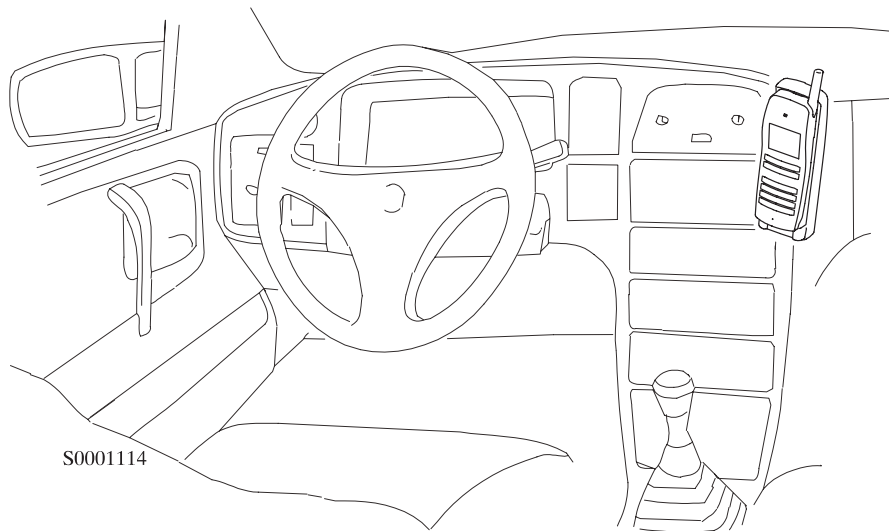


# After Sales Technical Documentation

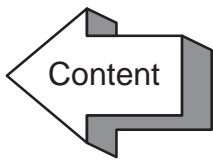
## RAE/RAK-1N Series

# CARK60 Installation Guide



### AMENDMENT RECORD SHEET

Amendment Number	Date	Inserted By	Comments



# ***RAE / RAK-1N Series***

## **CARK60 INSTALLATION GUIDE**

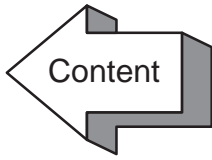
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## ***RAE / RAK-1N Series***

### **Introduction**

This installation guide has been prepared to provide the basic information necessary to install this car kit. This guide is not intended to be definitive, because different types and models of vehicles will require different installation work. The information given is for general guidance only.

The terms of warranty demand that this car kit be installed by an experienced installer and only genuine Nokia parts be used. An end user should never attempt to install this car kit without professional assistance as the installation requires special tools and knowledge.

Please refer to the NOKIA 9000 communicator's User's Manual and Accessory Guide for instructions on the telephone's operation, care and maintenance, including important safety information.

**Note:** Read the warnings below before beginning the installation procedure.

#### **WARNINGS**

**ENSURE THAT THE VEHICLE'S BATTERY IS DISCONNECTED BEFORE YOU START THE INSTALLATION PROCEDURE, AND THAT IT REMAINS DISCONNECTED DURING THE PROCEDURE.**

**DO NOT SMOKE OR USE OPEN FLAMES WHEN WORKING NEAR THE VEHICLE'S FUEL SYSTEM.**

**ENSURE THAT ELECTRICAL CABLES, HYDRAULIC LINES AND FUEL LINES ARE NOT DAMAGED DURING INSTALLATION.**

**ENSURE THAT NORMAL CONTROL AND OPERATION OF THE VEHICLE IS NOT IMPAIRED BY THE INSTALLATION, PARTICULARLY THE BRAKES AND STEERING.**

**ALTHOUGH ELECTRONIC SPEED CONTROL, ABS ANTI-LOCK BRAKE AND FUEL INJECTION SYSTEMS ARE RELATIVELY IMMUNE TO MALFUNCTION CAUSED BY NEARBY RADIO TRANSMISSIONS, SHOULD YOU EXPERIENCE FALSE OPERATION OF THESE SYSTEMS OR ARE IN ANY DOUBT WHATSOEVER AS TO THEIR FUNCTIONALITY, PLEASE CONSULT THE VEHICLE'S DEALER.**

**THE CAR KIT IS SUITABLE FOR USE ONLY IN VEHICLES WITH A 11..32 V NEGATIVE GROUNDING. USE ON OTHER SUPPLY VOLTAGES OR ALTERNATIVE POLARITY WILL DAMAGE THE EQUIPMENT.**

**THE PHONE SHOULD NOT BE LEFT SWITCHED ON FOR EXTENDED PERIODS WITHOUT RUNNING THE VEHICLE'S ENGINE. FAILURE TO COMPLY COULD DRAIN THE VEHICLE'S BATTERY.**

## Unpacking

Carefully unpack the equipment and ensure that the following items are present.

Charging Holder	MBR-1
Junction Box	(to be mounted with MKE-1) HFJ-3
Mounting Plate	(w/12 screws, 4 nuts, 4 washers) MKE-1
Swivel Mounting Plate	(incl. mounting plates & screws) MKR-1
Flat Mouning Kit	(incl. mounting plates & screws) MKK-1
Hands-Free Microphone	HFM-10
Hands-Free Speaker	(w/2 screws) HFS-6
Power Cable	(w/2 fused connectors & wire ends) PCH-4

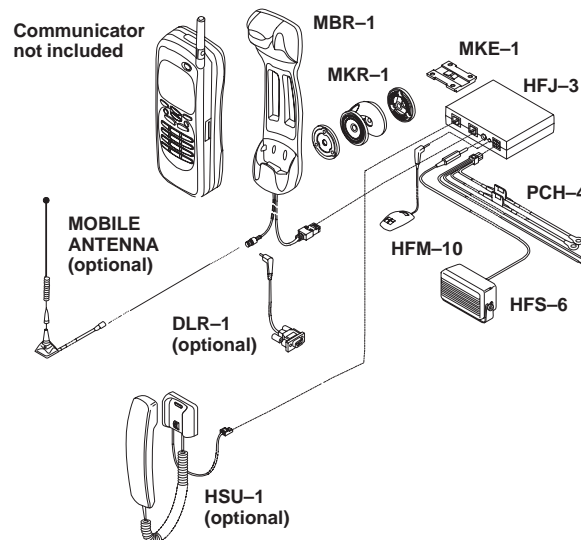


Figure 1. CARK60 Kit and options

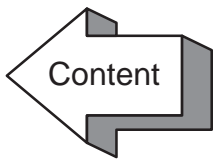
## Component Parts

### Charging Holder MBR-1

The Charging Holder unit offers your Communicator an external antenna connection, hands-free function, and firm attachment to the vehicle. The installation of the Holder can be done in two different ways: either 1) using Swivel (adjustable angles) or 2) using Flat Mounting Kit (fixed position).

### Mounting Plate MKE-1, Flat Mounting Kit MKK-1 and Swivel MKR-1

The Mounting Plate is used to mount the Hands-Free Junction Box. Screw the Mounting Plate to the appropriate place and slide on to the Junction Box.



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The Swivel or the Flat Mounting Kit can be used to mount the Holder to the vehicle. The Swivel is for adjustable mounting angles for each end of the Holder and the Flat Mounting Kit is for mounting in a flat, fixed position.

To install the Holder using the Flat Mounting Kit:

- 1) Attach the Snap Mounting Plate to convenient location using the four black screws provided.
- 2) Attach the Fixed Mounting Plate to the Holder (at whichever end is suitable) using the three silver screws provided.
- 3) Attach the Adapter Plate to the Fixed Mounting Plate using one of the large mushroom-head screws.
- 4) Slide the Adapter Plate on to the Snap Mounting Plate.

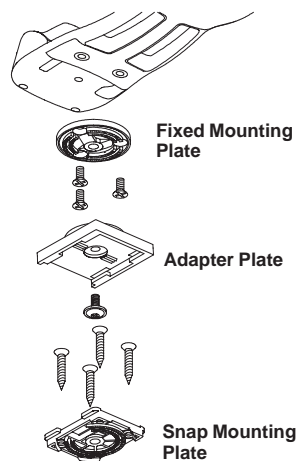


Figure 2. Flat Mounted Fixing Kit

To install the Holder using the Swivel:

- 1) Attach one of the Fixed Mounting Plates to a convenient location inside the vehicle using the three black screws. Attach the other Fixed Mounting Plate to the Holder (at whichever end is suitable) using the three silver screws.
- 2) Fasten a Swivel Body to the Fixed Mounting Plate on the Holder using one of the large mushroom-head screws. Before tightening the screw, ensure that the Swivel Body is oriented to suit the mounting location. Repeat this procedure for the Swivel Body which is to be attached to the Fixed Mounting Plate on the vehicle.
- 3) Position the Holder in the desired orientation so that the teeth of the Swivel bodies interlock. Fasten the bodies together using the silver bolt and nut.

4) Once the desired position has been obtained ensure that all the screws are fastened securely.

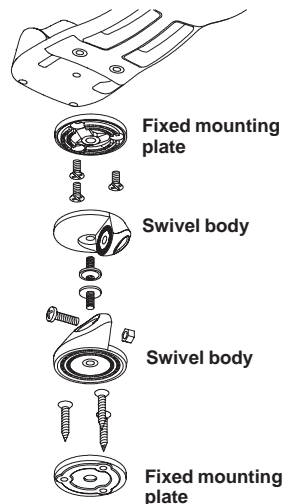


Figure 3. Swivel Mounted Fixing Kit

### Junction Box HFJ-3

The Hands-Free Junction Box provides and controls the supply voltages for the accessories and charging current for your Communicator. In addition, it controls the audio paths to accessories and hands-free equipment. The jack marked HANDSET/ACCESSORY is reserved for the optional handset.

### Hands-Free Microphone HFM-10 and Speaker HFS-6

The Hands-Free Microphone connects directly to the Junction Box MIC jack and Hands-Free Speaker to the SPEAKER jack.

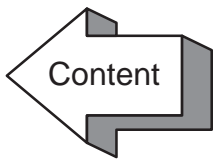
### Power Cable PCH-4

The Power Cable connects to the Junction Box via the 4 pin connector. The red (+12 V) and black (GND) wires connect to the battery via the supplied fused connectors. The yellow (XCRM) wire is for car radio mute and the blue (IGNS) wire is for ignition sense. The XCRM line goes down to 0 volts during a call. The maximum sink current is 250 mA (see "Installation; Car Radio Muting"). The IGNS line is connected to a +12 V voltage source, controlled by the Car Ignition Key. The Ignition Sense can utilize voltages up to 24 V (see "Installation; Ignition Sense").

### Handset HSU-1 (optional)

An optional Handset offers more privacy during a call. The Holder is attached by screwing the Mounting Plate provided to the vehicle and sliding the Holder into place.





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### **RS-232 Adapter Cable DLR-1 (optional)**

The Adapter Cable is an optional connection between your PC and the Communicator.

### **External Mobile Antenna (not supplied)**

The Hands-Free Car Kit is designed to operate with a high quality external antenna. However, due to many different types of antennas being available, an antenna is NOT included as part of this kit. Please, consult the dealer to find out which is the most suitable antenna type for your installation.

## **Installation**

There are some important aspects that require special attention in positioning Hands-Free Car Kit accessories.

The positioning of the Phone Holder is the most important factor when trying to achieve the most comfortable position for the user. The location of the Holder should be selected so that the visibility of the Communicator's display is good under all lighting conditions, but not so that the driver's attention is easily distracted. The Holder should be located so that the driver can easily reach the keypad. Under no circumstances should the Holder prevent the driver from controlling or operating the vehicle in any way or observing traffic.

The Junction Box can be installed in a hidden location, since there is no need to disconnect cables during normal operation. Ensure the location does not subject the unit and cables to moisture or mechanical pressure.

The Hands-Free Microphone should be installed according to the directions in the separate microphone installation guide. Ensure the microphone is as close to the driver's mouth as possible, and attached to a surface that is mechanically quiet. The microphone should be mounted at least 3 ft/1 m away from the Hands-Free Speaker to avoid acoustic feedback.

The Hands-Free Speaker is not very sensitive to vibrations, thus it can be located more freely. The main idea is to optimize two requirements: The driver should hear the signal from the loudspeaker without any special effort, but attenuation between the loudspeaker and the microphone should be as high as possible. That is, they must "look" in opposite directions in order to minimize the acoustic feedback.

Ensure cables are routed as far away as possible from the vehicle's electronic systems (refer to WARNINGS). In addition, ensure cables are not subjected to undue mechanical stress for example, under seats or against sharp edges. The charging holder should always be connected to the external mobile antenna via a non-radiating cable (for example, coaxial cable).

## Car Radio Muting CRM

The Communicator offers a feature that can mute the car radio automatically during a conversation. This feature is convenient and provides for safer hands-free operation. The Car Radio Muting feature is based on a grounded line, so it means that in standby, the yellow wire (XCRM) is not grounded and car radio works normally, but during a call, line is grounded and car radio is muted. The maximum load that this line can handle is 250 mA. Note that an auxiliary relay or muting unit must be used when the car radio doesn't have a mute feature available.

When a relay is used this should be connected in series with the car radio main supply. A 200 mA fuse should be used to protect the XCRM output in event of a short circuit. Some radios have separate supplies for amplifiers and motors, and another for memory backup purposes. Very often these radios also have a secret code system, which activates itself if a break in the memory supply is detected. Be careful when installing the relay not to break the memory supply (usually marked ACC or +MEM), but to install the relay in the main supply feed.

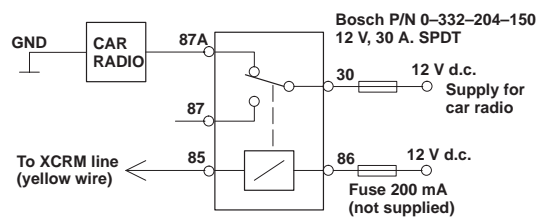


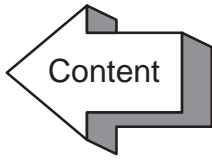
Figure 4. Radio Muting Circuit

Another possibility is to use a special muting unit, which mutes the radio by connecting load resistors to the speaker lines of the car radio. Four loudspeakers can be muted and the maximum permitted power is 20 watts per channel. The muting unit can also be used as a relay to cut the main supply feed of the car radio.

## Ignition Sense IGNS

The Ignition Sense feature prevents your Communicator from draining the car battery by executing an auto power off in 20 seconds after the ignition key has been turned off. The blue wire of the power cable is used for the ignition sense feature. The use of ignition sense is recommended to prevent accidental draining of the car's battery. The wire is connected via a 200 mA fuse to a 12/24 volt potential that is controlled by the ignition key. Do not connect it directly to the high voltage sections of the ignition circuit.

All installations should take into account any special requirements of the customer. However, should the customer require an installation that is illegal or unsafe, these facts must be pointed out to the customer and a policy of non-compliance adopted.



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### **Testing**

Once installed, the equipment should be tested to ensure that it is operating satisfactorily and that the position of the units does not impair on the driver's ability to control and operate the vehicle in any way.

Use the Communicator to make a call when the vehicle is parked with the engine running. During the call, switch off the engine. Ensure that the phone is operational with the engine running and with the engine switched off. For operating information refer to the 'Accessories Guide' supplied with the Communicator.

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