Installation manual

CRE2-144-R70

Cordis Array II

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Document history

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Warning

The equipment to which this manual applies must only be used for the purpose for which it was designed. Improper use or maintenance may cause damage to the equipment and/or injury to personnel. The user must be familiar with the contents of the appropriate manuals before attempting to operate or work on the equipment.
Radionor Communications AS disclaims any responsibility for damage or injury caused by improper installation, use or maintenance of the equipment.

Comments

To assist us in making improvements to the product and to this manual, we welcome comments and constructive criticism.
e-mail: contact@radionor.no

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Table of contents

About this manual

Purpose of manual

This installation manual provides you with the necessary information to carry out the mechanical and electrical installation and the configuration of the CRE2-144-R70.

Target audience

This manual is intended for customers, electrical and mechanical personnel for installation and configuration of the CRE2 system and the CRE2 system operators.

License information

The Cordis Array II, CRE2, is not a licensed product. However, a local license for the use of radio frequencies is required for operation.

Maintenance purposes

This manual is also intended as reference material for the maintenance personnel. Keep this manual for later use.

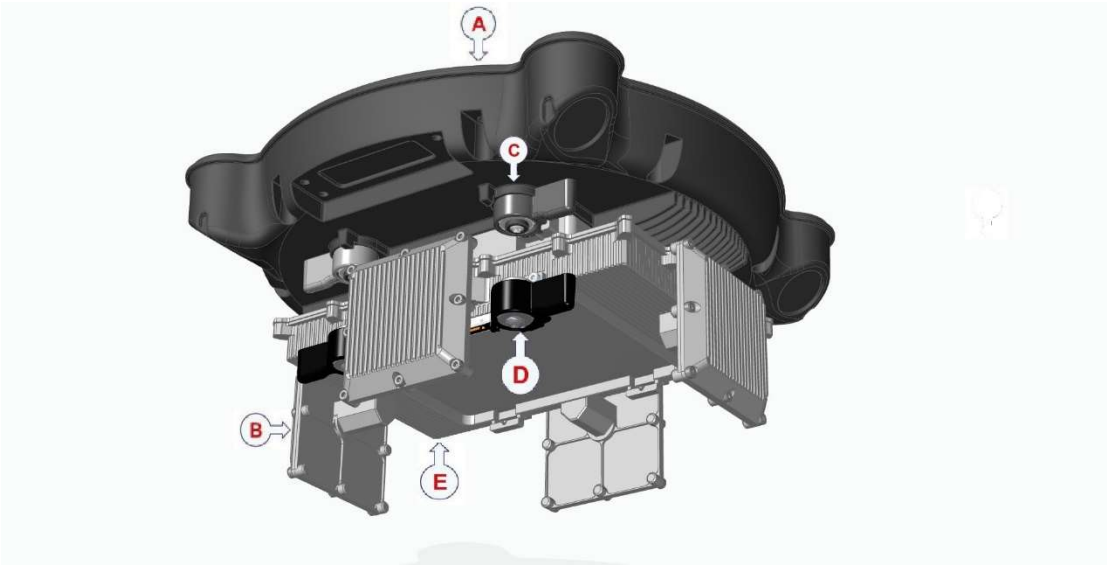
Cordis Array II

System description

The Cordis Array II, CRE2, is developed for use in environments where digital high-speed reliable communication and data transfer are crucial for efficient and safe operations.

The CRE2 operates in the 5 GHz frequency band and has proven high capacity communication in challenging conditions. Wireless link is protected with embedded AES-256 encryption implemented in hardware.

System diagram



A Skyranger R70 payload interface

B Patch antenna

C Skyranger payload lock

D Interposer payload lock

E Radio Unit

Scope of supply

Standard parts delivered

These items are included in a basic delivery.

Units

- 1 ea Radio Unit

Other items

- End user documentation

Additional item needed

Additional items required for operation.

- Computer for configuration purposes

Restrictions in guarantee

Changes or modifications to the product not explicitly approved by Radionor Communications AS will void the guarantee.

The liability of Radionor Communications AS is limited to repair of this system only under the given terms and conditions stated in the sales documents. Consequential damages such as customer's loss of profit or damage to other systems traceable back to this system's malfunctions, are excluded. The warranty does not cover malfunctions of the system resulting from the following conditions:

- Incorrect connection.
- The Radio Unit housing has been opened by the customer.

Radio frequency license

A frequency license from the national authorities in the country where the equipment is operating is mandatory for legal operation of the equipment. The customer undertakes the full responsibility to obtain a frequency license for operation of the equipment in the country of operation. The customer covers all costs and risk related to the frequency license application and operation of the equipment.

Support information

- **Company name**: Radionor Communications AS
- **Address**: Ingvald Ystgaards veg 23, 7047 Trondheim, Norway
- **Tel**: +47 72 81 05 00
- **E-mail address**: contact@radionor.no
- **Website**: http://www.radionor.no

Installation

Preparations

Mechanical drawings

Outline dimension drawings are included in this manual.

Related topics

- *Outline dimensions CRE2-144-R70,* on page 18

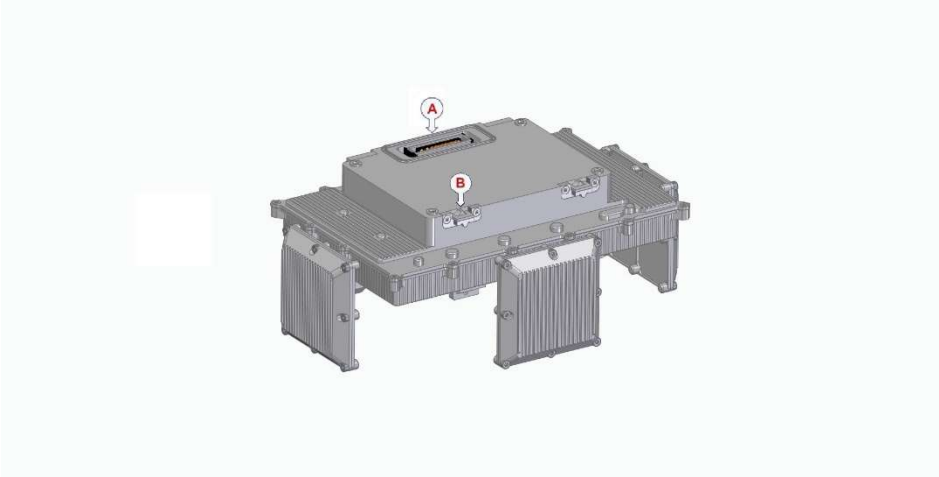
Necessary tools and equipment

Since the Skyranger R70 and radio unit has specialized locking system for mounting the radio unit to the UAV, there is no need for tools.

An external PC is required for configuration of the Radio Unit through a web interface.

Mounting the Radio Unit to Skyranger R70

The Radio Unit is designed with four mounting locks which must be used mounting the radio unit.

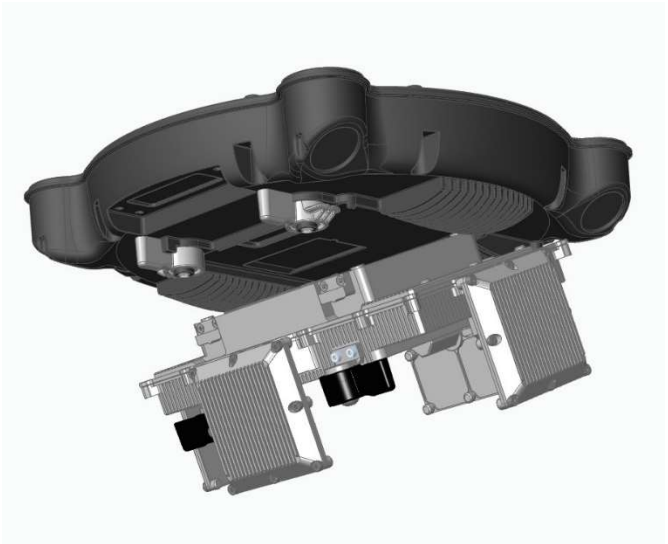


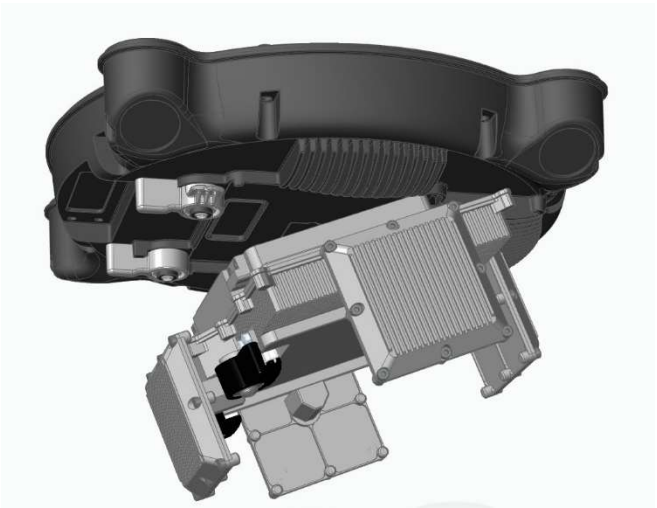
A Skyranger R70 connector

B Mounting hooks

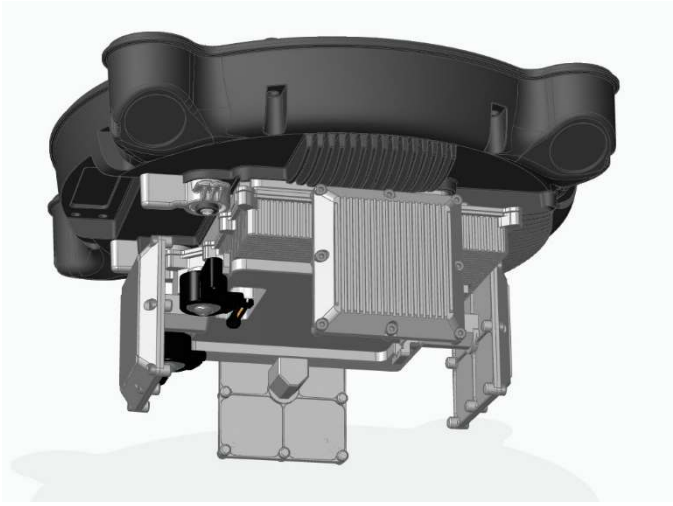
Procedure

1 Slide the radio unit into the Skyranger interface hooks.

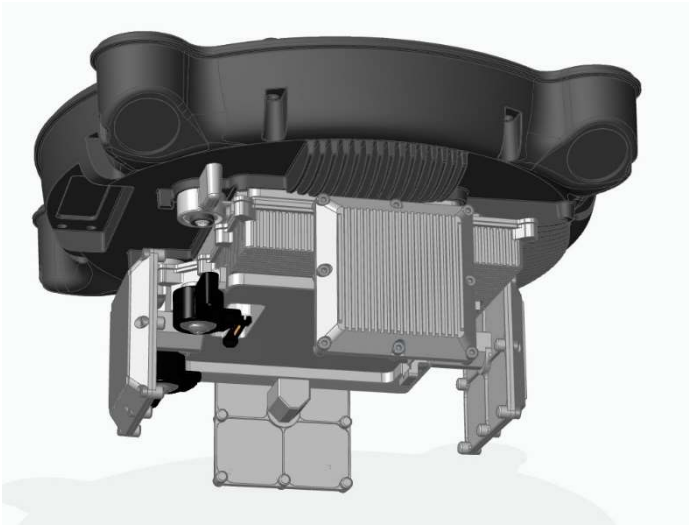




2 Then press the connector side against the interface so that the connectors connect. Make sure they connect properly.



3 Turn the two locks 90 degrees so that they lock the radio unit onto the Skyranger interface.



Related topics

- *Outline dimensions CRE2-144-SMA,* on page 18

Cabling and interconnections

The CRE2-144-R70 has a specialized connector for the Skyranger R70. This connection is also found on the bottom part of the radio for connecting other payloads.

Getting started

Getting started work summary

Once all hardware units have been installed, and all cables have been connected, the Radio Unit can be powered up and set to work.

- Turning on the Radio Unit.
- Enable contact with the Radio Unit.
- Configure your site.

Turning on the Radio Unit

When the radio has been installed and the cables have been connected, you must turn on the radio.

Procedure

- Turn on the power source for the Skyranger R70. This will provide power to the radio.

  Boot time approximately 2 minutes.

Enabling contact with the Radio Unit

Note

The CRE2-144-R70 is always delivered pre-configured so enabling contact with the Radio Unit can be done from the Ground Control Station or from the hand controller.

You must enable contact with the Radio Unit via a web browser to be able to set up and communicate with the radio.

Prerequisites

In order to carry out the configuration you need these items:

- PC or laptop with an Ethernet interface.
- Up-to-date web browser.

Procedure

1 Set up the PC with:

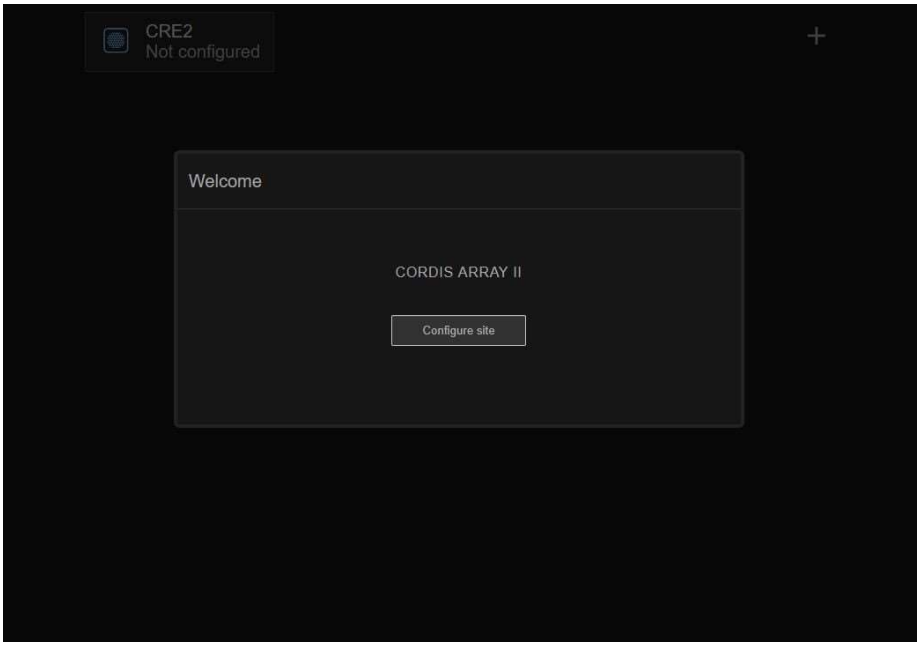
- **IP address**: 10.19.127.10
- **Netmask**: 255.255.0.0

2 Connect the PC to the Radio Unit via Ethernet.

3 Enter the radio's IP address in the web browser address bar.

The IP address for the Radio Unit is found on a label at the rear of the Radio Unit.

Observe that the **Welcome** page appears.



Result

You are now ready to start configuration of your site.

Note

The Welcome page only appears the first time you configure your site. After the configuration is completed, the web interface will take you directly to the Main view.

CRE2-144/CRE2-179 as base station

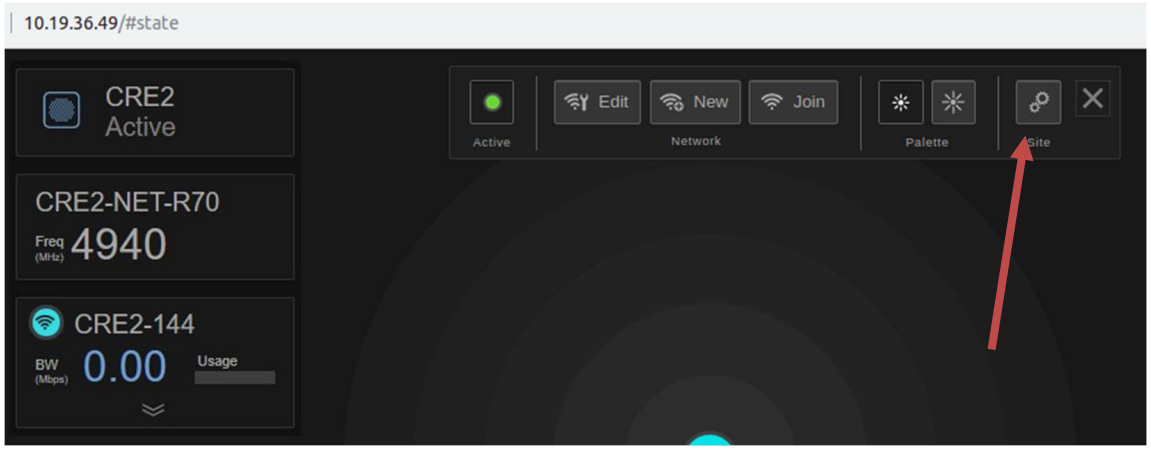
Note

This will guide you thru switching base stations between CRE2-144 and CRE2-179

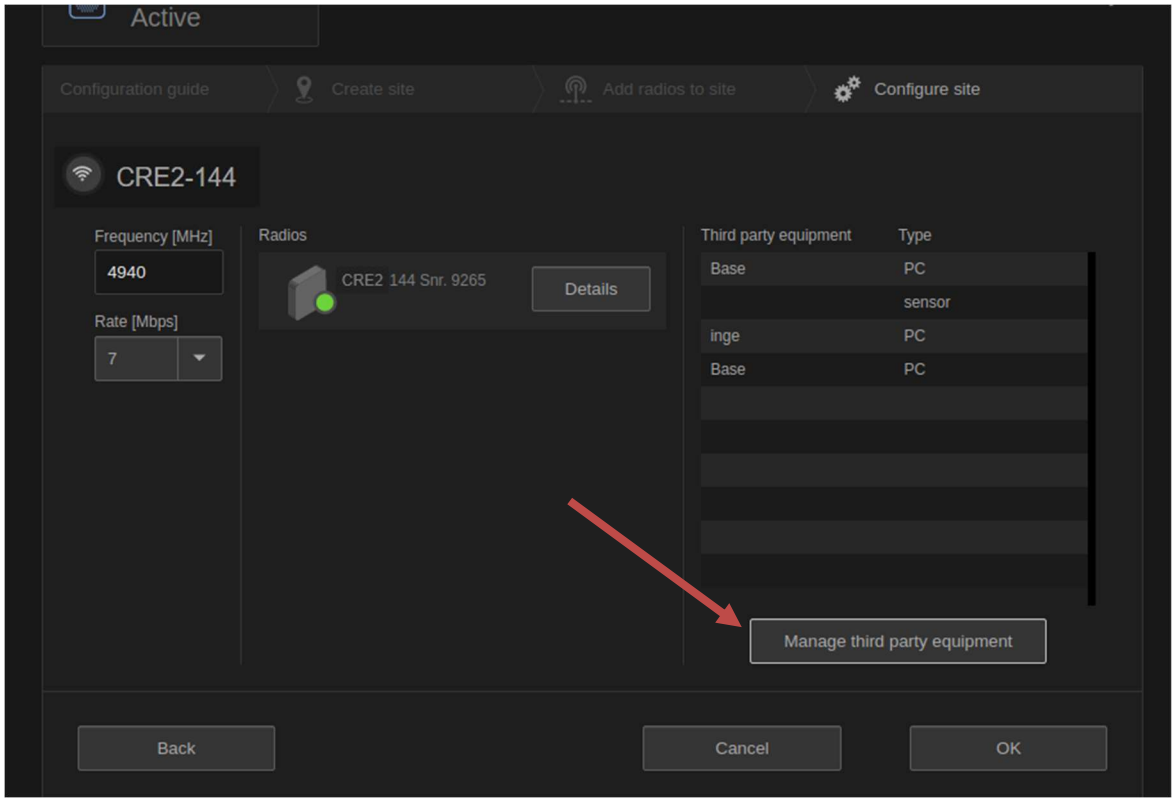
This checklist is used when the receiving radio used as receiver, is switched between the CRE2-144 and CRE2-179.

1. Turn off all radios: CRE2-144-R70, CRE2-144 and CRE2-179.
2. Turn on the CRE2-144-R70.
3. Wait two minutes for boot to complete.

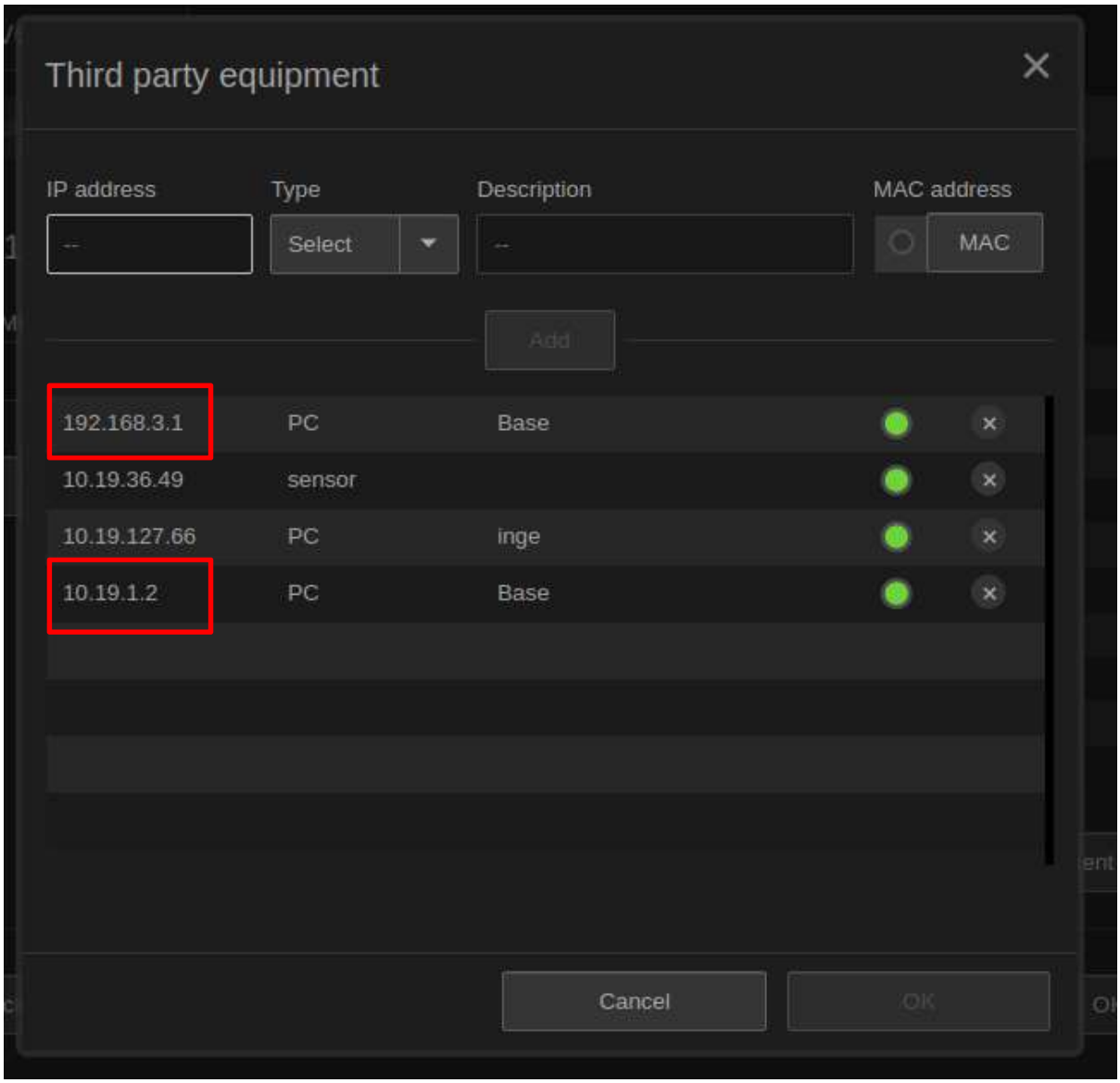
Depending on which radio is to be used, turn on the MBR-144 **or** the MBR-179. Not both.
Open configuration web page for the CRE2-144 or CRE2-179 on the tablet or PC connected to the MBR. The IP address of the CRE2-144 is written on the back.
Click on the plus-sign in the upper right corner to expand the settings menu. Click the button market “Site”:



Click “Manage third party equipment”:



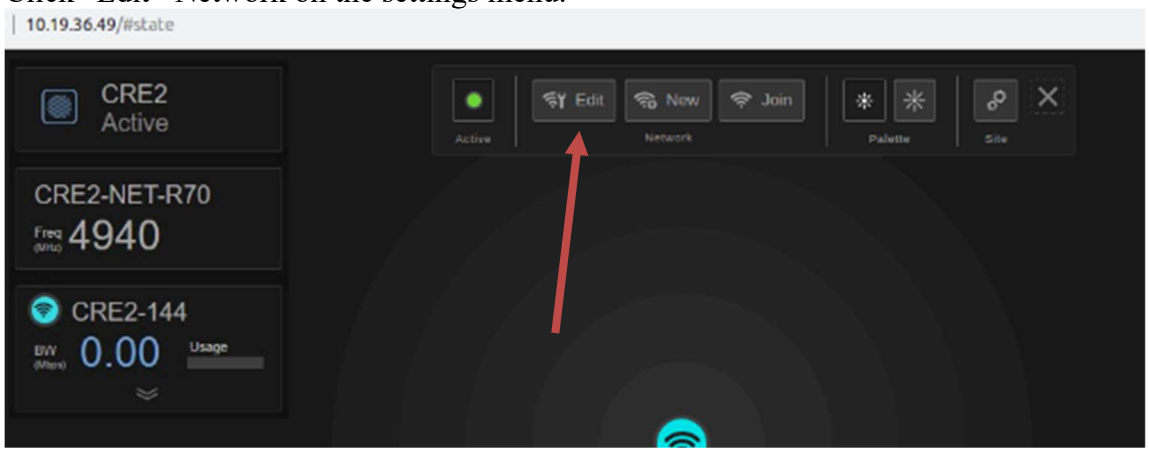
Check that the IP-addresses “10.19.1.2” and “192.168.3.1” are found in the list. If not add them manually.



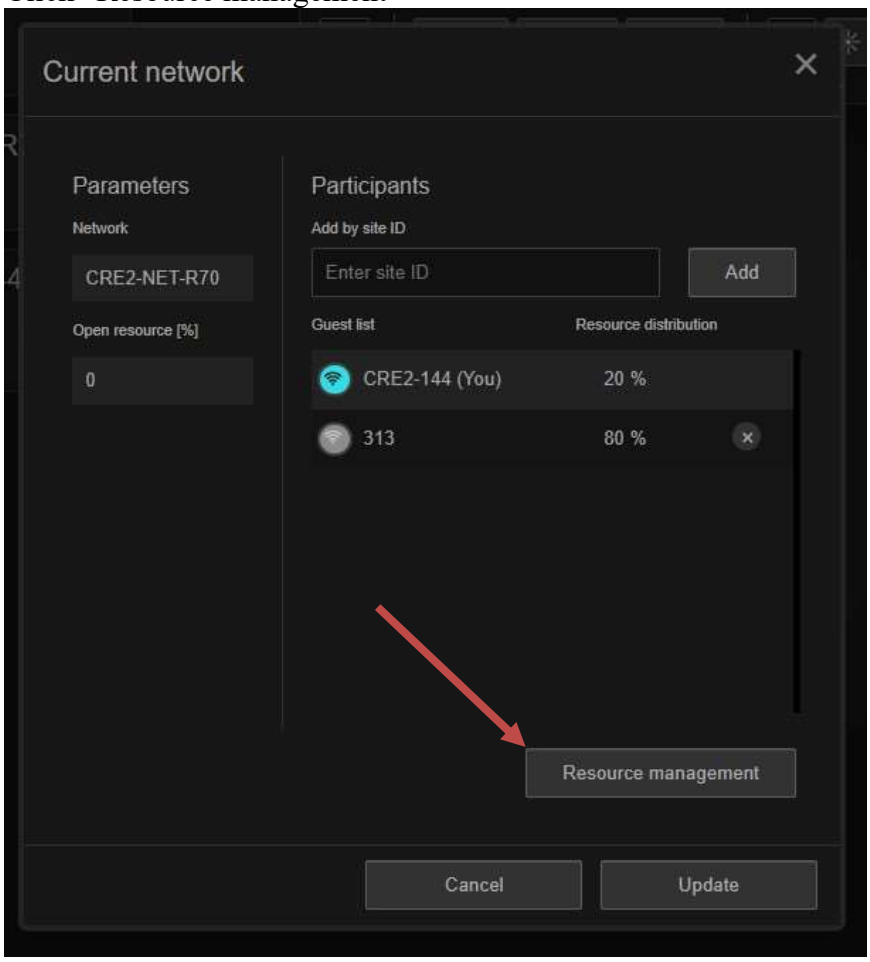
Click cancel on both the windows to get back to the main screen.

NB! Click ok if the two IP-addresses needed to be added.

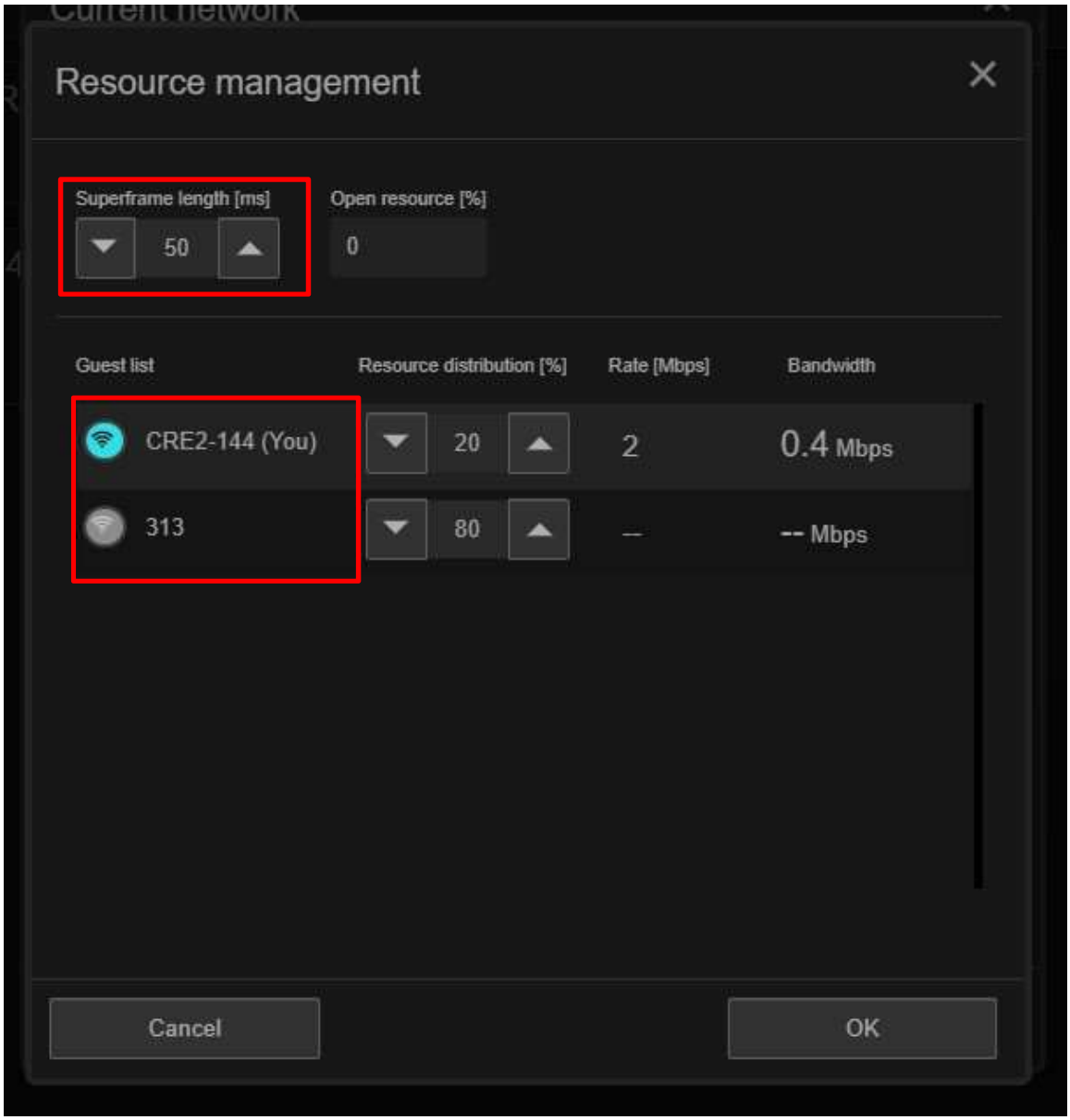
Click “Edit”-Network on the settings menu.



Click “Resource management”



Check that “MBR144” is set to 20%, “SKYRANGER” is set to 80% and “Superframe length” is set to 50ms.

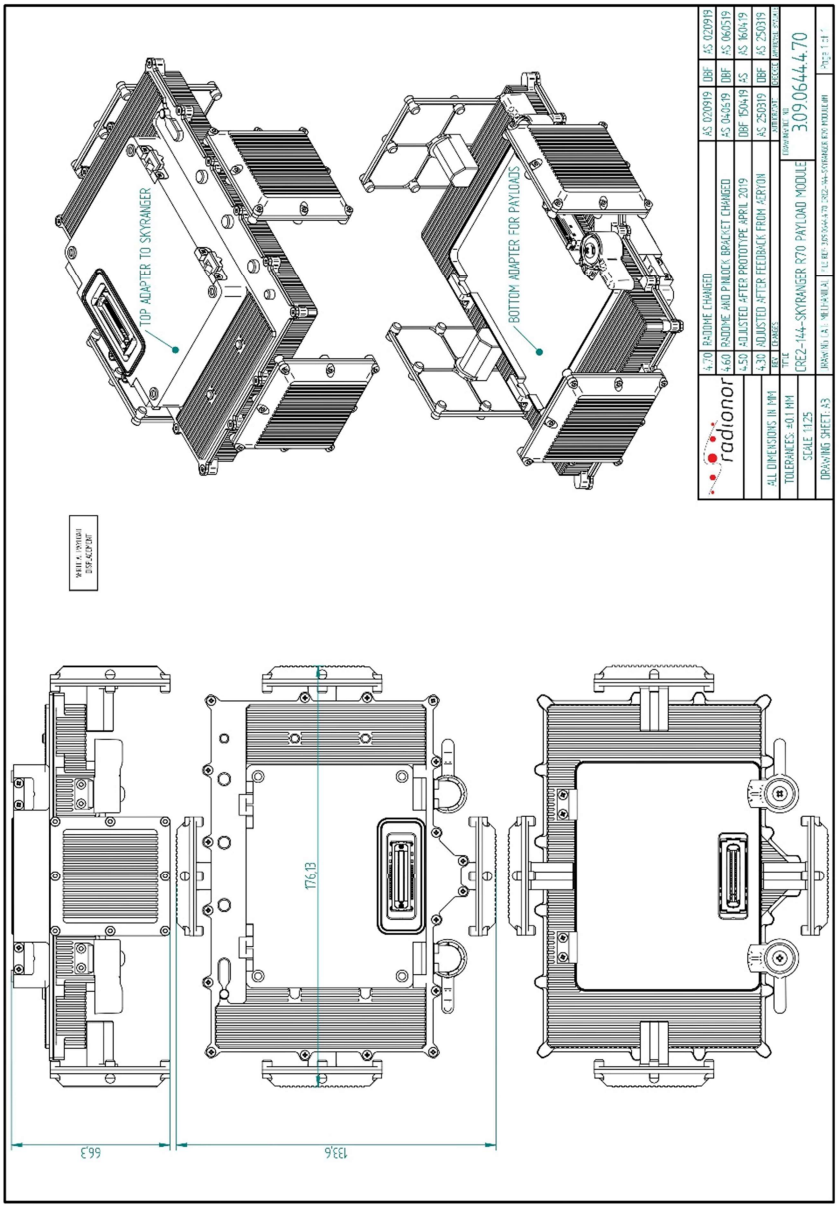


Drawings

Note

The drawings are not to scale. To-scale drawings are available on request.

Outline dimensions CRE2-144-R70



Technical specifications

Performance specifications

The performance specifications summarize the performance of the system.

Operational range	20 km (dependent on antenna placement and height)
User data	1 to 15 Mbps Available rates: 1, 2, 7, 15 Mbps
Antenna coverage	360 degrees azimuth, omni-directional

Radio frequency specifications

The radio frequency characteristics summarize the frequency ranges for the system.

Frequency range	4900 MHz to 5900 MHz (configurable range for the single 20 MHz channel)
Channel bandwidth	14 MHz
Tx power	Up to 2 W
Interface	FLIR Skyranger R70 Payload
Modulation	GMSK
Antenna elements	4

Weights and outline dimensions

The weights and outline dimension characteristics summarize the physical properties of the system.

Note

For more detailed information about the physical dimensions, see Drawings.

Height	66,3 mm
Width	133,6 mm
Length	176,13 mm
Weight	290 g

Power specifications

The power specifications summarize the power supply requirements for the Radio Unit.

Voltage	9 to 36 V DC (powered by the Skyranger R70)
Power consumption	25 W (max.)
Idle	8 W

Note

The Radio Unit is powered by the Skyranger R70.

Environmental specifications

The environmental specifications summarize the temperature and humidity requirements for the system.

Enclosure material	Coated aluminium
Operating temperature range	-40 to 40 ºC (air convection required)
Operating humidity	20 to 100 % RH
Storage humidity	20 to 70 % RH
Ingress protection - Radio Unit	IP68
Ingress protection - Connectors	IP68 unmated and mated

Conformity declaration

This product is in compliance with the European RED directive.

radionor

EU DECLARATION OF CONFORMITY

Manufacturer's name : Radionor Communications AS

Manufacturer's address: Ingvald Ystgaards Veg 23, 7047 Trondheim, Norway

declares that the product:

Product name: Cordis Array II

Model number: CRE2-144-M2, CRE2-144-M2-SMA, CRE2-144-OEM, CRE2-144-LW, CRE2-144-R70

Accessories: CRE2-CAM

is in conformity with the **Radio Equipment Directive, RED, 2014/53/EU** and with reference to ETSI guide **ETSI EG 203 367**, using the relevant sections of the following product standards:

Health and Safety (Article 3.1(a)	**EN 61010-1:2010/IEC 61010-1:2010**
EMC (Article 3.1(b) (Radio)	**EN 301 489-17 V3.1.1, EN 301 489-01 V2.1.1**
EMC (Article 3.1(b) (Radio)	**EN 60945:2002**
Spectrum (Article 3.2)	**EN 301 893 V2.1.1 (parts of)**

Further, the product is compliant to RoHS Directive **2011/65/EU** with reference to standard **EN 50581:2012**

Test references
Technical File: CRE2-144 series TCF Approval report, doc. no. 2.03.0115.2.00 issued by Radionor Communications AS

Place and date: Trondheim, 22nd of August 2019

Signature:

Atle Sægrov
CEO
Radionor Communications AS

Doc ref 1.01.0882.3.00

Equipment handling

Health and safety

Operation or troubleshooting of this equipment will not imply any risk for high voltages, explosions or exposure to gas. The product complies with IEC/EN 61010-1 regarding product safety, and IEC/EN 60945 regarding environmental conditions.

WARNING

RF Exposure: Safety precautions should be made with respect to RF exposure. The product should only be handled by trained personnel.

Keep a minimum distance of at least 50 cm from any humans to the antenna elements.

Disposal

All electrical and electronic components have to be disposed of separately from the municipal waste stream via designated collection facilities appointed by the government or local authorities. The correct disposal and separate collection of your old appliance will help prevent potential negative consequences for the environment and human health. It is a precondition for reuse and recycling of used electrical and electronic equipment. For more detailed information about disposal of your old appliance, please contact your local authorities or waste disposal service.

Handling the equipment

Observe the following when handling the equipment:

- All units must be handled with care.
- It must not be subjected to shocks, excessive vibration or other rough handling.

Storage

All the delivered system components must be stored within their original packing until they have been installed. See the environment specifications for the storage conditions.

If the system components have been installed but are not powered, the temperature at the installation location must be within the specified operation temperature range and humidity for each component. See the environment specifications for operation conditions.

Related topics

- *Environmental specifications* on page 25