

AIS Simulator

Version 1.04, October 2004

The program is simulating up to 10 Standard Class A vessels. Complete AIS messages are generated and might be sent as output from the PC serial port or TCP/IP, to be connected to an ECDIS and/or a Radar for display.

The ECDIS/Radar will recognize the data stream as data from a real AIS transponder with the simulated vessels within VHF coverage.

All the AIS messages are generated according to the AIS Standard ITU-R M.1371.1 and sent on the comport with standardized intervals. The most common message, the position report (Msg type 1) is sent with interval between 2 sec and 3 min. (Depending on SOG/ROT and Status). The Static/Voyage data report (Msg type 5) is sent every 6 min, or when any included data is changed.

In addition the following type of AIS objects might be simulated

- One AIS Base station (Generating Msg type 4 – Interval 10 sec)
Including up to 7 VTS Targets
- One SAR Aircraft (Generating Msg type 9 – Interval 10 sec)
- One Class B vessel (Generating Msg type 18 or 19 – Interval depending on SOG)
(NB! Standard format for Class B is still not finalized. Might be changed in 2004)
- One Aid to Navigation (Generating Msg type 21 – Interval 3 min)

Text messages and special messages as Persons onboard, Height over keel, Msg type 6 & 8 or 12 & 14, might be sent from all objects.

The AIS objects are simply controlled with a user-friendly interface. The position might be entered either as geographic coordinates or as Range/Bearing from a common Reference position. If the Reference position is changed, one might with this arrangement move the complete scenario accordingly. The vessels are simply controlled by changing SOG/COG/HDG/ROT. All relevant Static and Voyage data might be selected, For example MMSI number, Name, Type of ship, Type of cargo, Destination etc.

If the connected ECDIS/Radar are able to output NMEA position messages (GGA/GLL/RMC) back on the same comport, this positions might be selected as the Reference position. Hence, all simulated objects are continuously referring with range/bearing to your current ship position.

AIS Simulator is so far tested against Transas NaviSailor 3000 and ADVETO Aecdis2000.

Programming Language : Visual Basic.

Demo / Evaluation version.

A Demo of the program with 30 days or max 100 sessions is distributed. The data output will be terminated after 2 minutes. Otherwise the Demo has all functionality.

The Demo starts default with a Scenario including 3 ships in the Tromsø area.

If a Base station, a SAR Aircraft, a Class B vessel or an Aid To Navigation are activated, these will also start default in the Tromsø area.

If more than 3 Standard Class A vessels are activated, they will default be named 'AIS Vessel 4' etc. and they will start in a random position with random speed within a range of 30 nmiles from the reference position.

After the first session all data will be stored in a file 'AIS Simulator.ini'. Next time the program is started it will continue where it was terminated.

The complete scenario is simply moved by changing the reference position (Or collect a new reference position from a NMEA output telegram.)

The screenshot displays the AIS Simulator interface with the following components:

- Reference position for simulation:** Lat 69° 38,598' N, Lon 018° 56,807' E. Includes a 'DEMO' watermark.
- No. of vessels:** 4 (Standard Class A vessels sending message type 1 and 5).
- Options:**
 - Add an AIS base station (sending msg type 4)
 - Add a SAR Aircraft (sending msg type 9)
 - Add a Class B Vessel (sending msg type 18 or 19)
 - Add an Aid to Navigation (sending msg type 21)
- Vessel Data Table:**

EXPAND	MMSI	Standard Class A vessel	Lat	Lon	SOG	COG	HDG	ROT	ID1	ID5
>	00000101	M/S SANDY HOOK	69° 38,648' N	018° 57,107' E	0,0	105,9	110	0,0	9	1
>	00000102	M/S HURTIGRUTEN	69° 43,193' N	019° 12,655' E	25,0	050,0	050	0,0	29	1
>	00000103	M/S TANKER	69° 40,684' N	019° 01,343' E	3,3	190,0	190	0,0	9	1
>	00000104	AIS VESSEL 4	69° 40,466' N	019° 00,191' E	5,8	254,0	254	0,0	9	1
- Base Station Data Table:**

EXPAND	MMSI	AIS Base Station	Lat	Lon	ID4
>	66666666	Base Station	69° 37,640' N	018° 54,867' E	4
- Dynamic Data (Msg 1) for M/S SANDY HOOK:**

Parameter	Current value
Latitude	69° 38,648' N
Longitude	018° 57,107' E
SOG	0,0
COG	105,9
Heading	110
Rate of turn	0,0
Ring from RefPos (nmile)	0,117
Big from RefPos (deg)	064,4
Navigation Status	0 - Under way using engines
- Dynamic Data (Msg 1) for M/S HURTIGRUTEN:**

Parameter	Current value
Latitude	69° 43,193' N
Longitude	019° 12,655' E
SOG	25,0
COG	050,0
Heading	050
Rate of turn	0,0
Ring from RefPos (nmile)	7,225
Big from RefPos (deg)	050,0
Navigation Status	0 - Under way using engines
- Static Data (Msg 5) for M/S HURTIGRUTEN:**

Parameter	Value
MMSI No.	00000102
Name	
Call sign	
IMO No.	
Type of Ship	60 - Passenger Ship
Type of Cargo / Status	0 - Not specified
Position Device	1
Position Accuracy	0
Dim A	30
Dim B	8
Dim C	8
Dim D	
Voyage Data (Msg 5)	
Destination (max 20 charac)	TROMSØ
ETA	19
Passengers onboard	
Draught	
- Base Station Dynamic Data (Msg 4):**

Parameter	Current value
Latitude	69° 37,640' N
Longitude	018° 54,867' E
SOG	n/a
COG	n/a
Heading	n/a
Rate of turn	n/a
Ring from RefPos (nmile)	1,181
Big from RefPos (deg)	215,2
Navigation Status	0 - Under way using engines
- Message Monitor:**

Msg ID	Interval	Tx	Last msg sent
1	10 sec		13:23:21
5	6 min		13:22:01

Tromsø, 2004
Mats Kågstrøm

e-mail : mats.kagstrom@hitos.no

Mobile : +47 – 91 62 82 26

Office at Tromsø Maritime University College: +47 – 77 66 03 49