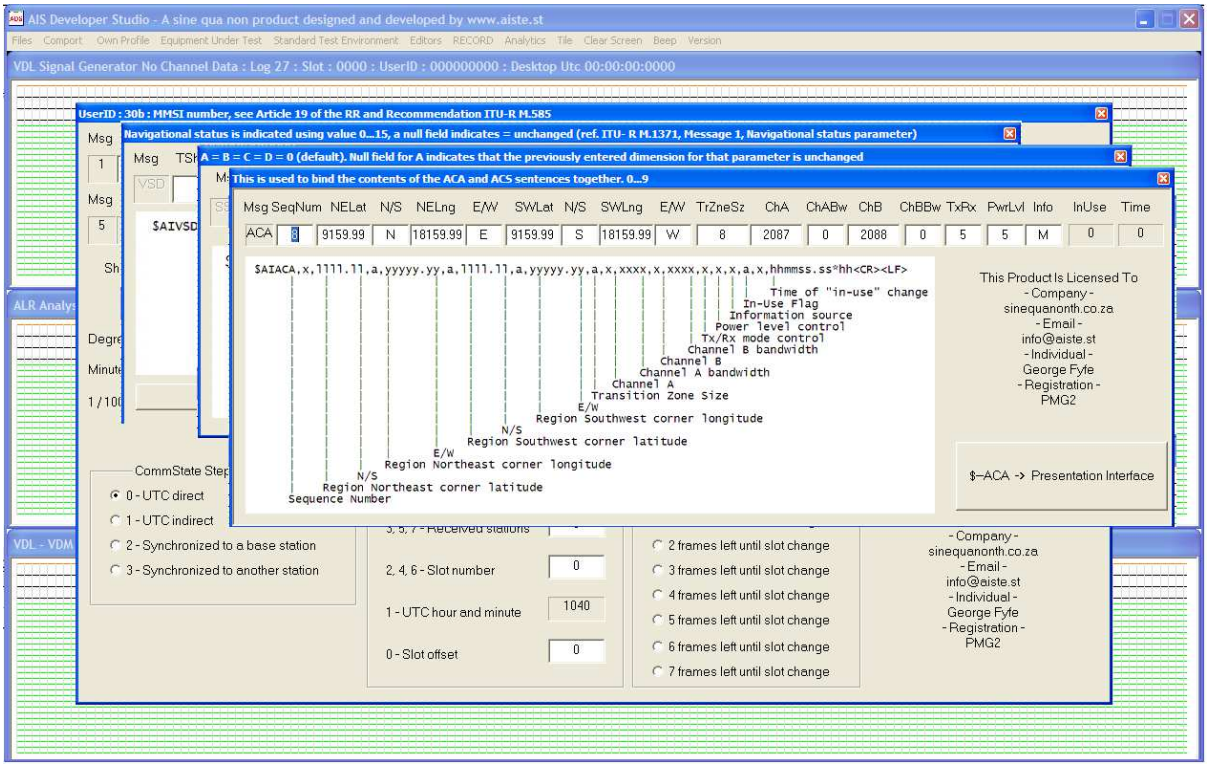

AIS Developer Studio

Release Version 1.0

ITU-R M.1371-5 Technology
IEC 61993 14.0 Operational tests

AUTONOMOUS MODE

MODULE

NOTICE

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Objective

The objective for the use of the AIS Developer Studio is to create a general VDL environment using a PC and optional external RF signal generator / power pad. Where the choice of the base-band VDL / VDO and VDM data is easily analyzed and defined. As an AID to AIS

This product should only be used for the purposes intended by its developers and then only according to acceptable reference standards and operating procedures.

Any deviation from this may well be in conflict with competent regional authorities in your area.

The AIS Developer Studio and or Interface/s should not be used to alter the operational status of any AIS unit unless authorized by a competent authority.

Under no circumstances should the AIS Developer Studio and or Interface/s be used to create any signal content outside the scope of this document using any procedure or method offered by the AIS Developer Studio Interface.

AISTE.ST formerly Sine Qua Non would like to take this opportunity to congratulate you on the purchase of one of the AIS Developer Studio suite of products. We want to assure you that this product range is designed using over 22 Years of AIS experience and thoroughly tested to ensure your complete satisfaction.

A demonstration program is provided free of charge. AISTE.ST requires that the user download the demo program and documentation from www.aiste.st and validate it for their respective use prior to placing an order for the un-encumbered licensed version.

Limited Warranty.

Where software discrepancies are identified and or module operational bugs are found. These should immediately be brought to the attention of AISTE.ST. The warranty is limited to the rectification of the discrepancy or bug by software upgrade, and should not exceed the original operational and technical specification as defined by AISTE.ST in the respective AIS Developer Studio module.

If you have any questions, queries or customisation requests related to this product, please do not hesitate to contact us by email:

Physical Address:
28 Mustang Ave
Pierre Van Ryneveld
Centurion
Gauteng
South Africa

Postal Address:
28 Mustang Ave
Pierre Van Ryneveld
Centurion
Gauteng
South Africa

Email: support@aiste.st
info@sinequanonth.co.za

Website: www.aiste.st
www.sinequanonth.co.za

Telephone: +27 0722253467

Thanking you,

AISTE.ST

Installation

The installation of AIS Developer Studio is as follows. Obtain the latest version of ADSV2.exe and license.txt from www.aiste.st. Create a new folder. Save the downloaded files in the folder. Run the application. This will allow the unit to run in demo mode.

Certain modulation formats will not run in demo mode.

AIS Developer Studio is not freeware.

Once you have evaluated it for your purpose please purchase your license file from www.aiste.st. Save your purchased license.txt file in the above-mentioned folder. This will allow the application to run in full un-unencumbered mode.

The license file will provide full user registration details.

Registered users will receive support if any problems with AIS Developer Studio arise.

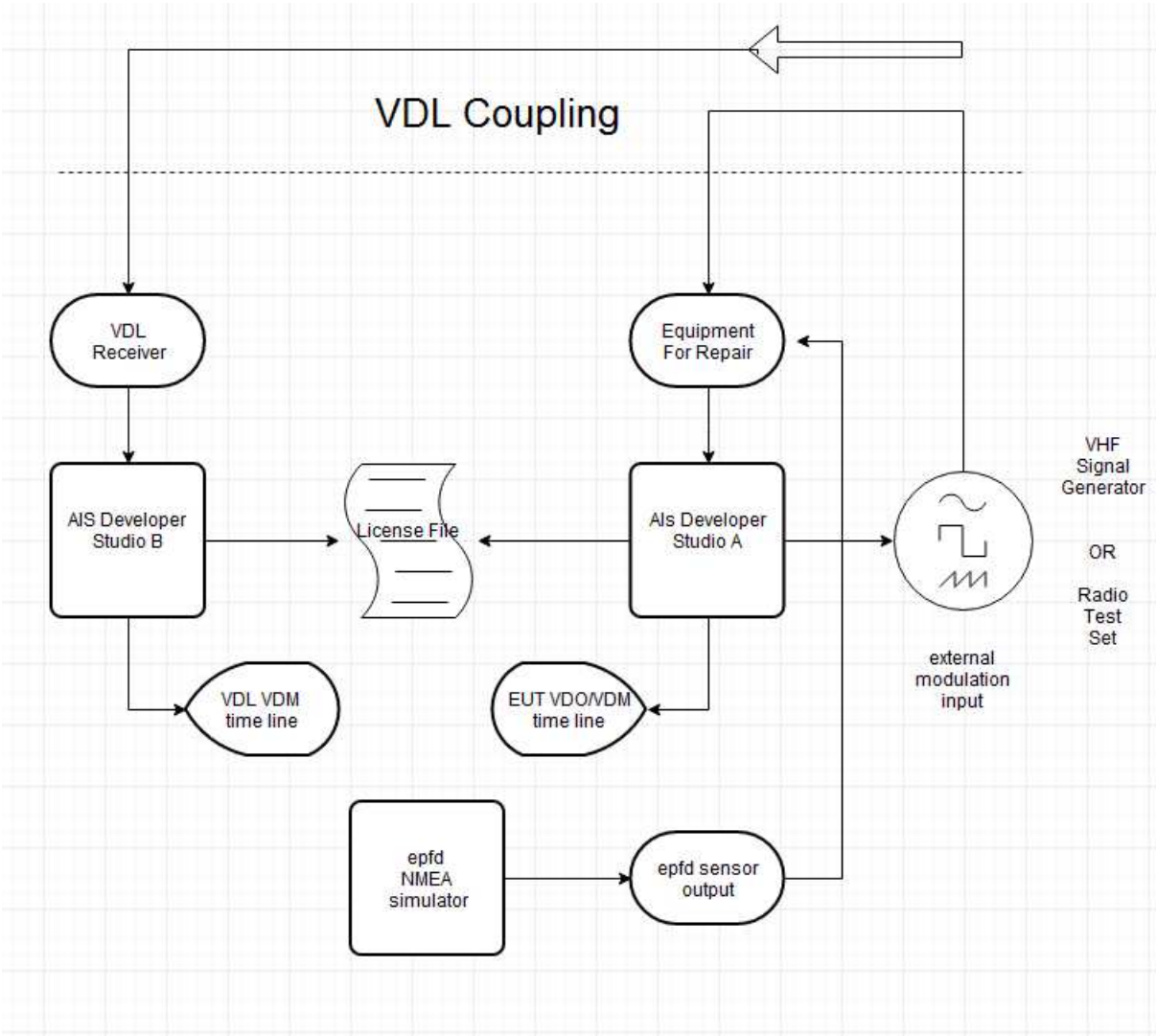
ALL requests for support should be addressed to support@aiste.st explaining any bug or discrepancy as well as a screenshot.

It is the intention of AISTE.ST through the current and further development of the AIS Developer Studio suite of components to continue to supply a cost effective method for development, production, integration and verification of protocols as used by AIS, ASM and VDE.

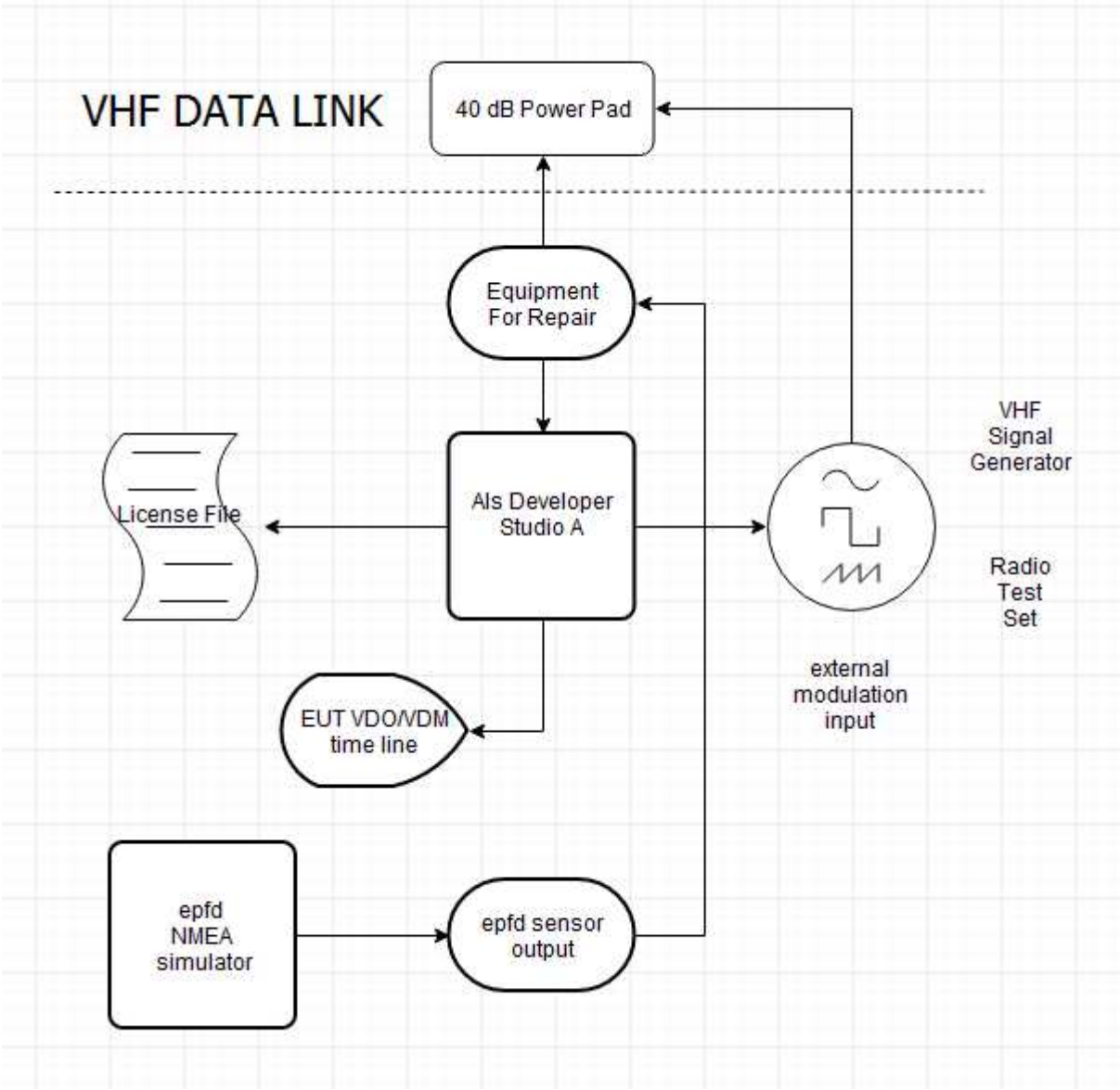
It is the intention of AISTE.ST to supply upgrades to the AIS Developer suite user group if and when they become available.

Users may subscribe to this upgrade service.

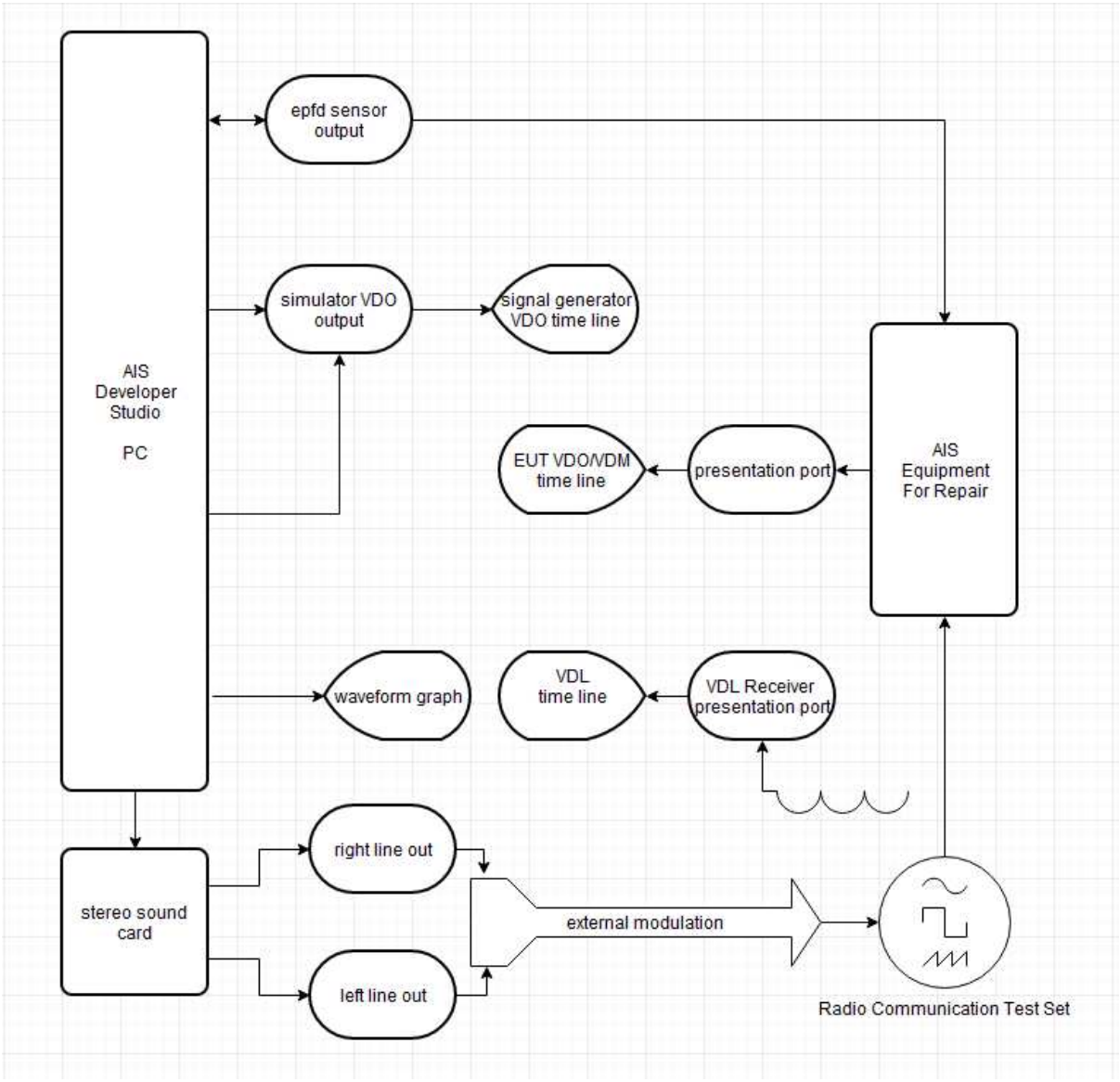
Verification set - up A



Verification set - up B



Verification set - up C



Method:

- The equipment shall be connected as illustrated in set-up A or set-up B or C
- As required disable internal GPS by placing a RF shroud (tin or aluminum cover) over GPS antenna to get default values as internal sensor data.
- As required remove RF shroud over GPS antenna to restore internal sensor data.

Hardware Setup:
Verification set - up B

Equipment Under Test:
Marine Data Systems MIV Type approved AIS Class A Unit.

Caution use 40dB RF power pads as required! This document assumes user technical competence.

Procedure: Use one or more of the following procedures.

Operational tests

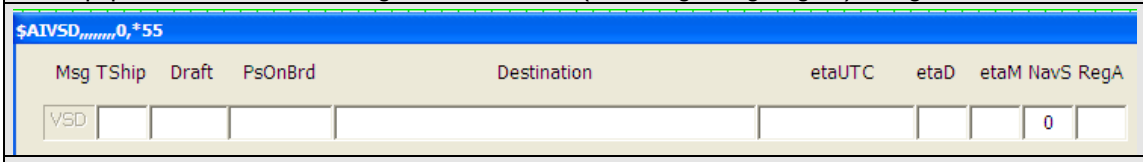
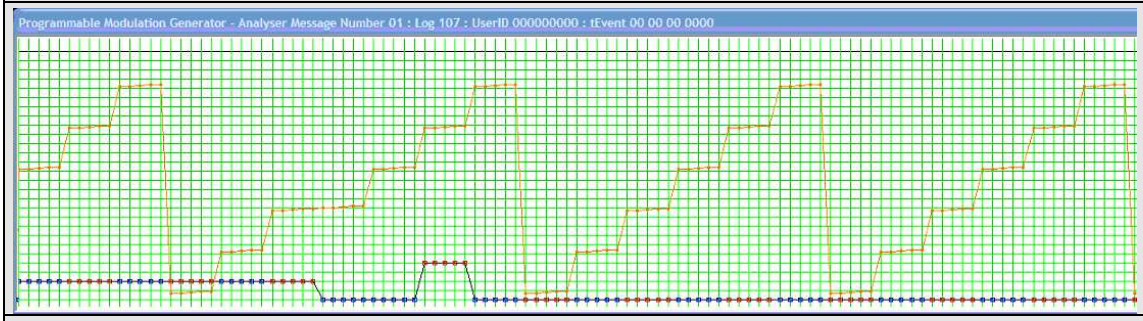
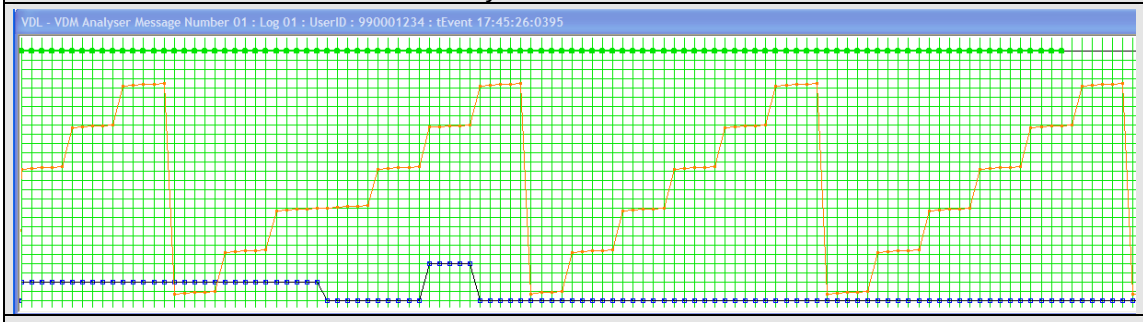
14.1.1 Autonomous mode

Method of measurement

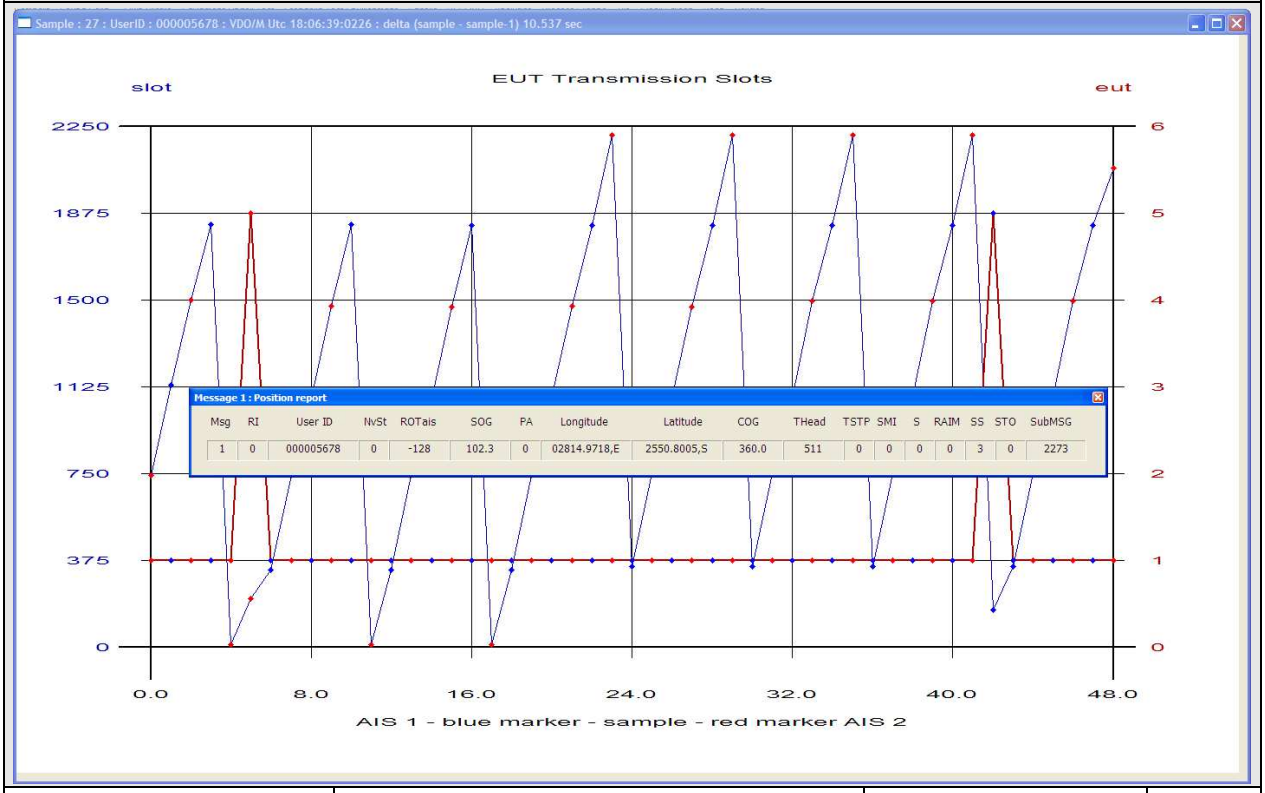
Set up a test environment of at least 5 test targets. Record the VDL communication and check for messages of the EUT.

Required results

Confirm that the EUT transmits continuously and that the transmitted data complies with sensor inputs.

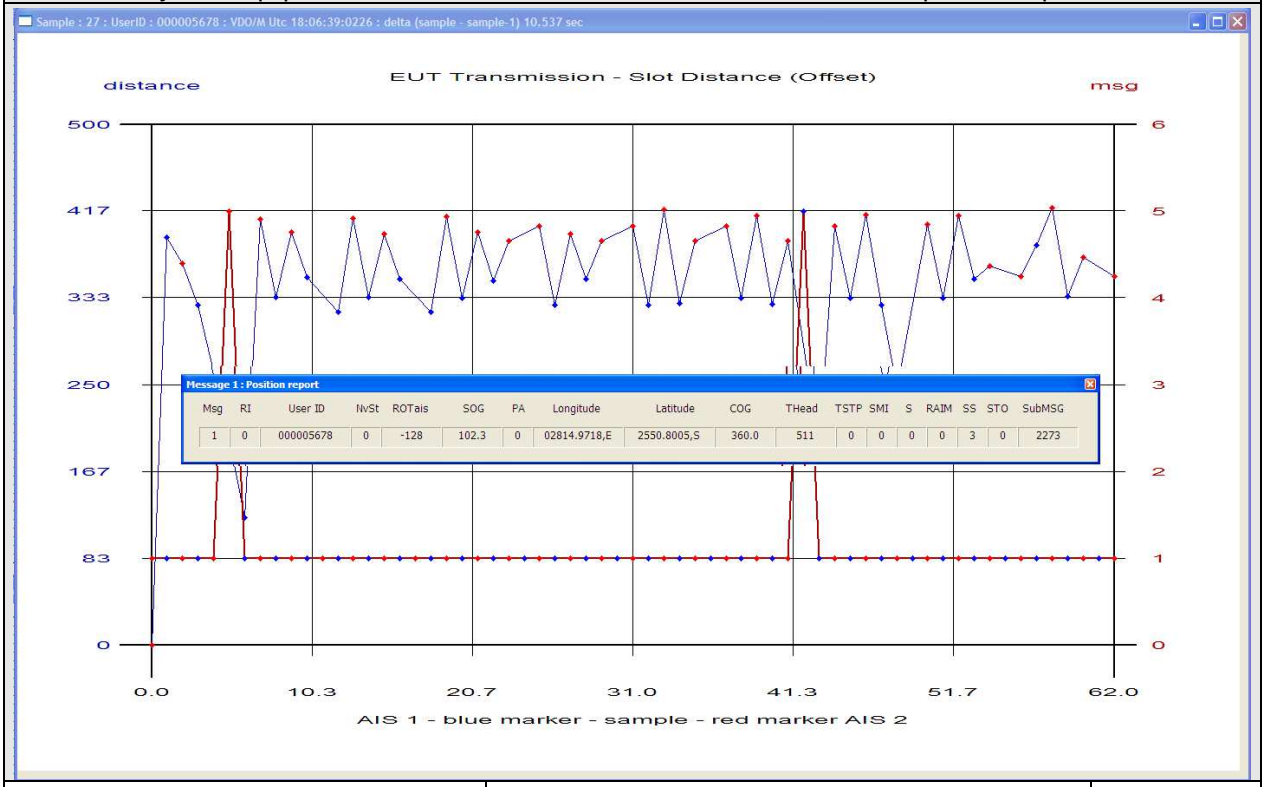
Transmit Position reports			
Test item	**Check**	**Remark**	**Result**
Hardware verification set–up: B Set RCTS: AIS1 Set RCTS Modulation to 2.4Khz: See TEST ENVIRONMENT MODULE for set-up details			
Restore Internal Sensor: Internal GNSS is in use			
Set Equipment Under Test Navigation status to 0 (travelling using engine) using $--VSD editor			
			
Start 5 test targets as follows: Standard Test Environment-> setup-> Profile 5 targets using licence defaults			
Standard Test Environment-> vdl->start			
			
Standard Test Environment Network Entry – VDO : Base-band modulated on RCTS AIS1			
			
EUT Reception of RCTS AIS1 - Standard Test Environment Network Entry - VDM			

Set Clear Screen->RECORD->Start
Select->Analytics->equipment under test->autonomous mode->transmission of position reports



MMSI	Check MMSI		Ok
Transmission rate	Check msg1 is transmitted continuously	Nominal 10 sec update	Ok
	Check msg5 is transmitted every 6 min	Nominal 6 min update	Ok
Position	Check latitude and longitude		Ok
Speed	Check SOG and COG		Ok
Heading/ROT	Check Heading and ROT are default		OK

Select->Analytics->equipment under test->autonomous mode->transmission of position reports - slot offset		



Transmission increment = 375 Slots	(417–333/2) = 42 Nominal (Slot Distance) = 333+42= 375nom	OK
Reporting Rate = 10 Sec	375*0.026666 = 9.99975 Sec	OK

14.1.1.2 Receive Position reports

Method of measurement

Set up a test environment of at least 5 test targets.

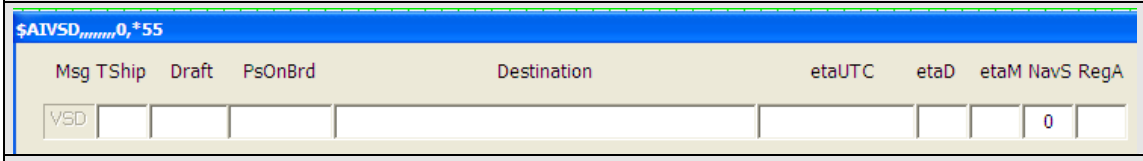
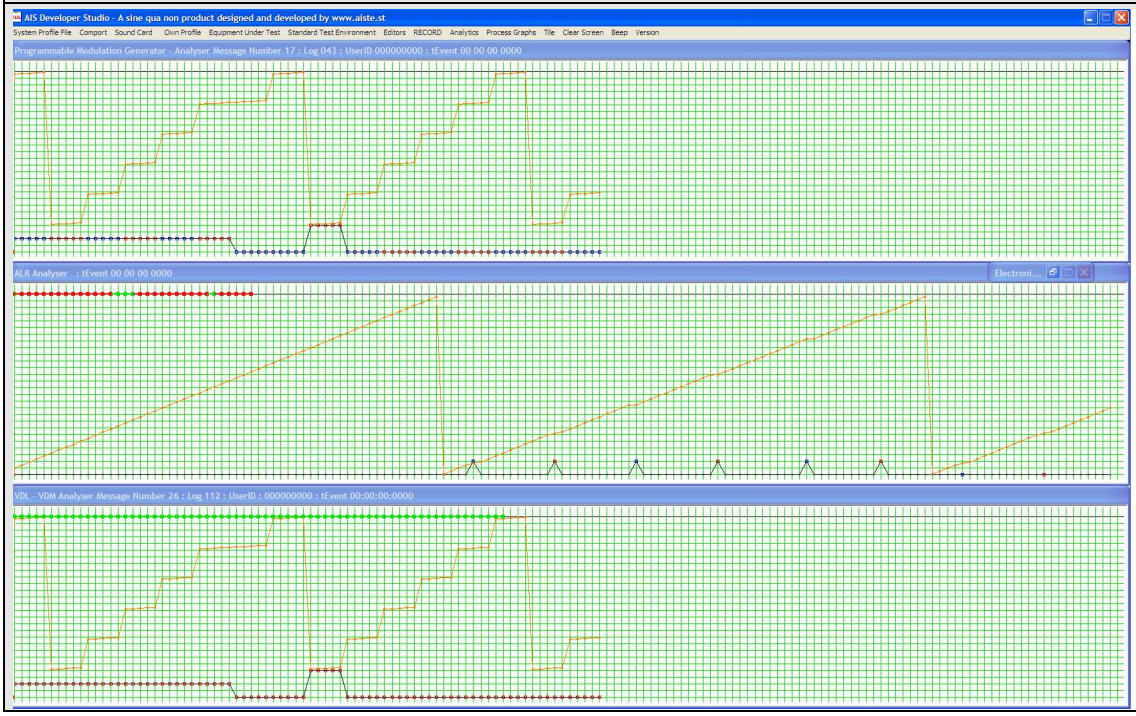
a) Switch on Test targets, then start operation of the EUT

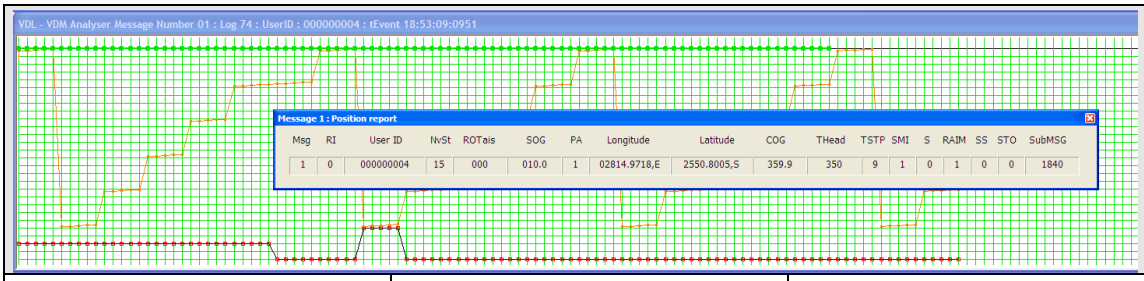
b) Start operation of the EUT, then switch on Test targets

Check the VDL communication and Presentation Interface outputs of the EUT.

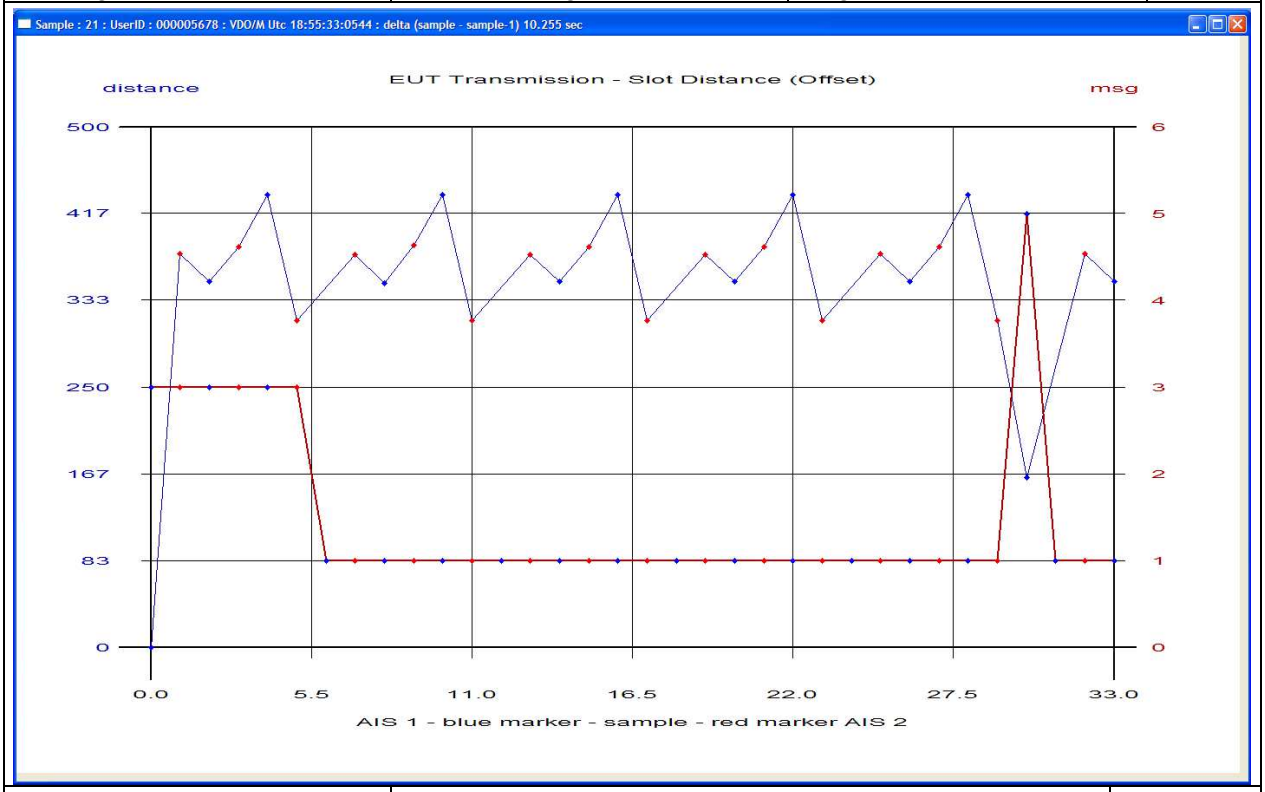
Required results

Confirm that EUT receives continuously under conditions a) and b) and outputs the received messages via the PI.

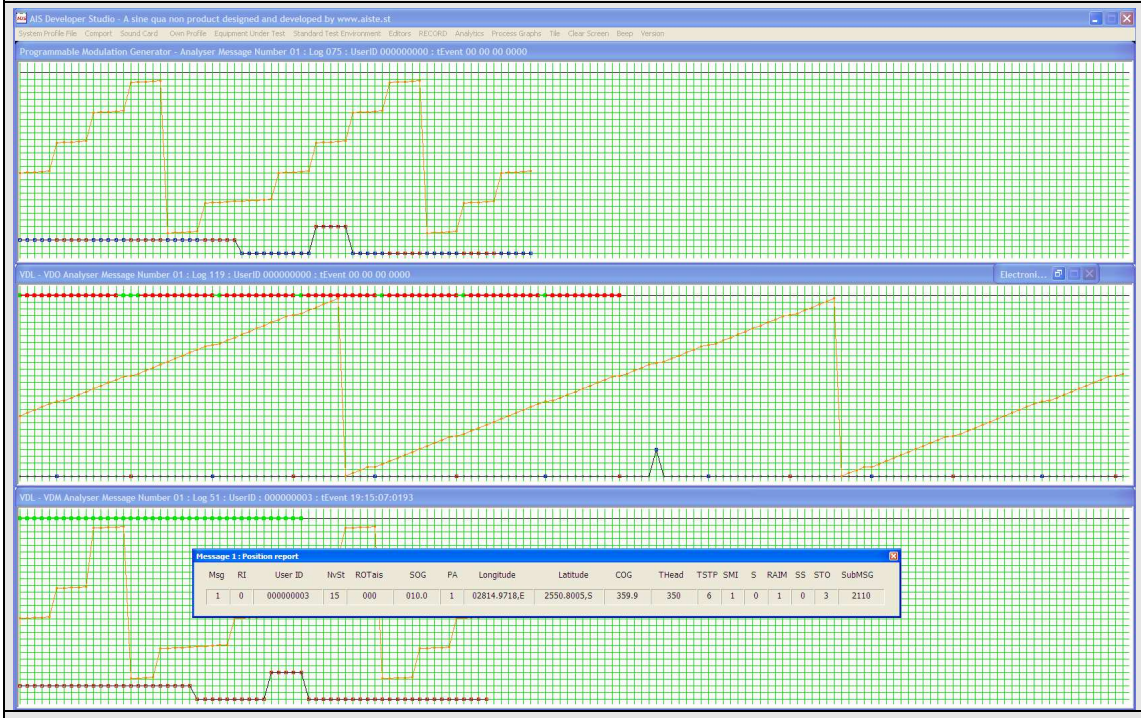
a)– Receive Test Targets Position reports, Targets first started			
Test item	**Check**	**Remark**	**Result**
Hardware verification set–up: B Set RCTS: AIS1 Set RCTS Modulation to 2.4Khz: See TEST ENVIRONMENT MODULE for set-up details			
Restore Internal Sensor: Internal GNSS is in use			
Set Equipment Under Test Navigation status to 0 (travelling using engine) using $--VSD editor			
			
Switch on Test targets, then start operation of the EUT & monitor PI output			
Start 5 test targets as follows: Standard Test Environment-> setup-> Profile 5 targets using licence defaults			
Standard Test Environment-> vdl->start			
			

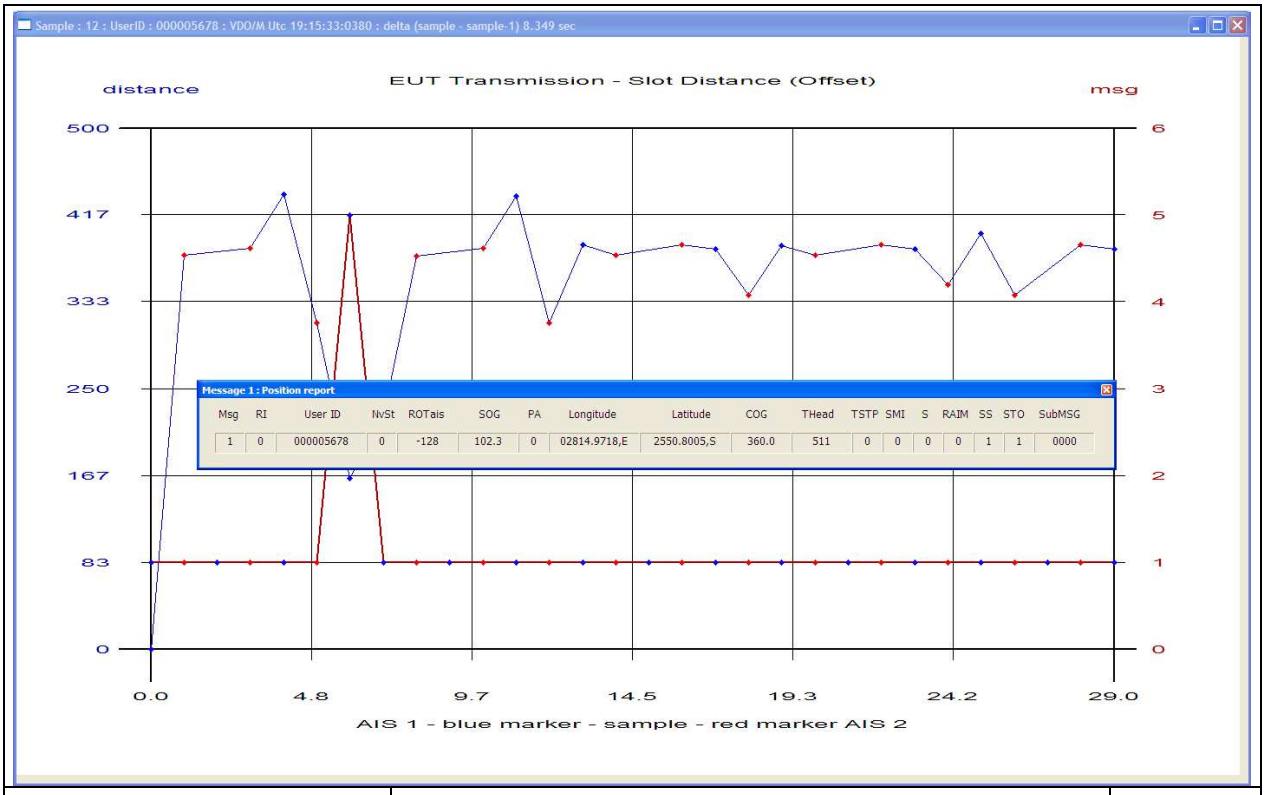


MMSI	Check MMSI	Target Profile	Ok
Position	Check latitude and longitude	Target Profile	Ok
Speed	Check SOG and COG	Target Profile	Ok
Heading/ROT	Check Heading and ROT	Target Profile	Ok



Transmission increment = 375 Slots	(417–333/2) = 42 Nominal (Slot Distance) = 333+42= 375nom	OK
Reporting Rate = 10 Sec	375*0.026666 = 9.99975 Sec	OK

b)– Receive Test Targets Position reports, EUT first started			
Test item	**Check**	**Remark**	**Result**
Hardware verification set–up: B Set RCTS: AIS2			
Switch on EUT, then start Test Targets – check operation of the EUT & monitor PI output			
Start 5 test targets as follows: Standard Test Environment-> setup-> Profile 5 targets using licence defaults Start EUT first			
			
Standard Test Environment-> vdl->start			
MMSI	Check MMSI	Target Profile	Ok
Position	Check the values of lat and lon	Target Profile	Ok
Speed	Check SOG and COG	Target Profile	Ok
Heading/ROT	Check Heading and ROT	Target Profile	Ok



Transmission increment = 375 Slots	(417–333/2) = 42 Nominal (Slot Distance) = 333+42= 375nom	OK
Reporting Rate = 10 Sec	375*0.026666 = 9.99975 Sec	OK

Abbreviations

The following is a list of abbreviations used in the AIS Developer Studio Suite

1pps	1 pulse per second
ACK	Acknowledge
AIS	Automatic Identification System
AIS1	Automatic Identification System channel 1 (161.975 MHz)
AIS2	Automatic Identification System channel 2 (162.025 MHz)
ANT	Antenna
BER	Bit Error Rate
BIT	Built In Self Test
BS	Base Station
BT	Bandwidth Time product
COG	Course over Ground
DBR	Differential Beacon Receiver
DSC	Digital Selective-Calling
DTE	Data Terminal Equipment
ECDIS	Electronic Chart Display and Information System
ECS	Electronic Chart System
EPFS/D	Electronic Position Fixing System/Device
ETA	Estimated Time of Arrival
GPS	Global Positioning System
HDLC	High-level Data Link Control
IEC	International Electro-technical Commission
IO	Input-Output
ITU	International Telecommunication Union
KDU	Keyboard Display Unit
LR	Long Range
MMSI	Maritime Mobile Service Identities
NU	Not Used
PA	Power Amplifier
PC	Personal Computer
PER	Packet Error Rate
PI	Presentation Interface
RF	Radio Frequency
ROT	Rate of Turn
RX	Receive
SOG	Speed over Ground
TDMA	Time Division Multiple Access
TX	Transmit
UTC	Coordinated Universal Time
VDL	VHF Data Link
VHF	Very High Frequency
RCTS	Radio Communications Test Set – Alternatively RF Signal Generator
ADS	AIS Developer Studio V2
NTP	Network Time Protocol
SNTP	Simple Network Time Protocol

Reference Documents

List of standards and specifications

Document Number	Title
IEC 61162-1	Maritime Navigation and Radio Communication Equipment and Systems - Digital Interfaces: Part 1 - Single Talker and Multiple Listeners.
IEC 61162-2	Maritime Navigation and Radio Communication Equipment and Systems - Digital Interfaces: Part 2 - Single Talker and Multiple Listeners High Speed Transmission.
IEC 61993-2 IEC 62287 IEC 62320	Universal Shipborne Automatic Identification System (AIS).
ITU-R M.1084-2	Interim solutions for improved efficiency in the use of Band 156-174Mhz by stations in the Maritime Mobile Service.
ITU-R M.1371-5	Technical characteristics for a universal ship-borne automatic identification system using time division multiple access in the maritime mobile band.
ITU-R M.493	Digital Selective Calling (DSC) system for use in the Maritime Mobile Service.
ITU-R M.823-2	Technical characteristics of differential transmissions for global navigation satellite systems from maritime radio beacons in the frequency band 283.5 - 315 kHz in region 1 and 285-325 kHz in regions 2 and 3.
ITU-R M.825-3	Characteristics of a transponder system using DSC techniques for use with vessel traffic services and ship-to-ship identification.
ITU Manual	ITU Manual for use by the Maritime mobile and Maritime Mobile-Satellite Services.
IEC 61108-1	Global navigation satellite systems (GNSS) - Part 1: Global positioning system (GPS) - Receiver equipment - Performance standards, methods of testing and required test results.
IEC/EN 60945	Maritime Navigation and Radio communication equipment and systems – General requirements-methods of testing and required results
NMEA 0183	

List of Related Software and Manuals

Module	Description	Part number
AIS Developer Studio Software for Windows. Verified to run on WINXP and WIN10	A Windows based application for configuring and testing various AIS products. Various levels of user access available dependent on licence.	ADSV2.exe

28 Mustang Ave
Pierre Van Ryneveld
Centurion
Gauteng
South Africa
Tel: +27 07222 53467
www.aiste.st
email: support@aiste.st