



Product Technical Specification

Intellian v130NX

125cm Maritime VSAT Antenna

Intellian Technologies, Inc.

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Korea

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Document Revision History

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1.0	20 Jun. 2019	SJ Kim	Draft Initiated
1.1	27 Feb. 2019	Harry	Minor Error Correction
1.2	2 Jun. 2021	Bongsoo Song	Part No revision after ECO
			LMR Cable Recommendation correction
			Size and weight correction
			NMEA 2000 Pin pattern correction
			Homologation update
			New Logo update
			Safety Compliance (EN 62368-1) standard revision
1.3	4 Aug. 2021	Chikwan Yun	NMEA 2000 Pin pattern correction
1.4	26 Jul 2022	Terry Jun	LNB Output frequency detailed LO added

Approvals

Name	Department	Signature	Date	Version
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1. Product Description

Intellian v130NX is a Ku-band Maritime VSAT Antenna System with a 125cm dish in diameters. The v130NX's new control platform with highly efficient RF design delivers superior performance compared to other 1.3meter class systems, enabling higher data rates and global operation. The v130NX's new operation platform provides the efficiency of configuration and activation with its smart operational software AptusNX.

2. Key Features

- **Single Coaxial Cable**

Intellian's v130NX incorporates RF cables and power cable into one coaxial cable. The single cable delivers Tx, Rx, DC power, FSK and Reference signals between Antenna and ACU.

- **Mediator embedded in ACU**

Mediator function is embedded in ACU which is capable of controlling and managing two VSAT antenna systems simultaneously to assign Primary and Secondary ACU without a mediator box.

- **Standardized Modular Components Across NX Series**

Modular components are used throughout the NX range, such as dynamic motor brakes with integrated encoders, Main Control Unit and skew assembly. Sharing common modules across Intellian's NX antenna series, the number of spare parts is reduced

- **Support Various BUCs without balancing work**

Intellian v130NX supports various types of Ku-band BUCs from 8W to 25W. The mounting assembly of BUC & LNB with RF component is simply attachable to the rear-side of the reflector with fully balanced structure, therefore removing the need of re-balancing work after changing BUCs.

- **Quick and Easy Deployment**

The v130NX is equipped with an external dome-on connector on the bottom of radome. Furthermore, the v130NX has built in dynamic motor brakes for preventing dish damaged during the power-off mode and it removes the need of shipping bracket. These allow users to install or pre-test without opening a radome.

- **AptusNX**

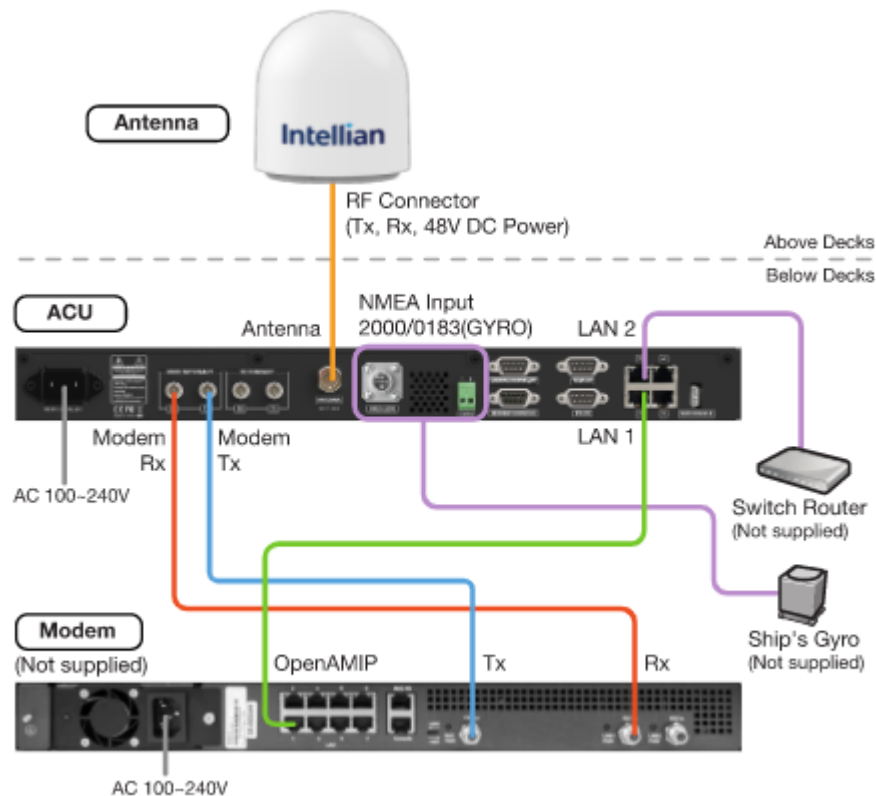
Intellian's all new integrated M&C platform, AptusNX provides responsive web user interface to manage and control the antenna system regardless of device types. It enables advanced alerts from the live data monitoring and analysis agent, the v130NX sends warning messages to the NOC in advance when it detects any abnormal operation. Configuration Wizard in AptusNX automates functions for system configuration so that operators are minimally involved in

system installation and operation, including automatic cable loss compensation, line-up test and auto diagnostics.

3. System Configuration

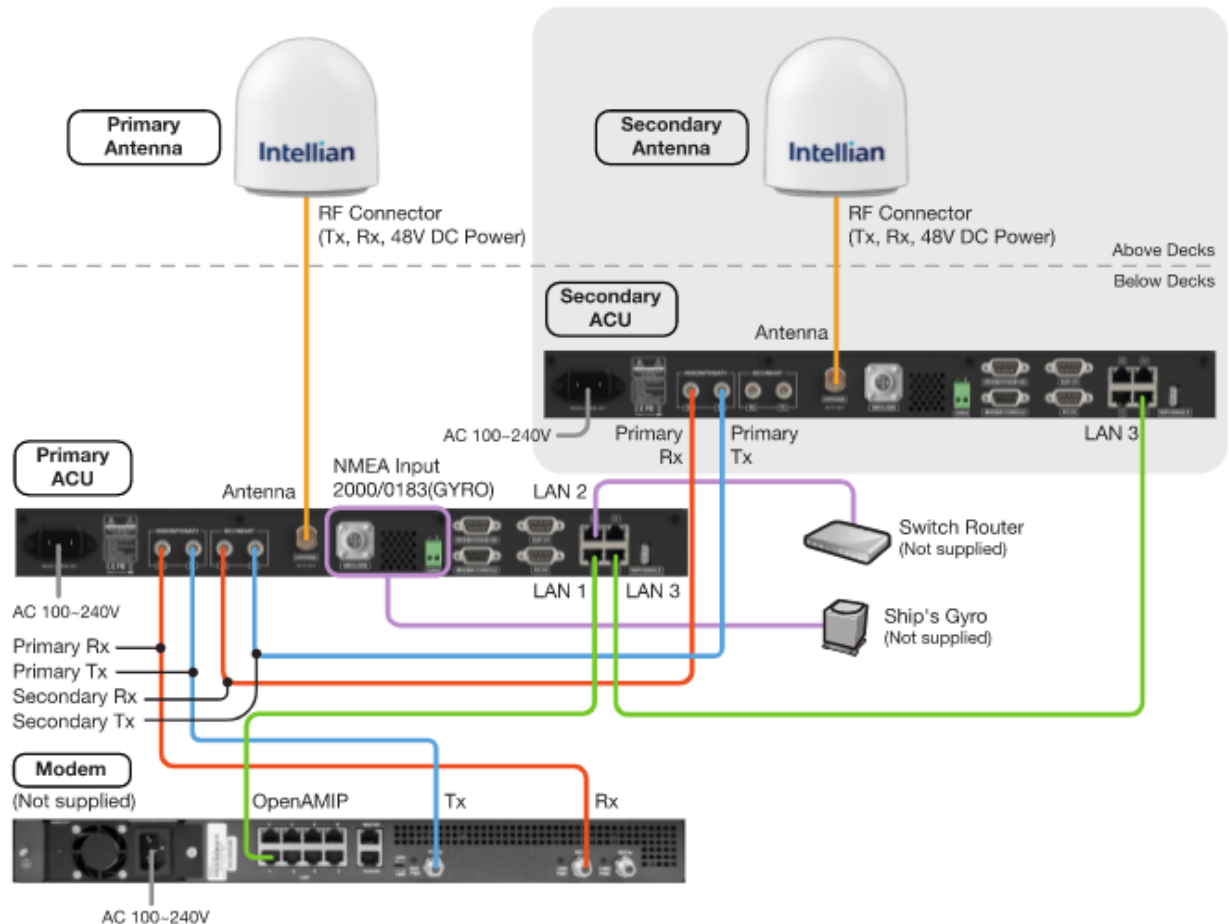
3.1. Basic Antenna System Configuration

The basic antenna system configuration consists of one antenna and one ACU. The configuration is as shown below.



3.2. Dual Antenna System Configuration

The dual antenna system configuration consists of two antennas and two ACUs. The embedded mediator function is capable of controlling and managing two antenna systems simultaneously to assign primary/secondary ACU. The configuration is as shown as below.

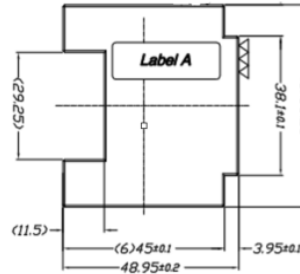
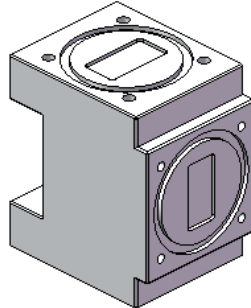


4. RF Specification

4.1. Optical Specification

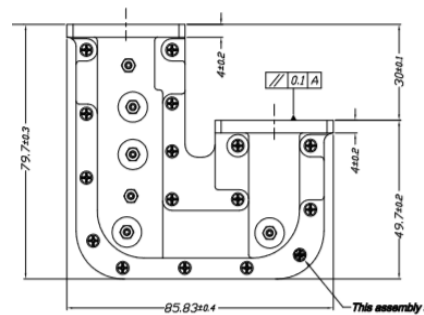
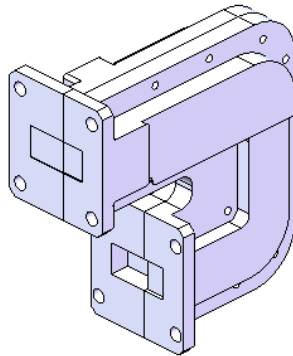
Item		Specification
Diameter		125cm
RX	Frequency	10.7 ~ 12.75 GHz Ku-band
	Gain	42 dBi @ 11.7GHz (w/o radome)
Tx	Frequency	13.75 ~ 14.5 GHz Ku-band
	Gain	43.5 dBi @ 14.25GHz (w/o radome)
Cross Pol Isolation		Min. 30 dBc
G/T over Rx Range at elevation angle > 30 deg.		> 21.0 dB/K @ 12.75GHz (w/ radome)
EIRP		51.5 dBW @ 14.25GHz, 8W BUC
Compliance Regulatory		EESS 502
Pattern Mask	Co-polarization: $\lambda/D^\circ < \Phi \leq 7^\circ$ $7^\circ < \Phi \leq 9.2^\circ$ $9.2^\circ < \Phi \leq 48^\circ$ $48^\circ < \Phi$	29-25Log Φ dBi +8 dBi 32-25Log Φ dBi -10 dBi
	Cross-polarization: $1.8^\circ \leq \Phi \leq 7^\circ$ $7^\circ \leq \Phi \leq 9.2^\circ$	19-25Log Φ dBi -2 dBi
Antenna Polarization		Linear (X-pol and Co-pol)
Tx-Band-to-Rx-Band Isolation (TRF + OMT Isolation)		80dBc @ Ku-Band

4.2. OMT Specification



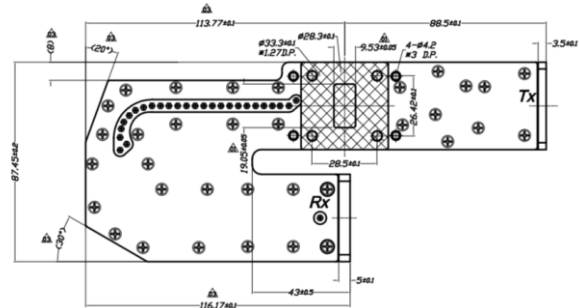
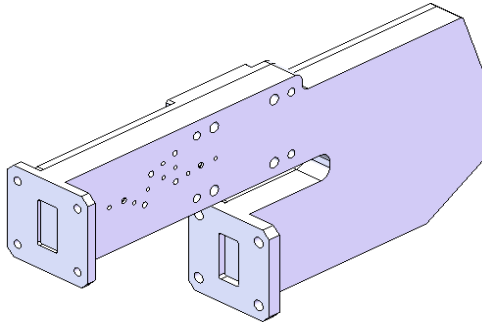
Item		Specification
Frequency	Rx	10.7~12.75GHz
	Tx	13.75~14.5GHz
Insertion Loss		0.3dB Max
Port to Port Isolation		35dB min
Return Loss (Rx/Tx)		17.9dB min.

4.3. Band Pass Filter Specification



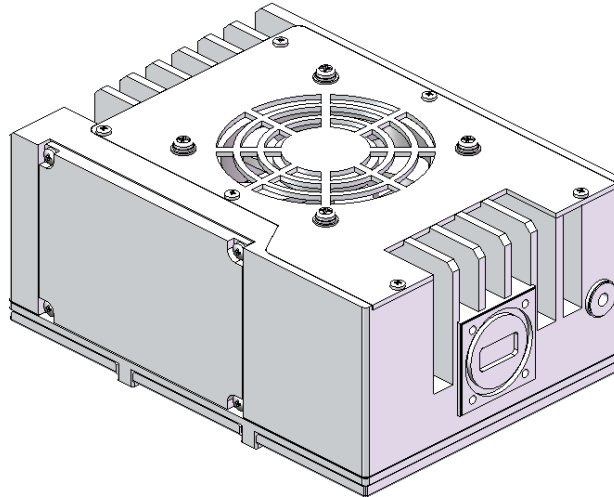
Item		Specification
Frequency		10.7~12.75GHz
Insertion Loss		0.5dB Max
TRF Rejection		75dBc min@13.75GHz
Radar Rejection		70dBc min@10.0GHz
Return Loss		17.9dB min.

4.4. Diplexer Specification



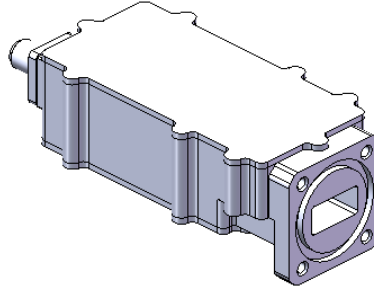
Item		Specification
Frequency	Rx	10.7~12.75GHz
	Tx	13.75~14.5GHz
Insertion Loss (Rx/Tx)		0.5dB Max
TRF Rejection		75dBc min@13.75GHz
RRF Rejection		75dBc min@12.75GHz
Radar Rejection		70dBc min@10.0GHz
Return Loss (Rx/Tx)		17.9dB min.

4.5. BUC Specification



Item	Specification		
Product	8W	16W	25W
P/N	V1-2212	V1-2213	V1-2217
RF Frequency	13.75 ~ 14.50GHz		
Local Frequency	12.80GHz		
IF Frequency	950 ~ 1700MHz		
Input VSWR	Max. 2:1		
Output VSWR	Max. 2:1		
L.O Phase Noise	Max. -70dBc @1 kHz Max. -80dBc @10 kHz Max. -90dBc @100 kHz Max. -100dBc @1 MHz		
Output power	8W Linear Min. +39dBm	16W Linear Min. +42dBm	25W Saturation Min. +42dBm
Gain	Min. 59dB	Min. 59dB	Min. 66dB
Power Supply	+18 ~ 60Vdc	+36 ~ 60Vdc	+36 ~ 60Vdc
Power Consumption	Max. 90W	Max. 180W	Max. 230W

4.6. LNB Specification



Item	Specification
P/N	V5-4007_A
Connector Type	SMA
Input Frequency	10.7~12.75GHz
Output Frequency	950~2000MHz @ Local 10.75GHz 950~1450MHz @ Local 11.25GHz <i>specified from the chosen LO.</i>
Conversion Gain	54 ~ 62dB
Gain Flatness	Max. 8dB
Local Stability	±1ppm(±10KHz)
Phase Noise	Max. -74dBc @1 kHz Max. -79dBc @10 kHz Max. -100dBc @100 kHz Max. -125dBc @1 MHz
Input VSWR	Max 2.7:1
Output VSWR	Max 2.5:1
G1dB	Min. 10dBm
Image Rejection	Min. 5dBc @ Lo Freq. 11.25GHz Min. 20dBc @ Lo Freq. 9.75GHz
Power Consumption	Max. 380mA

5. Mechanical Specification

5.1. Size & Weight

Item	Specification
Height	1724mm
Diameter	Ø1681mm
Weight	144.2kg



5.2. Pedestal Specification

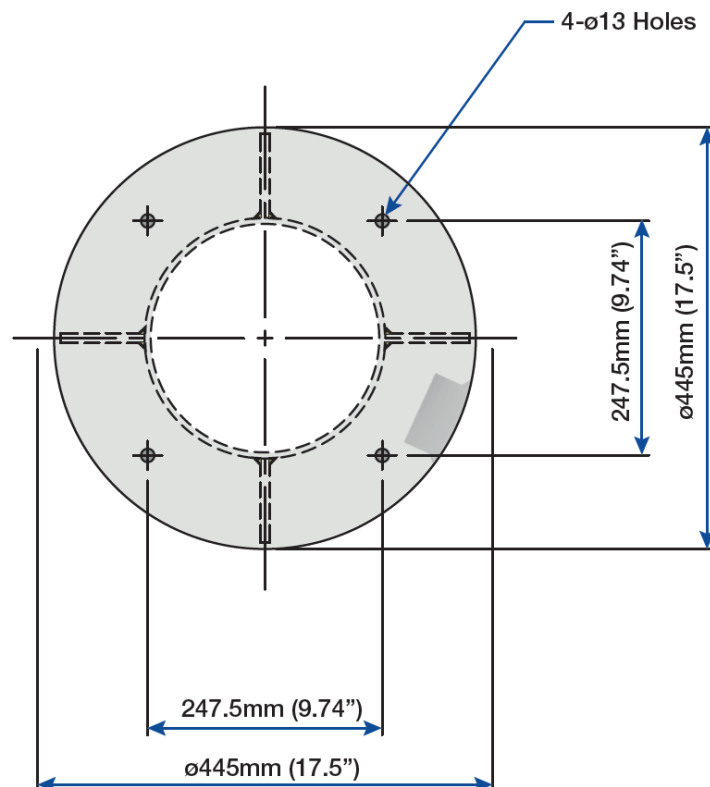
Item		Specification
Platform		Three Axis: Azimuth, Elevation, Cross-level
Positioning		3-axis Velocity Mode Servo Control: Azimuth, Elevation, Cross-Level
Pedestal Motion Range	Azimuth	Unlimited w/ home sensor (no limit switch)
	Elevation	-20 to +115
	Cross-level	Up to $\pm 37^\circ$

Power Source		ACU provide 48V DC over IFL coax cable
Above Deck IFL Termination		1 x 50Ohm N-type female TX/RX; 10MHz/50MHz/400MHz/433MHz/L-band (950 - 2150MHz) DC power to BUC & pedestal (and LNB)
Pointing Stabilization Accuracy		0.2 max in presence of specified ship motions
Ship Motions	Roll	25° at 6 second
	Pitch	15° at 6 second
	Yaw	8° at 6 second
	Turning rate	Up to 12°/sec & 5°/sec ²
AZ/EL/CL motor		Brushless DC motor with Encoder
Motor Brake		Dynamic Brake
Sensor		3 Gyro-Rate Sensor 1 Tilt Sensor(Fixed Sensor)

5.3. Mounting & Mast

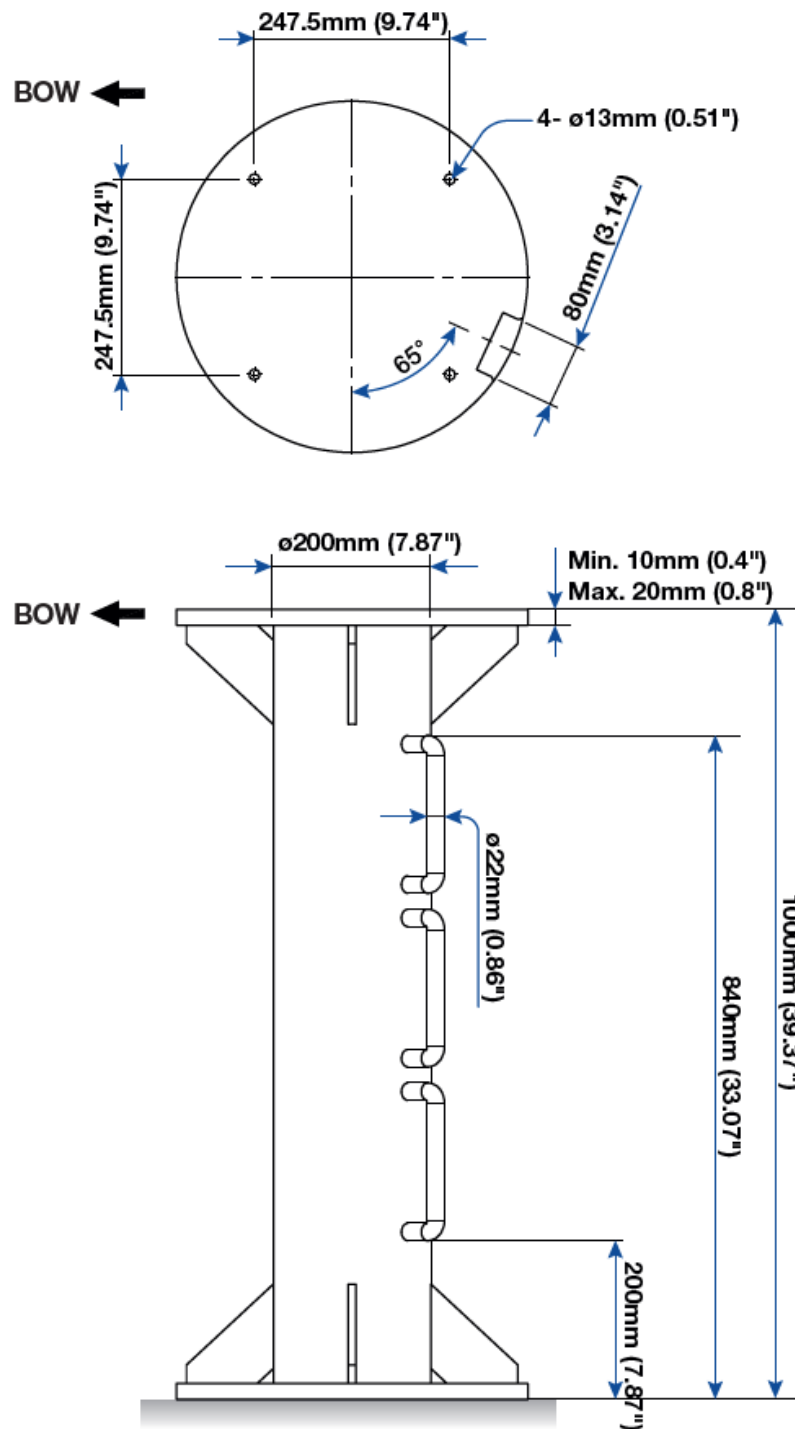
5.3.1. Mounting Hole Pattern

The mounting holes must be in the exact same place as shown in the diagram below.



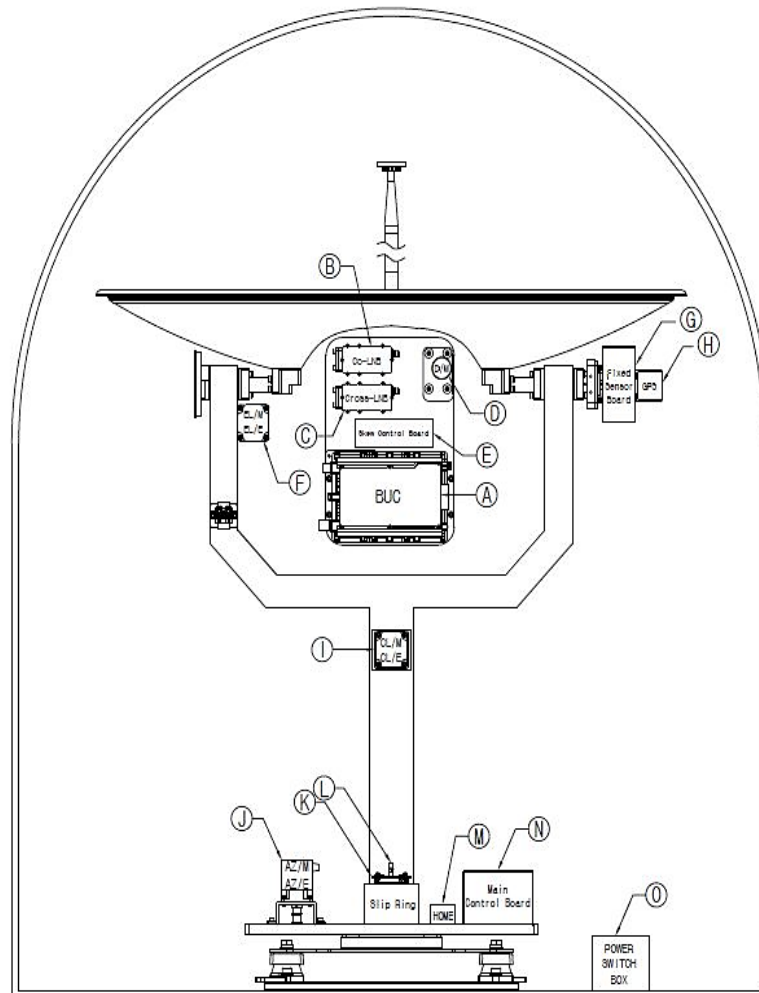
5.3.2. Mast Designing

The antenna mast must be designed to carry the weight of the antenna. The mast must also be able to withstand on-board vibration and wind speeds on the radome.



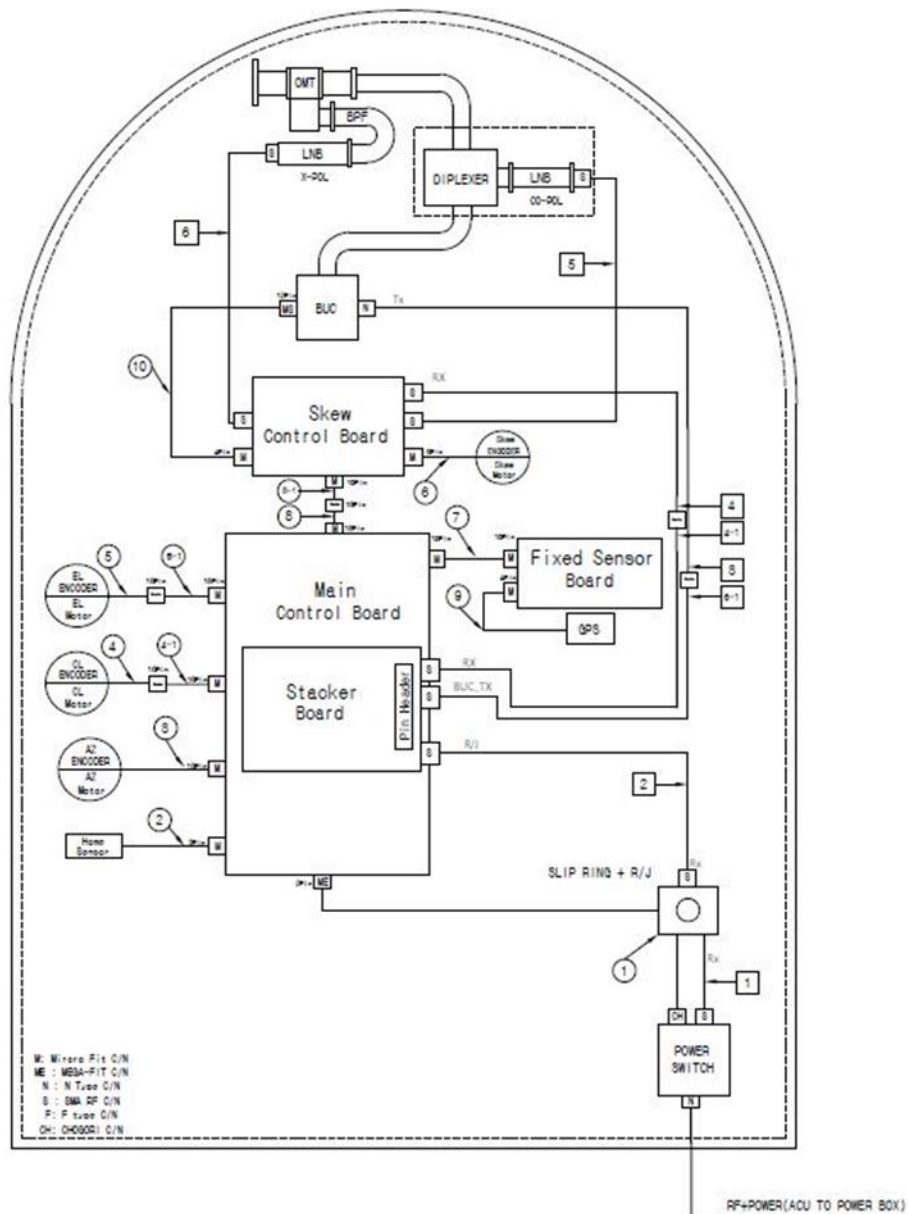
6. Electronic Specification

6.1. System Diagram



No.	Item	Part No.
A	NJRC KU BAND 8W BUC	V1-2212
B	Intellian KU BAND Co Pol LNB	V5-4007_A
C	Intellian KU BAND Cross Pol LNB	V5-4007_A
D	Skew DC Motor w/ Encoder	V5-4006
E	Skew Control Unit	V5-4002
F	EL BLDC Motor w/ Encoder	V5-3008_A
G	Fixed Sensor Unit	V5-4004
H	GPS Module	V5-5004

I	CL BLDC Motor w/ Encoder	V5-3008_A
J	AZ BLDC Motor w/ Encoder	V5-3008_A
K	Slip Ring	V5-5002
L	Rotary Joint (1 CH)	V5-5001_A
M	Home Sensor	V5-5003
N	Main Control Unit	V5-4001
O	Power Switch Unit	V5-4003_A



Control Part (○)

No.	Part No.	Description
①	LT0001	- Slip-ring Cable - Connector: Mega-fit 2p & CHOGORI 2p - Cable Length: 1000mm & 410mm - Cable spec: 2c x 1.5mm, White silicon shield
②	LT0004	- Home Sensor Cable - Connector: Micro-fit 4p - Cable Length: 210mm - Cable spec: 3c x 0.3mm Black
③	BV0027	- BLDC MOTOR(AZ) - Connector: Micro-fit 16p - Cable Length: 700mm - Cable spec: 5pr x 28AWG+4c x 22AWG, White silicon shield
④	BV0027	- BLDC MOTOR(CL) - Connector: Micro-fit 16p - Cable Length: 700mm - Cable spec: 5pr x 28AWG+4c x 22AWG, White silicon shield
④-1	LF1001	- ANT MCU to CL Motor(Extension) - Connector: Micro-fit 16p & Micro-fit 16p - Cable Length: 200mm - Cable spec: 5pr x 28AWG+4c x 22AWG, White silicon shield
⑤	BV0027	- BLDC MOTOR(EL) - Connector: Micro-fit 16p - Cable Length: 700mm - Cable spec: 5pr x 28AWG+4c x 22AWG, White silicon shield
⑤-1	V5-5040	- ANT MCU to EL Motor(Extension) - Connector: Micro-fit 16p & Micro-fit 16p - Cable Length: 700mm - Cable spec: 5pr x 28AWG+4c x 22AWG, White silicon shield

⑥	LT0016	- Skew Motor - Connector: Micro-fit 6p - Cable Length: 350mm - Cable spec: 6c x 26AWG, White
⑦	LT0005	- ANT MCU to Stabilizing Sensor Unit - Connector: Micro-fit 10p & Micro-fit 10p - Cable Length: 1900mm - Cable spec: 8c x 28AWG, White silicon shield
⑧	LF1002	- ANT MCU to Gender - Connector: Micro-fit 18p & Micro-fit 16p - Cable Length: 1340mm - Cable spec: 2c x 20AWG + 13c x 26AWG, White silicon shield
⑧-1	LT0012	- Ku Conversion Skew Cable Assembly - Connector: Micro-fit 18p & Micro-fit 16p - Cable Length: 1570mm - Cable spec: 5pr x 28AWG+4c x 22AWG, White silicon shield
⑨	LT0021	- GPS Cable - Connector: Micro-fit 4p - Cable Length: 170mm - Cable spec: 4c x 28AWG, Black
⑩	V5-5038	- Skew Control Unit to BUC - Connector: Mini-fit 4p & PT06E-14-1M2S - Cable Length: 610mm - Cable spec: 4c x 18AWG, White

RF Part (□)

No.	Part No.	Description
1	V5-5031	RF Cable for Power Switch Unit to RJ Connector: SMA(male) & SMA(male) Cable Length: 1000mm Cable Spec: RG405 KSC
2	V5-5032	RF Cable for RJ to ANT MCU Connector: SMA(male) & SMA(male) Cable Length: 450mm Cable Spec: RG405 KSC

3	LF1003	- RF Cable for Gender Tx to Ku BUC - Connector: SMA(male) & N type(male) - Cable Length: 1400mm - Cable Spec: RG405 KSC
4	LF1004	- RF Cable for Gender Rx to Skew Control Unit - Connector: SMA(male) & SMA(male) - Cable Length: 1400mm - Cable Spec: RG405 KSC
5	V5-5036	- RF Cable for Skew Control Unit to Co-pol LNB - Connector: SMA(male) & SMA(male) - Cable Length: 275mm - Cable Spec: RG405 KSC
6	V5-5035	- RF Cable for Skew Control Unit to X-pol LNB - Connector: SMA(male) & SMA(male) - Cable Length: 230mm - Cable Spec: RG405 KSC

6.2. Power

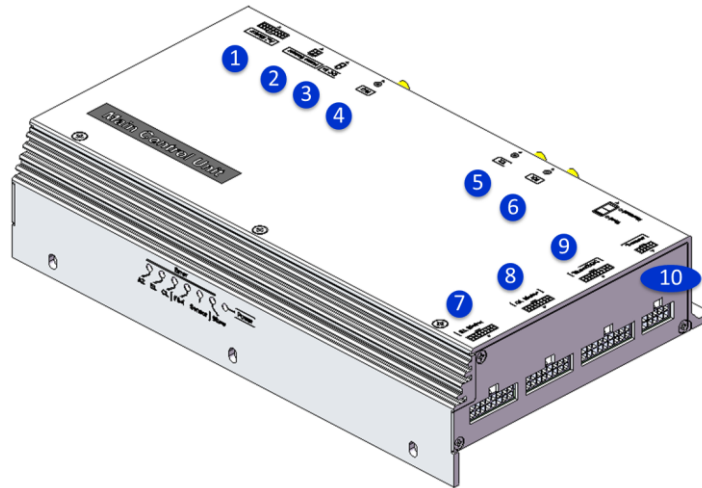
Item	Specification
Antenna Power	48VDC supplied from ACU over Coax Cable
Antenna Power Consumption	Max 500W (SMPS)
ACU Power Input	100 ~ 240 VAC, 50~60Hz, 3.3A

Due to the signal losses across the length of the RF coax on L-band, Intellian recommends the following 50ohm coax cable types for standard system installation.

* The maximum DC resistance of RF cable is 0.8 ohm.

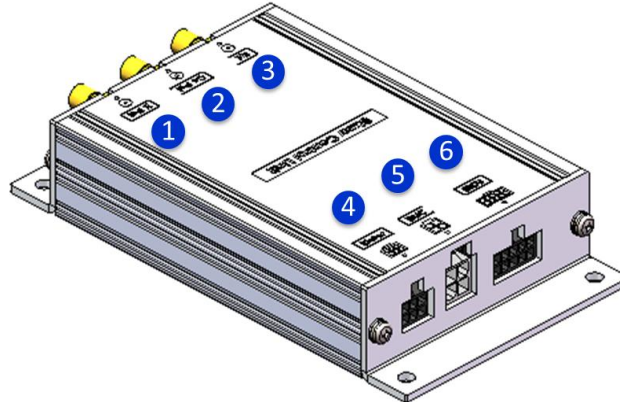
Coaxial Cable Type	Loss in dB/M	Loss in dB/100M	Recommended Max. Cable Length
LMR400	0.196	19.6	60M
LMR600	0.128	12.8	100M

6.3. Main Control Unit



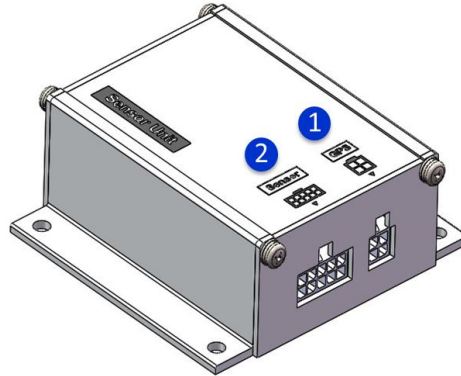
Part Number		V5-4001
No.	Port	Description
1	BLDC Motor_ AZ	16pin Micro Fit connector, AZ motor
2	Home sensor	4pin Micro Fit connector, Home sensor
3	48V DC Input	2pin Mega Fit connector, DC power input
4	Rotary Joint	SMA(male) – RG405 – SMA(male) RF Cable for RJ to ANT MCU
5	TX	SMA(male) – RG405 – SMA(Female) RF Cable for Gender Tx to Ku BUC
6	RX	SMA(male) – RG405 – SMA(Female) RF Cable for Gender Rx to Skew Control Unit
7	BLDC Motor_ EL	16pin Micro Fit connector, EL motor
8	BLDC Motor_ CL	16pin Micro Fit connector, CL motor
9	Skew I/F	18pin Micro Fit connector, Skew interface
10	Fix Sensor I/F	10pin Micro Fit connector, Sensor interface

6.4. Skew Control Unit



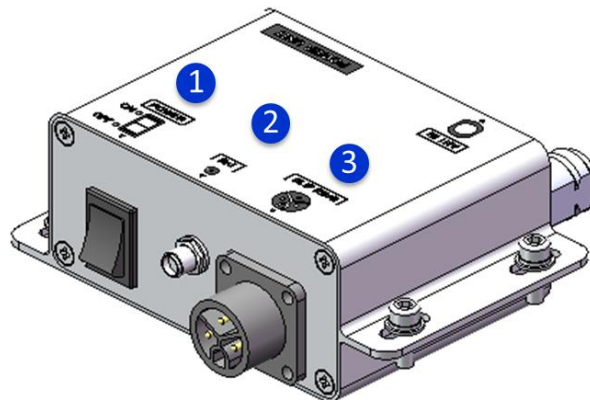
Part Number		V5-4002
No.	Port	Description
1	X-pol LNB	SMA(Female) – RG316 – MCX(male) RF Cable for Skew Control Unit to X-pol LNB
2	Co-pol LNB	SMA(Female) – RG316 – MCX(male) RF Cable for Skew Control Unit to Co-pol LNB
3	RX	SMA(Female) – RG316 – MCX(male) RF Cable for Gender Rx to Skew Control Unit
4	Skew Motor	6pin Micro Fit connector, Skew motor
5	BUC I/F	4pin Mini Fit connector, BUC M&C, Power
6	Skew I/F	10pin Micro Fit connector, Skew interface

6.5. Sensor Unit



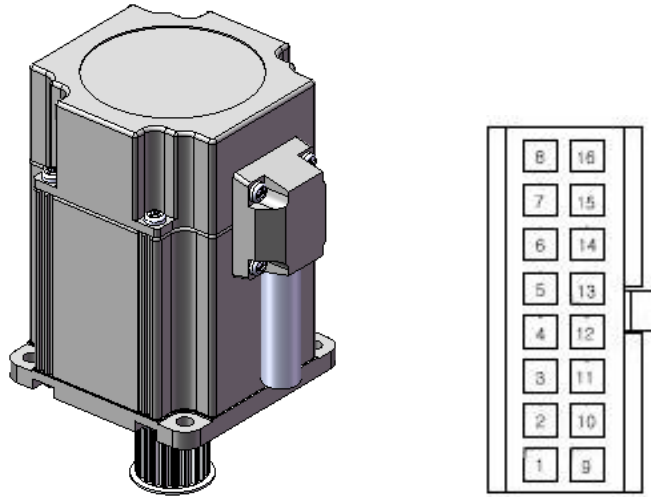
Part Number		V5-4004
No.	Port	Description
1	GPS	4pin Micro Fit connector, GPS Interface
2	Sensor I/F	10pin Micro Fit connector, Sensor Interface

6.6. Power Switch Unit



Part Number		V5-4003_A
No.	Port	Description
1	Power Switch	18AWG, 4pin Power on-off Switch Cable
2	Rotary Joint	SMA(male) – RG405 – MCX(male) RF Cable for RJ to ANT MCU
3	48V DC Output	16AWG, Chogori 2pin DC Power_48V_2P

6.7. Encoder Embedded Motor (AZ/EL/CL)

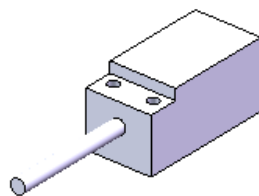


Part Number		V5-3008
No.	COLOR	Description
1	GRAY	HALL_GND
2	-	N/C
3	PINK_BAR	HALL_U
4	YELLOW_BAR	HALL_V
5	YELLOW	HALL_W
6	GRAY_BAR	ENCODER_GND
7	BLACK	GND
8	ORANGE	ENCODER_A-
9	WHITE	OUT V(AWG22)
10	BLACK	OUT U(AWG22)
11	RED	OUT W(AWG22)
12	PINK	+5V
13	-	N/C
14	WHITE	ENCODER_B+
15	ORANGE	ENCODER_A+

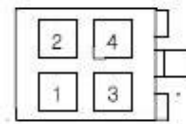
16	WHITE BAR	ENCODER_B-
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Model	Voltage	No Load		Rated Load			
		RPM	Current	Output	RPM	Torque	Current
B650-20D0-M1109	48[VDC]	2,700RPM (±5%)	0.4A (Max)	50[W]	2,000 RPM (±5%)	2/43[Kg.cm]	2.0A (Max)

6.8. Home Sensor



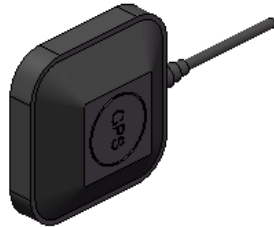
Micro Fit connector



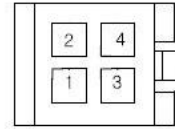
Part Number		V5-5003
No.	COLOR	Description
1	BLUE	GND
2	-	NC
3	BROWN	+13V
4	BLACK	Home sensor Detect signal

Model	Voltage	Detecting distance	Response Frequency	Protection	weight
PSN17-5DN	13VDC] (10V~30V)	5mm ±10%	700Hz	IP67 (IEC specification)	Approx. 71g

6.9. GPS



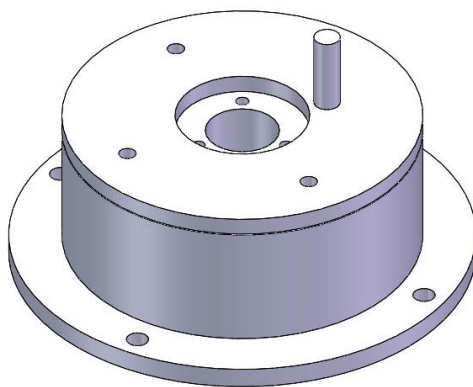
Micro Fit connector



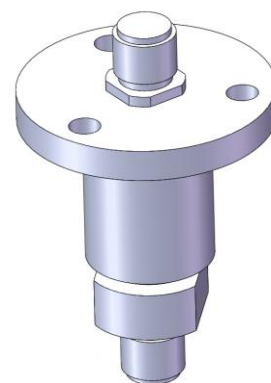
Part Number		V5-5004
No.	COLOR	Description
1	BLACK	GND
2	-	NC
3	RED	5V
4	WHITE	GPS RX signal

Model	Voltage	Support Channel	Module	Band	Dimension
PSN17-KGM4646U7	5[VDC] (3.3V~5V)	56Ch	UBLOX7	L1 (1575.42MHZ)	46x46x13.5mm

6.10. Slip Ring / Rotary Joint



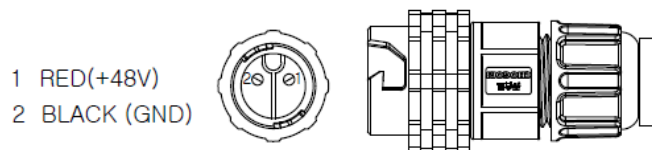
[Slip Ring]



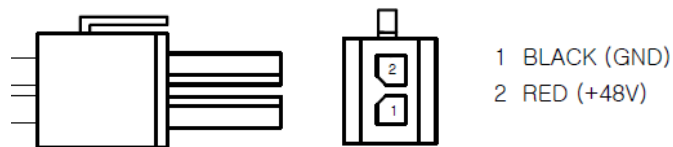
[Rotary Joint]

Slip Ring

COLOR	Description
BLACK	GND
RED	+48Vdc



Input Connector (Power Box)



Output Connector (MCU)

Part No.	Circuits	Current	Voltage	Speed	Life
V5-5002	2ch	15A/Ring	48Vdc	300RPM	50x10 ⁶ rotation

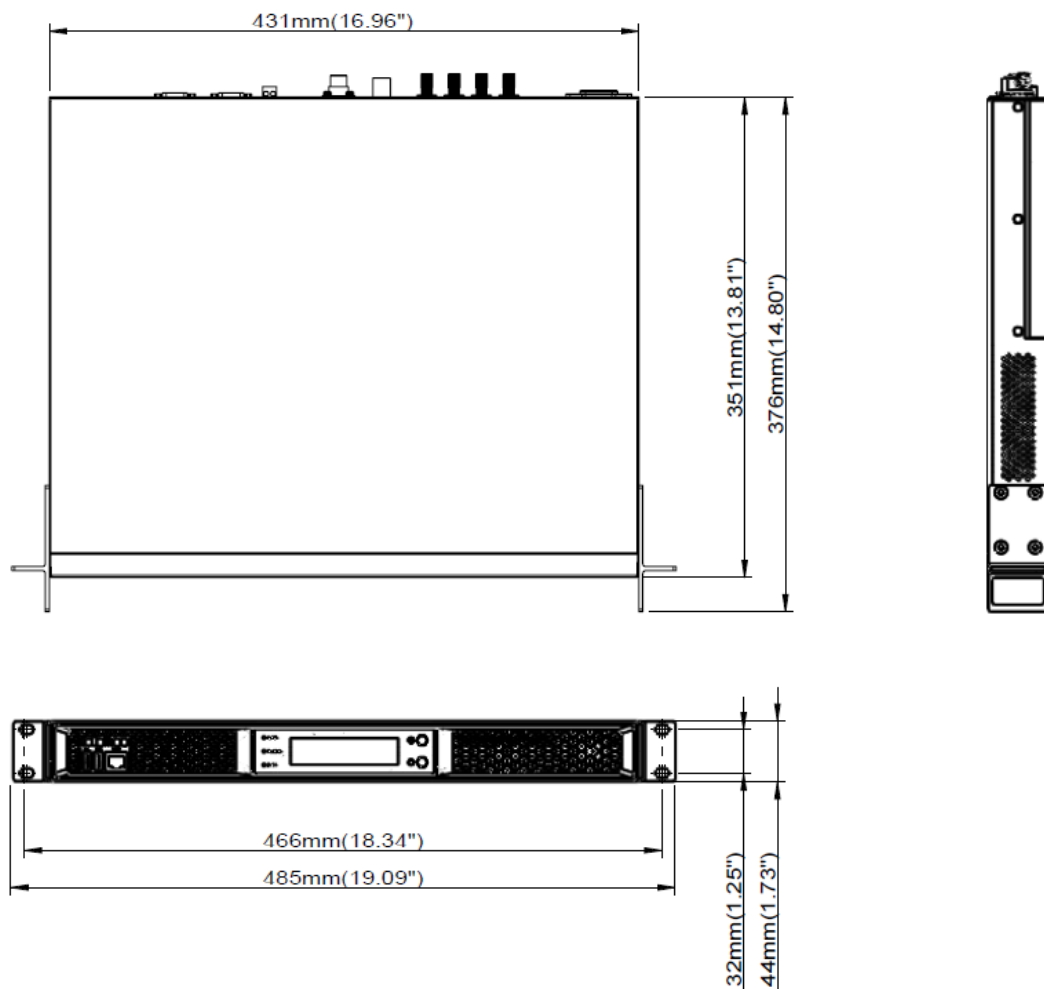
Rotary joint

Part No.	Channel	Freq. Range	Insertion Loss	VSWR	Speed
V5-5001_A	1ch	DC~18GHz	Max. 0.4dB	Max. 1.4:1	60RPM

7. Antenna Control Unit Specification

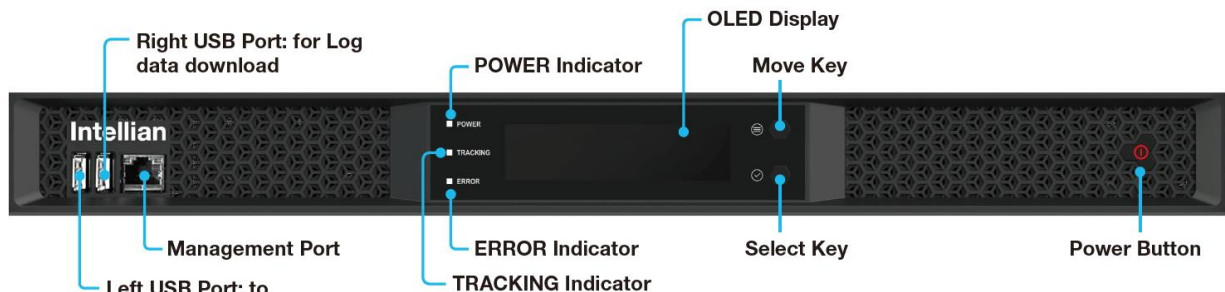
7.1. Size & Weight

Part Number	VP-T84G2
Item	Specification
Size (W x D x H)	431mm x 350mm x 44.3mm
Weight	5.5Kg

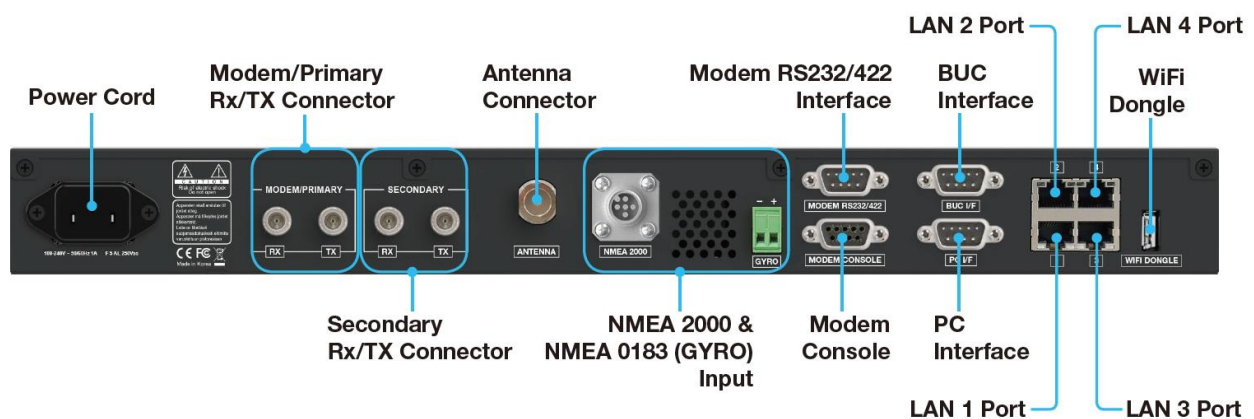


7.2. Interface

Item	Specification
Display	256x64 Graphic OLED
Key	2 Push Keys
LED Indicator	3 LEDs for Power, Tracking, Error
USB Port	1 PC Connection & Firmware Upgrade(front) 1 Logs Download(front) 1 Wifi(rear, for wifi dongle)
Ship's Gyrocompass Interface	NMEA2000 / NMEA0183
GPS	NMEA Out
Serial Interface	RS-232C (57600bps 8, N, 1)
Modem Interface	Ethernet port / RS-232C/422C / I/O Console
Ethernet port	RJ45, TCP/ IP connection
RF Interface	Primary/Modem RX/TX IN/Out: F-Type x 2ea Secondary BDE RX/TX IN/Out: F-Type x 2ea Antenna RX/TX/DC power IN/Out: N-Type x 1ea



[ACU Front]



[ACU Rear]

7.3. Gyrocompass Interface

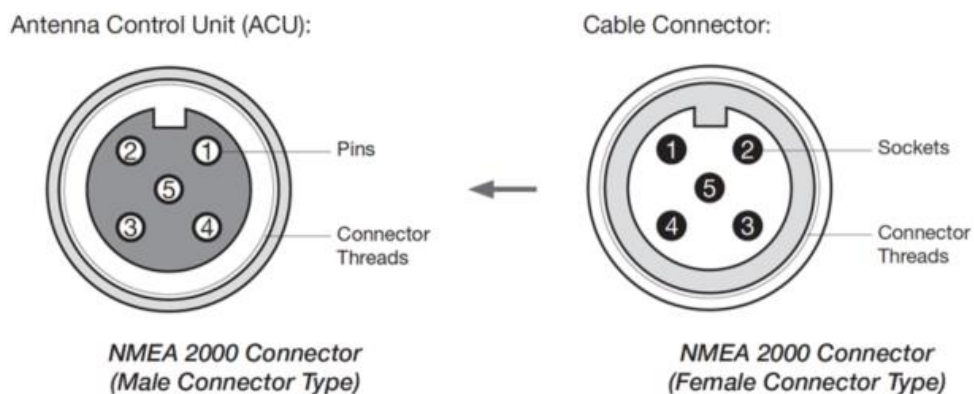
Item	NMEA 0183	NMEA 2000
Connector Type	2 Conductors	Mini-C 5 pin
Heading Sentence	xx HDT (4800 Baud, 8, N, 1)	PGN Number = 127250 (Vessel Heading)

7.3.1. NMEA 0183 Connector



No.	Description
1	HEADING_IN
2	HEADING_GND

7.3.2. NMEA 2000 Connector

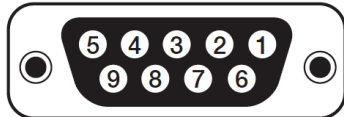


No.	Description
1	Shield(N/C)
2	NET-S(N/C)
3	NET-C(N/C)
4	CAN-H
5	CAN-L

7.4. Connector Pinouts

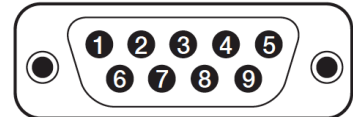
7.4.1. Modem Console Connector (D-Sub 9, Serial)

Antenna Control Unit (ACU):



*D-Sub 9 Pin: MODEM CONSOLE
(Female Connector Type)*

Cable Connector:

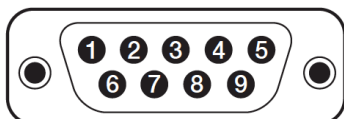


*D-Sub 9 Pin
(Male Connector Type)*

No.	Description
1	GND
2	GPS OUTA
3	MODEM LOCK
4	MUTE 0
5	N/C
6	GPS OUTB
7	EXM AGC
8	MUTE 1
9	N/C

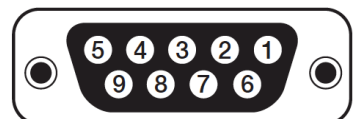
7.4.2. Modem Interface Connector (D-Sub 9, RS232/RS422)

Antenna Control Unit (ACU):



*D-Sub 9 Pin: MODEM RS232/422
(Male Connector Type)*

Cable Connector:



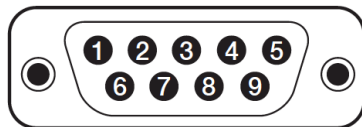
*D-Sub 9 Pin
(Female Connector Type)*

No.	Description
1	N/C
2	MODEM TX / MAX422 RX+
3	MODEM RX / MAX422 TX+

4	N/C
5	GND
6	N/C
7	MAX422 RX-
8	MAX422 TX-
9	N/C

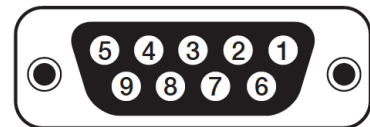
7.4.3. PC Interface Connector (D-Sub 9, RS23)

Antenna Control Unit (ACU):



*D-Sub 9 Pin: PC I/F
(Male Connector Type)*

Cable Connector:



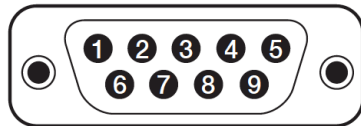
*D-Sub 9 Pin
(Female Connector Type)*



No.	Description
1	N/C
2	ACU MAIN RX
3	ACU MAIN TX
4	N/C
5	GND
6	N/C
7	IARM RX to PC DBG TX
8	PC TX to IARM DBG RX
9	N/C

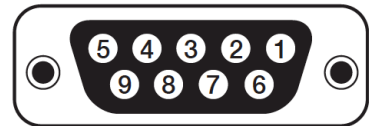
7.4.4. RS232/RS422 Connector (D-Sub 9, BUC Interface)

Antenna Control Unit (ACU):



*D-Sub 9 Pin: BUC I/F
(Male Connector Type)*

Cable Connector:



*D-Sub 9 Pin
(Female Connector Type)*

No.	Description(KU-BAND)	No.	Description(KA-BNAD)
1	N/C	1	BUC RS422 RX+
2	Modem TX to BUC RS232 RX	2	BUC RS422 RX-
3	BUC RS232 TX to Modem RX	3	BUC RS422 TX+
4	GND	4	GND
5	GND	5	GND
6	N/C	6	BUC RS422 TX-
7	N/C	7	BUC Keyline RX+
8	N/C	8	BUC Keyline RX-
9	N/C	9	N/C

8. Package Specification

8.1. Size & Weight

Item	Specification
Size (W x D x H)	2010 mm x 1920 mm x 1968.5 mm
Weight	332kg (Incl. Antenna set)

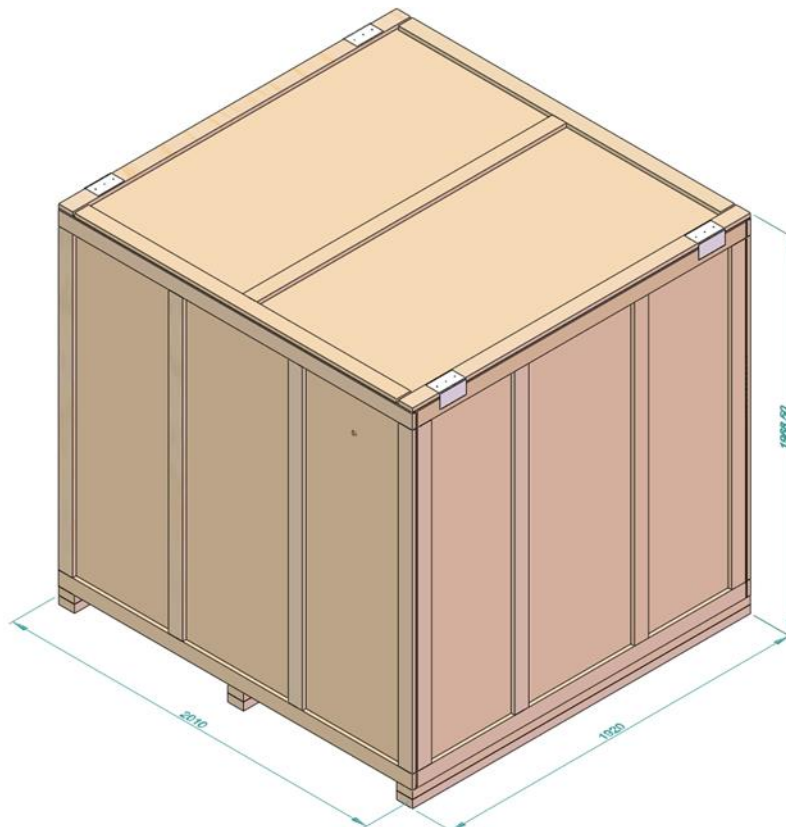


Fig 12. Antenna Package

8.2. Components in the Package

Description	Q'ty	Size	Remarks
Antenna Control Unit(ACU)	1	43.1x35x4.3cm	Antenna Control Unit(ACU)
Quick User Manual	1		
RF Hazard Sticker	1		Radiation Safety Distance Label (15m)
Mounting Template	1		
ACU Side Bracket (Rack Type)	2		ACU to 19inch Rack
Flat Head Screw	10	M4x12L	Bolt Kit for Rack Type Mount Bracket
USB Cable (A-A)	1	1.8m	ACU(Front Panel) to PC
AC Power Cord (CEEE7/7)	1	1.5m	ACU Power (220V)
RG-6 RF Cable	2	1m	ACU to Modem
Modem Interface Cable (For iDirect Modem)	1	1.5m	ACU to Modem (iDirect Modem)
Ethernet Cable (RJ45 / LAN)	2	1m	ACU to PC/Intellian M&C
WiFi Dongle	1		
Hex Bolt	5	M12 x 100L	Bolt Kit for Antenna - Deck Assembly (1 spare set included)
Flat Washer	5	M12	
Spring Washer	5	M12	
Hex Nut	10	M12	
Hex Head	5	M6 x 40L	Bolt Kit for Radome Assembly
Spring Washer and Flat Washer	5	M6	
Radome door key	2		1 Door key and 1 Spare key

9. Environmental Specification

Intellian v130NX is qualified under reliability test standards as below. This Intellian standards are much severe than usually used in marine equipment conditions. Also, all tests are performed with one unit through the continued sequence. Therefore, Intellian products will have better reliability and durability than other products in competition.

Item		Specification
Temperature (ADE)	Operational	IEC-60945 (-25°C to +55°C/Power On)
	Survival	IEC-60945 (-40°C to +80°C/Powered On and a non-functional state)
	Storage	IEC-60945 (-40°C to +85°C/Power off)
Temperature (BDE)	Operational	IEC-60945 (-15°C to +55°C)
	Survival	IEC-60945 (-25°C to +70°C)
	Storage	IEC-60945 (-40°C to +85°C)
Wind		56 m/sec (125 mph)
Humidity		IEC-60068-2-30 Upper test Temp: +40°C(-3), Humidity 98% Lower test Temp.: +15°C(+3), Humidity 71% ~ 78%
Vibration	Operational	IEC-60945
	Survival	IEC-60721-3-6 Class 6M3 DNV Standard No. 2.4, Class C (TBD)
Shock	Operational	IEC-60068-2-27 Method Ea 20g, 7ms
	Survival (Transient)	IEC-60721-3-6 Class 6M3 type II 30g, 6ms
	Survival (Bump)	IEC-60068-2-29 Method Eb 25g, 6ms
Salt mist		Saline solution: 5 ±1 % NaCl Storage period: 7 Days (IEC-60945)
Water proofing		IPX5 (IEC-60529)
Solar		IEC 60945-Annex B. Operational +32°C air temperature with the addition of 670 Watt/m2 solar radiation

10. Regulatory Compliance

10.1. Safety Compliance

It is expected that the terminal as a minimum will comply with the following:

1. IEC 62368-1 (EN 62368-1)

10.2. EMI/EMC Compliance

The terminal shall as a minimum comply with the following EMI/EMC requirements:

1. FCC Part 15 Class-B EMI Requirement (CISPR22) Verified to CFR47
2. IEC-60945
3. CE - Confirms to EU Directive of Electromagnetic Compatibility (EMC) 89/336/EEC
4. Essential Requirement Under RED Directives 2014/53/EU (replace R&TTE Directives 1999/5/EC)
 - ETSI EN 301-843-1
 - ETSI EN 302-340

10.3. RoHS Compliance

The antenna system complies with RoHS Directives.

- EC Recast 2011/65/EU and all applicable

10.4. Homologation & Type Approval

Country	Specification	Comply	Remark
USA	FCC	Comply	
EU	RED	Comply	
Brazil	ANATEL	Comply	
Korea	KC	Comply	
NOM	Mexico	Comply	
RMRS	Russia	Comply	Heating model in progress

EOD