Final

Product Specification

- Model Name: Intellian i3L
- Model. No : B2-341U

Reviewed by	Approved by

Product Management/ Intellian Technologies, Inc.

Customer	Approved by

Note: This specification is subject to change without notice.

Contents

1. Introduction 3
1.1. General description 3
1.2. Purpose 3
1.3. System components 3
1.4. General scope of this spec sheet 3
2. Configuration 4
2.1. Components of the system configuration 4
2.2. Basic configuration of the overall system 6
3. Key features 6
4. Technical specification 8
4.1. Mechanical specification 8
4.2. Antenna specification 8
4.3. Stabilized pedestal assembly 9
4.4. ACU (Antenna Control Unit) 9
4.5. RF cable specification 10
5. Package 12
6. Reliability – Environmental test specification 13
7. Certification 14
8. Appendix 15
8.1. Specification of LNB 15

1. Introduction

1.1. General description

Intellian i3L is the satellite antenna system which includes a 37cm dish diameter, a 2-axis satellite tracking antenna system, designed and manufactured so as to automatically identify, track and capture the DVB (Digital Video Broadcasting) format satellite signal.

1.2. Purpose

Intellian i3L is a digital satellite antenna system designed specifically for vessels that operate within European and Middle East countries. It automatically identifies, tracks and captures satellite signals from the Digital Video Broadcasting (DVB: the international standard for digital TV transmissions) compatible Satellites. Specifically, Intellian i3L has Wide Range Search (WRS) algorithm, which minimizes the search time at initial state and Dynamic Beam Tilting (DBT) technology, which dynamically shapes the antenna beam to utilize stabilization. Once the satellite is acquired, the antenna DBT continuously measures the heading, pitch, and roll of the vessel by obtaining satellite signal level around the antenna point, and transmits commands to the antenna motors to keep the antenna pointed at the satellite at all times. This active stabilization is enhanced by a conical scan tracking function to detect and lock onto the strongest signal, resulting in the clearest reception possible. Intellian i3L has a simple and easy installation design which allows users to connect one receiver from its single RF output through the antenna control unit (ACU).

1.3. System components

The Intellian i3L satellite TV antenna system consists of two major groups; an Antenna group and Controller group. Each group is comprised of the items listed below. All equipment comprising the Antenna Unit is incorporated inside the radome assembly and is integrated into a single operational entity.

- **Antenna Unit includes,**

a. Mechanical unit
b. Control unit
c. RF unit
d. Radome Assembly

- **Controller Group includes,**

a. Antenna Control Unit

1.4. General scope of this spec sheet

This spec sheet describes Intellian satellite TV antenna system, i3L's antenna unit, antenna control unit and its key specification and features. In order to complete the

satellite TV antenna system, it is required that user configure the Satellite Receiver (Decoder/ STB) and TV system according to their own manufacturer's operating instructions.

2. Configuration

2.1. Components of the system configuration

The following text provides a basic functional overview of the system components and component interconnection as referred to in the System Block Diagram in next section.

The system is comprised of two major sections: The Antenna Unit is comprised solely of the antenna radome assembly which is mounted on the ship's upper deck or mast location chosen for best satellite reception to minimize blockages by the mast structure or funnel and interference with other ship's navigation and communication systems such as marine radars, radio and magnet compass etc. The Antenna Control Unit (ACU) and all other ancillary equipment can be mounted in various locations on the ship.

2.1.1. Antenna unit

The antenna & radome assembly (Antenna Unit) consists of mechanical unit, control unit, RF unit, and Radome. The mechanical unit manipulates the antenna to receive the optimal satellite signal regardless of the movement of the vessel, and the control unit controls mechanical operation of the antenna. RF unit transmits the optimum satellite signal to the IRD, and the radome provides an environmental enclosure for the antenna pedestal assembly inside it. This keeps wind, water condensation and salt-water spray off the antenna pedestal assembly. This prevents damage and corrosion that would shorten the expected life span of the equipment.

2.1.2. Antenna Control Unit (ACU)

The Antenna Control Unit (ACU) provides the power to the antenna and controls the various settings of the antenna. Additionally, VFD (Vacuum Fluorescent Display) allows for you to operate the ACU in the dark.

The ACU's main function is,

a. Provide power for the Antenna Unit
b. Monitor the antenna status
c. Change the target satellite
d. Set up the user environment
e. Set the current GPS information
f. Set satellite information
g. Move antenna manually
h. Perform self-diagnosis of the antenna
i. Set up the interface with a PC

j. IRD Interface.

It is recommended that the ACU to be mounted near one of the television locations where you can see the television screen while you are controlling the antenna.

2.1.3. System power requirement

Intellian i3L has been designed to work on a boat's power supply rated from 9V~30 V DC (Standard 12V or 24V DC). If your IRD and television require a 110/240V AC power, a suitable DC to AC converter will be needed to operate the unit(s) you're your boat's DC power supply.

2.1.4. Satellite receiver (not supplied by Intellian)

This antenna can only be connected to one standard receiver, or one Integrated Receiver- Decoder (IRD). Both can receive "free" programming, but an IRD is required when the desired programming is encrypted. When authorized, it will decode the encrypted signals for use. Authorizing the receiver-decoder is a process of registering your receiver and paying subscription fees to the service provider. The service provider then arranges for a signal to be sent through the satellite to your receiver-decoder, which will "enable" it to decode the programming you subscribed to.

2.1.5. Television/ monitor (not supplied by Intellian)

An appropriate television monitor is used to view the satellite television programming and to view the on screen displays from the receiver.

2.2. Basic configuration of the overall system

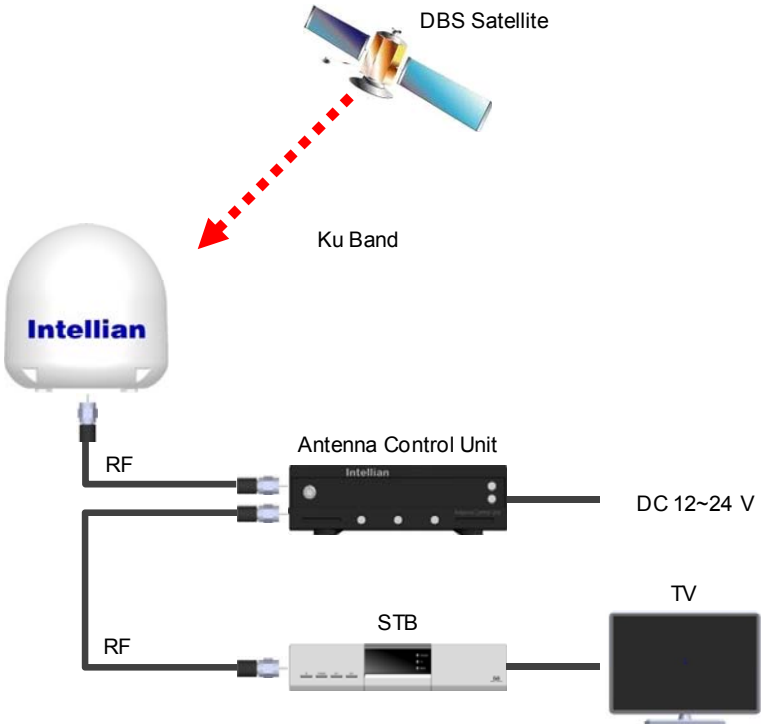


Figure1. i3L Basic configuration of Overall System

3. Key features

- **Compact size**

Intellian i3L is compact in size and perfect for small vessels that operate within European and Middle East countries.

- **Fully Automated System**

Automatic satellite search and identification function
2-axis step motor for manipulating the pedestal

- **Enhanced Antenna**

High efficiency 37cm parabolic antenna
Horizontal/Vertical Polarization

- **Easy Installation**

One Cable from the ACU to the antenna

- **Superior Dynamic Tracking**

Dynamic Beam Tilting (DBT) by rotating sub-reflector.

- **Fastest Search Algorithm**

Wide Range Search (WRS) algorithm
Statistical search algorithm

- **DVB (Digital Video Broadcasting) Signal Identification**

High Speed Identification employing DVB Decoder with CPLD.
QPSK Demodulator Lock for DSS Signal

- **Built-in GPS and NMEA 0183 Interface Port**

The i3L includes a built-in GPS inside of the antenna unit for faster signal acquisition The ship's GPS can also be connected through the NMEA 0183 port in the rear panel of the ACU.

- **New type Antenna Control Unit**

Easy satellite information change and update.
Easy antenna status check and automatic diagnosis
Easy antenna control using PC interface with USB cable

- **Outstanding reliability**

Intellian i3L provides highly reliable system through the implementation of a modularized design, and the usage of strictly proven components.

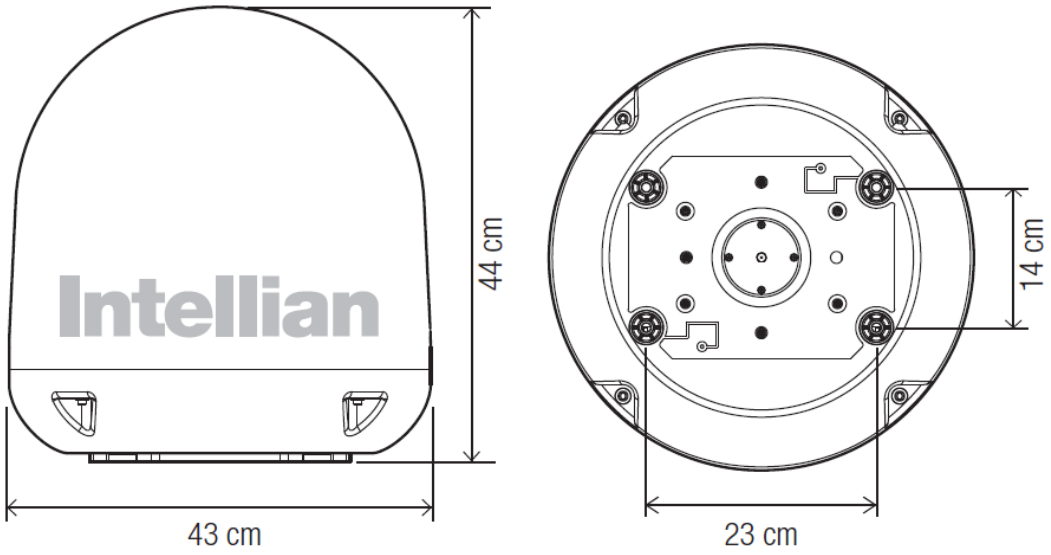
- **Easy Installation**

Intellian i3L allows users to connect one receiver from its single RF output through the antenna control unit (ACU).

4. Technical specification

4.1. Mechanical specification

Item		Requirement specification
Size	Radome Height	44 cm (17.3”)
	Radome Diameter	43 cm (16.9”)
Weight		9kg
Reflector Diameter		37 cm (14.6”)
Material	Radome	A.S.A (Acrylate-Styrene-Acrylonitrile)
	Reflector	Aluminum Alloy
Driver Belt Type		S3M (Tooth Type)
RF Output(s)		Single



Front View *Bottom View*

Figure 2. Dimension of i3L Radome

4.2. Antenna specification

Item	Requirement specification
Antenna Type	ADE (Axially Displaced Ellipse)
Size	37 cm (14.6”)
Polarization	Vertical / Horizontal
Frequency	Ku-Band 10.7 ~ 12.75 GHz
Antenna Gain	32 dBi @ 12.2GHz

Minimum EIRP	50 dBW

4.3. Stabilized pedestal assembly

Item		Requirement specification
Type		Two-axis: Azimuth, Elevation
Stabilization		2 Dimensional Velocity Mode Servo
Actuator		Size 17 DC Step Motors
Tracking Method		Conical Scanning by the rotation of Sub-Reflector
Tracking Rates	Roll/Pitch	60 °/sec
	Azimuth/Turn	60 °/sec
Range of Motion	Azimuth	680°
	Elevation	+10° to +80°

4.4. ACU (Antenna Control Unit)

Item	Requirement specification
Size	17.8 cm (7”) x 21.68 cm (8.5”) x 5.38 cm (2.1”)
Weight	1.2 Kg
Display	2 Line 20 Character VFD Module
User Control Key	5 Integrated Touch Switches
Serial Interface	19200bps 8, N, 1 (USB B type)
Power Requirements	DC 9 ~ 30V (Typ. 30W, Max 50W)
GPS Interface	Built-In (NMEA 0183 GPS)

4.4.1. Antenna Control Unit

Figure 3. ACU Drawing

4.4.2. Connection diagram of ACU

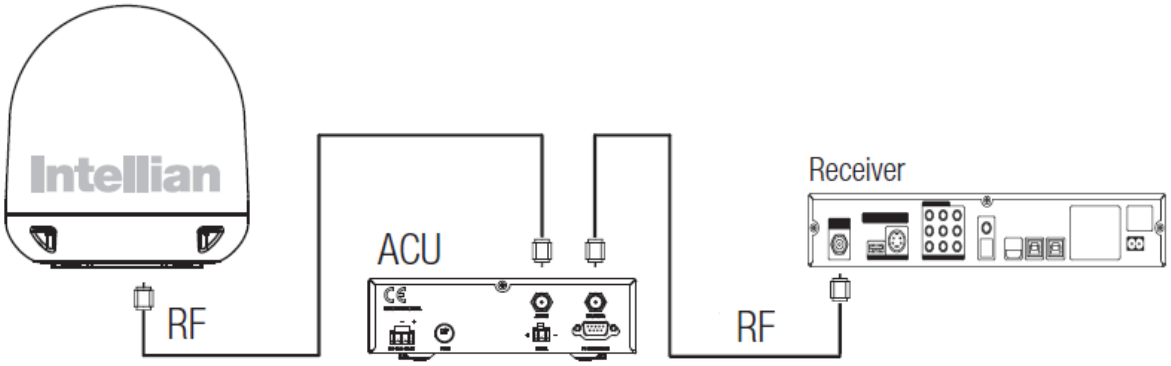


Figure 4. i3L Basic Configuration Diagram

4.5. RF cable specification

Item		Requirement specification
Part No.		9116 Coax
Manufacturer		BELDEN CDT
Compatible Cable		RG-6 Cable
Conductor	AWG	18
	Conductor Diameter	0.040 inch

	Conductor Material	BCCS – Bare Copper Covered Steel
Insulation	Insulation Material	Gas-injected FPE – Foam Polyethylene
	Insulation Diameter	0.180 inch
Outer Shield	Outer Shield Type	Tape / Braid
	Outer Shield Material	Tape – Bonded Aluminum Foil Braid -- Aluminum
Outer Jacket Material		PVC – Polyvinyl Chloride
Overall Nominal Diameter		0.270 inch
Temperature		Operation : -40°C to +80°C Storage : -30°C to +80°C
Applicable Standards	UL Specification	CATV
	EU CE Mark	Yes
	EU RoHS Compliant	Yes
	UL Flame Test	UL1685 UL Loading
Electrical Characteristics	Conductor DC Resistance	28 Ohms / 1000 ft (1.38 Ohms / 15m)
	Outer Shield DC Resistance	9 Ohms / 1000 ft (0.45 Ohms / 15m)

4.5.1. 15m RF cable

Item		Requirement specification
Functions	Power	Supplying Power to Antenna from ACU
	RF	Sending RF Signal from Antenna to ACU
	Communication	Communication between ACU and Antenna
Maximum Extendable Length		50m

5. Package

Item		Size	Quantity
Antenna		-	1EA
Installation Kit Pack	ACU	-	1EA
	ACU Bracket	-	2EA
	RG6 (Antenna – ACU RF Cable)	15m	1EA
	RG6 (ACU – Receiver RF Cable)	3m	1EA
	Power Cable	10m	1EA
	PC Serial Cable	1.8m	1EA
	NMEA Connector	AK950-2	1EA
	Power Connector	AK950-3	1EA
	Hex Bolt	M8x35L	5EA
	Tapping Screw	ø4x16L	5EA
		ø3x8L	5EA
	Flat Washer	M8	10EA
	Spring Washer	M8	5EA
	Install CD	-	1EA
	Manual	-	1EA
	Installation Template	180x270	1EA

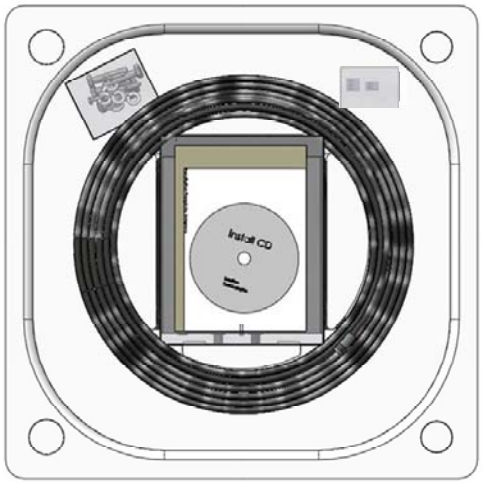


Figure 5. Installation kit box

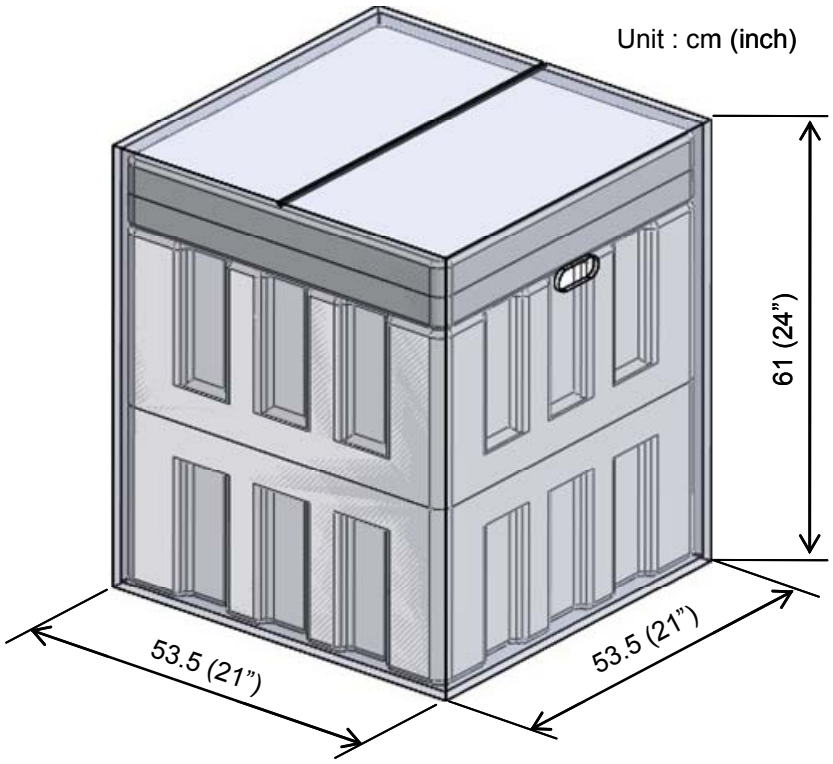


Figure 6. Package box

6. Reliability – Environmental test specification

Intellian i3L products are qualified under reliability test standards as below. This Intellian standards are much sever that usual marine equipment condition. 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	Requirement specification
Operating Temperature and Humidity	-15°C ~ 55°C, 95%R.H
Storage Temperature	-25°C ~ 70°C, 95%R.H
Thermal Shock	-20°C ~ 70°C
Shock	27G, 11 msec
Vibration	1G over 6~350 Hz, 60 sweeps (X,Y,Z axis)
Water ingress	IPX6

7. Certification

- **EN60945 : 2002**

Item	Specification
9.2	Conducted Emissions
9.3	Radiated Emissions from enclosure port
10.3	Immunity to Conducted Radio frequency disturbance
10.4	Immunity to Radiated Radio frequencies
10.5	Immunity to Fast Transients on ac power, signal and control lines
10.6	Immunity to Surges on ac power lines
10.7	Immunity to Power supply short-term variation
10.8	Immunity to Power failure
10.9	Immunity to Electrostatic Discharge

8. Appendix

8.1. Specification of LNB

This Section provides specification of LNB.

B00002F (LNB Universal)

Item	Requirement specification
Reception Frequency	Low Band 10.70 ~ 11.70 GHz
	High Band 11.70 ~ 12.75 GHz
Output Frequency	Low Band 950 ~ 1950 MHz
	High Band 1100 ~ 2150 MHz
Noise Figure	Low Band 0.6 dB (typ.)
	High Band 0.6 dB (typ.)
Conversion Gain	53 dB (min.) 63 dB(max.)
Gain Flatness	±0.5 dB / 26 MHz
Cross Pol. Isolation	25 dB (typ.)
L.O. Frequency	Low Band 9.75 GHz
	High Band 10.60 GHz
L.O. Frequency Stability	±1.0 MHz (max.) @ +25°C
	±2.0 MHz (max.) @ -40°C ~ +60°C
L.O. Phase Noise	-50 dBc/Hz @ 1 KHz
	-75 dBc/Hz @ 10 KHz
	-95 dBc/Hz @ 100 KHz
Image Rejection	40 dB (min.)
Output VSWR	2.0 : 1 (max.)
Output Impedance	75 Ω (F type female)
DC Current Consumption	160 mA (max.)
Low/High Band Switching	Low Band 0 kHz
	High Band 22 kHz ±4 kHz
Polarity Switching Voltage	10.5 ~ 14.0 V @ VP
	16.0 ~ 19.0 V @ HP
Operating Temperature	-40°C ~ +60°C