SIMRAD

RS90
Installation Manual

ENGLISH

simrad-yachting.com

Preface

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All screens in this manual are simulated.

For free owner's manuals and the most current information on this product, its operation and accessories, visit our web site: www.simrad-yachting.com

Navico Holding AS is not responsible for any changes or modifications to the radio not expressly approved by Navico AS as the responsible entity for its compliance. Modifications could void the user's authority to operate the radio.

Compliance statements

DISCLAIMER: It is the owner's sole responsibility to install and use the instrument and peripheral components in a manner that will not cause accidents, personal injury or property damage. The user of this product is solely responsible for observing safe boating practices.

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Governing Language: This statement, any instruction manuals, user guides and other information relating to the product (Documentation) may be translated to, or has been translated from, another language (Translation). In the event of any conflict between any Translation of the Documentation, the English language version of the Documentation will be the official version of the Documentation.

This manual represents the RS90 as at the time of printing. Navico Holding AS. and its subsidiaries, branches and affiliates reserve the right to make changes to specifications without notice.

IMPORTANT

1. DSC functions will not operate on the RS90 until your MMSI has been entered.

2. The radio channels installed into this Simrad VHF radio may vary from country to country depending upon the model and government or national communications authority regulations.

3. Navico recommends that you check the radio operating licensing requirements of your country before using this Simrad VHF radio. The operator is solely responsible for observing proper radio installation and usage practices.

4. A DSC warning label is supplied with this Simrad VHF radio. To comply with FCC regulations, this label must be affixed in a location that is clearly visible from the operating controls of this radio. Make sure that the chosen location is clean and dry before applying this label.

5. This radio is designed to generate a digital maritime distress call to facilitate search and rescue. To be effective as a safety device, this radio must be used only within the geographic range of a shore-based VHF marine Channel 70 distress and safety watch system. The geographic range may vary but under normal conditions is approximately 20 nautical miles.

MMSI and license information

You must obtain a user Maritime Mobile Service Identity (MMSI) and enter it into your RS90 radio in order to use the DSC functions. Similarly for the Automatic Terminal Information Service (ATIS) MMSI. Contact the appropriate authorities in your country. If you are unsure who to contact, consult your Simrad dealer.

The user MMSI is a unique nine digit number, similar to a personal telephone number. It is used on marine transceivers that are capable of using DSC (Digital Select Calling).

Depending upon your location, you may need a radio station license for the RS90 You may also need an individual operator's license.

Simrad recommends that you check the requirements of your national radio communications authorities before operating DSC functions.

RF emissions notice

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This device's antenna must be installed in accordance with provided instructions; and it must be operated with minimum 96 cm spacing between the antennas and all person's body (excluding extremities of hands, wrist and feet) during operation. Further, this transmitter must not be co-located or operated in conjunction with any other antenna or transmitter.

FCC statement

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

→ *Note:* This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a normal installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an output on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced technician for help.
- A shielded cable must be used when connecting a peripheral to the serial ports.

Industry Canada statement

This device complies with Industry Canada license-exempt RSS standard(s).

Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the devise.

Le présent appareil est conforme aux CNR d'industrie Canada applicables aux appareils radio exempts de licence.

L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pa produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication.

Conformément à la réglementation d'Industrie Canada, le présent émetteur radio peut fonctionner avec une antenne d'un type et d'un gain maximal (ou inférieur) approuvé pour l'émetteur par Industrie Canada. Dans le but de réduire les risques de brouillage radioélectrique à l'intention des autres utilisateurs, il faut choisir le type d'antenne et son gain de sorte que la puissance isotrope rayonnée quivalente (p.i.r.e.) ne dépassepas l'intensité nécessaire à l'établissement d'une communication satisfaisante.

Notice specific to the HS35 handset

This ISM device complies with Canadian ICES-001.

Maintain a minimum separation of 2.5 cm (1 inch) from the face.

Cet appareil ISM est conforme à la norme NMB-001 du Canada.

Maintenir une distance minimum de 2,5 cm (1 inch) de la surface.

CE compliance statement

This product complies with CE under R&TTE directive 1999/5/EC. The relevant Declaration of Conformity is available in the following website under the model's documentation section:

http://www.simrad-yachting.com

	Important safety information Read carefully before installation and use
⚠	**Warning:** Indicates a potentially hazardous situation that could result in death or serious injury.
⚠	**Caution:** Indicates a potentially hazardous situation that could result in minor or moderate injury.

Contents

1 About this manual

This manual describes the installation of the Simrad RS90 marine VHF radio.

For instructions on operating the radio, please see the separate manual: *Simrad RS90 Marine VHF Radio Operating Manual*.

This manual is organized as follows:

- System Overview
  Describes the components and main features of the radio.
- Preparation
  Describes the parts and tools you need to install the radio.
- Installation
  Describes the mounting instructions and electrical connections.

→ *Notes*

- Different setups of the RS90 marine VHF radio are provided for different countries, depending on the VHF radio regulations of each country.
- Diagrams in this manual are not to scale.

2 System Overview

Introduction

The Simrad RS90 VHF radio is a comprehensive solution for marine VHF radio applications.

The radio comprises:

- RS90 VHF transceiver
- One wired handset as standard, and optionally up to 3 more wired handsets. (Maximum of 4 wired handsets in total)
- One external speaker, and optionally up to 3 more external speakers
- Up to 2 optional wireless handsets

In addition to routine ship-to-ship or ship-to-shore VHF communications, the RS90 has many advanced features, including NMEA 2000 and NMEA 0183 network connectivity, which allows the radio to share information with other onboard devices, such as a GPS antenna, a chart plotter or a multi-function display.

For detailed features and specifications, see the Appendices in *Simrad RS90 Marine VHF radio Operating Manual*.

System diagram legend

1	RS90 VHF radio transceiver
2	12 VDC power supply
3	HS90 wireless handset
4	HS90 wired handset
5	External loudspeaker
6	NMEA 0183 GPS and horn button
7	AIS Data Output
8	Loud hailer speaker
9	VHF antenna with PL259 connector
10	NMEA 2000 network connection

System overview diagram
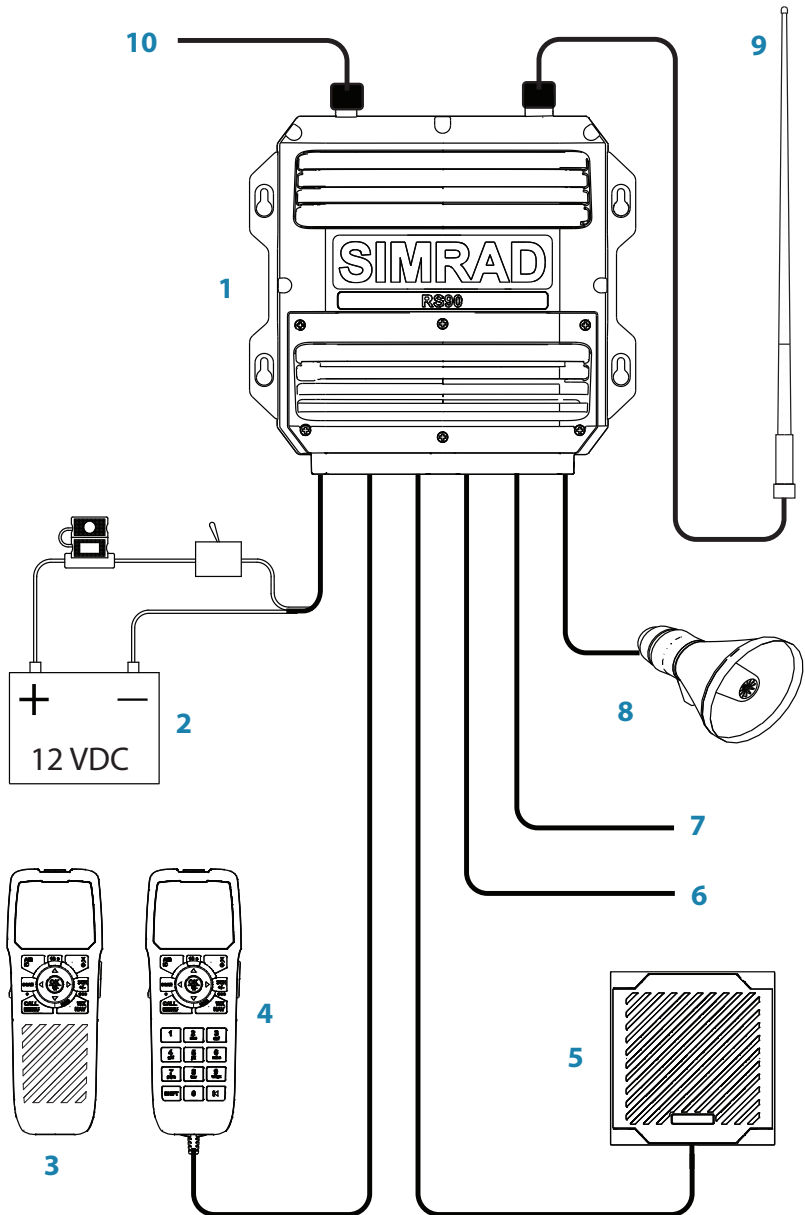
3 Preparation

⚠	**Caution:** Under extreme operating conditions, the temperature of the rear heat-sink on this radio may reach a surface temperature that is unsafe to touch. Caution is advised to prevent possible skin burns.

→ *Note:* You must obtain a Maritime Mobile Service Identity (MMSI) for the vessel before you can use the Digital Selective Calling (DSC) function of this radio. Consult your local maritime authority or radio spectrum authority to obtain your MMSI.

Checklist

The following items are included in the RS90 radio package:

Wired handset

- HS90 wired handset with cradle
- 5 m handset connector cable, including mid-cable connector.
- Mounting bracket for optional extension cable
- Silicon cover for cable connector
- Handset fasteners:
  - 3.5 mm x 15 mm self-tapping screw x2 (cable mounting bracket)
  - 3.5 mm x 10 mm self-tapping screw x2
  - 3 mm x 40 mm self-tapping screw x1
  - M3.5 x 28 mm machine screw x2
  - M3.0 x 40 mm machine screw x1
  - M3.5 nut x2
  - M3.0 nut x1
  - Spring washer x2
  - Flat washer x2
  - Spring washer x1
  - Flat washer x1

Transceiver

- RS90 transceiver unit
- 2 m power supply cable
- 8-pin terminal connector x4
- 2-pin terminal connector x2
- Spare 10 A fuse
- Transceiver fasteners:
    - M3.5 mm x 23 mm self-tapping screw x4
    - M3.5 x 28 mm machine screw x4
    - M3.5 nut x4
    - Flat washer x4

External speaker unit

- External speaker (with 5m cable)
- Foam gasket (for flush mounting)
- Plastic speaker surface mount box
    - Speaker fasteners:
        - M3 x 40 mm self-tapping screw x4
        - M3 x 10 mm self-tapping screw x4
        - M3 x 10 mm machine screw x4
        - M3 x 40 mm machine screw x4
        - M3 nut x8
        - Spring washer x8
        - Flat washer x8

Documentation

- Operating Manual
- Installation Manual
- Warranty Card
- DSC Warning Label
- Declaration of Conformity document (where applicable)
- → *Note:* A VHF antenna is not provided by Simrad. An antenna with a PL259 plug is required. Consult your Simrad dealer for advice if required.

4 Installation

Positioning

Transceiver

Make sure that the position of the transceiver:

- Is at least 1 m (39 inches) from the VHF antenna.
- Allows easy connection to the 12 VDC electrical source, the antenna, and the NMEA 2000 connection.
- Is at least 45 cm (18 inches) from any magnetic compass to avoid magnetic deviation of the compass during radio operation.
- Provides suitable space for installing the wired handset cradle(s) nearby. (A 20 m extension cable is available as an optional extra.)
- Provides reasonable access to the wiring via the top panel.

The transceiver can be positioned vertically on a bulkhead or horizontally. Avoid positions that might get wet or hot, such as in the engine compartment or close to the bilge.

Ideally, the transceiver is positioned vertically with the wiring glands facing downwards in order to prevent the ingress of water.

DSC warning label

The DSC warning label should be positioned close to the wired handset.

Installing the transceiver

1. Hold the transceiver at the chosen location and mark the 4 hole positions onto the mounting surface.
2. Drill the 4 holes where marked (maximum diameter 3.5 mm).
3. Attach the transceiver using screws or pan head machine screws.

211.2 mm (8.31")

195.1 mm (7.68")

195.7 mm (7.70")

92.4 mm (3.64")

65.0 mm (2.56")

15.5 mm (0.61")
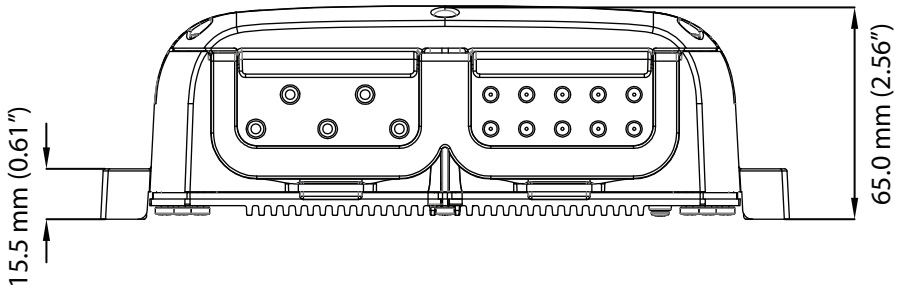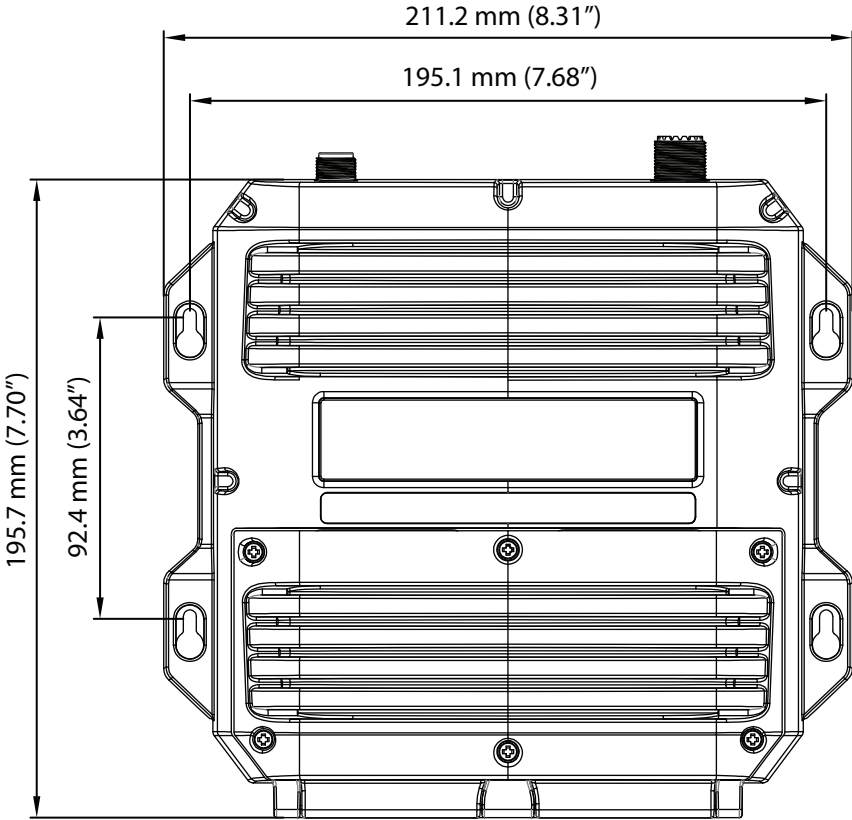
Installing a wireless handset cradle

The wireless handset has a cradle that incorporates inductive charging for the rechargeable battery.

1. Choose a suitable location that provides sufficient room for the handset to fit securely in the charging cradle.

2. Hold the cradle at the chosen location and mark the positions of the fastening holes and the wire hole onto the mounting surface.

3. Drill the holes where marked.

4. Feed the wire through the wire hole. If mounting outside, seal the wire in the hole.

5. Attach the handset cradle using screws or pan head machine screws.

6. Connect the wire to a 12 VDC source via a 1 A fuse:

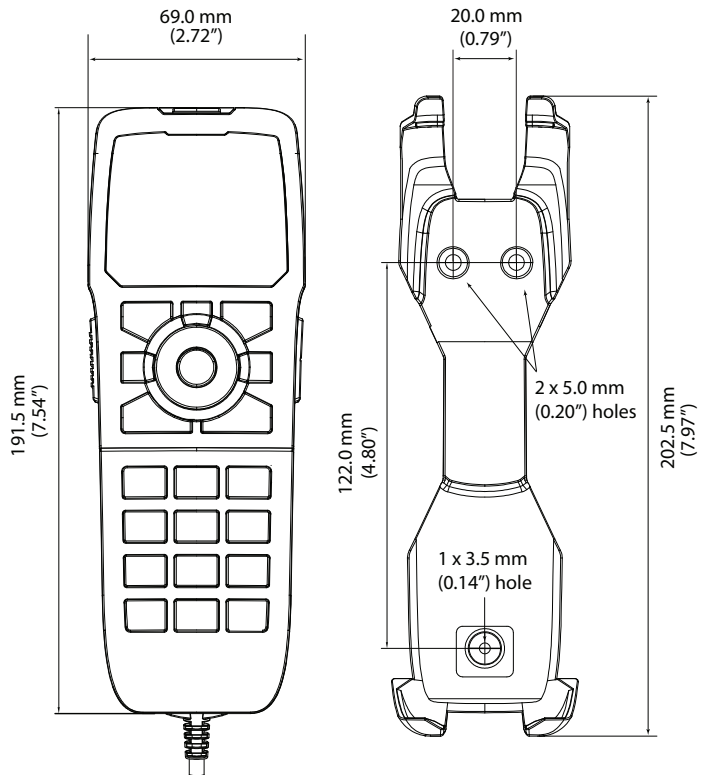   • Red wire to 12 VDC positive

   • Black wire to negative.
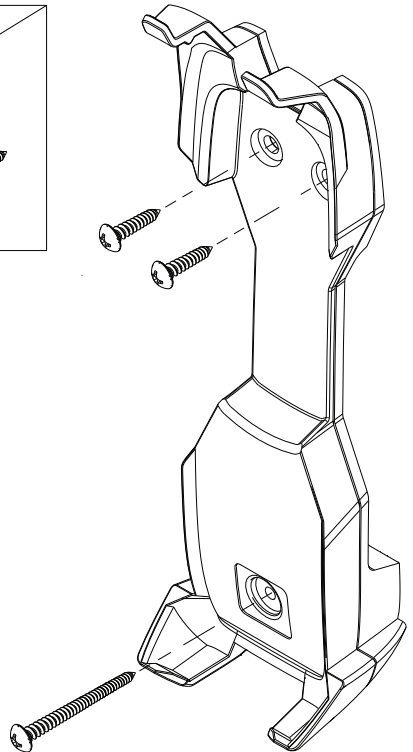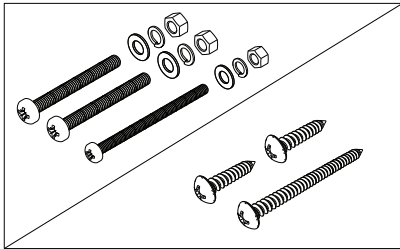
Installing a wired handset cradle

This is the same as installing a wireless handset cradle with the exception that no wiring is required.
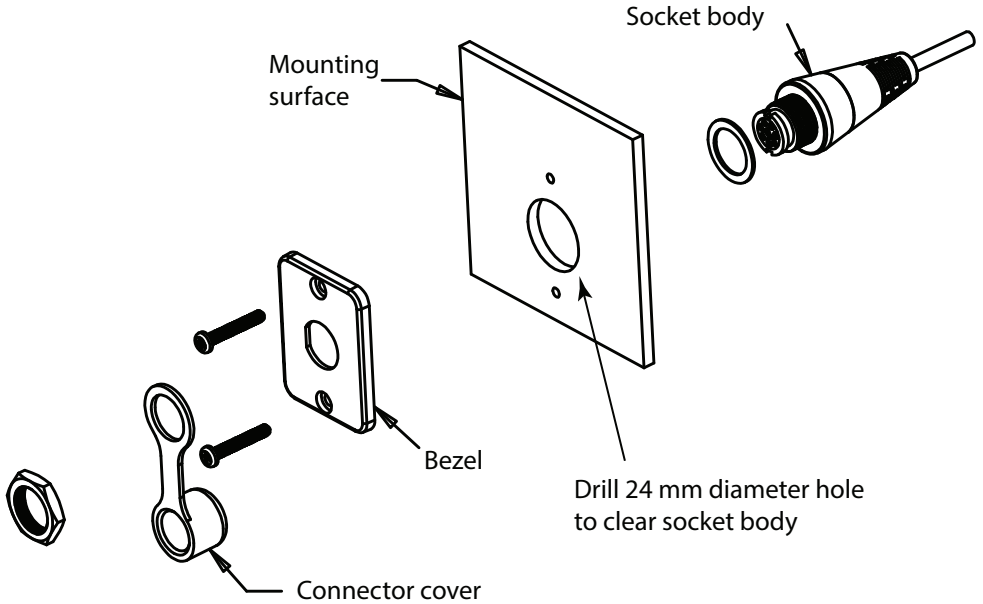
Fastenings

- Top holes
  2 x M3.5 x 28 mm machine screws, nuts and washers, or
  2 x 3.5 mm self-tapping screws

- Bottom hole
  1 x M3 x 40 mm machine screw, nut and washers, or
  1 x 3 mm x 40 mm self-tapping screw.

69.0 mm
(2.72")

20.0 mm
(0.79")

191.5 mm
(7.54")

122.0 mm
(4.80")

2 x 5.0 mm
(0.20") holes

202.5 mm
(7.97")

1 x 3.5 mm
(0.14") hole

Installing a handset cable connector

Each wired handset cable includes a connector assembly that must be installed in a bulkhead, dashboard or other suitable panel.

Socket body

Mounting surface

Bezel

Connector cover

Drill 24 mm diameter hole to clear socket body

External speakers installation options

Flush mount option

1. Fit the foam gasket to the rear of the speaker and remove the plastic trims that cover the screw holes.

2. Cut a 92 mm (3 5/8") diameter hole in the mounting surface, allowing space for the speaker's overall dimensions.

3. Temporarily fit the speaker and mark the four screw holes.

4. Drill holes of appropriate size for fasteners to be used.

5. Fit the speaker and secure with a small amount of sealant applied to the fasteners.

6. Refit the plastic trim pieces.

Fastenerss

• 4 x M3 x 10 mm machine screws, spring washers, flat washers and M3 nuts, or

• 4 x 3 mm x 10 mm self tapping screws.
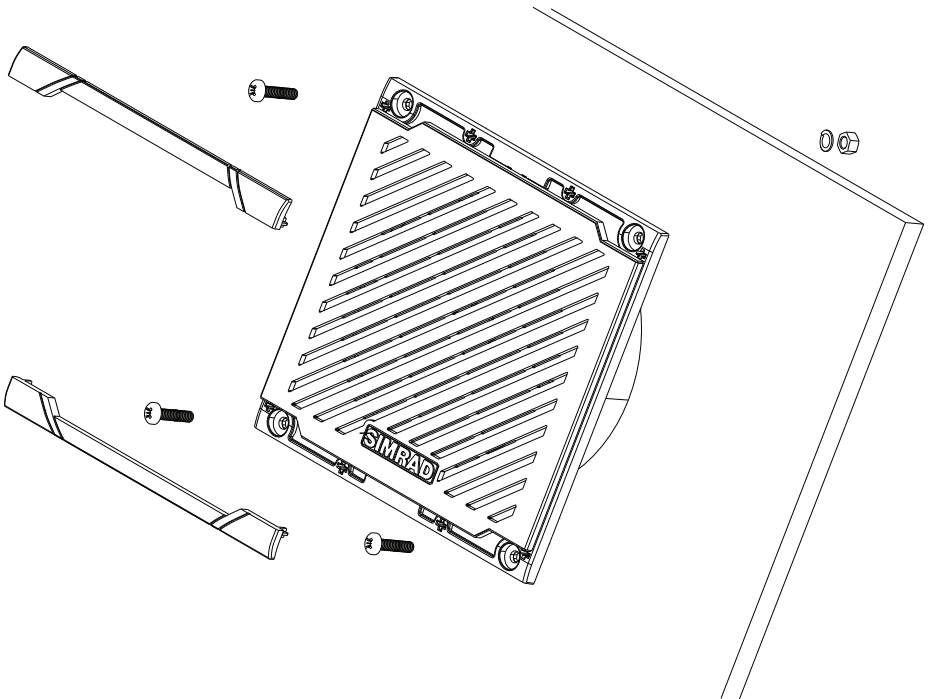
External speaker - surface mount option

1. Position the surface mount box and mark the four screw holes through it.

2. Drill a hole in the mounting surface for the speaker wire and feed the wire through the hole.

3. Seal the cable in the hole in the mounting surface.

4. Lift the plastic trims that cover the screw heads.

5. Fix the speaker with fasteners through it and the box.

6. Replace the plastic trims.

Fasteners

- 4 x M3 x 40 mm machine screws, spring washers, flat washers and M3 nuts, or
- 4 x 3 mm x 40 mm self tapping screws.
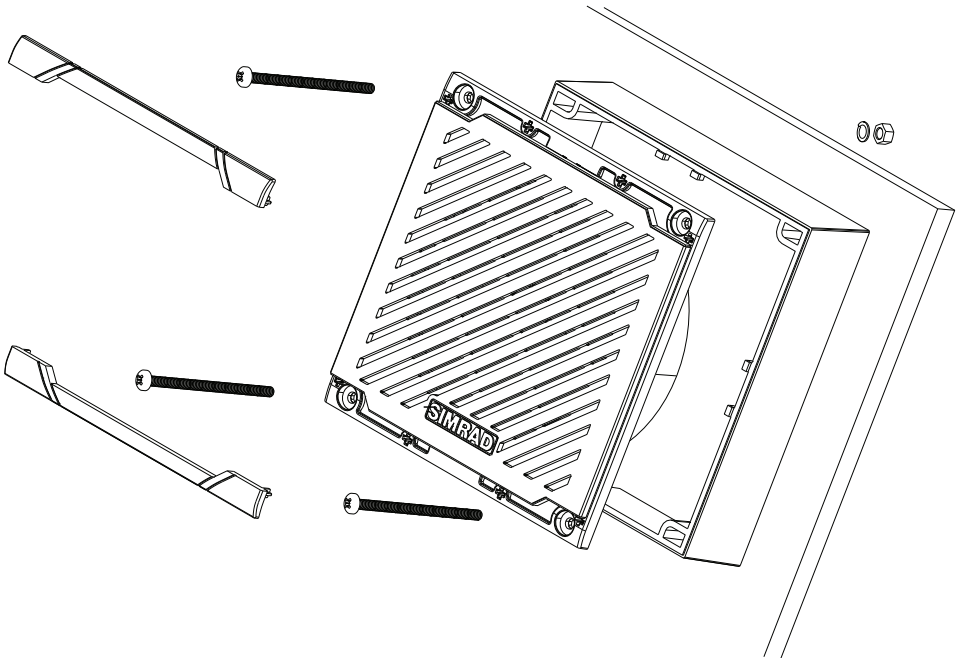
Transceiver external connectors

VHF antenna

A suitable radio antenna (not supplied) must be mounted and connected with a PL295 connector before you can operate the radio. Consult your Simrad dealer for advice, if necessary.

Always mount the VHF antenna as high as possible and at least 1 m (39 inches) from the transceiver.

NMEA 2000 (N2K) connector

The RS90 radio can be connected to an NMEA 2000 network using a cable (not supplied). For further information, see "NMEA 2000 Network" on page 26.

Transceiver internal connectors

To access the internal connectors, remove the cover plate by unscrewing the captive screws. The connectors are on the internal circuit board, which is located as shown below.
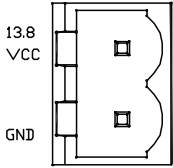
Internal
connector
blocks
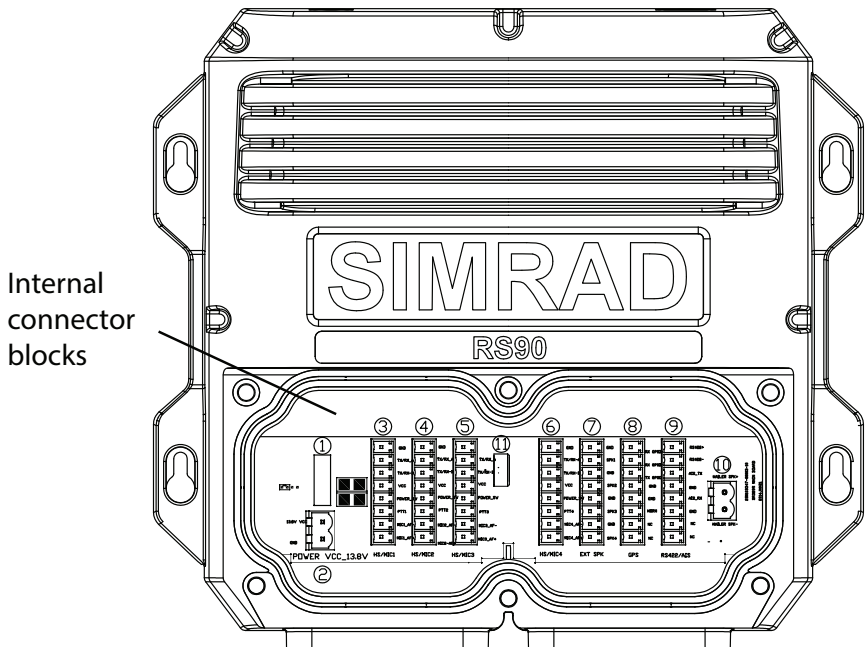
Transceiver internal connector numbering
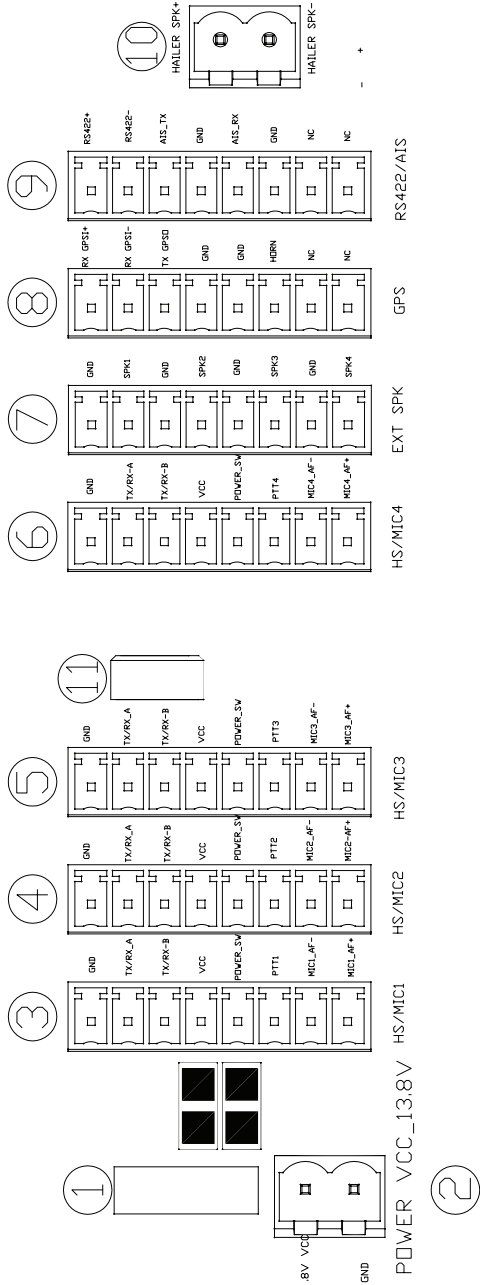
Connector 1 - Fuse

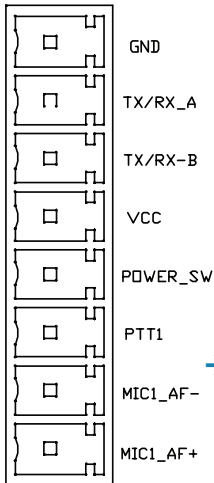Install a 10 Amp MINI® blade fuse.

Connector 2 - Power connection

13.8
VCC

GND

Label	Wire colour
VCC	Red
GND	Black

➜ *Notes:*

- Voltage: 12 VDC (10.8 VDC to 15.6 VDC)
- Ground must be connected to the vessel's common ground, which must be negative.

Connectors 3, 4, 5 and 6 - Wired handsets

GND

TX/RX_A

TX/RX-B

VCC

POWER_SW

PTT1

MIC1_AF-

MIC1_AF+

Number	Label	Wire colour
1	GND	Black
2	TX/RX_A	Blue
3	TX/RX_B	Green
4	VCC	Red
5	POWER-SW	White
6	PTT	Grey
7	MIC_AF-	Yellow
8	MIC_AF+	Orange

➜ *Notes:*

- All the necessary wires are included in the handset cable supplied.
- The wired handset cable includes a connector assembly that must be installed in a bulkhead, dashboard or other suitable panel. See page 18.
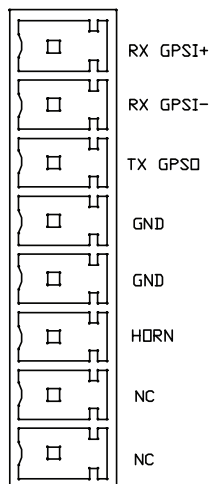
Connector 7 - External speakers
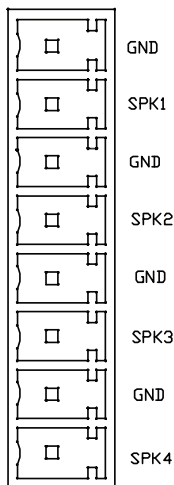
Number	Label	Wire colour
1	GND	Black
2	SPK1	Red
3	GND	Black
4	SPK2	Red
5	GND	Black
6	SPK3	Red
7	GND	Black
8	SPK4	Red

You can connect a 4 W 8 Ω or an 8 W 4 Ω speaker to each pair of speaker terminals.

```
GND
SPK1
GND
SPK2
GND
SPK3
GND
SPK4
```

Connector 8 - Horn button and NMEA 4800 bps 0183 GPS

Number	Label	Description
1	RX GPS+	NMEA0183 Input+ Balanced, RS422, GPS data input
2	RX GPS-	NMEA0183 Input- Balanced, RS422, GPS data input
3	TX GPSO	NMEA0183 Output+ Connect to ship's NMEA0183 input
4	GND	NMEA0183 Output- Single end, GND
5	GND	Wire to horn button
6	HORN	Wire to horn button
7	-	-
8	-	-

```
RX GPSI+
RX GPSI-
TX GPSO
GND
GND
HORN
NC
NC
```

→ *Note:* Use a normally-open horn button.

Connector 9 - AIS Data Output
(NMEA 0183HS 38400 bps)

```
☐  RS422+
☐  RS422-
☐  AIS_TX
☐  GND
☐  AIS_RX
☐  GND
☐  NC
☐  NC
```
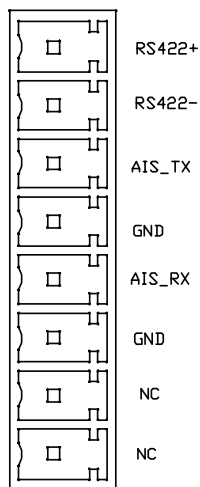
Number	Label	Description
1	RS422+	Output+ (RS-422 type) AIS RS422 data output only
2	RS422-	Output- (RS-422 type)
3	AIS_TX	Output+ (RS-232 type) Connect to PC or chart plotters
4	GND	Output- (RS-232 type)
5	AIS_RX	Not used
6	GND	Not used
7	-	-
8	-	-

Connector 10 - Loud hailer speaker

```
HAILER SPK+

◉

◉

HAILER SPK-
```
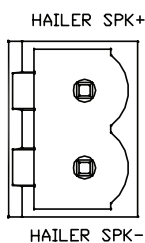
Number	Label	Description
1	HAILER SPK+	
2	HAILER SPK-	

Important: Do not short circuit these 2 connectors.

Install the hailer speaker in a forward-facing location on the boat. This is because, in addition to transmitting foghorn sounds, the hailer speaker 'listens back' when not transmitting.

→ *Note:* Use a 4-8 ohm speaker or loud hailer horn rated at no less than 30 W. Higher impedance will reduce audio output volume.

Connector 11 - programming connector

This is a Micro-USB receptacle used for factory diagnostic purposes.

Setting up the radio

→ *Note:* You must enter your User MMSI before the DSC functions of this radio will work.

See the Setup section in the RS90 Operating Manual for full setup details.

NMEA 2000 Network

The radio can be connected to an NMEA 2000 network using an NMEA 2000 compliant cable (not supplied).

1	Simrad chart plotter or MFD
2	GPS antenna
3	12 VDC supply
4	NMEA 2000 backbone with termination
5	VHF antenna
6	RS90 VHF radio transceiver

→ *Notes*

- The NMEA backbone must be terminated at each end.
- The 'drop' cable to each device must not exceed 6 m.
- Further information on NMEA 2000 is available on the Simrad website.

NMEA 2000 Network Diagram
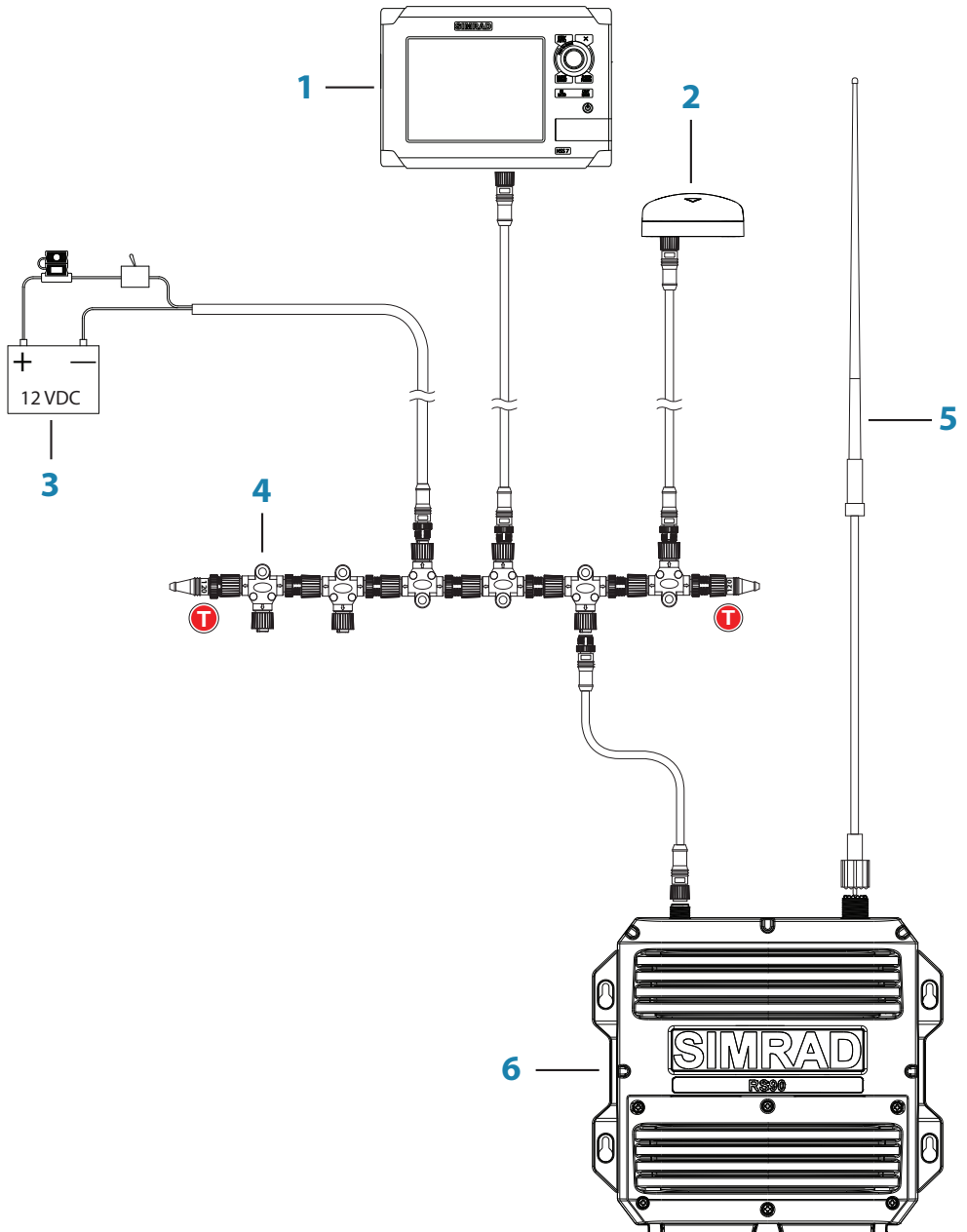
Appendix 1 - Accessories

Part number	Description
000-11226-001	HS90 handset and speaker kit
000-11227-001	RS90 transceiver
000-11228-001	HS90 handset
000-11229-001	External speaker
000-10791-001	HS35 wireless handset
000-	20 m extension cable for handset

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