



# SAAB R5 SUPREME AIS Installation Short Instruction

7000 118-363 D2

R5 SUPREME AIS

*This quick installation guide serves as a complement to the standard manuals found on the documentation CD. It is designed to give immediate access to essential information when executing an installation and a functionality test. **Installation of the R5 SUPREME AIS Transponder System should always be carefully planned and executed by skilled personnel.***

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## RECOMMENDED PHYSICAL LOCATION

Please consult the complete system manual P/N: 7000 118-300 for physical location and mounting aspects of the system units and the VHF and GNSS antennas.

## SYSTEM MODE

**Important:** The R5 SUPREME CDU can be set up to operate in different system modes, **AIS, Navigation or a Combined AIS and Navigation mode.**

This short instruction deals with AIS functions only. If Navigation system functions are activated, additional setup will be necessary.

### Physical

R5 SUPREME AIS Transponder  
Size W x H x D: 227x77x192 [mm]  
R5 SUPREME CDU  
Size W x H x D: 255x140x84 [mm]  
Gimbal Mount  
Size W x H x D: 295x170x84 [mm]

### Power

R5 SUPREME AIS Transponder  
Input 12/24 VDC (Max 30 VDC)  
Power Consumption: 20W (60W peak)  
R5 SUPREME CDU  
Input 12/24 VDC (Max 30 VDC)  
Power Consumption: 13W

### GPS Receiver (AIS internal)

Receiver: 50 CH  
Frequency: L1 (1575.42 MHz)  
Update Rate: 2 Hz  
Position accuracy (SA off)  
Position <2.5 m GPS (CEP, 50%)  
Antenna feeding: 5 VDC

### Electrical Interfaces

R5 SUPREME AIS Transponder

RS 422 Port	Default speed (bps)
Pilot In/Out	38400
ECDIS In/Out	38400
LR In/Out	9600
Sensor 1 In/Out	4800
Sensor 2 In/Out	4800
Sensor 3 In/Out	4800

*Note: RTCM-104 corrections are accepted on any of the ports above,*

Signal connector RS422: 26 pin HD-SUB (M)  
Signal connector I/O: 26 pin HD-SUB (F)  
Ethernet connector: RJ45  
Power connector: 4 pin ConXall (M)  
GPS 50 ohm antenna connector TNC female  
VHF 50 ohm antenna connector BNC female

R5 SUPREME CDU

RS 422 Port	Default speed (bps)
CDU Pilot In/Out	38400

Ethernet connector: RJ45  
Power connector: 4 pin ConXall (M)

### Cables (recommended)

VHF and GPS RG214/U  
Sensors e.g. Gyro RFE-HFI 2x2x0.75 mm<sup>2</sup>  
Ethernet Cable CAT-5

### VHF Transceiver

Frequency 156-163 MHz  
Output power 1/12.5 W  
Channel bandwidth 25 kHz  
Bit Rate 9600 bps  
Intervals between position reports 1-180 s  
Modulation FM-GMSK/GFSK  
Transmitter 1  
Receivers 3  
Transceiver Sensitivity <-107 dBm

### Environmental data

Protected environment (IEC 60945)  
Operating temperature -15 °C to 55 °C

### Compass safe distance

R5 SUPREME AIS Transponder  
65 cm to standard magnetic compass  
40 cm to steering magnetic compass  
R5 SUPREME CDU  
75 cm to standard magnetic compass  
50 cm to steering magnetic compass

### The R5 SUPREME AIS Transponder System is compliant with the following Standards

IMO Performance Standard for AIS (MSC 74(69) Annex 3)  
ITU-R M. 1371-5  
ITU-R M. 825-3  
ITU-R M. 1084-5  
IEC 61993-2 Edition 2  
IEC 61162-1/2 Edition 4/1 (NMEA 0183, Version 4.0)  
IEC 61108-1 Edition 2  
IEC 60945 Edition 4  
IEC 62288 Edition 2  
IEC 62923-1 Edition 1  
IALA Guidelines on AIS

Specifications subject to change without notice



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## INSTALLATION

Connect the system as detailed below.

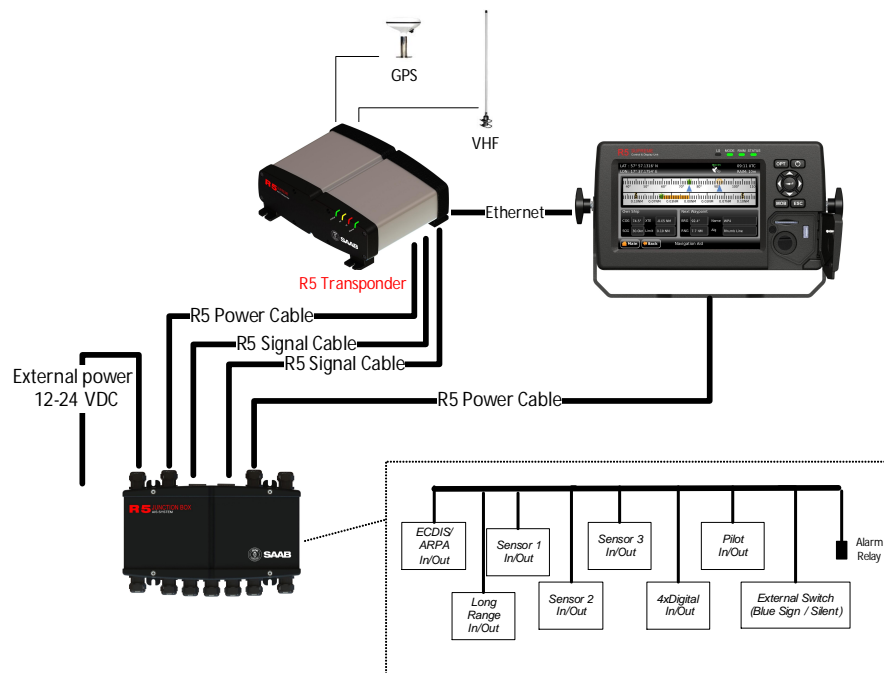
Connect External GNSS sensor, and if available Heading and Rate Of Turn sensors, to the Junction box Sensor inputs.

Connect External ECDIS to Junction box ECDIS port.

ARPA displays with AIS support may be connected to Junction box ECDIS or Pilot port.

*Note: An additional Pilot port for temporary access to AIS data is available under the CDU front hatch.*

Connect the alarm relay to alarm/alert system.



System overview

## INITIAL SET UP

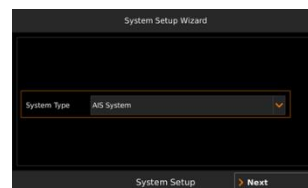
### SYSTEM POWER UP

The R5 SUPREME AIS Transponder and CDU units will start to operate when power is applied. The system is fully operational within two minutes.

### SETUP WIZARD

The first time the R5 CDU is powered up, a setup wizard will be launched that will guide through the system setup

Make sure the transponder has power and is connected by network to the R5 CDU before continuing.



Set up the system as an AIS system and follow the set up guide. Make sure to configure network unique IP and LWE ID for the transponder and CDU. Default AIS user password is **user** in lower case letters.

## SYSTEM CONFIGURATION

Set up the following parameters under: *Main Menu* → *Maintenance* → *Configuration* → *AIS* → *Ship Static*

- MMSI
- IMO
- Call Sign
- Ship Name
- Height over Keel
- Ship Type

### SET SHIP DIMENSIONS

Set up the ship dimension parameters under: *Main Menu* → *Maintenance* → *Configuration* → *AIS* → *Ship Dimensions*



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There are two methods for setting Ship Dimensions. The configuration parameter "Ship Size Mode" under: **Main Menu → Maintenance → Configuration → Interface → Misc. Interfaces** can be set to "Standard" or "Simplified" (default).

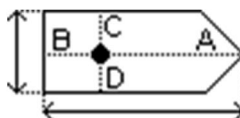
If external system will be used for full AIS configuration including ship size/antenna configuration, Standard Mode is recommended unless the external system integration has been verified with R5 specifically.

### Standard Mode

In this mode data is entered exactly as it will be reported on VHF link.

Input:

- A, B, C, D for internal antenna [m]
- A, B, C, D for external antenna [m]

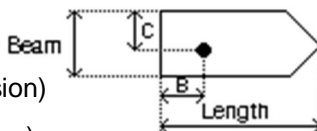


### Simplified Mode (default)

In **Simplified mode** the transponder will automatically calculate and correctly round the A,B,C and D values reported on the VHF link from Length, Beam, X and Y.

Input:

- Length x.x [m] (one decimal precision)
- Beam x.x [m] (one decimal precision)
- B, C for internal antenna relative to ship x.x [m] (one decimal precision)
- B, C for external antenna relative to ship x.x [m] (one decimal precision)



## SYSTEM FUNCTIONAL TEST

### TRANSPONDER STATUS LED'S

Normal transponder operation can be verified using the LEDs in the front. TX and RX LEDs will flash during VHF TX and RX.

System Status	Status LED
Normal Operation	Solid GREEN
Unacknowledged active alerts	Flashing RED
Acknowledged active alerts	Solid RED
Power failure	OFF

### CDU STATUS LED'S

The Status LEDs on the CDU front shall be interpreted in the same way as the Transponder Status LED.

Note: LEDs will behave differently during boot. Allow two minutes from power on before examination of LED status.

### ALERT LIST

Make sure no unexpected alerts are active. **Main Menu → Status → Alert List**

Disable any active alerts not applicable for the installation in the Alert Configuration mode. **Main Menu → Maintenance → Configuration → Alert → AIS Alert**

### TIME AND DATE

Verify system time and date in the upper right corner. If incorrect, the transponder internal GPS does not have a position fix. This will also be indicated by an alert "UTC Sync Invalid".

### GPS STATUS

Verify GPS antenna installation quality in the GPS Status View

**Main Menu → Status → AIS → AIS Internal GPS Status**

### VHF COMMUNICATION TEST

Verify two way VHF communications with other vessels using the Communication Test mode. **Main Menu → Maintenance → Communication Test**



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## JUNCTION BOX INTERFACES

Terminal Marking	Pin Marking	Signal	Type
POWER IN	+	Ext Power In +	12/24 V DC in
POWER IN		No connection	-
POWER IN	-	Ext Power In -	0 V DC
CAN BUS	P	CAN Bus P	Differential CAN
CAN BUS		No connection	-
CAN BUS	N	CAN Bus N	Differential CAN
R5 POWER	+	R5 Power +	<b>R5 Power Cable Red</b>
R5 POWER		No connection	-
R5 POWER	-	R5 Power -	<b>R5 Power Cable Black</b>
R5 POWER	R	R5 Power R	<b>R5 Power Cable Brown</b>
R5 POWER	F	R5 Power F	<b>R5 Power Cable Orange</b>
ECDIS	TX-A	ECDIS TX-A	RS422 transmit
ECDIS	TX-B	ECDIS TX-B	RS422 transmit
ECDIS	GND	ECDIS GND	RS422 isolated signal ground
ECDIS	RX-A	ECDIS RX-A	RS422 receive
ECDIS	RX-B	ECDIS RX-B	RS422 receive
LONG RANGE	TX-A	Long Range TX-A	RS422 transmit
LONG RANGE	TX-B	Long Range TX-B	RS422 transmit
LONG RANGE	GND	Long Range GND	RS422 isolated signal ground
LONG RANGE	RX-A	Long Range RX-A	RS422 receive
LONG RANGE	RX-B	Long Range RX-B	RS422 receive
SENSOR 2	TX-A	Sensor 2 TX-A	RS422 transmit
SENSOR 2	TX-B	Sensor 2 TX-B	RS422 transmit
SENSOR 2	GND	Sensor 2 GND	RS422 isolated signal ground
SENSOR 2	RX-A	Sensor 2 RX-A	RS422 receive
SENSOR 2	RX-B	Sensor 2 RX-B	RS422 receive
SENSOR 1	TX-A	Sensor 1 TX-A	RS422 transmit
SENSOR 1	TX-B	Sensor 1 TX-B	RS422 transmit
SENSOR 1	GND	Sensor 1 GND	RS422 isolated signal ground
SENSOR 1	RX-A	Sensor 1 RX-A	RS422 receive
SENSOR 1	RX-B	Sensor 1 RX-B	RS422 receive
EXT SWITCH	F	Ext Switch F	External switch

EXT SWITCH		No connection	-
EXT SWITCH	R	Ext Switch R	External switch
AUX PWR	+	AUX Power +	12/24 V DC out
AUX PWR		No connection	-
AUX PWR	-	AUX Power -	0 V DC out
SENSOR 3	TX-A	Sensor 3 TX-A	RS422 transmit
SENSOR 3	TX-B	Sensor 3 TX-B	RS422 transmit
SENSOR 3	GND	Sensor 3 GND	RS422 isolated signal ground
SENSOR 3	RX-A	Sensor 3 RX-A	RS422 receive
SENSOR 3	RX-B	Sensor 3 RX-B	RS422 receive
GPIO OUT	0	GPIO OUT 0	General binary output
GPIO OUT	1	GPIO OUT 1	General binary output
GPIO OUT	2	GPIO OUT 2	General binary output
GPIO OUT	3	GPIO OUT 3	General binary output
GPIO OUT	GND	GPIO OUT GND	GPIO out signals ground
GPIO IN	0	GPIO IN 0	General binary input
GPIO IN	1	GPIO IN 1	General binary input
GPIO IN	2	GPIO IN 2	General binary input
GPIO IN	3	GPIO IN 3	General binary input
GPIO IN	GND	GPIO IN GND	GPIO in signals ground
ALARM RELAY	NC	Alarm Relay NC	Normally closed
ALARM RELAY	COM	Alarm Relay COM	Common
ALARM RELAY	NO	Alarm Relay NO	Normally open
PILOT PORT	TX-A	Pilot Port TX-A	RS422 transmit
PILOT PORT	TX-B	Pilot Port TX-B	RS422 transmit
PILOT PORT	GND	Pilot Port GND	RS422 signal ground
PILOT PORT	RX-A	Pilot Port RX-A	RS422 receive
PILOT PORT	RX-B	Pilot Port RX-B	RS422 receive
USB	USB	USB 1.1	Service / SW Upgrade

### R5 Power Cable, 7000 118-077, A

Pin	Signal Name	Colour
1	12/24VDC positive	Red
2	GND	Black
3*	External Switch (R)	Brown
4*	External Switch (F)	Orange