

# AIS Developer Studio

*Release Version 1.0*

*ITU-R M.1371-5 Technology*

MARINE RADIO WORKSHOP

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.**

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**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](http://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:

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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](http://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](http://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@aieste.st](mailto:support@aieste.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.



### **AIS 2019 Overview**

For many of us, radio communication is a part of our everyday life. AIS systems have become a convenient method of communication and management. We have come to count on them! We depend on them.

Without them - we feel information is limited. Some are established as a base station to provide means of contacting other AIS units or perhaps issue virtual aids to navigation.

Others are mobile mounted to keep us informed of changes in our daily routine. Yet other types are aids to navigation or ATONS and emergency position-indicating radio beacon station AIS EPERBS. Some are fixed, some we carry around, but ALL may one day develop defects. Often they are not very serious.

The cost of re-furbishing a marine radio workshop to service AIS may prove daunting and prohibitive. In most cases hardware repairs followed by operational verification is what is required.

### **Add Minimal Cost AIS Capability**

AIS Developer Studio provides a cost effective way of adding AIS capability to any "Radio Service Workshop".

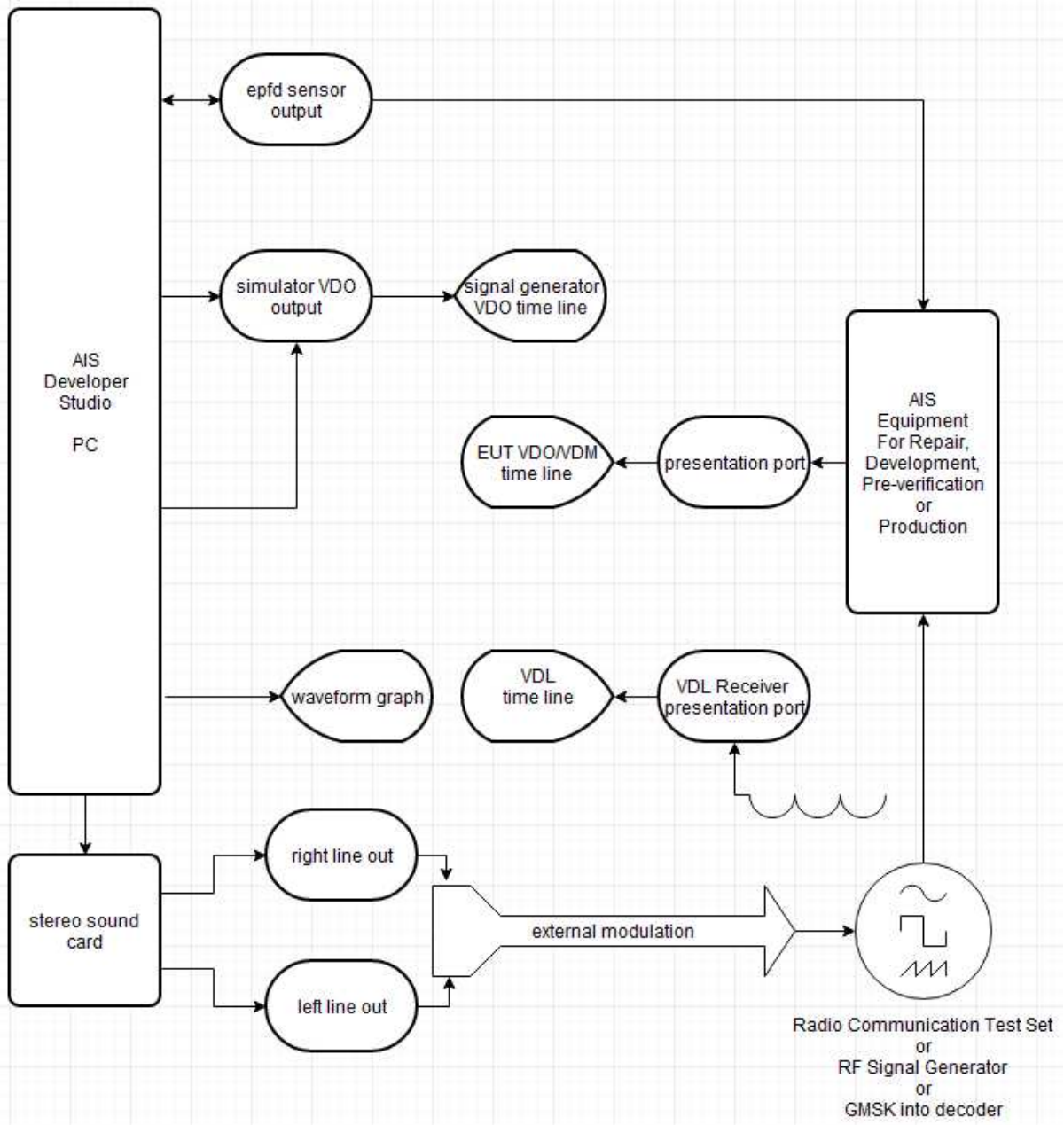
Whilst two-way radio technicians provide hardware repair capability, the use of the standard communications monitor is desirable as in most cases it does not have to be re-capitalized.

A cheap commercial AIS receiver adds VDL reception capability to the system components.

External modulation of the Radio Communications Test Set using AIS Developer Studio PMG2 module allows real time operational verification of AIS Transceiver whilst monitoring the AIS protocol stack of the equipment under test.

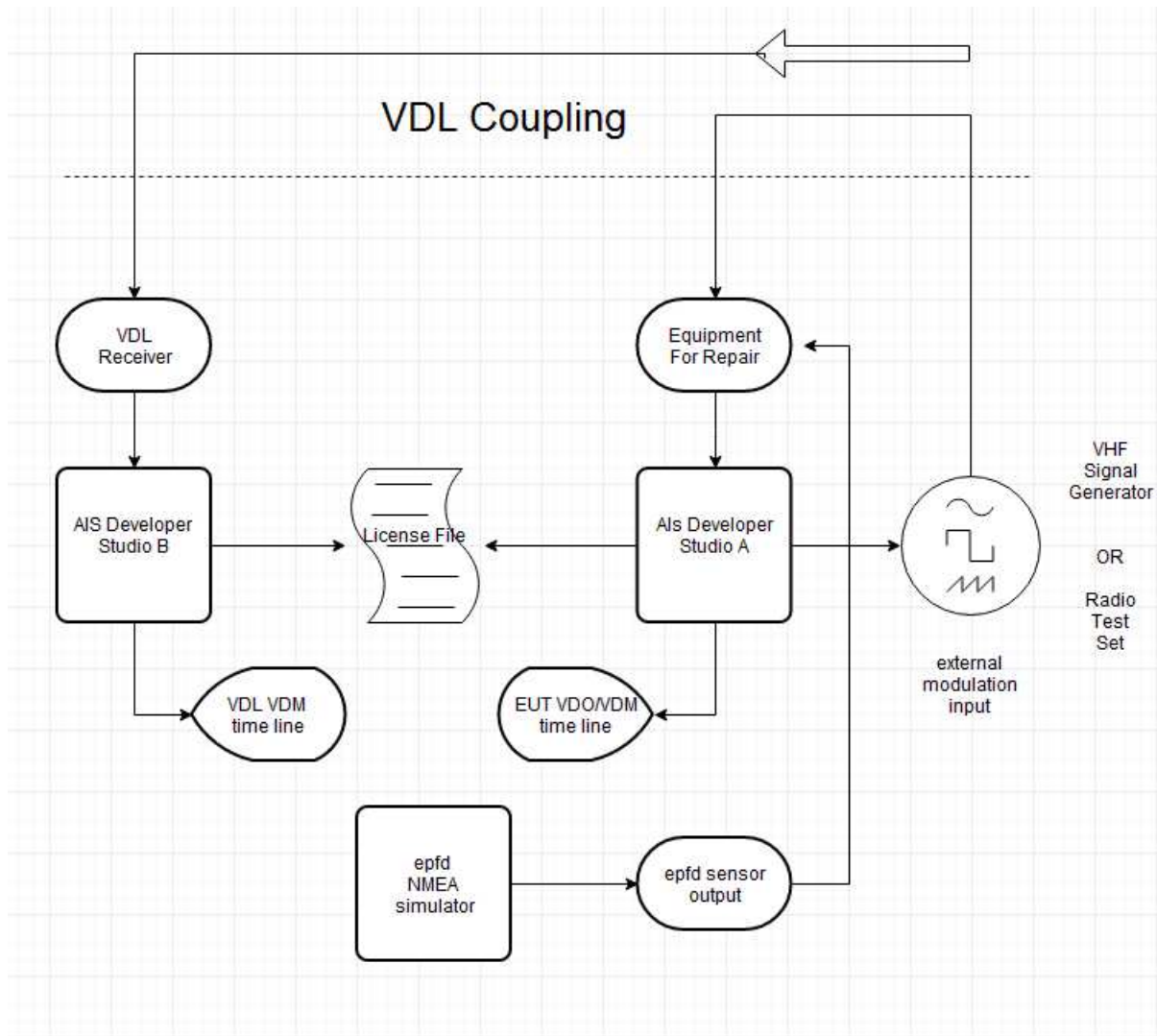


### Minimal Cost AIS Workshop



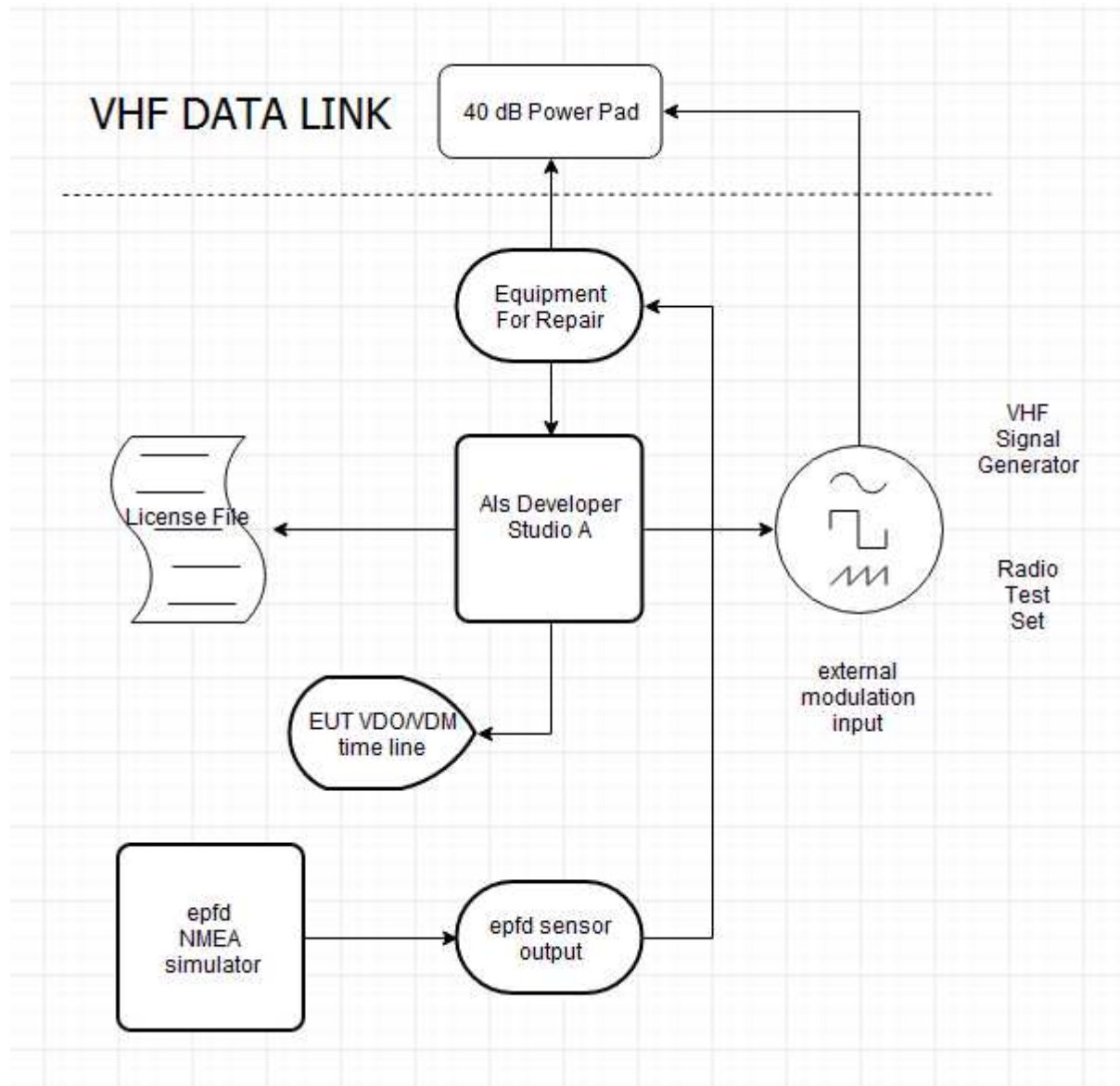


**Verification set-up A**





Verification set-up B







## Method of measurement

Setup hardware as per **Minimal Cost AIS Workshop or Verification set-up A / B / C.**

## Procedure

AIS Developer Studio suite of modules using EUT PI and VDL receiver PI and externally modulating the signal generator or radio communications test set.

- Step through documented procedures.

### WARNING

Many different signal generators and test sets are used to test radio communications transceivers. Some of these devices contain both signal generator and monitor receivers, which share a common output connector to the EUT path. If the signal generator is connected to the antenna connector to test the receiver, and the transmitter keys, then **serious damage can result to the signal generator.**

Higher quality instruments provide architectures with EUT reverse power protection. This circuitry will prevent damage to the signal source if a high RF power level is applied to its output connector from the EUT. Generally speaking...An AIS transmission may be too fast to correctly activate some of these protection circuit.

Make use of **EXTERNAL RF POWER PADS.**

Example EXT modulation input on “Marconi 2955: Radio communications Test Set”



Rhode and Schwarz CMS33 Radio Text Set “MOD EXT INPUT”





### 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
PMG	Programmable Modulation Generator
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
VSWR	Voltage Standing Wave Ratio
ADS	AIS Developer Studio V2
NTP	Network Time Protocol
SNTP	Simple Network Time Protocol
ADS	AIS Developer Studio



**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

**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



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