

**CCS Technical Documentation
RH-12/RH-28 Series Transceivers**

9 – Car Installation Kit

[This page left intentionally blank]

Table of Contents

	Page No
Introduction	5
Installation guide for CARK126.....	6
Introduction	6
Warnings	7
Components of CARK126	8
Component parts	8
Mobile holder MBC-15S.....	8
Swivel mount HHS-15 and Mounting plate MKU-1	9
Mounting plate MKU-1.....	9
Handsfree unit HFU-4.....	9
System cable SCU-4.....	9
Antenna coupler AXF-15S.....	9
Power cable PCU-4.....	10
HF microphone HFM-8.....	10
External HF speaker HFS-12.....	10
External antenna.....	10
Privacy handset HSU-3 (not included)	10
Installation	11
PCU-4.....	11
Ignition sense IGNS.....	12
Car radio muting CRM	12
Testing.....	12
Installation guide for CARK112.....	14
Introduction	14
Warnings	14
Unpacking	16
Wireless HF Unit HFW-1	17
Installation.....	17
Mounting Plate MKU-1	18
Remote Control Button CUW-2	18
Installation.....	18
HF Microphone HFM-8	19
HF Speaker HFS-12	19
Power Cable PCU-4	19
Cables.....	20
Ignition Sense IGNS	20
Car Radio Muting CRM	20
Testing	21

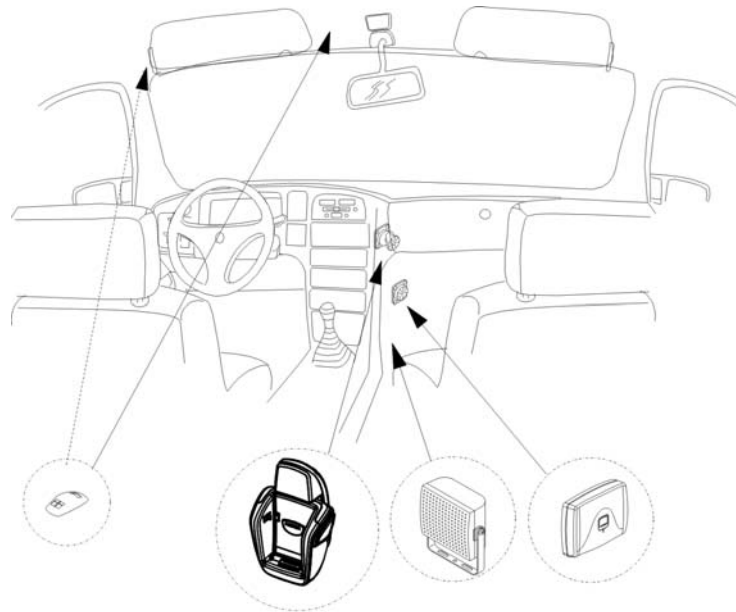
[This page left intentionally blank]

Introduction

RH-12/RH-28 will support several car kits and solutions for handsfree operation as listed in Chapter 1.

A comprehensive documentation for the accessories is found from the relevant accessory programs.

Installation guide for CARK126



Introduction

This installation guide provides the basic information required to install the CARK126. This guide is not intended to be definitive, because different vehicle types and models will require different installations. The information given is for general guidance only.

The terms of warranty require that this car kit be installed by an experienced installer and using only genuine Nokia parts. 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 telephone's User's Guide for instructions on the telephone's operation, care and maintenance, including important safety information.

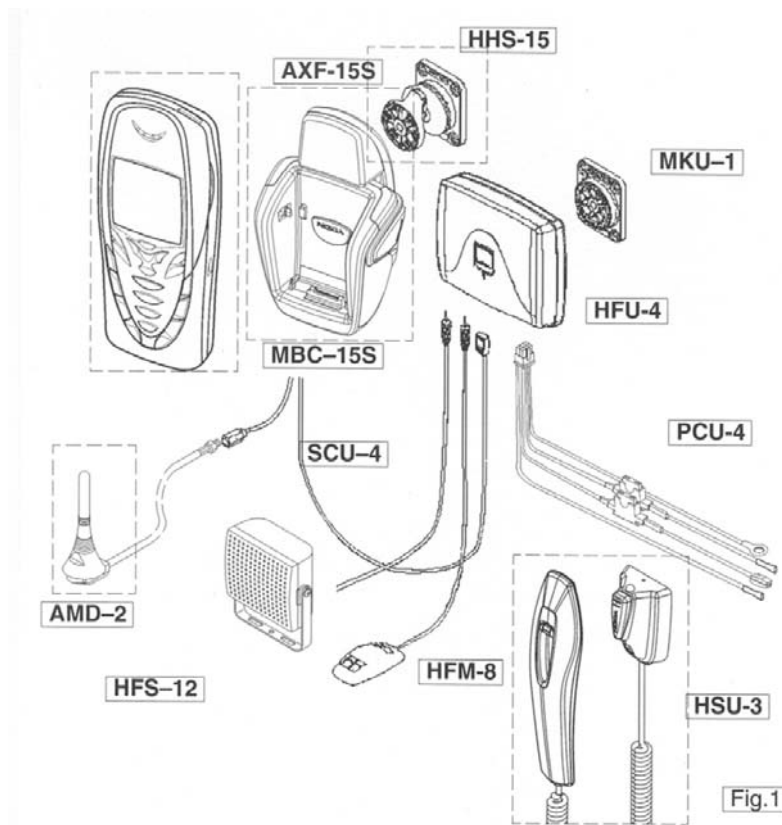
Note: Read the warnings below before beginning the installation procedure.

Warnings

- 1 ENSURE THAT THE VEHICLE'S BATTERY IS DISCONNECTED BEFORE YOU START THE INSTALLATION PROCEDURE, AND THAT IT REMAINS DISCONNECTED DURING THE PROCEDURE.
- 2 DO NOT SMOKE OR USE OPEN FLAMES WHEN WORKING NEAR THE VEHICLE'S FUEL SYSTEM.
- 3 ENSURE THAT THE VEHICLE'S ELECTRICAL CABLES, HYDRAULIC LINES, FUEL LINES AND SAFETY EQUIPMENT ARE NOT DAMAGED DURING INSTALLATION.
- 4 ENSURE THAT NORMAL CONTROL AND OPERATION OF THE VEHICLE IS NOT IMPAIRED BY THE INSTALLATION, PARTICULARLY THE BRAKES AND STEERING. MAKE SURE THAT AIRBAG OPERATION IS NOT OBSTRUCTED.
- 5 ELECTRONIC AND OTHER SOPHISTICATED SYSTEMS (e.g. SPEED CONTROL, ABS ANTI-LOCK BRAKES, FUEL INJECTION, NAVIGATION, AND AIR-BAG SYSTEMS) ARE RELATIVELY IMMUNE TO MALFUNCTION CAUSED BY NEARBY RADIO TRANSMISSIONS. HOWEVER, SHOULD YOU EXPERIENCE FALSE OPERATION OF THESE SYSTEMS OR ARE IN ANY DOUBT WHATSOEVER AS TO THEIR FUNCTIONALITY, PLEASE CONSULT THE VEHICLE'S DEALER.
- 6 THE CAR KIT IS SUITABLE FOR USE ONLY IN VEHICLES WITH A 12V NEGATIVE GROUNDING. USE ON OTHER SUPPLY VOLTAGES OR ALTERNATIVE POLARITY WILL DAMAGE THE EQUIPMENT.
- 7 THE PHONE SHOULD NOT BE LEFT SWITCHED ON FOR EXTENDED PERIODS WITHOUT RUNNING THE VEHICLE'S ENGINE. FAILURE TO COMPLY WITH THIS INDICATION COULD DRAIN THE VEHICLE'S BATTERY.

Components of CARK126

Figure 1:



The CARK126 includes the above parts. Please note that the items surrounded by broken lines are not supplied with the CARK126 in Europe and Asia.

In the US, Canada and Latin America other sales packages than the CARK126 exist. The main difference is that the mobile holder and antenna coupler are included instead of being sold separately. External antenna AMD-2 is not sold in the US, Canada and Latin America.

Other mobile holders connectable to CARK126 are MBC-14M, MBC-13L and MBC-17. MBC-17 is sold in the US, Canada and Latin America both separately as well as a part of Cark142. Privacy handset HSU-3 is sold in Europe only.

Component parts

Mobile holder MBC-15S

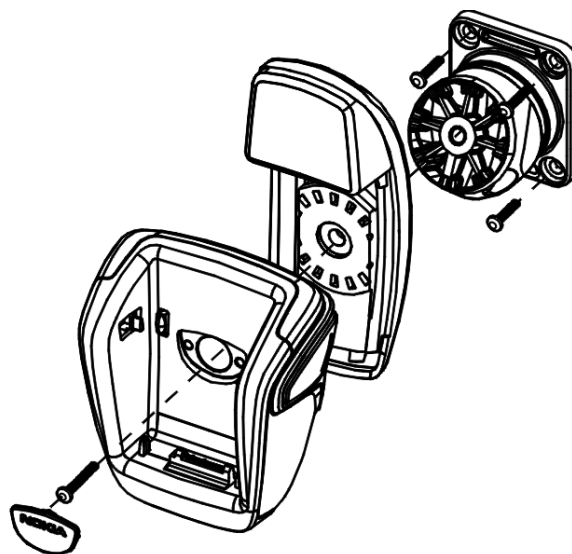
The holder for the mobile phone is always attached to the vehicle's interior in an upright position using the swivel mount HHS-15, as shown in the following Figure 2. The mounting is secured with a screw (included with the HHS-15). The screw recess is covered with the NOKIA logo plate.

Swivel mount HHS-15 and Mounting plate MKU-1

The HHS-15 is a swivel mount which offers two installation methods for the MBC-15S holder. Either use all the components to make a swivel mounting, or use the flat mounting plate for a fixed position.

For an exploded view, see the following figure.

Figure 2:



Mounting plate MKU-1

The HFU-4 handsfree unit is attached to the vehicle's interior using the MKU-1 mounting plate. The mounting is secured with a screw (included with MKU-1).

Handsfree unit HFU-4

The HFU-4 handsfree unit enables the phone to operate in handsfree mode. It is attached to the vehicle's interior using the MKU-1 mounting plate. The mounting is secured with a screw (included with MKU-1).

System cable SCU-4

The system cable SCU-4 plug-in connector connects to the **PHONE** socket in HFU-4 and to the bottom connector underneath the AXF-15S. (The other cable from the AXF-15S connects to the external antenna.) For a diagram, refer to Figure 1.

Antenna coupler AXF-15S

The Antenna coupler AXF-15S is used to create a contact with an external antenna. It is installed between MBC-15S and HHS-15, and secured with a screw (included with AXF-15S). For a diagram, refer to Figure 2.

Power cable PCU-4

The power cable connects to the **DC** socket in the HFU-4 and to the vehicle's power supply. See section "Installation" for more information.

HF microphone HFM-8

The HF microphone connects to the **MIC** socket in the HFU-4. Turn the plug clockwise to lock it firmly in place.

External HF speaker HFS-12

The external HF speaker connects to the **SPEAKER** socket in HFU-4. Twist the plug clockwise to lock firmly in place.

External antenna

An external antenna (not included) is recommended for the car kit. It connects to the antenna coupler AXF-15S.

For additional information, please refer to documentation supplied with the antenna.

To meet FCC guidelines for exposure to radio frequency devices, the external antenna must be installed in a position so that no person will be within 20 cm (8 inches) of the antenna. It is recommended that the external antenna be mounted on the roof of the car in the middle for the center to the back portion of the roof of the car, or, if a convertible, the middle of the trunk lid on that portion closest to the car's interior.

Privacy handset HSU-3 (not included)

The privacy handset HSU-3 offers more privacy during a call. It connects to the **HAND-SET** socket in HFU-4. For more information, please refer to the user guide for the handset.

Installation

Refer to the cover for an example of installation positions.

The HFU-4 and the different parts are connected as mentioned in the section "Component parts".

There are some important aspects that require special attention when positioning the car kit accessories.

The location of the holder should be selected so that the visibility of the phone's display is good and the driver's attention is not distracted. The location of the holder should allow the driver to easily reach the keypad. Under no circumstances should the holder prevent the driver from controlling or operating the vehicle in any way.

The HF microphone should be installed according to the instructions given in the separate microphone installation guide. Ensure that 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 1 m (3 ft) away from the handsfree unit speaker to avoid acoustic feedback.

Make sure that the cables are routed as far away as possible from the vehicle's electronic systems. This is to prevent interference. Also, ensure that cables are not subject to undue mechanical stress, e.g., under seats or against sharp edges.

Note: Ensure that the vehicle's battery is disconnected before you start the installation procedure or before making changes to the installations, and that it remains disconnected during the installation procedure.

PCU-4

The cables from the PCU-4 are colour coded. They are listed in column A of the following table and each cable should be connected to the corresponding item listed in column B.

A	B
Red cable (with 2 amps fuse)	The + voltage on the vehicle's power supply.
Black cable	The negative GND connection.
Blue cable (with 1 amp fuse)	The + 12V voltage controlled by the vehicle's ignition key. (refer to section "Ignition Sense IGNS")
Yellow cable	Used for car radio muting (CRM) and is connected to car radio. The line goes down to 0 volts during a call. See section "Car Radio Muting CRM".

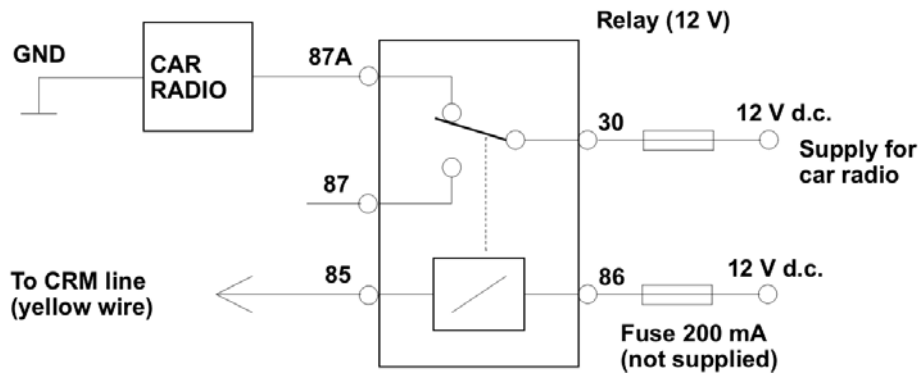
Ignition sense IGNS

The ignition sense feature prevents your car kit from draining the car battery by executing an auto power off in 20 seconds after the ignition key has been turned off. The blue cable from PCU-4 is used for the ignition sense feature. The use of ignition sense is recommended to prevent accidental draining of the car battery. The cable is connected via a 1 A fuse to a 12 volt supply that is controlled by the ignition key. Do not connect it directly to the high voltage sections of the ignition circuit. Check the availability of the feature in your phone's user's guide.

Car radio muting CRM

The car kit includes a feature that can mute the car radio automatically during a phone conversation. Below is the circuit diagram for CRM.

Figure 3:



Note: The contacts of the relay 12 V DC must stand the maximum current consumed by a radio, and the impedance of the relay coil must be over 100 ohm when the supply of the relay coil is <16 V DC.

Alternatively, you can use a special muting unit, which mutes the radio by connecting load resistors to the speaker lines of the car radio.

A third possibility for the customer is to refer to the car radio user manual to determine whether there is a CRM cable or point of connection in the car radio available. Then the CRM line from CarK126 can be directly connected to either of those.

All installations should take into account any special requirements on behalf 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.

Testing

Once installed, the equipment should be tested to ensure that it operates satisfactorily and that the position of the units does not impair the driver's ability to control and oper-

ate the vehicle in any way.

Installation guide for CARK112

Introduction

This installation guide has been prepared to provide the basic information necessary to install the 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 are used. An end user should never attempt to install this car kit without professional assistance as the installation requires special tools and knowledge.

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.

Please refer to the phone's User's Guide for instructions on the phone's operation, care and maintenance, including important safety information.

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

Warnings

1. ENSURE THAT THE VEHICLE'S BATTERY IS DISCONNECTED BEFORE YOU START THE INSTALLATION PROCEDURE, AND THAT IT REMAINS DISCONNECTED DURING THE PROCEDURE.
2. DO NOT SMOKE OR USE OPEN FLAMES WHEN WORKING NEAR THE VEHICLE'S FUEL SYSTEM.
3. ENSURE THAT THE VEHICLE'S ELECTRICAL CABLES, HYDRAULIC LINES, FUEL LINES, AND SAFETY EQUIPMENT ARE NOT DAMAGED DURING INSTALLATION.
4. ENSURE THAT NORMAL CONTROL AND OPERATION OF THE VEHICLE IS NOT IMPAIRED BY THE INSTALLATION, PARTICULARLY THE BRAKES AND STEERING. ENSURE THAT AIR-BAG OPERATION IS NOT OBSTRUCTED.
5. ELECTRONIC AND OTHER SOPHISTICATED SYSTEMS (e.g. SPEED CONTROL, ABS ANTI-LOCK BRAKE, FUEL INJECTION-, NAVIGATION-, AND AIR-BAG SYSTEMS) ARE RELATIVELY IMMUNE TO MALFUNCTION CAUSED BY NEARBY RADIO TRANSMISSIONS. HOWEVER, SHOULD YOU EXPERIENCE FALSE OPERATION OF THESE SYSTEMS OR ARE IN ANY DOUBT WHATSOEVER AS TO THEIR FUNCTIONALITY, PLEASE CONSULT THE VEHICLE'S DEALER.
6. THE CAR KIT IS SUITABLE FOR USE ONLY IN VEHICLES WITH A 12 V NEGATIVE GROUNDING. USE ON

OTHER SUPPLY VOLTAGES OR ALTERNATIVE POLARITY WILL DAMAGE THE EQUIPMENT.

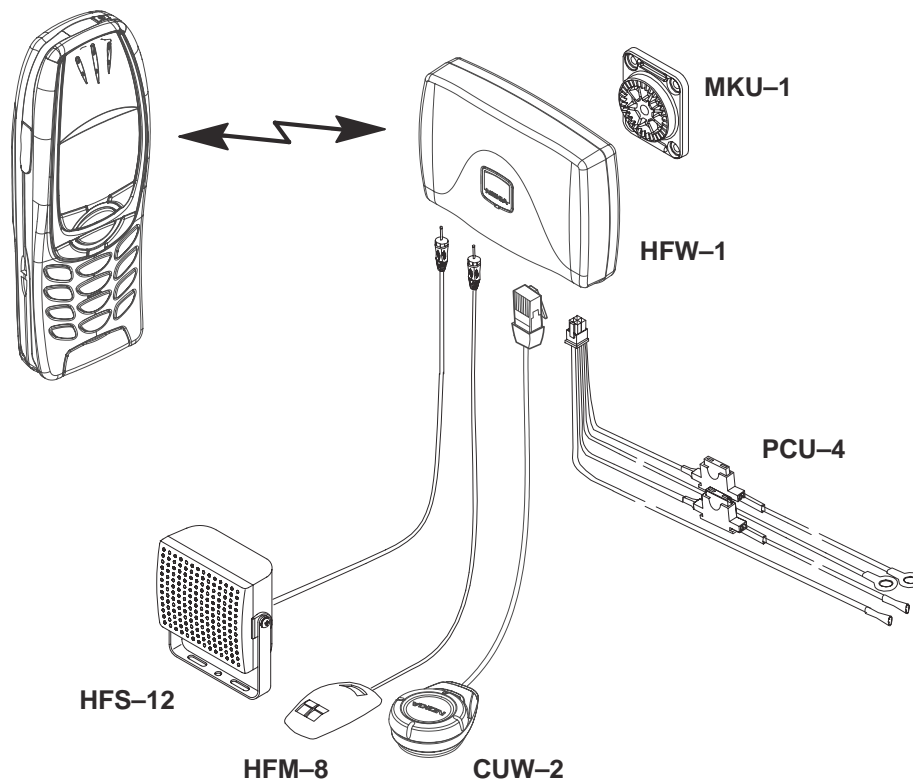
7. THE PHONE SHOULD NOT BE LEFT SWITCHED ON FOR EXTENDED PERIODS WITHOUT RUNNING THE VEHICLE'S ENGINE. FAILURE TO COMPLY COULD DRAIN THE VEHICLE'S BATTERY.

Unpacking

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

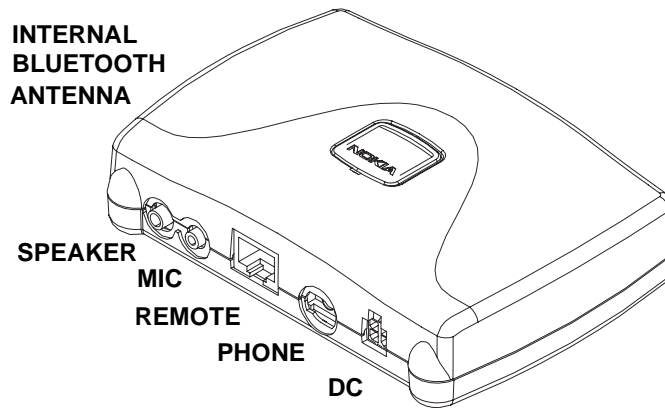
- Wireless Hands Free Unit, HFW-1
- Remote Control Button, CUW-2
- Power Cable, PCU-4
- Mounting Plate, MKU-1
- HF Microphone, HFM-8
- HF Speaker, HFS-12

Figure 4:



Wireless HF Unit HFW-1

Figure 5:



The HFW-1 is used in a fixed car installation and it offers a wireless handsfree function, a fast charging function when a phone is connected into it by a charging cable (phone specific, not supplied with CARK-112) and a wireless connection to external devices.

The HFW-1 unit is attached to the vehicle interior using the mounting plate MKU-1. HFW-1 is secured to MKU-1 with a screw (included with MKU-1).

Power is supplied to DC socket from the vehicle's battery via the power cable PCU-4.

The HF microphone HFM-8, connects to the MIC socket. And the HF speaker HFS-12, connects to the SPEAKER socket.

PHONE socket is for the charging of the phone (charging cable phone specific - not included with car kit).

The HFW-1 is always connected to a car battery. To save the car battery the HFW-1 goes to a sleep mode. Sleep mode is activated if: 1. the car is not running and a phone is not connected by a charging cable and there is no wireless traffic or 2. charging of the phone has been stopped.

Installation

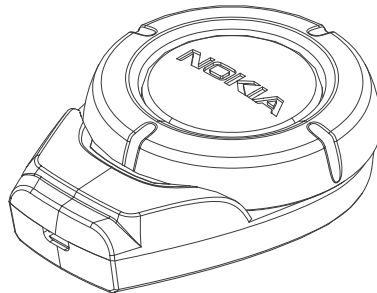
After tightening the MKU-1 screws, secure HFW-1 installation to the MKU-1 mounting plate with the screw going through HFW-1. The Nokia logo lid is placed on the HFW-1 to cover the recess.

Do not install the HFW-1 unit in a metal casing (or similar location) that can prevent the unit from transmitting radio frequencies. Aim the internal Bluetooth antenna (see picture) towards the user (Bluetooth phone).

Mounting Plate MKU-1

MKU-1 is a fixed position mounting plate. It is used to attach Wireless HF Unit (HFW-1) to the vehicle.

Remote Control Button CUW-2



The Remote Control Button (CUW-2) allows convenient operation of the phone. The car installation includes a Remote Control Button CUW-2, which is connected to the HFW-1 with a cable (REMOTE socket). The speaker volume of the HFW-1 can be controlled with a ring (rotary switch) in the CUW-2. It is possible to receive a call or to dial by pressing a send/end push button in the CUW-2 (also voice dialing).

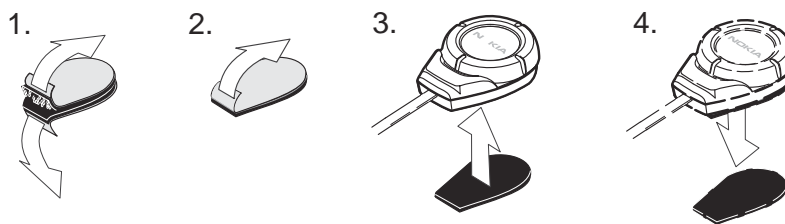
To read more about the use of CUW-2, see CARK112 User's Guide.

Installation

The positioning of the Remote Control Button CUW-2 is important, to achieve the most comfortable position for the user. The location of the CUW-2 should be selected so that the visibility of the Remote Control Button is good under all lighting conditions, but not so that the driver's attention is easily distracted. The CUW-2 should be located so that the driver can easily reach it. Under no circumstances should the CUW-2 prevent the driver from controlling or operating the vehicle in any way or observing traffic.

To attach the Remote Control Button:

- 1 Detach the two grip pads from each other.
- 2 Peel off the protective sheet (pad with soft fabric) from the adhesive side and attach the pad to the desired location in the car. Make sure the surface where you attach this pad is dry and clean from dirt and dust.
- 3 Peel off the protective sheet (pad with rugged fabric) from the adhesive side and attach the pad to the bottom of the Remote Control Button.
- 4 Press the Remote Control Button against the pad in the car until button is firmly in place.



HF Microphone HFM-8

The HF 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 handsfree unit speaker to avoid acoustic feedback.

Insert the HFM-8 plug into the MIC socket in HFW-1 and twist 90° clockwise to lock firmly in place.

HF Speaker HFS-12

Install the HF speaker so that it is at least 3 ft./1 m away from the HFM-8 microphone to avoid acoustic feedback. Insert the HFS-12 plug into the SPEAKER socket and twist 90° clockwise to lock firmly in place. Under no circumstances should the HFS-12 prevent the driver from controlling or operating the vehicle in any way or observing traffic.

Power Cable PCU-4

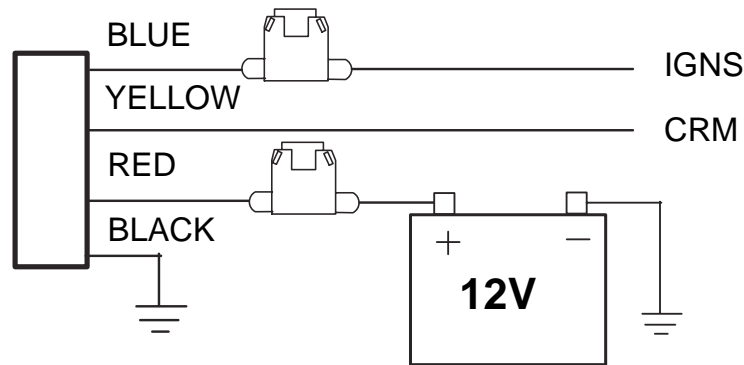
The power cable connects the wireless handsfree unit HFW-1 to the vehicle's power supply (DC socket).

The red wire must be connected to the + voltage on the vehicle's power supply via the supplied fused connector. The black wire must be attached to a good negative GND connection.

The blue ignition sense (IGNS) wire is connected to +12 V voltage controlled by the vehicle's ignition key via the supplied fused connector.

See section "Ignition Sense".

The yellow wire is used for car radio muting (CRM). The line goes down to 0 volts during a call. See section "Car Radio Muting".



Cables

Ensure cables are routed as far away as possible from the vehicle's electronic systems (refer to WARNINGS)*. Also, ensure that cables are not subjected to undue mechanical stress e.g. under seats or against sharp edges.

* To prevent disturbance, cables should be routed as far away from the interference source as possible.

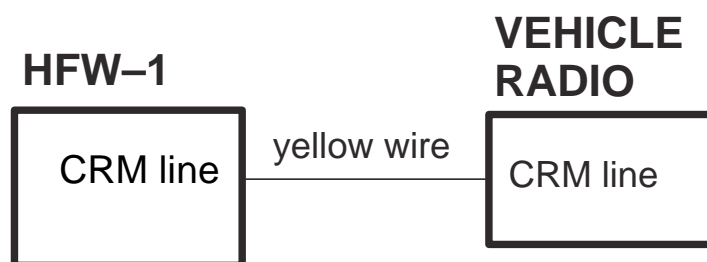
Ignition Sense IGNS

The blue wire of the power cable PCU-4 is used for the ignition sense feature. The use of ignition sense is recommended to prevent accidental draining of the car's battery and making the automatic connection to the phone. The wire is connected via a 1 A fuse to a 12 volt potential that is controlled by the ignition key. Do not connect it directly to the high voltage sections of the ignition circuit.

Car Radio Muting CRM

The car kit offers a feature that can mute the car radio automatically during a conversation. The car radio muting feature is based on a grounded line, so it means that in standby, the yellow wire (CRM) is not grounded and car radio works normally, but during a call, line is grounded and car radio is muted.

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).



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.

You can reset the car kit to the original settings, for example, to change the default user of the car kit.

To reset the car kit: Detach the microphone cable from HFW-1 unit for less than 5 seconds. After the car kit has been reset, the indicator light of the remote control button is shown for several seconds.

Use the phone 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 CARK112 User's Guide or User's Guide supplied with the phone.

[This page left intentionally blank]