

Saab TransponderTech

R4 IAIS Transponder System

MANUAL SUPPLEMENT



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Saab TransponderTech AB, SWEDEN**ii Disclaimer**

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iii Software

This manual is a supplement to the R4 AIS Class A Transponder System Operator's Manual (7000 108-131) and Installation Manual (7000 108-011). It describes the special R4 IAIS Transponder System functions, and reflects the capabilities of R4 IAIS Display software version 1.1x and R4 IAIS Transponder software 1.1x.

iv Supplemental Manual Part Number and Revision

Part number 7000 108-310, revision D.

This manual is a replacement for 7000 108-310 revision B. Definition of signal cable 7000 108-317 has been added (Appendix 1)

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1 PRODUCT DESCRIPTION

1.1 R4 IAIS System Overview

The R4 IAIS Transponder System has two modes of operation: Class A mode and Inland AIS mode.

In Class A mode, the R4 IAIS Transponder system has the functions of an R4 AIS Class A Transponder system. This mode is intended for use by seagoing ships and a special license key is needed to unlock the mode.

In Inland AIS mode, the system has the function of an Inland AIS Transponder system as specified by European requirements for inland waterway vessel tracking and tracing systems (EC regulation 415/2007). This mode is intended for ships operating within areas that has adopted this standard.

The Inland AIS mode of operation is interoperable with normal Class A operation. The Inland mode adds functions for Inland specific ship parameters, blue sign status, water level information and ETA/RTA messages.

2 R4 IAIS SYSTEM INSTALLATION

With exception of an option for external control of blue sign status as described below, the R4 IAIS transponder system shall be installed as an R4 AIS Class A transponder system. Refer to the R4 AIS Class A Installation Manual, ref [1].

2.1 External control of blue sign status

The status of the blue sign can be controlled by discrete inputs on pins 45 (GND) and 47 (signal) on the 50-pole DSUB connector of R4 Transponder.

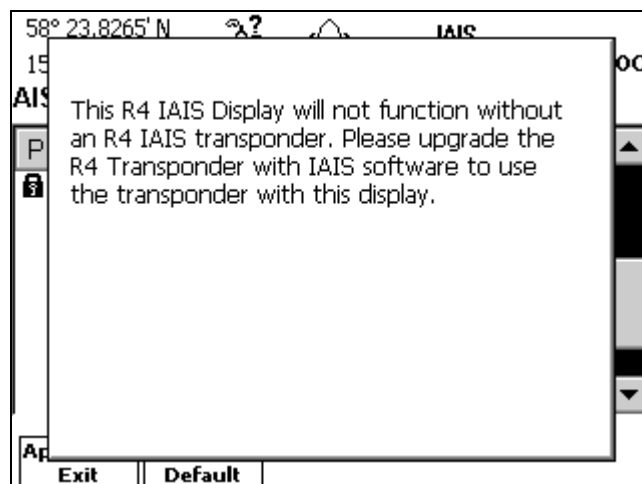
To use this feature, pin 45 shall be connected to 0 V. If pin 47 is fed with 24 V, the ships blue sign will be 'set', if pin 47 is left open the blue sign will be 'not set'.

These pins are not available in the standard R4 Transponder Signal Cable (p/n 7000 108-031), a special cable is needed (p/n 7000 108-317). This cable is color coded as shown in Appendix 1 to this document.

It is configurable whether blue sign information shall be derived from the external switch (if connected) or from manual inputs on the display. Refer to the configuration section below.

2.2 R4 IAIS Transponder and Display Compatibility Check

The R4 IAIS Display will only work together with an R4 IAIS transponder unit. If the display detects that an incompatible transponder unit has been connected, a warning will be displayed as illustrated below:





3 R4 IAIS SYSTEM CONFIGURATION

In general, configuration parameters common for normal (Class A) operation and Inland AIS operation will be shared between both modes. Thus, whenever applicable, configuration settings entered in one system mode will be used also in the other mode.



3.1 System mode selection

System mode is determined by the *AIS Mode* parameter in the *System Mode* view.




This view is accessed by pressing the *MODE* key followed by function key *Config, PAGE* key and then pressing function key *System Mode*.

58° 23.8272' N				<input type="checkbox"/> IAIS	13 19 UTC
15° 41.9720' E					
SYSTEM MODE					
Parameter	Value				
AIS Mode	Inland AIS				
Apply and Exit	Get Default	Enter License			

The default mode is 'Inland AIS' mode and the system will operate as an Inland AIS Transponder system. To be able to change the mode to Class A mode, a valid license key must be used to unlock the parameter. This is done by pressing the function key **Enter License**.

58° 23.8263' N				<input type="checkbox"/> IAIS	13 20 UTC
15° 41.9722' E					
LICENSE INPUT					
Parameter	Value				
Enter License Key:	<input type="text"/>				
Apply and Exit	Get Default	Backspace			

Enter the license key for Class A mode and press **Apply and Exit** (the user password may be required). If the key was valid the Class A mode will now be accessible:

58° 23.8274' N				<input type="checkbox"/> IAIS	13:10 UTC
15° 41.9729' E		SYSTEM MODE			
Parameter	Value				
AIS Mode	Inland AIS  Class A Inland AIS				
Apply and Exit		Get Default			

Once a valid license key is set the Class A mode will always be accessible, even if the transponder has been rebooted. The setting of the *AIS Mode* parameter is protected by the user password.

System configuration for Class A mode operation is equal to the R4 AIS Class A Transponder system configuration as described in ref [1] and ref [2].

3.2 Configuration for Inland AIS mode operation



For Inland AIS Mode operation, the system shall be configured as an R4 AIS Class A Transponder system with additions as described in the sections below.

3.2.1 Ship Static Data

The *Ship Static Configuration* view is used to configure static data for the ship and convoy. When operating in Inland AIS mode, several new parameters can be configured:

- Euro number
- Euro Ship type
- Ship/Convoy length and beam with 0.1 m resolution
- Reporting rate: Auto or pre set time intervals for position reports
- Quality of speed (SOG), course (COG) and heading (HDG) readings – High or Low
- ATIS code (should be entered as value for parameter *Callsign*)

Ship/Convoy size set in the *GNSS Antennas* view has to be the same as Length and Beam from the *Ship Static Configuration* view, rounded upwards. If this is not the case, a *Ship Size Mismatch Alarm* will be generated.



58° 23.8243' N   IAIS 13:40 UTC

15° 41.9935' E

SHIP STATIC CONFIGURATION

Parameter	Value
-General AIS-	
MMSI	12345
IMO	1234567
Ship Name	EXCALIBUR
Callsign	C21SA
Height Over Keel	4.6 m
-Inland AIS-	

Apply and Exit Get Default

58° 23.8242' N   IAIS 13:41 UTC

15° 41.9935' E

SHIP STATIC CONFIGURATION



Parameter	Value
Euro Number	123456
Euro Type	General Cargo Vessel
Length	16.4 m
Beam	3.9 m
Reporting Rate	Auto
Quality, Speed	Low
Quality, Course	Low

Apply and Exit Get Default

3.2.2 Water Level Timeout

Water level information will be automatically erased after a time from the last update that can be defined by the *Max Water Levels Age* parameter in the *AIS Display Configuration* view

This view is accessed by pressing the *MODE* key followed by function key **Config** and then pressing function key **AIS Config** followed by function key **AIS Display**.

58° 23.8236' N   IAIS 13:47 UTC

15° 41.9932' E

AIS DISPLAY CONFIGURATION

Parameter	Value
Max. Targets In Plot	20
Max. Targets In List	100
Persons On Board Query	Disabled
Require Text Message Ack	Yes
Max Water Levels Age (hh:mm)	03:00

Apply and Exit Get Default

3.2.3 External blue sign input

Whether blue sign status is to be derived from an external switch (if connected) or set from the display is determined by the *External Blue Sign Input* parameter in the *Other I/O Configuration* view.

This view is accessed by pressing the **MODE** key followed by function key **Config**, **PAGE** key and then pressing function key **I/O Config** followed by function key **Other I/O Config**.

Parameter	Value
External Blue Sign Input	No
AIS GPS Output Port	No Output

Apply and Exit Get Default

If the *External Blue Sign Input* parameter is set to 'yes', the status of the blue sign is controlled by discrete inputs as described in the installation section above.

3.2.4 Internal GPS Data Output

It is possible to output data from the transponders internal GPS receiver. The output port for the GPS data is determined by the *AIS GPS Output Port* parameter in the *Other I/O Configuration* view.

This view is accessed by pressing the **MODE** key followed by function key **Config, page** key and then pressing function key **I/O Config** followed by function key **Other I/O Config**.

The screenshot shows a menu titled "OTHER I/O CONFIGURATION" with a table of parameters. The "AIS GPS Output Port" parameter is selected, and its dropdown menu is open, showing options: "No Output", "Pilot", "ECDIS", "Long Range", and "Display". The "No Output" option is currently selected. At the bottom of the screen, there are two buttons: "Apply and Exit" and "Get Default".

Parameter	Value
External Blue Sign Input	No
AIS GPS Output Port	No Output

Buttons: Apply and Exit, Get Default

When the parameter is set to Pilot, ECDIS, Long Range or Display the internal GPS data from the transponder will be output on the selected serial port. The sentences that will be output are GGA, VTG and ZDA every second as well as GSV and GSA every 20 second.

4 CLASS A MODE OPERATION

Class A mode operation is indicated by an **AIS** icon in the status bar on the top of each page

In Class A mode, the IAIS system will operate as an R4 Class A Transponder system. Refer to the R4 AIS Class A Transponder System Operator's manual, ref [2].

5 INLAND AIS MODE OPERATION

Inland AIS mode operation is indicated by an **IAIS** icon in the status bar on the top of each page

5.1 Status Bar Additions

When operating in Inland AIS mode an icon is indicating current status of the blue sign. If no icon is present, the current blue sign status is 'not available'.

The icon can be one of:

- The blue sign is set
- The blue sign is not set



This icon is displayed in the middle right of the status bar.

The upper right corner of the status bar can also display the assigned reporting rate of channel A and B, when remotely assigned by a competent authority via the AIS Network.

5.2 Set Inland Voyage Parameters

Voyage related parameters are set in the *AIS Voyage* view. The following parameters are specific for the Inland AIS Mode:

- Blue sign status can be defined as Set, Not Set or Not Available. If the transponder has been configured to receive blue sign status from an external switch, this setting will be locked as 'External'
- Number of blue cones (hazardous cargo indication)
- Loaded or Unloaded status
- Draught and Air-Draught
- Number of assisting tug-boats
- Number of crew, passenger and personnel
- Reg App Flags (to be used as devised by competent authority)



58° 23.8241' N   IAIS 15:32 UTC

15° 41.9943' E

AIS VOYAGE SETTINGS

Parameter	Value
-General AIS-	
Nav Status	Under Way Using Engine
Destination	WIENNA
ETA (mm-dd hh:mm)	04-05 13:00 UTC
Cargo	Non Hazardous
-Inland AIS-	
Blue Sign	Not Available

Apply and Exit **Get Default**



58° 23.8244' N   IAIS 15:33 UTC

15° 41.9941' E

AIS VOYAGE SETTINGS

Parameter	Value
Blue Cones	Unknown
Loaded/Unloaded	Not Available
Draught	1.10 m
Air-Draught	2.80 m
Assisting Tug-Boats	0
Crew Members	24
Passengers	153

Apply and Exit **Get Default**

58° 23.8245' N   IAIS 15:34 UTC

15° 41.9942' E

AIS VOYAGE SETTINGS

Parameter	Value
Draught	1.10 m
Air-Draught	2.80 m
Assisting Tug-Boats	0
Crew Members	24
Passengers	153
Personnel	0
Reg App Flags	0

Apply and Exit **Get Default**

5.3 View Other Targets

This section describes Inland AIS Mode specific functions for viewing other Inland targets which appears in the *Target List*, *Extended Info* and *Plot* views.

5.3.1 Target List

In the *Target List* view, the status of the blue sign for inland targets is indicated by the icon before the ship's MMSI. A filled icon indicates that the blue sign is set and an unfilled icon that the blue sign is not set. An 'I' icon indicates an inland target with blue sign status 'not available'. A target symbol without an additional icon indicates a Class A target. Class B targets are indicated by 'B'.

MMSI	Name	RNG	BRG	1
4545	ISABELLE	0.0	103	▲
20023	MICHELLE	5.3	60	
20022	CATRINE	6.9	106	
20024	YVETTE	9.0	37	1
20006	DAGNY	15	46	
20003	ELIZA	17	296	
20004	ANNA	17	65	
20018	JOHANNA	18	261	▼

58° 23.8244' N
15° 41.9941' E
IAIS
14:17 UTC
TARGET LIST All Targets Range Unit: Nm




Extended Info Show Sector Send SRM Send Text Message

5.3.2 Extended Info

The *Extended Info* view presents several new Inland specific parameters:

- The target's blue sign as indicated by a filled (set) or unfilled (not set) square
- The target's SOG, COG and HDG accuracy, indicated by L (Low) or H (High)
- The target's draught with centimeter accuracy
- The target's loaded status, being either Loaded or Unloaded
- The target's euro number
- The target's ship type, being one of the Inland ship types
- The target's cargo, including indication of blue cones in addition to the normal AIS classification

The view with its three different lower parts is illustrated in the figures below.

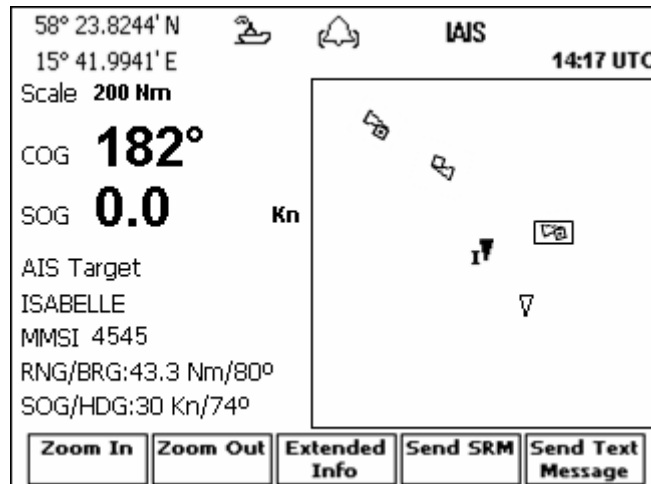
58° 23.8244' N			IAIS	14:17 UTC
15° 41.9941' E				
ISABELLE 				
Call Sign: XYZ1234		MMSI: 4545		
BRG: 80°		58° 31.4509' N		
RNG: 43 Nm		17° 03.5645' E		
Nav Status: Under Way Using Engine				
COG: 74.8°		HDG: 74°		
SOG: 30.0 Kn		ROT: 0		
Quality: RAIM, Pos: H				
DTE: Not Available	Reg. App: 0	Age: 9 s		
Show Next				

58° 23.8244' N			IAIS	14:17 UTC
15° 41.9941' E				
ISABELLE 				
Call Sign: XYZ1234		MMSI: 4545		
Bearing/Range		58° 23.8239' N		
93° / 0.0 Nm		15° 41.9943' E		
Destination: STOCKHOLM				
ETA: 24 Aug 11:34 UTC				
Draught: 5.00 m		Loaded		
Show Next				

58° 23.8244' N			IAIS	14:17 UTC
15° 41.9941' E				
ISABELLE 				
Call Sign: XYZ1234		MMSI: 4545		
BRG: 80°		58° 23.8239' N		
RNG: 43 Nm		15° 41.9943' E		
Euro No: 343434				
Type: Passenger Ship, Ferry, Cruise				
Cargo: Non Hazardous / 0 Blue Cones				
Dim: L: 30, B: 12 (25, 5, 6, 6 m)				
Sync: UTC Direct, Pos. Sensor: GPS				
Show Next				

5.3.3 Plot

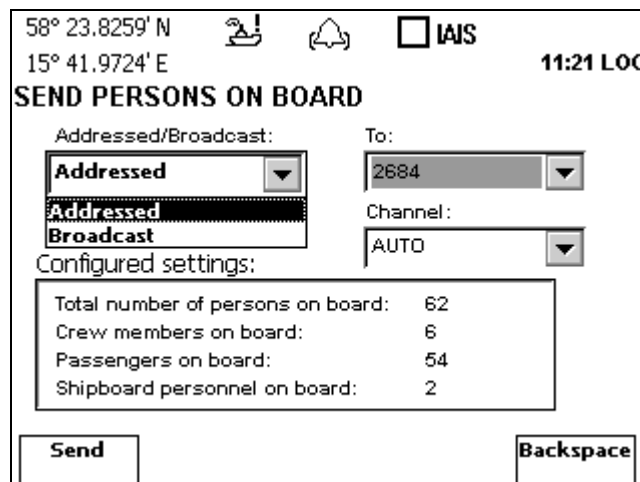
The *Plot* view indicates the status of the blue sign for inland targets. A set blue sign is indicated by a filled square by the plotted target, and a not set blue sign is indicated by an unfilled square. An 'I' icon is used for inland targets with blue sign status 'not available'. Non-Inland (Class-A) targets do not have any square by them. Class-B targets are indicated by a 'B' appended to the target icon.



5.4 Send Persons On Board

Whilst operating in Inland AIS mode, it is possible to send information about number of persons on board. The transmission can be addressed to a specific target or broadcast to all targets within range. The actual figures to send are defined in the *AIS Voyage Settings* view as described above.



Transmissions are initiated from the *Send Persons On Board* view. This view is accessed by pressing the *MODE* key followed by function key *ALARMS & MSGS*, and then pressing function key *Persons On Board*.



5.5 Send ETA and Read RTA



Whilst operating in Inland AIS mode, it is possible to send an estimated time of arrival (ETA) to for example a lock, bridge or terminal. It is also possible to read a received recommended time of arrival (RTA) sent in response to the ETA. These functions are accessible in the *Send ETA* and *Inland RTA* views of the *Alarms & Msgs* mode.

The views are accessed by pressing the **MODE** key followed by function key **ALARMS & MSGS**, **PAGE** key and then pressing function key **Inland ETA/RTA**. This brings forth the following view.

58° 23.8245' N			IAIS	15:49 UTC
15° 41.9937' E				
ETA/RTA AT LOCK/BRIDGE/TERMINAL				
Send ETA	Inland RTA			

5.5.1 Send ETA

The *ETA at Lock/Bridge/Terminal* view is used to send an estimated time of arrival (ETA) to a lock, bridge or terminal. The view is illustrated below.

58° 23.8242' N			IAIS	15:51 UTC
15° 41.9941' E				
ETA AT LOCK/BRIDGE/TERMINAL				
ETA	<input type="text" value="04-04 15:51"/>	UTC To	<input type="text"/>	<input type="text"/>
UN Country / Location Code	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Fairway Section No./Hecto.	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Terminal Code	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Tugboats (7=N/A)	<input type="text" value="0"/>	Airdraught	<input type="text" value="2.80"/>	m
Send ETA	Backspace			

Enter the ETA and the MMSI of the receiver station. Also enter, as appropriate, the following parameters for the ETA: country and location code, fairway section number and fairway hectometer, terminal code, number of tugboats and air-draught.

To edit a parameter, follow the steps outlined below.

1. Use the arrow keypad to select parameter to edit and press **ENTER**.
2. If the parameter to edit is a drop-down list, select the desired parameter using the \wedge \vee keys.



If the parameter to edit is number or text, enter the desired value using the alphanumeric keypad.

Note: The MMSI can be selected using both the \wedge \vee keys and numerically using the alphanumeric keypad.

3. Press **ENTER** when done.
4. Repeat step 1 – 3 for each parameter to edit.
5. When done, press function key **Send ETA** to send the message to the selected receiver.

5.5.2 Read RTA

The *RTA at Lock/Bridge/Terminal* view is used to read received recommended time of arrival (RTA) messages. The view is illustrated below.

58° 23.8245' N			IAIS	15:53 UTC
15° 41.9944' E				
RTA AT LOCK/BRIDGE/TERMINAL				
RTA	<input type="text"/>	UTC	From	<input type="text"/>
UN Country / Location Code	<input type="text"/>	<input type="text"/>		
Fairway Section No./Hecto.	<input type="text"/>	<input type="text"/>		
Terminal Code / Op. Status	<input type="text"/>	<input type="text"/>		
MMSI	Recommended Arrival	Read		
				<input type="button" value="Delete"/>

To read a received RTA message, select it in the list in the lower part of the view using the \wedge \vee keys.

To delete a received RTA message, first select it in the list using the \wedge \vee keys and then press function key **Delete**.

The Operational Status (Op. Status) parameter may have any of the values Operational (oper.), Limited Operation (limited), Out of Order (not oper.) or Not Available (not avail.).

5.6 Water Levels

In Inland AIS mode, it is possible to view water level information transmitted in the AIS network.

This information is accessed by pressing the **MODE** key followed by function key **ALARMS & MSGS**, and then pressing the **PAGE** key followed by function key **Water Levels**.

58° 23.8244' N		IAIS		14:17 UTC	
15° 41.9941' E					
WATER LEVELS					
Country	Gauge Id	Water Level			
SE	1	+3.40 m			
SE	145	Unknown			
SE	1025	-13.64 m			
SE	1041	0.00 m			
Details					

The function key **Details** will provide access to the following view for a highlighted item in the list.

58° 23.8244' N		IAIS		14:17 UTC	
15° 41.9941' E					
WATER LEVEL DETAILS					
Header	Data				
UN Country Code	SE				
Gauge Id	1025				
Water Level	-13.64 m				
Last Update	02 May 15:12 LOC				
Age	37 min				

The water level information is stored in non permanent memory in the display and will thus be erased as soon as the display is switched off. Any water level will also be erased automatically following a preset time from the last update. This time can be configured as described above from 1 minute to 99 hours and 59 minutes. The default value is three hours.

6 REFERENCE DOCUMENTS

- | | | |
|----------|--------------|---|
| Ref. [1] | 7000 108-011 | Installation Manual, R4 AIS Class A
Transponder System |
| Ref. [2] | 7000 108-131 | Operator's Manual, R4 AIS Class A
Transponder System |

APPENDIX 1: R4 INLAND AIS TRANSPONDER CABLE WIRING DIAGRAM

R4 Inland AIS Transponder cable wiring diagram valid for signal cable **7000 108-317 rev. A** and Power Cable **7000 108-032 rev. C**

