

Saab TransponderTech

# INSTALLATION GUIDE

## J4N Junction Box for R4 Navigation System



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**ii Disclaimer**

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**iii Validity of this Document**

This installation guide is valid for the J4N Junction Box, part number 7000 109-121

**iv Installation Guide Part Number and Revision**

Part number 7000 109-126, revision B

**v Disposal Instructions**

Broken or unwanted electrical or electronic equipment parts shall be classified and handled as 'Electronic Waste'. Improper disposal may be harmful to the environment and human health. Please refer to your local waste authority for information on return and collection systems in your area.

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## 1 INTRODUCTION

### 1.1 About this installation guide

This installation guide provides information to facilitate installation of the Saab TransponderTech J4N Junction Box for the R4 (D)GPS Navigation System.

As the J4N Junction Box is intended for use with the R4 Navigation System, this installation guide contains information that is relevant for this type of installation. It is important to note that more details of the R4 Navigation System installation are found in the Installation Manual for the R4 Navigation System (part number 7000 109-009).

The main part of this installation guide concerns the basic stand-alone navigation configuration. Additional information related to dual redundant and combined AIS/navigation installations are provided in chapter five.

### 1.2 Unpacking the equipment

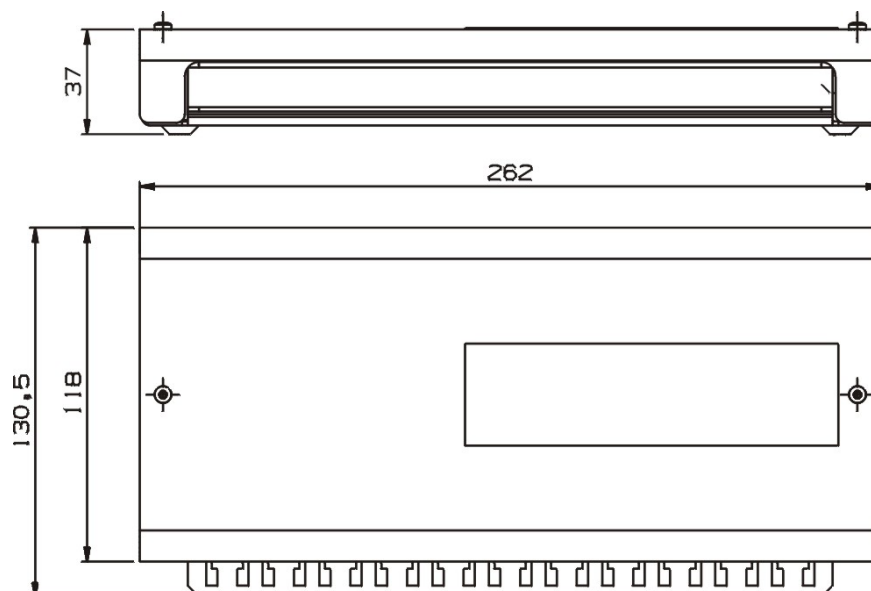
When unpacking the equipment, please check that the following is included in the delivered package, if any parts are missing, please contact the Saab TransponderTech dealer.

#### Standard J4N package:

Name	Qty.
J4N Unit	1
Mounting Screws (In plastic bag located inside the box)	4

## 2 GENERAL INFORMATION

### 2.1 Physical Size (mm)



## 2.2 Cabling

This guide details how to mount the standard cables that are included in the standard delivery package for the R4 Navigation System.

- R4 Navigation Sensor Power and Data Cable, part number 7000 109-011.
- R4 Display Power Cable, part number 7000 108-132.
- R4 Display Signal Cable, part number 7000 108-133.

The basic configuration is shown below.

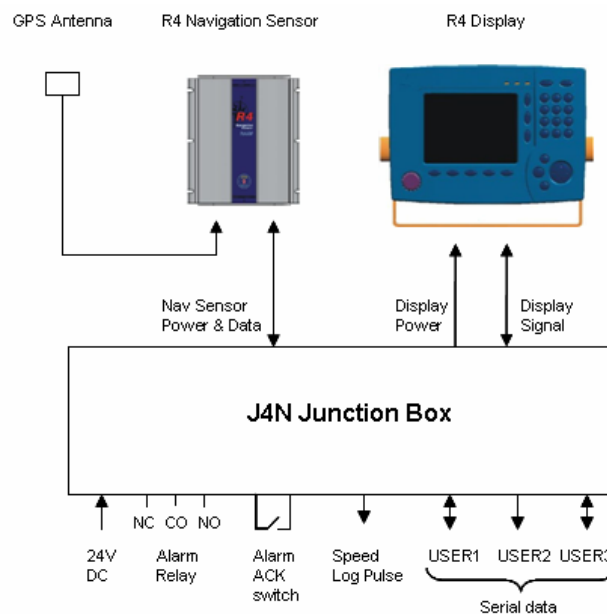


Figure 1: Overview of R4 Navigation System installation

## 2.3 Power Supply

The R4 Navigation System (sensor and display) is designed to operate on 24 volts DC. The nominal power used by the display and sensor is 11.2 W.

The J4N Junction Box includes the required fuses for the display and navigation sensor (2 and 1 Amperes respectively).

## 2.4 Clearance area (mm)

Leave a clearance around the J4N Junction Box to facilitate service and installation. See recommended clearance area below.

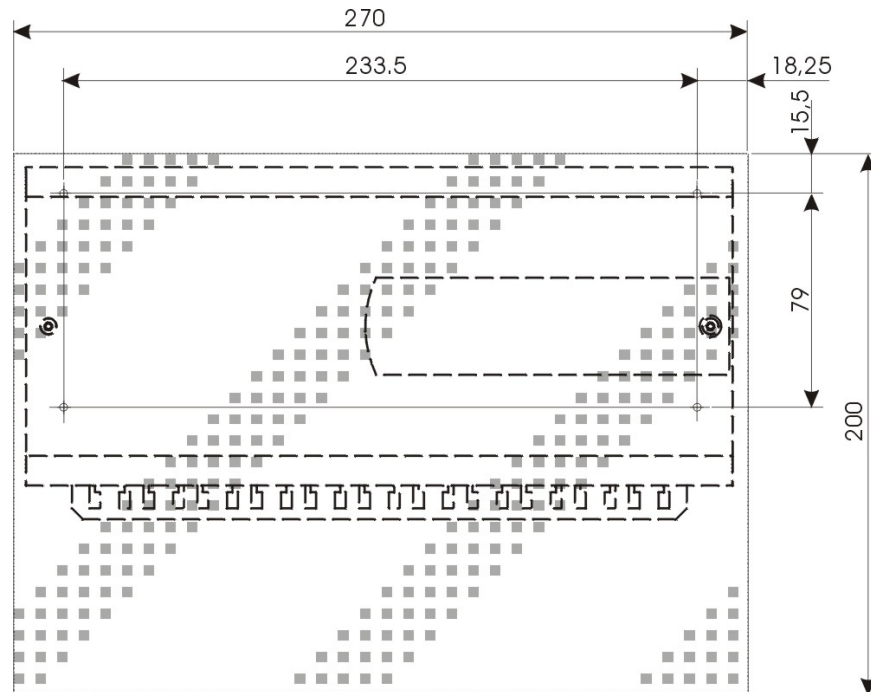


Figure 2: Recommended clearance area

## 2.5 J4N Alarm Relay

The J4N junction box includes a relay (RE1) driven by the discrete alarm output of the R4 Navigation Sensor. The relay switch may be connected to an audible alarm device or the ship's alarm system. An external switch for acknowledge of alarms may also be connected. The R4 Navigation System also facilitates alarm messages and acknowledge of alarms in serial 'NMEA' format. Refer to the R4 Navigation System installation manual for details.

## 2.6 J4N Circuit Board

The components and available connections of the J4N circuit board are shown in figure 3 and listed in table 1 below. The schematic for the J4N circuit board is included in Appendix A of this installation guide.

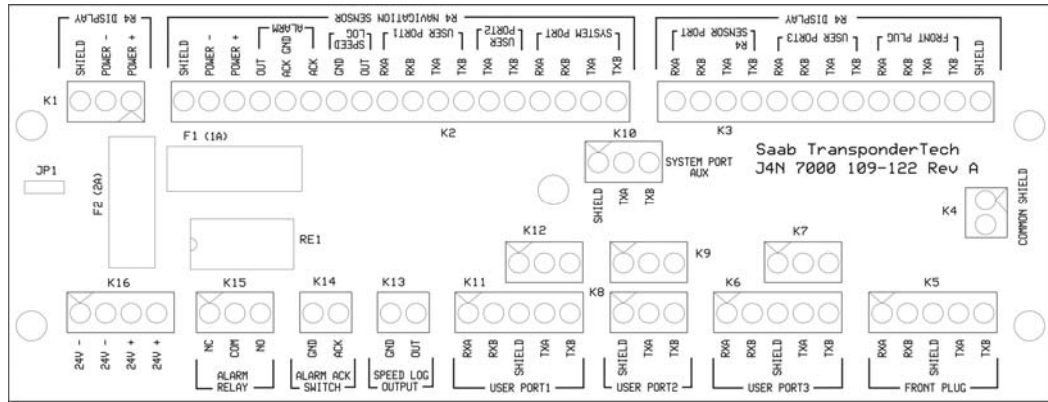


Figure 3: J4N Circuit Board Layout

Item	Description
K1	Terminal block for R4 Display power cable.
K2	Terminal block for R4 Navigation Sensor power and data cable.
K3	Terminal block for R4 Display signal cable.
K4	Terminal block for common external grounding of cable shields, if required.
K5	Terminal block for R4 Display front plug (Pilot Port).
K6	Terminal block for User Port 3.
K7	Auxiliary terminal block for User Port 3 Tx lines.
K8	Terminal block for User Port 2 (This port is Tx only).
K9	Auxiliary terminal block for User Port 2.
K10	Auxiliary terminal block for R4 Navigation Sensor System Port Tx lines.
K11	Terminal block for User Port 1.
K12	Auxiliary terminal block for User Port 1 Tx lines.
K13	Terminal block for speed log pulse output.
K14	Terminal block for external alarm acknowledge switch.
K15	Terminal block for alarm relay. ‘NC’ (normally closed) /‘NO’ (normally open) refers to the normally powered state of the relay under no-alarm conditions.
K16	Terminal block for 24V DC power. Dual terminals are available for re-distribution of power in multi-system configurations.
JP1	Jumper point for connection of signal shields to the junction box chassis, if required. Per default unpopulated (open).
RE1	Alarm relay.
F1	1 Ampere fuse for R4 Navigation Sensor.
F2	2 Amperes fuse for R4 Display.

Table 1: J4N Circuit Board Components



### 3 MOUNTING THE BOX

1. Open the lid of the J4N Junction Box
2. Fix the box on an appropriate surface with the 4 supplied screws. Use the four holes that are located in each corner of the bottom plate.
3. Connect the R4 Navigation Sensor power and data cable, the R4 Display power cable and the R4 Display signal cable as described in the next section below.
4. Connect cables to external equipment as required in accordance with table 1 and indications on the J4N board. Refer to the installation manual for the R4 Navigation system for details relating to the external interfaces if required.
5. Clamp the cables to the clamp area located on the front of the box.
6. Fix the lid to the box casing
7. If needed, also clamp the cable outside the box.

### 4 CONNECTING R4 NAVIGATION SENSOR AND DISPLAY CABLES

#### 4.1 Installing the R4 Navigation Sensor Power and Data Cable

Connect the R4 Navigation Sensor power and data cable to the J4N Junction Box terminal block K2 as indicated in figure 4 below.

Note: The shield of the R4 Navigation Sensor power and data cable is connected to power supply return. It is not connected to the other shields in J4N and may be left unconnected (and properly isolated if so required).

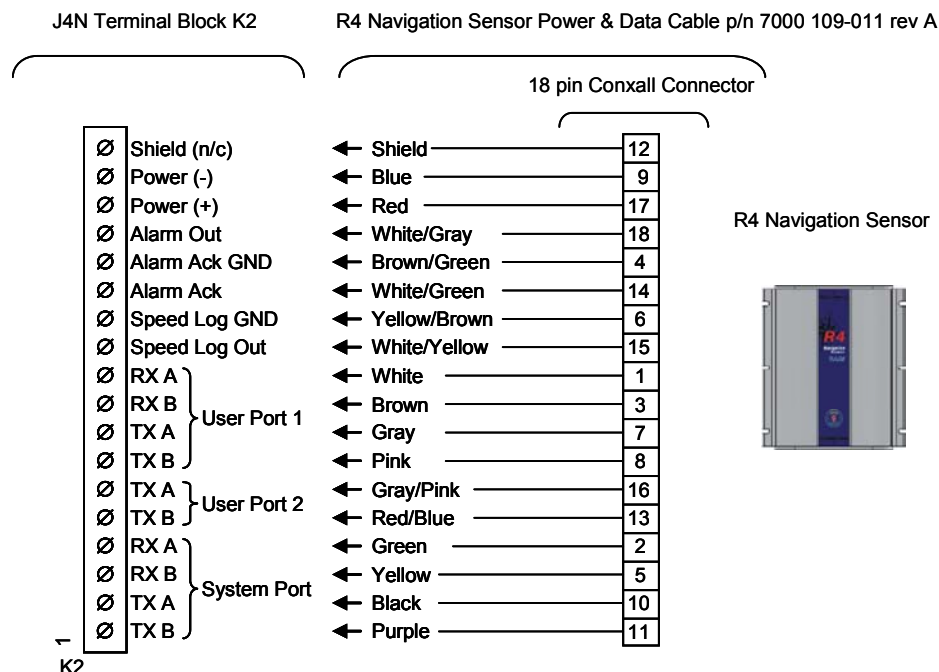


Figure 4: Connection between J4N and the R4 Navigation Sensor

### 4.2 Installing the R4 Display Power Cable

Connect the power cable for the R4 Display to the J4N Junction Box terminal block K1 as indicated in figure 5 below.

Note: The ‘shield’ of the R4 Display power cable is not used in the cable or display. It is not connected to the other shields in J4N and may be left unconnected.

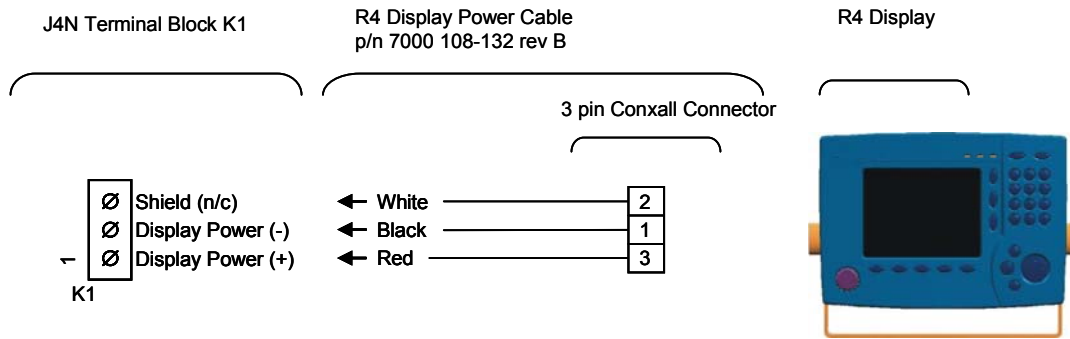


Figure 5: Power connection between J4N and the R4 Display

### 4.3 Installing the R4 Display Signal Cable

Connect the signal cable for the R4 Display to the J4N Junction Box terminal block K3 as indicated in figure 6 below.

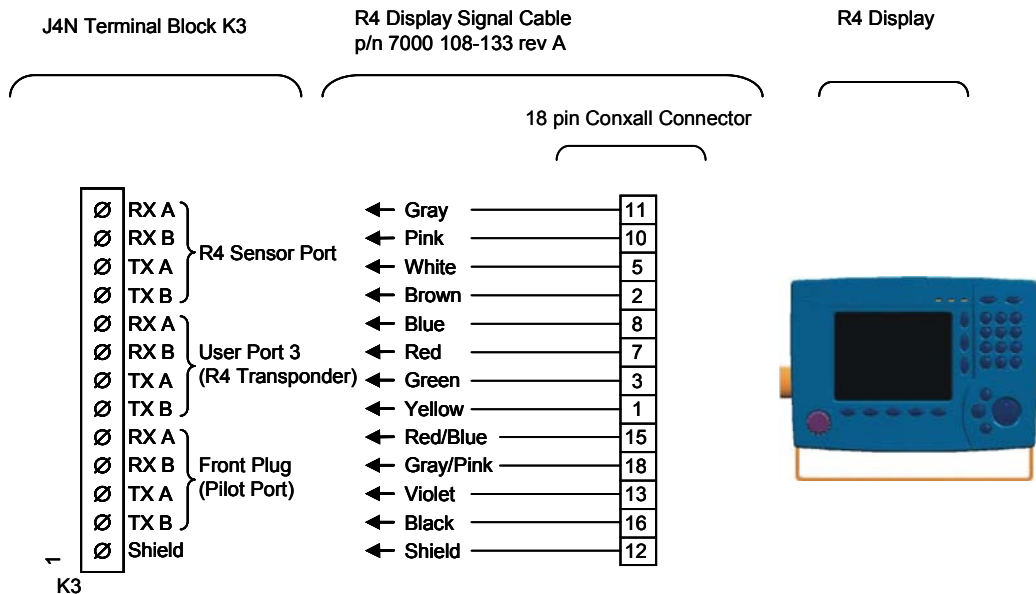


Figure 6: Signal connection between J4N and the R4 Display

## 5 DUAL DISPLAY, REDUNDANT & COMBINED AIS/NAV INSTALLATIONS

### 5.1 Dual-Display (slave) Installation

A secondary (slave) display can be connected to the R4 Navigation system as illustrated by figure 7 below. The displays shall be interconnected by the User 3 ports (Tx to Rx and vice versa). The Tx lines from the R4 Navigation Sensor shall be connected to both displays. The R4 Navigation Sensor Rx lines shall be connected to the primary (master) display unit only. The power cable to the slave display shall be connected in parallel with power connection to the master unit. There is no need to replace the 2A fuse for the display power supply in the J4N Junction Box.

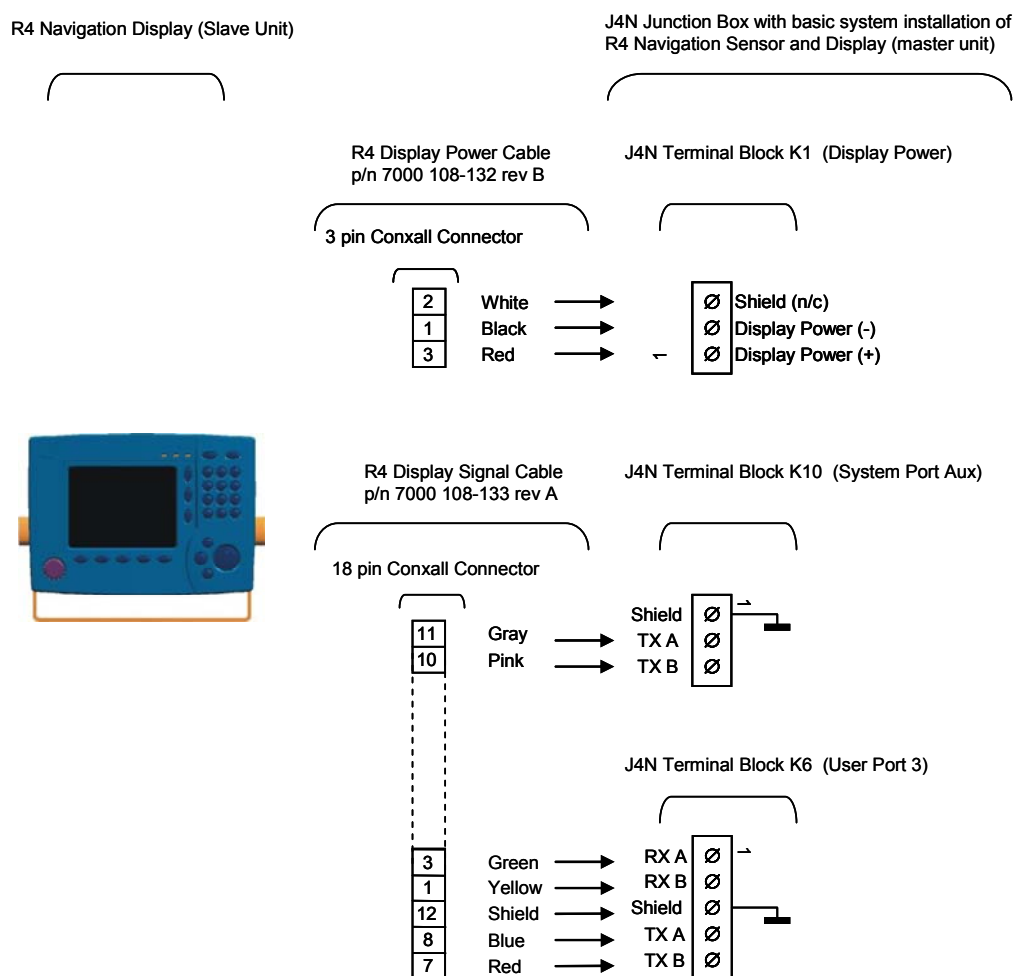


Figure 7: Connection of dual-display slave unit

In order to enable this mode of operation, the master display shall be configured as a 'dual-display master' whereas the slave display shall be configured as 'dual-display slave'. Refer to the R4 Navigation System operators manual (with supplements) for further details.

Note: Dual-display operation is supported by R4 Navigation display software version 5.0.96 onwards.

## 5.2 Redundant System Installation

Two R4 Navigation Systems may be interconnected in a ‘redundant configuration’ thus enabling them to automatically share database and navigation settings.

In order to accomplish this, the Tx lines of the User 3 port on one system shall be connected to the Rx lines of the other system and vice versa. Refer to figure 8 for a suggested configuration using two J4N Junction Boxes.

In order to enable synchronized operation, one unit must be configured as ‘redundant master’ and the other unit as ‘redundant slave’. For further details refer to the operators manual for the R4 Navigation System.

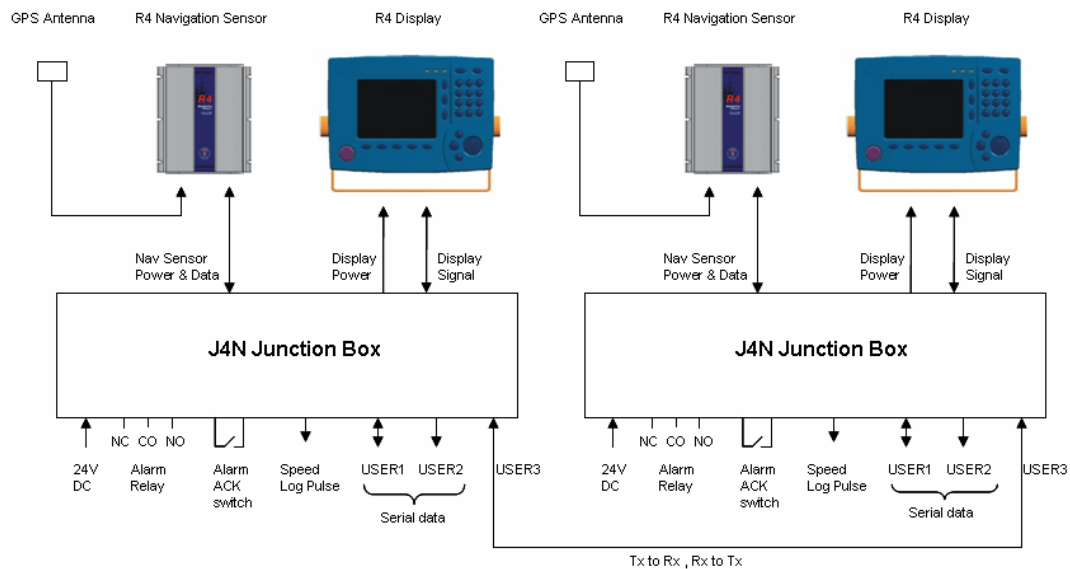


Figure 8: Dual redundant system installation

### 5.3 Combined AIS/Nav System Installation

The R4 Combined AIS and Navigation system combines the R4 Navigation System with the R4 AIS Transponder system using a single display. A suggested installation using the J4N Junction Box and a J4 Junction Box for the AIS transponder system (part number 7000 100-165) is outlined in figure 9.

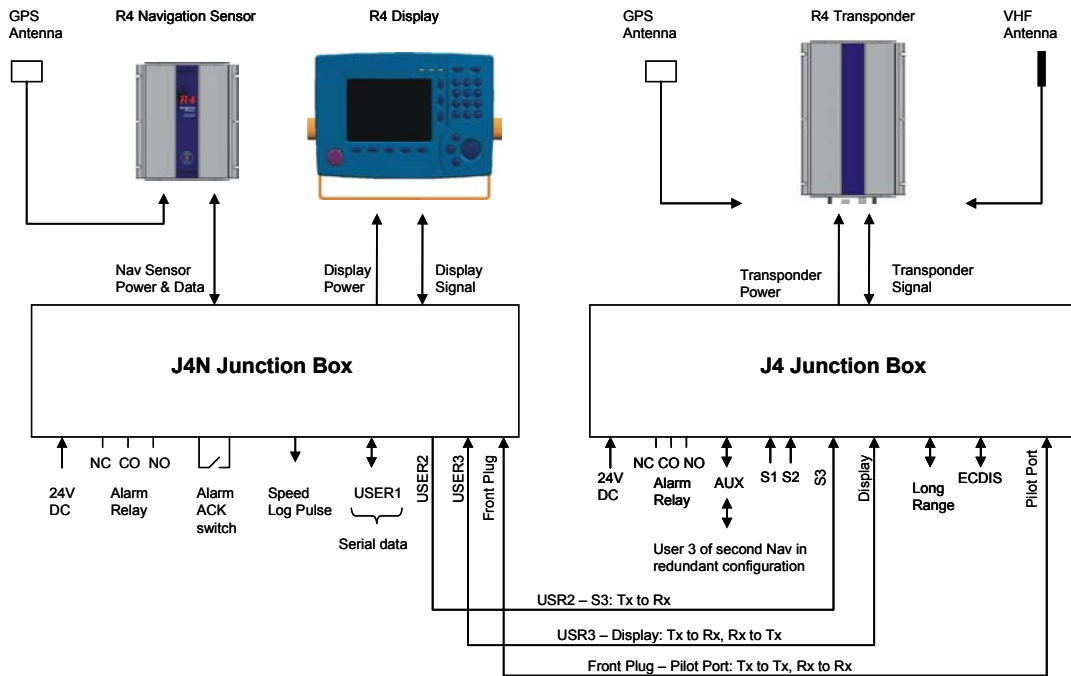
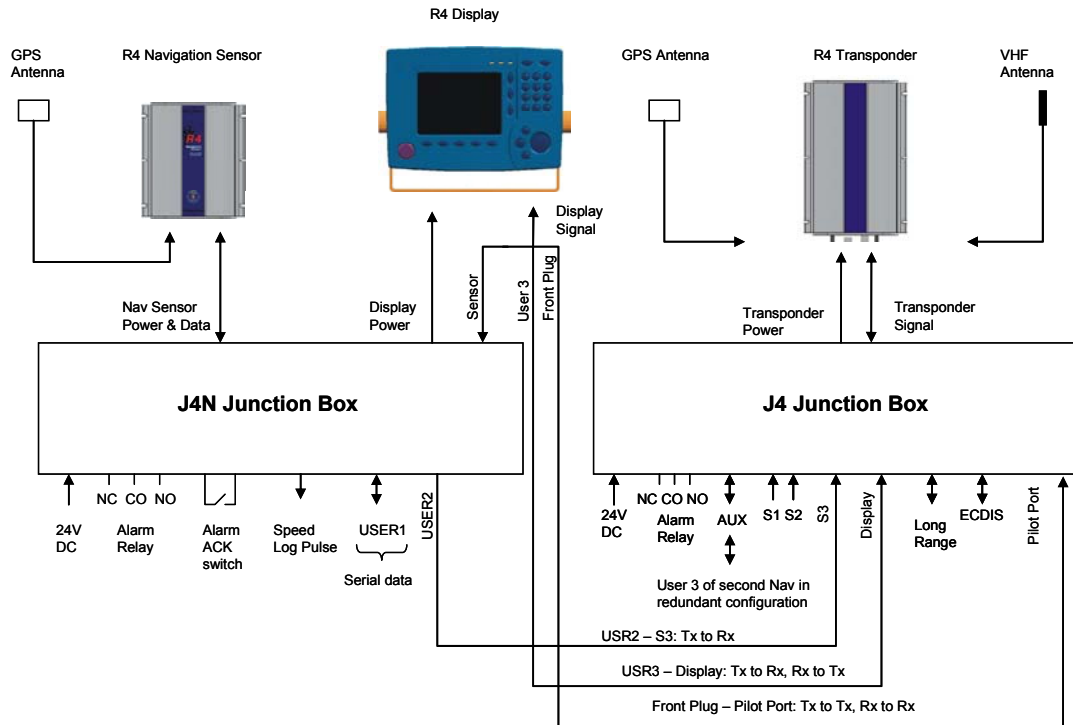


Figure 9: R4 Combined AIS and Navigation System installation

Optionally, the R4 Display signal cable leads can be connected directly to the terminal blocks of J4 & J4N Junction Boxes as follows.



**Figure 10: Optional display connection in combined AIS and Navigation System installation**

In this case, the leads of the R4 Display signal cable shall be connected according to the table below.

Junction Box / Terminal Block	Terminal	Display data cable lead	Display connector pin
J4N / K3 R4 Display	R4 Sensor port Rx A	Gray	11
J4N / K3 R4 Display	R4 Sensor port Rx B	Pink	10
J4N / K3 R4 Display	R4 Sensor port Tx A	White	5
J4N / K3 R4 Display	R4 Sensor port Tx B	Brown	2
J4 / K3 - Pilot	Rx A	Red/Blue	15
J4 / K3 - Pilot	Rx B	Gray/Pink	18
J4 / K3 - Pilot	Tx A	Violet	13
J4 / K3 - Pilot	Tx B	Black	16
J4 / K6 - Display	Rx A	Green	3
J4 / K6 - Display	Rx B	Yellow	1
J4 / K6 - Display	Tx A	Blue	8
J4 / K6 - Display	Tx B	Red	7

**Table 2: Connection of R4 Display signal cable in a combined AIS/Nav installation.**

## 6 TECHNICAL SPECIFICATIONS

### PHYSICAL

Dimensions:           Height: 37 millimeters  
                              Width: 262 millimeters  
                              Depth: 130 millimeters

Weight:                 0.95 kilograms

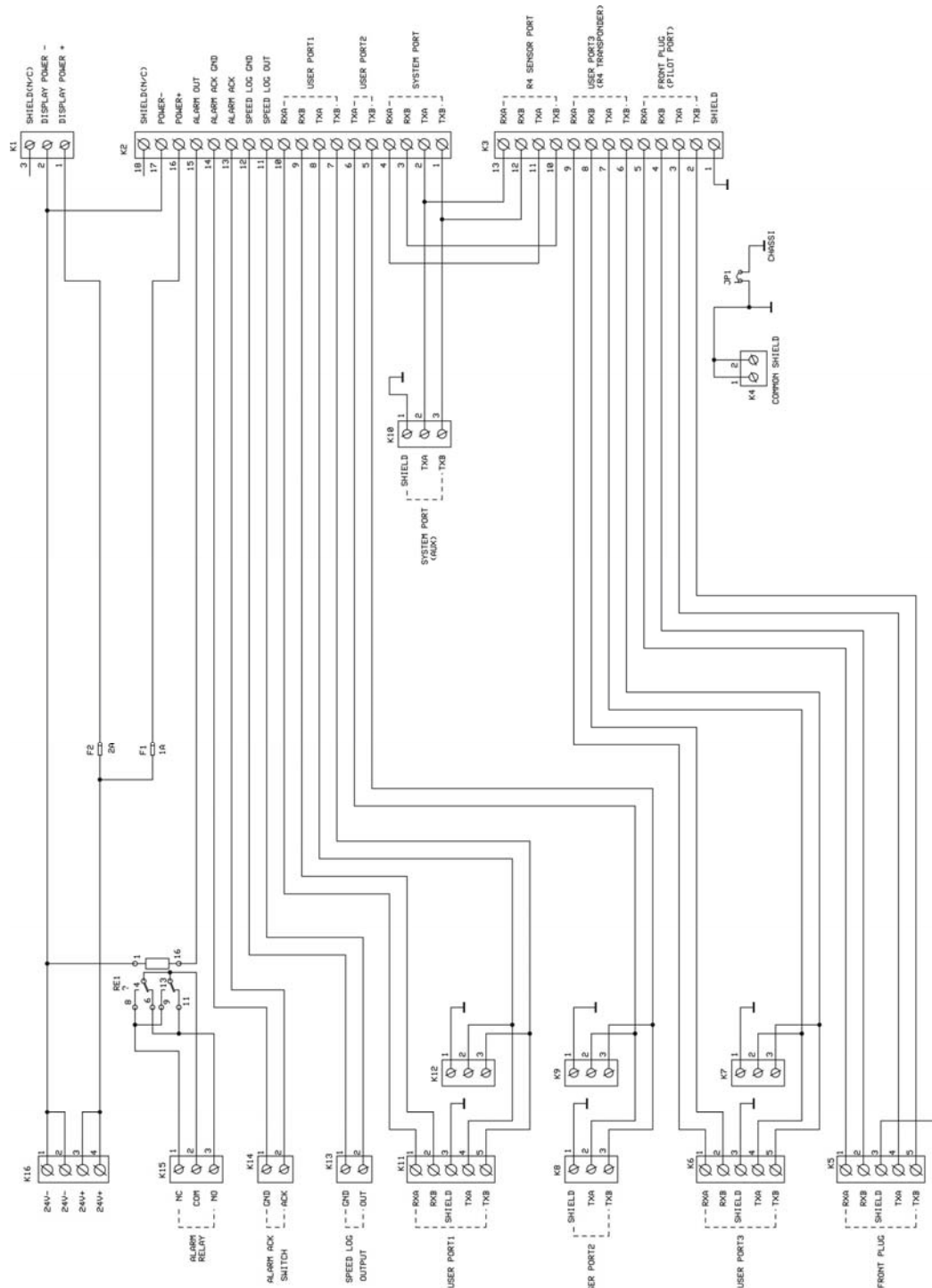
### J4N ALARM RELAY

Max switching current: 3 A

Max switching voltage: 250 VDC or 230 VAC

Max switching power: 60W (DC) or 120 VA (AC) resistive load

# APPENDIX A: J4N SCHEMATIC





### APPENDIX B: J4N PCA LAYOUT

