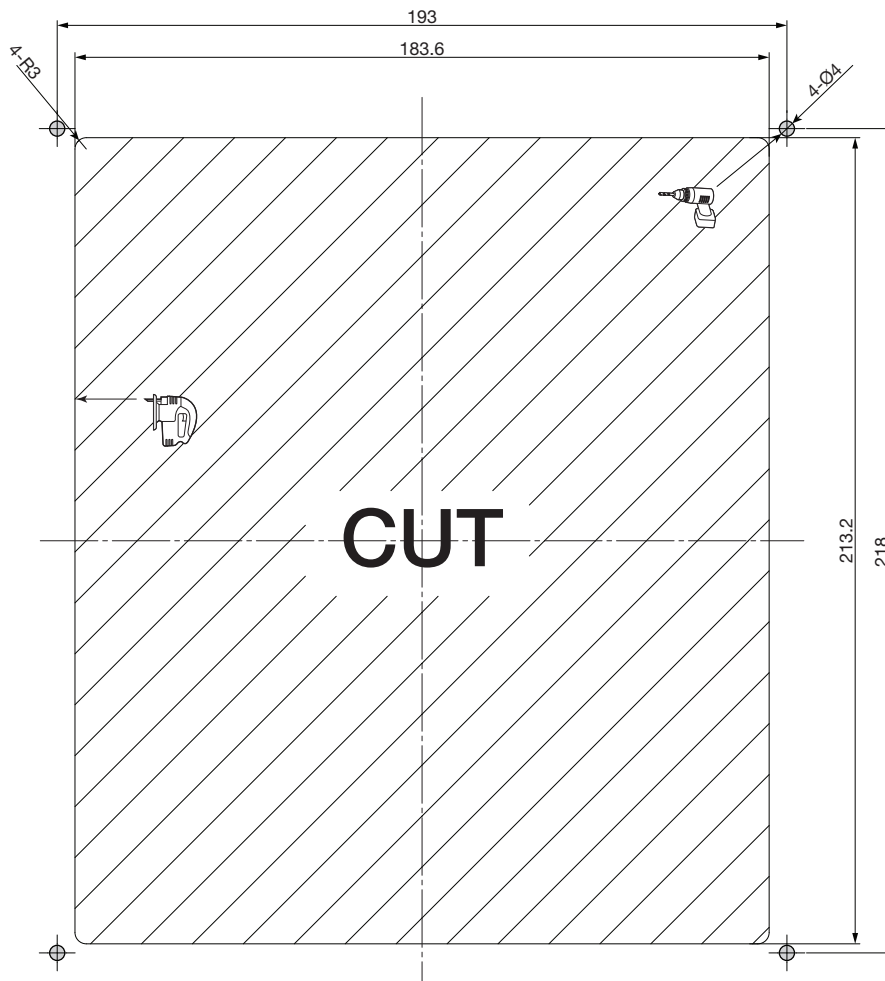
Dimensions

Unit: mm

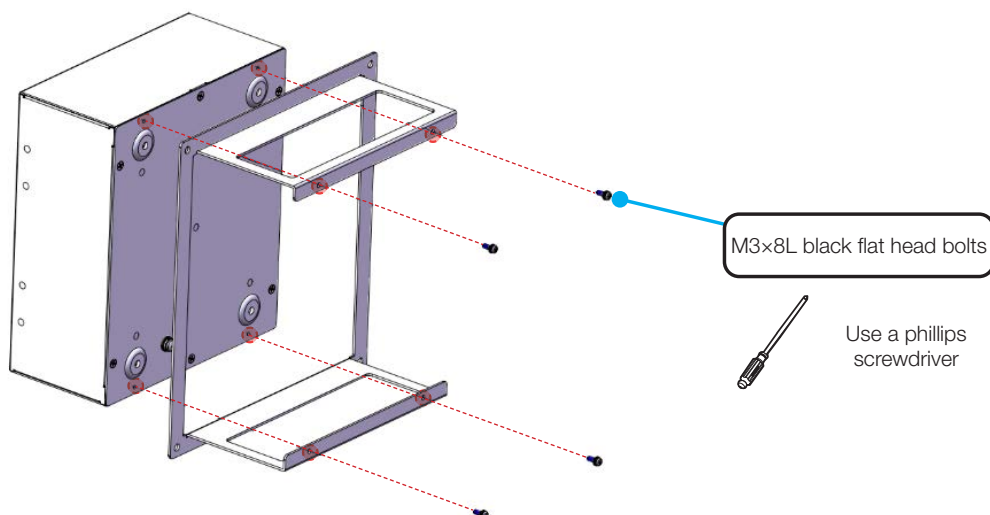


Mounting Alarm Unit

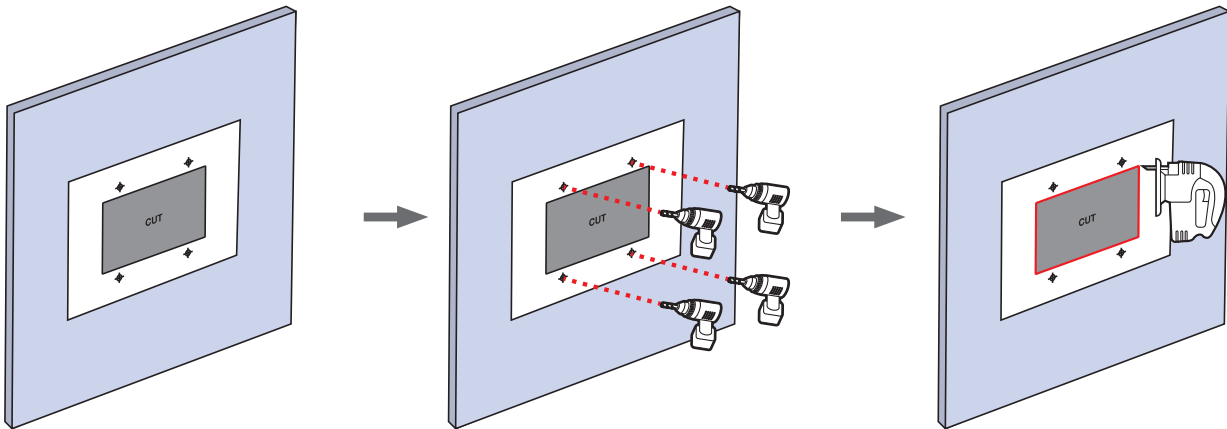
1. Print out the mount template. When printing the mount template, set the print scale to 200% in the print setup.



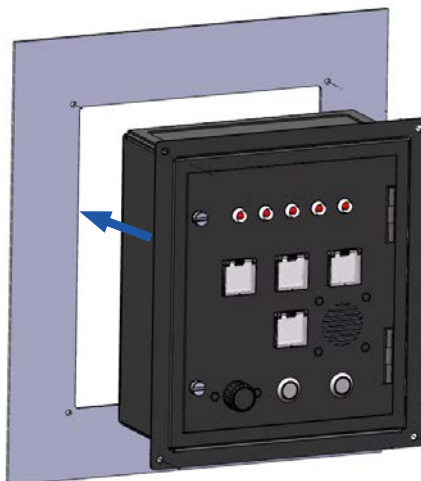
2. Bring the AISI 410 #8-25 Pan washer self-drilling screws(4ea) , M3×8L black flat head bolts (4ea) and mount bracket for flush mounting from the install kit box.
3. To assemble the mount bracket to the SSAS box, insert the SSAS box into the mount bracket and secure it using four M3 × 8L black phosphate flat head bolts, as shown in the image below. Fully tighten the bolts using a Phillips screwdriver.



4. Secure the template to the ship panel.
5. Drill four 4.5mm holes using a 6mm drill bit.
6. Using a jigsaw or rotary cutting tool, cut along the inside of the solid line indicated on the template.

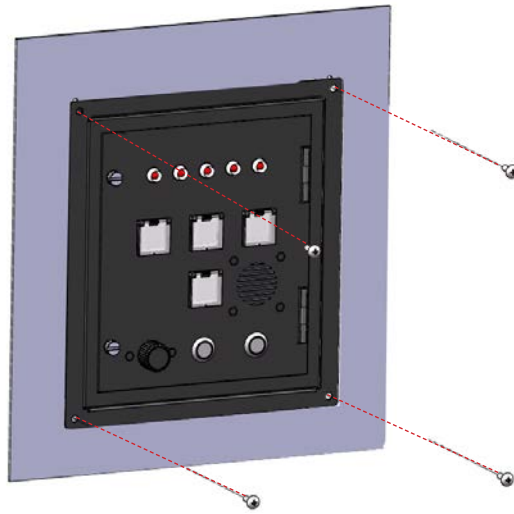


7. Insert the Alarm Unit into the cutout to check the fit.
Note: If necessary, use a file or sandpaper to adjust the hole size.
8. Remove the template from the mounting surface.
9. Insert the Alarm Unit into the cutout.



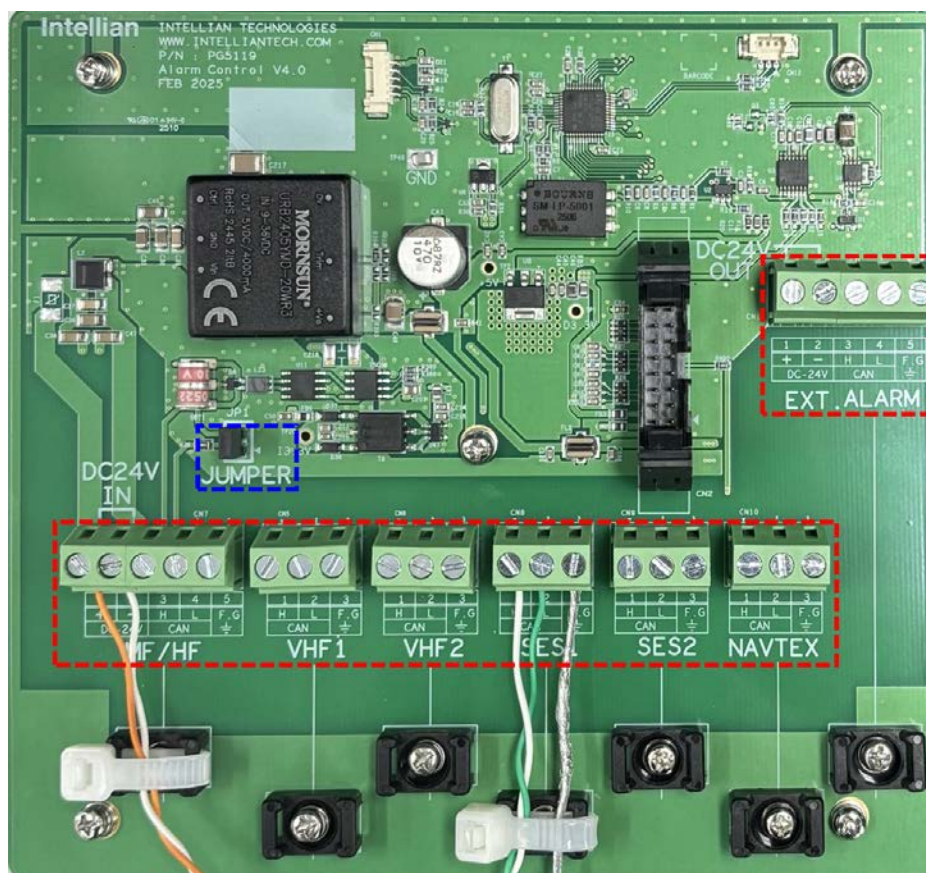
Note: If access to the back of the SSAS box will be restricted after installation, connect all necessary cables to the cradle and secure them with the locking bracket or locking rings before inserting the device.

10. Secure the device to the mounting surface using the included screws.



Alarm Unit (AU1000) CAN Cable Connection

This section details the CAN cable connection procedure for the AU1000 Alarm Unit (AU1000) with the JB1000 Junction Box.



• CAN Network Configuration:

This assumes the CAN network starts with the sequence: SES1 → JB1000 → AU1000.

• Jumper Configuration (Blue box):

- If AU1000 is the last unit in the CAN chain: Short the blue marked jumper. (e.g., JB1000 → AU1000: Short the jumper.)
- If further units are connected after AU1000: Leave the blue marked jumper open. (e.g., JB1000 → AU1000 → SB7000A: Leave the jumper open.) (Reference: The jumper is shown in the shorted position in the image below.)

• Connector Connectivity (Red box):

The red marked connectors, each with 3 or 5 ports (+, -, CAN H, CAN L, F.G), are internally connected. For example, the CAN H port on VHF1 is electrically connected to the CAN H port on SES1.

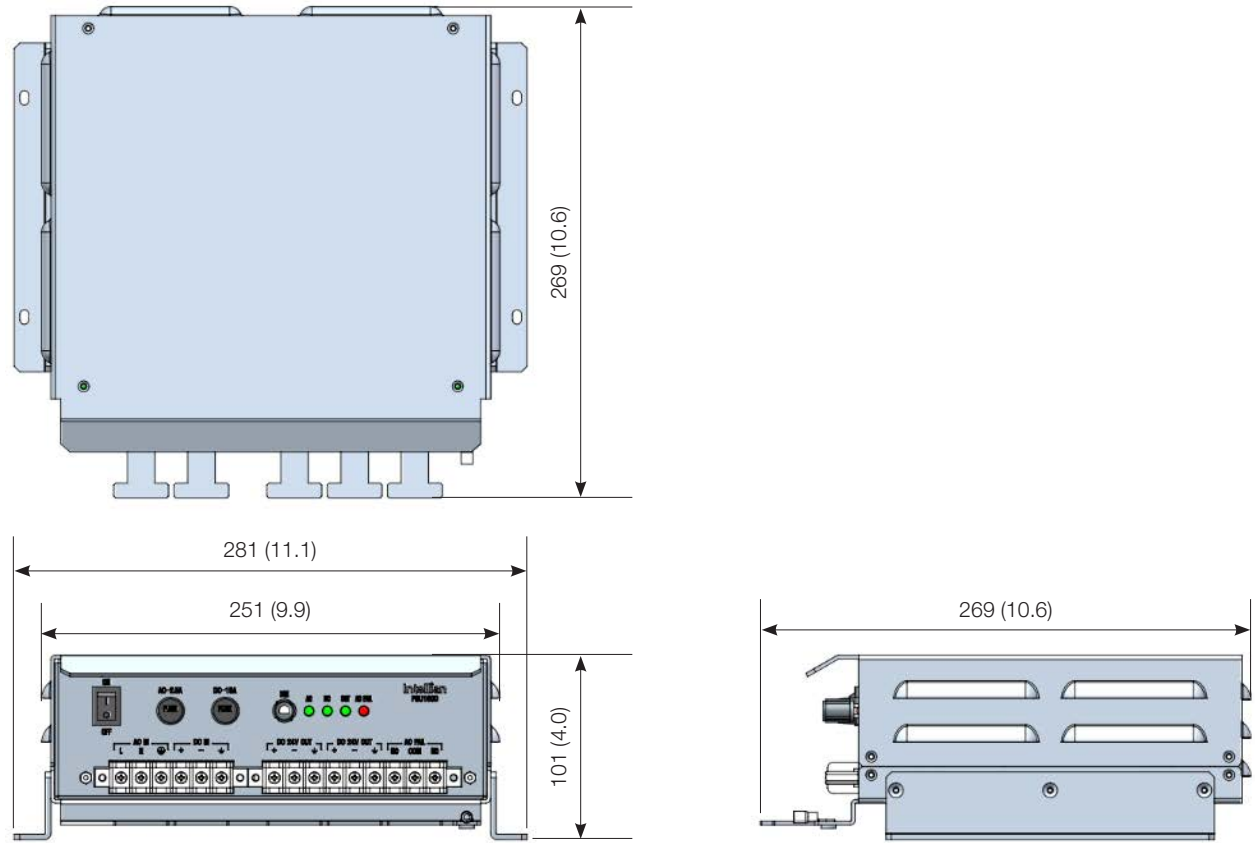
• Connection Procedure:

1. Connect the CAN cable to one of the 7 available connectors on the AU1000, depending on the GMDSS equipment being connected.
2. Ensure the entire CAN unit is connected in a serial (daisy-chain) configuration.

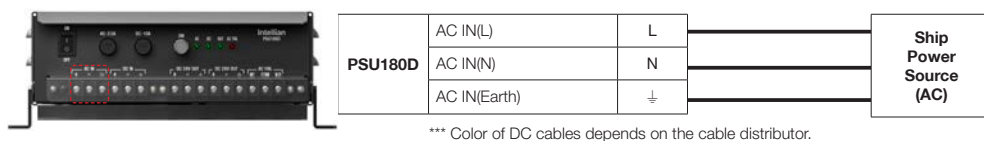
12.2.6 Power Supply (PSU-180D)

Dimensions

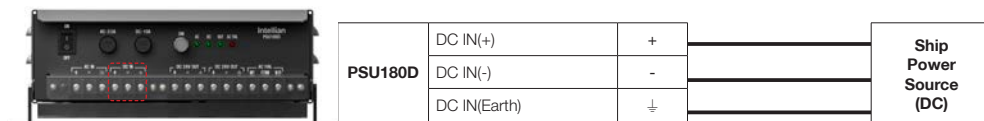
Unit: mm (inch)



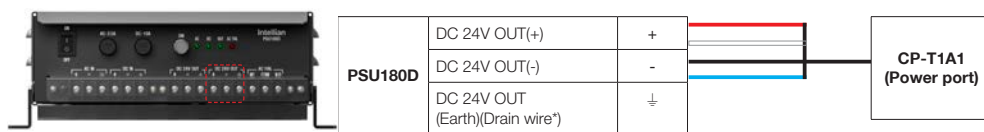
Power Supply (PSU-180D) Cable Connection



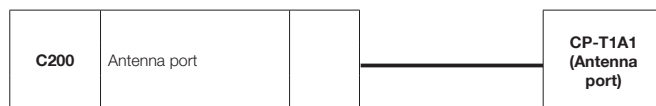
*** Color of DC cables depends on the cable distributor.



*** Color of DC cables depends on the cable distributor.



Cable P/N : NS-A296-248 (45H180300-00)



Cable P/N : MC-0034
→ LMR Cable 25m, TNC(M) to TNC(M)

12.3 BAM Alert List

Alert Identifier	Title
3013	Doubtful pos
3016	Lost position
3062	System fault
3062	Printer fault
3079	Paper low
3116	Lost connection
3122	Distress Rx
3122	Urgency Rx
3122	Distress missed
3122	Urgency missed
3123	MSI Rx
3123	Safety Rx
3123	Safety missed
3079	Storage low
12001	Invalid antenna
12002	Lost handset
12002	Lost antenna ADU
12002	Lost antenna BDU/ADU
12002	Lost alarm box
12002	Lost alarm unit
12002	Lost SSAS box
12201	Invalid SIM card
12202	Lost SIM card
21002	GMDSS fault
22002	Safety Tx fail

12.4 Abbreviation / Acronym

Abbreviation / Acronym	Meaning
A	
AC	Alternating Current
ACK	Acknowledgment
ACNI	Automatic Carrier Noise Injection
ADU	Above Deck Unit
AF	Audio Frequency
ALC	Automatic Level Control
ALF	Adaptive Load Forecasting
ALR	Alarm Report
ARC	Automatic Repeat reQuest
AWG	American Wire Gauge
B	
BAM	Bridge Alert Management
BATT	Battery
BCX	Bandwidth Compression and Expansion
BDU	Below Deck Unit
BOW	Bow
C	
CNR	Carrier-to-Noise Ratio
CRQ	Change Request
D	
dB/K	Decibels per Kelvin
dBW	Decibel-watts
DC	Direct Current
E	
ESD	Electrostatic Discharge
EXT	External
F	
FCC	Federal Communications Commission
G	
G/T	Antenna Gain-to-Noise-Temperature Ratio
GEO	Geostationary Orbit
GGA	Global Positioning System Fix Data
GLL	Geographic Latitude and Longitude
GMDSS	Global Maritime Distress and Safety System
GND	Ground
GNS	Global Navigation Satellite
GNSS	Global Navigation Satellite System
GPIO	General Purpose Input/Output
H	
HBT	Heterojunction Bipolar Transistor
I	
IEC	International Electrotechnical Commission

Abbreviation / Acronym	Meaning
L	
L2	Second Frequency Band
LAN	Local Area Network
LCD	Liquid Crystal Display
LEO	Low Earth Orbit
LMR	Land Mobile Radio
M	
Max	Maximum
MED	Marine Equipment Directive
MHz	Megahertz
MIC	Microphone
Min	Minimum
MoCA	Multimedia over Coax Alliance
N	
NRM	Normal Response Mode
NRX	Noise Reduction X
P	
P/N	Part Number
PABX	Private Automatic Branch Exchange
PoE	Power over Ethernet
POTS	Plain Old Telephone Service
PTT	Push-To-Talk
PTTs	Push-To-Talk systems
PWR	Power
Q	
QIG	Quick Installation Guide
R	
RED	Radio Equipment Directive
RF	Radio Frequency
RMC	Recommended Minimum Navigation Information
RSS	Received Signal Strength
RX	Receive
S	
SDT	Safety Display Terminal
SIM	Subscriber Identity Module
SIP	Session Initiation Protocol
SSAS	Ship Security Alert System
T	
TNC	Threaded Neill-Concelman
TX	Transmit
U	
UHF	Ultra High Frequency
UI	User Interface
USB	Universal Serial Bus
USIM	Universal Subscriber Identity Module

Abbreviation / Acronym	Meaning
V	
VBUS	USB Power Voltage
VBW	Video Bandwidth
VDC	Volts Direct Current
VHF	Very High Frequency
VHW	Water Speed and Heading
VTG	Velocity Made Good
W	
WAN	Wide Area Network
Wi-Fi	Wireless Fidelity
Z	
ZDA	Time & Date (UTC + Local Time Offset)

Note