

# **TECHNICAL REQUIREMENTS FOR THE PROCESSING AND VISUALISATION OF INLAND AIS RELATED DATA IN INLAND ECDIS DISPLAYS**

**Edition 1.2 – input to IECDIS R&D contract**

Version: Final

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## 1 INTRODUCTION

Edition 2.4 of the Inland ECDIS standard defines only minimum aspects of (Inland) AIS processing and visualisation like the colours and symbols to be used for the visualisation of received AIS targets and the time out values of the target information. The requirements are partially deviating from the information mode to the navigation mode.

Other data like (Inland) ship static and voyage related data as well as certain dynamic data items, received application specific messages and the display and input of own ship data are not yet covered by the Inland ECDIS standard. Also the growing list of AIS Application Specific Messages (ASM) does not have any provisions for the harmonized processing and display on board.

This document provides the minimum requirements for a harmonized processing and display of (Inland) AIS information in Inland ECDIS applications in order to support safe and easy usage of Inland AIS data in Inland ECDIS displays on board a vessel. This part supplements the Inland ECDIS standard and bundles all Inland AIS related aspects, also those parts already included in Edition 2.4. This new document shall be included into a future version of the Inland ECDIS Standard.

This document does not imply any obligation to transmit Inland AIS data beyond applicable regulations by national authorities or river commissions.

This document further provides additional guidelines for the integration and display of extended Inland AIS information.

## 2 REFERENCES

The content of this document is partially based on or refers to:

Document title	Organization	Publication date
Directive 2005/44/EC of the European Parliament and of the Council of 7 September 2005 on harmonised river information services (RIS) on inland waterways in the community	EU	7.9.2005
Commission Regulation (EC) No 415/2007 of 13 March 2007 concerning the technical specifications for vessel tracking and tracing systems referred to in Article 5 of Directive 2005/44/EC of the European Parliament and of the Council on harmonised river information services (RIS) on inland waterways in the Community	EU	13.3.2007
Commission implementation regulation (EU) No 689/2012 of 27 July 2012 amending Regulation No 415/2007 of 13 March 2007 concerning the technical specifications for vessel tracking and tracing systems referred to in Article 5 of Directive 2005/44/EC of the European Parliament and of the Council on harmonised river information services (RIS) on inland waterways in the Community	EU	27.7.2012
Commission Regulation (EC) No 909/2013 of 10 September 2013 concerning the technical specifications for the electronic chart system and information system for inland navigation (Inland ECDIS) to in Article 5 of Directive 2005/44/EC of the European Parliament and of the Council on harmonised river information services (RIS) on inland waterways in the Community	EU	10.09.2013

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Document title	Organization	Publication date
Commission Regulation (EU) No 164/2010 of 25 January 2010 on the technical specifications for Electronic Reporting in inland navigation	EU	25.01.2010
IMO Resolution MSC.232(82), Appendix 3; REVISED PERFORMANCE STANDARDS FOR ELECTRONIC CHART DISPLAY AND INFORMATION SYSTEMS (ECDIS)	IMO	December 2006
International Standard IEC 62388, Maritime navigation and radiocommunication equipment and systems - Shipborne radar - Performance requirements, methods of testing and required test results	IEC	June 2013
International Standard IEC 62288, Maritime navigation and radiocommunication equipment and systems - Presentation of navigation-related information on shipborne navigational displays - General requirements, methods of testing and required test results	IEC	July 2014
Recommendation ITU-R M.1371, "Technical characteristics for an automatic identification system using time-division multiple access in the VHF maritime mobile band"	ITU	February 2014
International Standard IEC 61993-2, Edition 2 "Maritime navigation and radio communication equipment and systems – Automatic Identification System, Part 2: Class A shipborne equipment of the universal automatic identification system (AIS)"	IEC	October 2012
International Standard IEC 61162-1, "Maritime navigation and radio communication equipment and systems - Digital interfaces - Part 1: Single talker and multiple listeners"		August 2016
"Part 1: Single talker and multiple listeners"	IEC	Nov. 2010
"Part 2: Single talker and multiple listeners, high speed transmission"		Sept. 1998
UNECE Location code (RECOMMENDATION No. 16)	UNECE	1998
UNECE Ship type code (RECOMMENDATION No. 28) [not all ship type codes are used in VTT]	UNECE	2014 / 2010
CCNR Technical clarifications on Inland AIS	CCNR	2008
Minimum requirements for Inland ECDIS devices in information mode and comparable chart display devices for using Inland AIS data on board	CCNR	2014

### 3 GENERAL REQUIREMENTS

The following general requirements shall apply for Inland ECDIS applications both Information and Navigation mode.

### 3.1 Processing

Wherever coded data elements are provided for input by the user only the translated clear text values shall be shown to the skippers.

Further it is required to use intelligent search fields and optional filter parameters for all input fields which allow more than 10 different values from a pre-defined list.

In order to avoid the input of wrong or inconsistent data the applications shall integrate consistency-checks wherever possible and provide user guidance in case that values out of the range defined by the standard are input by users.

#### 3.1.1 Configuration of own vessel data

The Inland ECDIS application shall allow easy changing of the following data from the main navigation screen:

- Actual navigational status (from a pull-down menu, in clear text as given by ITU-R M.1371). Any changes shall be directly programmed into the Inland AIS station.

In addition the following data shall be editable via a dedicated user action like program icon or menu dialogue:

- Vessel and convoy type (in clear text according to table 3.4 “Inland vessel data report” as given by the Vessel Tracking and Tracing Standard ) making use of the conversion table in Appendix C “Inland Vessel and Convoy Types” in the VTT Standard
  - Hierarchical input starting with selection of the vessel type
    - Vessel (single)
      - Motor freighter
      - Container vessel
      - Motor tanker (show remaining matching vessel types)
      - Gas tanker
      - Passenger vessel (show remaining matching vessel types)
      - Tug (show remaining matching vessel types)
      - Other vessel types (show remaining matching vessel types)
    - Convoy
      - Motor freighter tug (show remaining matching vessel types)
      - Motor tanker tug (show remaining matching vessel types)
      - Pushtow (show remaining matching vessel types)
      - Pushtow tanker/gas (show remaining matching vessel types)
      - Tug (show remaining matching vessel types)
    - Otherwise (show remaining matching vessel types)
  - Alternatively an intelligent text field to enter the full-text description of the ERI ship type or a full list of ship types could be implemented.
- If the Inland ECDIS application supports the Convoy Message ASM, the configuration of the formation code should be integrated into the overall configuration of the vessel and convoy type.
- Type of ship and cargo (in clear text as given by ITU-R M.1371) shall be automatically derived from Vessel and Convoy type according to conversion table in Appendix C “Inland Vessel and Convoy Types” of the VTT Standard Edition 2.0. It is recommended to display the extended description of vessel types as provided by UN recommendation 28
- Loading information (in clear text from selection menu, according to table 2.7 Inland vessel data report as given by the Vessel Tracking and Tracing Standard)

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- Dangerous cargo indication (in clear text from selection menu, according to table 2.7 Inland vessel data report as given by the Vessel Tracking and Tracing Standard)
- Internal Reference Point / dimensions of vessel/convoy in decimetre accuracy (supported by an appropriate graphical representation)
  - If vessel type has been set to vessel/unknown no further configuration will be available:
    - The application shall automatically calculate the A, B, C, D values according to the following formulas:
      - $A = LS - BI$  (rounded upwards)
      - $B = BI$  (rounded upwards)
      - $C = CI$  (rounded upwards)
      - $D = BS - CI$  (rounded upwards)
  - If vessel type has been set to convoy:
    - Input of convoy length (LC) in decimetre accuracy
    - Input of convoy beam (BC) in decimetre accuracy
    - Input of convoy extension on bow side (EA)
    - Input of convoy extension on stern side (EB)
    - Input of convoy extension on board side (EC)
    - Input of convoy extension on starboard side (ED)
    - The application shall automatically calculate the A, B, C, D values according to the following formulas:
      - $A = LS - BI + EA$  (rounded upwards)
      - $B = BI + EB$  (rounded upwards)
      - $C = CI + EC$  (rounded upwards)
      - $D = BS - CI + ED$  (rounded upwards)
    - Figure 1 presents a graphical summary of the described approach.
  - The overall dimension of a convoy must not be smaller than the size of the main vessel
  - In addition user pre-defined standard convoy setups can be stored and selected

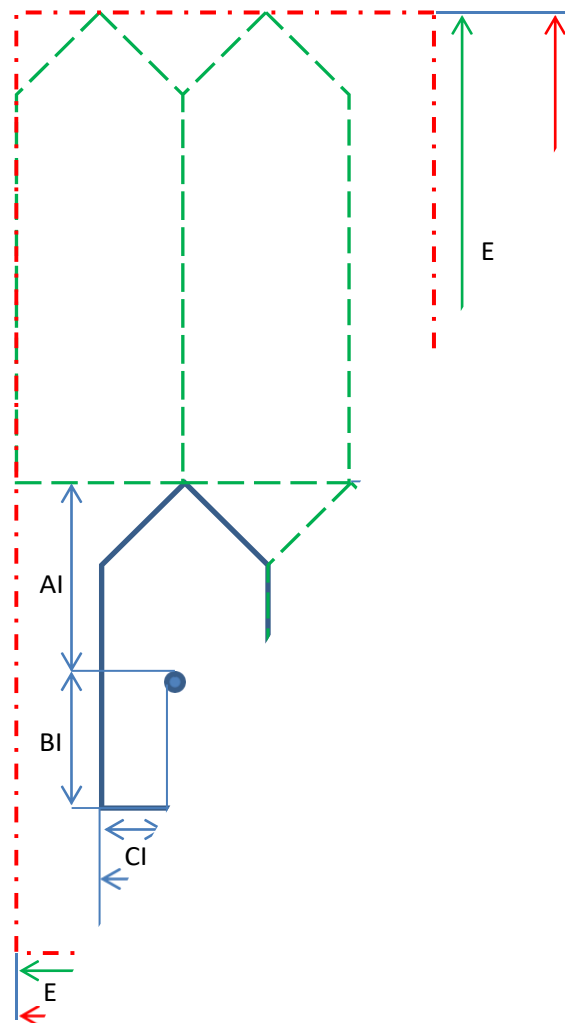


Figure 1: Input parameters for vessel / convoy dimensions

- Maximum present static draught in centimetre accuracy (shall be automatically converted into the maximum present static draught for AIS Msg. 5)
- Destination
  - (ideally) the Inland ECDIS application shall provide a comfortable input for an ISRS location code
    - Variant 1
      - Optional filter by country (list of European Inland navigation countries, automatic filtering by 2 digit UN country code)
      - Optional filter by fairway section code (list of available rivers for the selected country, automatic filtering by 5 digits fairway section code)
      - Optional filter by Function code (list of the following functions:
        - Port/harbour: hrbare, hrbsn, ptare, termnl
        - Berth: berths\_3, berths\_1
        - Anchorage area: achare, achbrt
        - Built-up areas: BUAARE
        - Mooring facilities/pontons: morfac, ponton



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- Variant 2
  - Intelligent full-text search for location name based on optional filters taken from the RIS Index derived from the ERDMS
- Variant 3
  - Selection of the destination based on a map display where all ISRS locations are displayed and can be selected
  - Output of the ISRS code matching the user selection
  - If no applicable ISRS code could be found an ISRS code can be selected that is the closest to the destination.
  - If this is not feasible then a new ISRS code can be entered or a free text. When doing this a warning shall be displayed.
- The ETA shall be entered using a calendar tool with automatic UTC conversion:
  - (the local time of the ECDIS PC shall be used as reference time zone and converted into UTC for use in the AIS). The ECDIS application should inform the user that the time zone for provision is the time zone of the PC.
- Number of crew members on board
- Number of passengers on board
- Number of supporting personnel on board

The following data set shall not be configurable at all or only in case of password protection:

- User ID (mandatory field, must not left blank, only numerical values with exactly 9 digits shall be allowed)
- Vessel Name (limitation to 20 6-Bit ASCII characters as given by ITU-R M.1371)
- Call sign (limitation to 7 6-Bit ASCII characters as given by ITU-R M.1371)
- ENI number (only numerical values with exactly 8 digits with optional leading zero converted into 6-Bit ASCII characters as given the Vessel Tracking and Tracing Standard )<sup>1</sup>
- IMO number (only numerical values with exactly 9 digits shall be allowed)
- Configuration of own vessel dimensions (typically it needs to be configured if the internal or external reference point is in use)
  - Input of own vessel length (LS) in decimetre accuracy
  - Input of own vessel beam (BS) in decimetre accuracy
  - Distance from the GNSS antenna to board side (CI) in decimetre accuracy
  - Distance from the GNSS antenna to the stern (BI) in decimetre accuracy
- Type of EPFS (selection from clear text options as given by ITU-R M.1371)
- Quality of speed information (high/low) (only relevant if external sensor connected, high – if type approved external sensor in use)
- Quality of course information (high/low) (only relevant if external sensor connected, high – if type approved external sensor in use)
- Quality of heading information (high/low) (only relevant if external sensor connected, high – if type approved external sensor in use)

Before any parameters of the Inland AIS mobile station are edited in the Inland ECDIS application it shall be ensured that the values stored in the Inland AIS mobile station are imported. Ideally this takes place during the start phase of the Inland ECDIS application. During operation the parameters of the Inland AIS mobile station in the Inland ECDIS application shall be updated with the values received by the AIVDO messages. This ensures a consistent handling of AIS parameters in setups with multiple Pls. After configuration of all values it shall be possible to save the values and write them back into the Inland AIS station using the input sentences of IEC 61993-2 and the VTT standard.

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<sup>1</sup> In deviation from the VTT standard the ENI regulation only allows for numerical values

### 3.2 Display

The character height and the size of AIS symbols in millimetres shall not be less than 3,5 times the nominal viewing distance in metres.

The minimum size of AIS symbols and the minimum character height of AIS information shall be 3,5 mm.

Wherever coded data elements are provided for display to the user only the translated clear text values shall be shown to the skippers. This also applies to ISRS codes which shall be translated back into clear text using the RIS Index derived from the ERDMS.

#### 3.2.1 Display of own vessel data

Inside the chart area the display shall present the following AIS information:

- Position of the own vessel (using WGS84 datum)
- Pointed vessel/convoy outline of the own vessel, displayed to scale in case that heading information is available for the own vessel

In addition to the display of the own vessel symbol plus navigation data displayed on the chart, the Inland ECDIS application shall be able to constantly present the skipper with the following data, outside the chart area:

- Own vessel's position (River plus River-km taken from IENC, "N/A" if not known)
- Actual navigational status (in clear text as given by ITU-R M.1371). The Inland ECDIS application shall give an indication if the vessel is moving when the status is set to "at anchor" or "moored"
- Status of the blue sign in case of direct connection (set / not set) if not displayed in the own vessel symbol
- Speed over ground (SOG) [in km/h]
- Rate of Turn (ROT) (if available)
- The actual dangerous cargo setting shall be indicated to the user (if not displayed in the own vessel symbol / on configuration)

The following alarms shall be presented to the user:

- Display a warning message or symbol in case of malfunctions of the Inland AIS unit:
  - if the connection to the Inland AIS mobile station has been lost (no VDO received for more than 5 seconds)
  - display of AIS alarms (VSWR, Tx malfunction, UTC indirect,...)
- The absence of DGPS data shall be indicated to the user (different level than warning/alarm) (on configuration)

In addition the following data shall be readable via a dedicated user action like program icon or menu dialogue:

- User ID (MMSI)
- Vessel Name
- Call sign
- ENI number
- IMO number
- Vessel and convoy type (in clear text according to table 2.7 Inland vessel data report as given by the Vessel Tracking and Tracing Standard )
- Type of ship and cargo (in clear text as given by ITU-R M.1371)

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- Loading information (in clear text according to table 2.7 Inland vessel data report as given by the Vessel Tracking and Tracing Standard )
- Dangerous cargo indication (in clear text according to table 2.7 Inland vessel data report as given by the Vessel Tracking and Tracing Standard )
- Reference Point in metre accuracy [A, B, C, D] (supported by graphical representation) (internal or external, depending on the configuration)
- Dimensions of vessel/convoy in decimetre accuracy (supported by graphical representation)
- Maximum present static draught in centimetre accuracy
- Destination (if available clear text based on RIS Index)
- ETA (the local time of the ECDIS PC shall be used as reference time zone and converted into UTC for use in the AIS)
- Type of EPFS (in clear text as given by ITU-R M.1371)
- Quality of speed information (high/low)
- Quality of course information (high/low)
- Quality of heading information (high/low)
- Position Accuracy (DGPS / no DGPS)
- True Heading (HDT) (in degrees)
- Course over Ground (COG) in degrees
- AIS Version Indicator
- Blue sign connected (yes/no as automatically detected by the AIS unit)
- Time since last received VDO message (red colour if greater than 5 seconds)
- Number of crew members on board
- Number of passengers on board
- Number of supporting personnel on board
- Total number of people on board (automatically calculated)

3.2.2 Display of other vessels

Information regarding the position and orientation of other vessels, gathered through Inland AIS, shall only be displayed if they are up-to-date (nearly real time) and accurate. The position and the orientations of other vessels by:

- A directed triangle, or
- A true outline (to scale)

Shall be not presented if the heading of these vessels is not available. A generic symbol is recommended (an octagon is recommended, a circle shall not be used for applications which are certified according to maritime standards) unless the user manually overrides this logic giving his clear consent and acknowledging the related risks coming from directed vessel representations derived from COG information.

The following time out values are recommended (from IEC 62388):

Category of vessel	Nominal reporting interval	Maximum time out value	Nominal reporting interval	Maximum time out value
	class A	class A	class B	class B
Vessel at anchor or moored and not moving faster than 3 knots (class B not moving faster than 2 knots)	3 min	18 min	3 min	18 min

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Vessel at anchor or moored and moving at more than 3 knots	10 s	60 s	3 min	18 min
Vessel operating in SOLAS mode, moving 0 to 14 knots	10 s	60 s	30 s	180 s
Vessel operating in SOLAS mode, moving 0 to 14 knots and changing course	3 1/3 s	60 s	30 s	180 s
Vessel operating in SOLAS mode, moving 14 to 23 knots	6 s	36 s	30 s	180 s
Vessel operating in SOLAS mode, moving 14 to 23 knots and changing course	2 s	36 s	30 s	180 s
Vessel operating in SOLAS mode, moving faster than 23 knots	2 s	30 s	30 s	180 s
Vessel operating in SOLAS mode, moving faster than 23 knots and changing course	2 s	30 s	30 s	180 s
Vessel operating in assigned mode	2 – 10 s	60 s	—	—

The AIS targets should be marked as outdated if the position information of moving vessels is older than 30 seconds.

Information that another vessel is carrying blue cones or lights may be displayed by a different colour of the vessel symbol. The number of the blue cones/lights shall only be displayed in the pick report.

Information on the intention of another vessel to pass on starboard (blue sign) may only be displayed on the right side of the directed triangle symbol or of the scaled shape if the heading of this vessel is available. If no heading information is available the information shall only be displayed in a direction independent form.

The following table is providing an example for the display:

Visualisation of Blue Sign status 0 to 2 and dangerous goods						
Blue sign	Not connected or not available		Not Set		Set	
Blue cones	0	1 to 3	0	1 to 3	0	1 to 3
Heading	No					
	Symbol					
	True shape					

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The full set of Inland AIS target information shall be accessible via a target list dialogue and/or by mouse action on a specific target.

Information regarding AIS base stations and AIS Search and Rescue Transmitters (SART) may be displayed, if the symbols can be distinguished from other symbols (e.g. symbols 2.10 and 2.11 of IEC 62288 Ed. 2, Table A.2).

It shall be possible to display all information transmitted by an AIS on user request.

In case convoy information is received through the Convoy Message ASM the convoy formation and outline may be displayed (only for the vessels sending heading information).

### 3.2.3 AIS AtoN Station

For the intelligent display of Inland AIS AtoN stations a matching between the Inland AIS AtoN object and the IENC object will be done through the MMSI number which has to be coded into the IENC. As long as no attribute is foreseen for this purpose the "INFORM" attribute shall be used as interim solution before a separate MMSI attribute is introduced in the future Inland ECDIS Ed. 2.5 respectively S 401.

When using Inland AIS AtoN information in combination with an Inland ECDIS application the following use cases can be distinguished:

#### **AIS AtoN on-position** (AtoN is within a defined distance around the intended position)

##### 1. ECDIS match

Inland AIS AtoN information (AtoN with AIS AtoN station) is available for an IENC AtoN object, matched through the MMSI number – the Inland AIS AtoN reports that it is on position (Standard case)

In this case the IENC object coded in the chart shall be replaced by the matching Inland AIS AtoN object at the position reported by the Inland AIS AtoN instead of the IENC object. This shall be done independent of the distance between the IENC object and the reported Inland AIS AtoN position.

##### 2. No ECDIS match

Inland AIS AtoN information (AtoN with AIS AtoN station) is available but no matching (through the MMSI Number) IENC AtoN object – the Inland AIS AtoN reports that it is on position (e.g. new buoy with AIS AtoN station, but IENC is outdated i.e. it does not have the information about the MMSI number)

In this case the appropriate Inland AIS AtoN object will be displayed at the position reported by the Inland AIS AtoN.

**AIS AtoN off-position** (AtoN is outside a defined distance around the intended position)**3. ECDIS match**

Inland AIS AtoN information (AtoN with AIS AtoN station) is available for an IENC AtoN object, matched through the MMSI number – the Inland AIS AtoN reports that it is off position

In this case the IENC object coded in the chart shall be replaced by the matching Inland AIS AtoN object for a missing Inland AIS AtoN object instead of the IENC object at the position of the IENC object.

In addition the matching Inland AIS AtoN off position object shall be shown at the position reported by the Inland AIS AtoN.

That way both the intended location as well as the drifted position will be shown.

**4. No ECDIS match**

Inland AIS AtoN information (AtoN with AIS AtoN station) is available but no matching IENC AtoN object – the Inland AIS AtoN reports that it is off position (e.g. new buoy with AIS AtoN station, but IENC is outdated i.e. it does not have the information about the MMSI number)

In this case only the matching Inland AIS AtoN off position object shall be shown at the position reported by the Inland AIS AtoN.

The IENC objects stay as they are.

**Virtual AIS AtoN****5. Virtual AIS AtoN information is being received**

In this case the matching Inland AIS AtoN virtual object shall be shown at the reported position.

**Approach for visualisation**

The timeout for the display of Inland AIS AtoN shall be 6 times the recommended reporting interval i.e. 18 minutes.

After the timeout period the Inland AIS AtoN symbol shall be immediately removed from the chart and not displayed as lost target. For the AtoNs with an IENC match the charted object will be shown instead.

The symbols shall use the AIS diamond outline as depicted in the table below.

Certain symbols will provide information about the direction of impact of the AtoN.

These “combined symbols” are composed of two symbols out of the SVG symbol library:

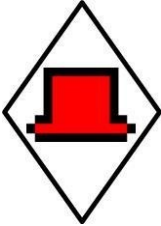
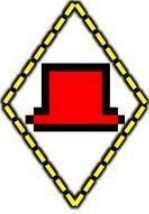

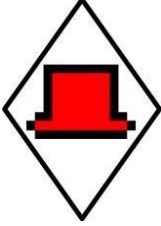
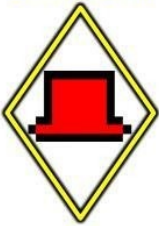
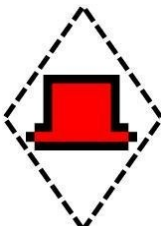
- The “inner part” (diamond shape and included symbol)
- The “outer frame” (a enveloping circle with an peripheral arrow)

The combination of these two parts depends on the orientation of the displayed chart and has to be changed when the orientation of the chart changes:

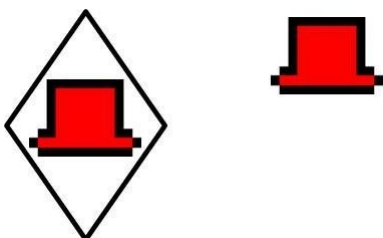
- The “inner part” is oriented according to the top of the Inland ECDIS display.

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- The “outer frame” is a transparent symbol, placed at the center location of the “inner part” and amended with an orientation angle. This angle points to the direction of impact of the sign.

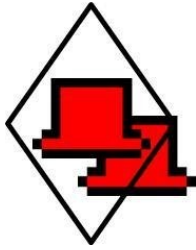
	On position	Off position	
<b>Match with IENC object</b>		<p><b>Missing</b></p>  <p>Set IENC position</p>	<p><b>Off Posn</b></p>  <p>current AtoN position</p>
<b>No match with IENC object</b>	 <p>footnote *1</p>	<p><b>Off Posn</b></p> 	
<b>Virtual AtoN</b>		Not applicable	

\*1 If there is an AtoN object without MMSI in the IENC it is not possible to match the two objects. The AIS AtoN symbol will be displayed in addition to the IENC object in this case. In case both objects are not very close they are displayed next to each other.



In case the position of the two objects is very close the IENC object may be displayed even within the diamond shape or even behind it.

Guidelines for the Visualisation of Inland AIS related data in Inland ECDIS Displays


















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The Inland AIS AtoN symbols shall use the AIS diamond outline as depicted in the table below:

	Code	CEVNI code	on position	missing	off position	virtual	Name
	0						Default, Type not specified
fixed aids, landmarks	1	4.A + 4.B					Channel near the right bank
	2	5.A + 5.B					Channel near the left bank
	3	4.C + 4.D					Cross-over right bank
	4	5.C + 5D					Cross-over left bank
	5	8.C - 8.C2					Bridge pillar
	6	8.C3 + 8.C4					Overhead cable
floating aids	7	1.A - 1.D					Buoy right-hand side
	8	2.A - 2.D					Buoy left-hand side
	9	3.A - 3.D					Bifurcation
	10	3.E1 + 3.F1					Bifurcation, pass right-hand side
	11	3.E + 3.F					Bifurcation, pass left-hand side
	12	1.F + 1.F1					Danger point or obstacle right-hand side
	13	2.F + 2.F1					Danger point or obstacle left-hand side
	14	-					Berth right-hand side
	15	-					Berth left-hand side

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	Code	CEVNI code	on position	missing	off position	virtual	Name
<b>other</b>	16	A.1					No entry * without direction of impact
							No entry * with direction of impact
	17	A.9					Do not create wash * with direction of impact
	18	C.2					Headroom limited
	19	-					Signal float
	20						Reserved for future use
<b>reserved</b>	21						Reserved for future use
	22						Reserved for future use
	23						Reserved for future use
	24						Reserved for future use
	25						Reserved for future use
	26						Reserved for future use
	27						Reserved for future use
	28						Reserved for future use
	29						Reserved for future use
	30						Reserved for future use
	31						Reserved for future use

\* For Inland AIS AtoN report the parameter "Name of Aids-to-Navigation" may be used to transmit the direction of impact of the AtoN. This information may be transmitted with or without preceding name value. In this case the content of the parameter contains two percent symbols '%%' directly followed by the direction of impact in full degrees clockwise starting from North e.g. %%270 for direction of impact 270 degrees.

The timeout for the display of Inland AIS AtoN shall be 6 times the recommended reporting interval i.e. 18 minutes.

After the timeout period the Inland AIS AtoN symbol shall be immediately removed from the chart and not displayed as lost target. For the AtoNs with an IENC match the charted object will be shown instead.

### 3.2.4 AIS Repeater Station

AIS Repeater stations may be used in some areas at the waterways. AIS Repeater stations are store and forward repeaters.

The occurrence of repeated AIS messages shall be considered by the display system.

Typically the repeat of messages is within 4 s. Messages containing a time stamp older than 30 s will not be repeated. Messages can be repeated three times maximum. Repeated messages are indicated by the repeat indicator set to >0 (= 1 to 3).

Only the most recent message of a vessel shall be displayed. Older messages which may be received from a repeater station shall be discarded in this case.

## 4 REQUIREMENTS OF THE INFORMATION MODE

### 4.1 Processing

### 4.2 Display

## 5 REQUIREMENTS OF THE NAVIGATION MODE

### 5.1 Processing

At least the following AIS messages need to be processed:

- Message 1,2,3
- Message 4, 11
- Message 5
- Message 6,8, (25,26?): see below for required ASM
- Message 7?
- Message 9 ?
- Message 12,14 (13?)
- Message 18,19,24
- Message 21

### 5.2 Display

In Navigation mode the following elements shall always be visible and shall not be obscured by other objects:

- Inland AIS symbols
- Inland AIS labels (if displayed)
- AIS AtoN information.

The transparency of the radar overlay shall therefore be user defined. Inland AIS labels should be able to be switched off either manually or on base of a configured timeout value.

## Guidelines for the Visualisation of Inland AIS related data in Inland ECDIS Displays

Information regarding the position and orientation of other vessels, gathered by Inland AIS, are permitted to be displayed only if they are up-to-date (nearly real-time – add reference to table with timeouts) and meet the accuracy that is required for the support of tactical and operational navigation. Position information of the own vessel that is received from a repeater station shall not be displayed.

AIS information of other vessels is useful for the planning of the passing, but of no use during passing itself, AIS symbols shall not disturb the radar image during passing and may be faded out therefore. Preferably, the application should allow the skipper to define the area where the symbol is faded out.

## 6 HANDLING OF APPLICATION SPECIFIC MESSAGES (ASM)

Next to the Inland ship static and voyage related data message whose input and display has already been handled in chapter 3 the VTT Standard defines several other Application Specific Messages which are supported either directly in the Inland AIS mobile station and/or in the connected Inland ECDIS application.

FI	FIG	Name of International Function Message	Sent by	Broadcast	Addressed
10	Gen	Inland Ship Static and voyage related data	Ship	x	
19	Gen	Control Message	Shore	x	
21	VTS	ETA at lock/bridge/terminal	Ship		x
22	VTS	RTA at lock/bridge/terminal	Shore		x
23	VTS	<del>EMMA warning</del> (no longer supported)	<del>Shore</del>	<del>x</del>	-
24	VTS	Water Level	Shore	x	
25	VTS	Present Bridge Clearance	Shore	x	
40	<del>A-to-N</del>	<del>Signal Status</del> (no longer supported)	<del>Shore</del>	<del>x</del>	-
41	A-to-N	Signal Station	Shore	x	
55	SAR	Inland Number of Persons on board	Ship	x	x (preferably)

Table 1: Overview of Inland specific ASMs

In addition the following messages of the IFM branch shall also be used in inland navigation (see ITU-R M-1371) and processed and displayed by Inland ECDIS applications

- IFM 0 – Text telegram 6-bit ASCII
- IFM 2 – Interrogation on specific IFM
- IFM 3 – Capability interrogation
- IFM 4 – Capability Interrogation reply
- IFM 5 – Application acknowledgement to an addressed binary message

### 6.1 FI 19: Control Message

#### 6.1.1 Processing

The Inland ECDIS application shall automatically enable/disable ASM functions according to the information coming from the Control Message.

#### 6.1.2 Display

The Inland ECDIS application shall provide an overview which ASM are currently allowed or forbidden by the competent authority through the Control Message.

## 6.2 FI 21: ETA at lock/bridge/terminal

### 6.2.1 Processing

If the send button is pressed the message shall be sent into the Inland AIS mobile station using the virtual MMSI number applicable for the current location. The list of virtual MMSI numbers is maintained in the ASM inventory document of the VTT EG.

If no virtual MMSI is available any ETA message shall be sent to the closest AIS Base Station.

### 6.2.2 Display

The ETA/RTA function shall be available to user either by using a dialogue window or by map interaction where all ISRS locations are displayed and can be selected. If a RIS Index or a related IENC object code is available, the location name and object name shall be shown in clear text. After selection of the desired location it shall be possible to select ETA from a context menu.

If the destination is entered manually without map interaction the procedures defined for the entry of the destination field (see chapter **Error! Reference source not found.**). Just the use of a free text is only applicable as long as it is conforming to the ISRS structure.

All fields shall allow intelligent search functionality. The chosen location object shall then be automatically translated into the UN country code, UN location code, Fairway section number, terminal code and fairway hectometre as required by the standard.

Once the location has been selected it shall be possible to enter the ETA at the chosen location. The entry of the time shall be made according to the local time zone of the destination. The user shall be noticed that local time has to be used. The application shall then internally convert the time into UTC.

Then the number of assisting tug boats shall be selectable from a pull-down menu given the possible value from 0 to 6 or unknown.

Finally it shall be possible to enter the maximum present static air-draught in centimetre. Basic consistency checks shall verify that e.g. the value – if not 0 (not used) – is not smaller than 100cm.

On user request, the list of relevant ETA (together with requested RTA) information shall be presented. The ETA and RTA might also be presented using labels at the appropriate location on the chart.

## 6.3 FI 22: RTA at lock/bridge/terminal

### 6.3.1 Processing

Processing of this message is mandatory.

### 6.3.2 Display

The reception of an RTA answer shall be graphically indicated to the user. The ETA/RTA dialogue shall then show the location name (RIS Index location name and object name if available), the ETA and the received RTA (all local time). Further the operational status received in the RTA message shall be shown in clear text.

A reply button shall allow sending an updated ETA to the object. In that case all previously entered information shall be pre-filled that the user only needs to change the data which changed.

An RTA message might also be received without a previously sent ETA message.

#### **6.4 FI 23: EMMA warning**

The EMMA message is obsolete and shall not be used.

#### **6.5 FI 24: water level message**

##### 6.5.1 Processing

Processing of this message is mandatory.

##### 6.5.2 Display

Received water level data shall be accessible via a separate dialogue window. Only water level stations for which actual values have been received shall be shown in the overview. The water level gauge names shall be automatically converted from the gauge ID into the common name and shown in clear text as given by the RIS Index. The water levels shall be automatically converted from the difference value transmitted by Msg 24 into the real water level by adding the reference water level to the difference value.

Next to the water level the date and time of the last reception shall be shown according to the local time zone. Ideally it shall be possible to configure a maximum age for water level data. In case the age of the water level information exceeds that value the water level information shall no longer be shown in the application.

In addition it may be possible to show the actual water level and latest reception time in a text box, by doing a mouse-over or pick report at a certain water level gauge object on the IENC.

If the depth information and vertical clearance information of the chart is updated within the area of applicability of the gauge it has to be clearly indicated.

#### **6.6 FI 40: Signal status**

This message is outdated and depreciated. Message FI 41 shall be used instead.

#### **6.7 FI 41: Signal Station**

This message replaces message FI 40.

##### 6.7.1 Processing

Processing of this message is optional.

## Guidelines for the Visualisation of Inland AIS related data in Inland ECDIS Displays

### 6.7.2 Display

In case a signal status message is received the matching signal symbol shall be displayed instead of the matching (through the ISRS code) IENC object. Therefore it can only be displayed with an IENC match. Otherwise the message will be discarded.

The displayed orientation shall follow the value given in the Inland AIS message. It shall be possible to internally configure a maximum age for signal status messages. When the last received Inland AIS signal status message for a signal becomes older than the configured timeout interval the signal shall no longer be displayed.

The signal icon shall only be displayed with the same SCAMIN value as the matching IENC object.

In case the icon is no longer displayed because of the SCAMIN value, there shall be a visual indication that a dynamic signal station information is available for the object. At mouse over the full signal icon shall be displayed.

## 6.8 FI 25: Present Bridge Clearance

### 6.8.1 Processing

Processing of this message is mandatory.

### 6.8.2 Display

Received vertical bridge clearance data shall be accessible via a separate dialogue window. Only bridges for which actual values have been received shall be shown in the overview. The bridge names shall be automatically converted from the ISRS code into the common name and shown in clear text as given by the RIS Index.

The vertical clearance values shall be automatically converted into meter values.

Next to the vertical clearance the date and time of the last measurement shall be shown according to the local time zone. The date and time shall be calculated using the time of the reception subtracted by the "time to the last measurement". Ideally it shall be possible to configure a maximum age for vertical bridge clearance data. In case the age of the vertical bridge clearance information exceeds that value the vertical bridge clearance information shall no longer be shown in the application.

If received, the accuracy value shall be displayed in cm. In case accuracy value 0 is transmitted then no accuracy information shall be shown (not at all, also not with the value left blank).

In addition it may be possible to show the vertical bridge clearance measurement time and accuracy on top of the chart in a text box, by doing a mouse-over or pick report at a certain ridge opening object on the IENC.

## 6.9 IFM 0: Text telegram 6-bit ASCII

### 6.9.1 Processing

The Inland ECDIS application shall provide a means to send a text telegram to a certain AIS station or as a broadcast message. This shall be possible through a menu dialogue. Additionally the application



## Guidelines for the Visualisation of Inland AIS related data in Inland ECDIS Displays

may provide the possibility of sending an addressed message through the right click menu when selecting a vessel on the chart display.

### 6.9.2 Display

When a text telegram is being received, the Inland ECDIS application shall present a visual notification to the user. It shall then be possible to read the message. It shall clearly be visible if the message has been broadcasted or addressed. For addressed messages it shall be possible to reply directly from the reading dialogue. For broadcasted text telegrams a reply must not be possible.

## 6.10 IFM 2: Interrogation on specific IFM

### 6.10.1 Processing

The Inland ECDIS application shall receive and process interrogation messages. It shall reply to interrogations based on the available data using an addressed message.

### 6.10.2 Display

No information is displayed.

## 6.11 IFM 3: Capability interrogation

### 6.11.1 Processing

The Inland ECDIS application shall receive and process capability interrogations and answer with IFM 4 – capability reply.

### 6.11.2 Display

The processing of IFM 3 shall not be visible to the user.

## 6.12 IFM 4: Capability Interrogation reply

### 6.12.1 Processing

In case a capability interrogation message has been received the Inland ECDIS application shall answer with a capability interrogation reply. This process shall not be visible to the user.

### 6.12.2 Display

## **6.13 IFM 5: Application acknowledgement to an addressed binary message**

### 6.13.1 Processing

When requested, IFM 5 should be used by the Inland ECDIS application to confirm the reception of an addressed binary message. It should never acknowledge a binary broadcast message.

### 6.13.2 Display