Service Training

Self-study Programme 422

Mobile Phone with Bluetooth®

Design and Function

Everyone knows the Vikings.
They were battle-tried warriors, who kept the Old World on its toes for around 250 years starting in 793A.D. when they attacked England in their seagoing long boats. They also discovered and colonised new worlds.
But would you associate them with a modern, wireless communication technology called Bluetooth®?

There is indeed an association because the name of this system is a small tribute to the Viking king Harald I Bluetooth Gormson (Harald Blåtand in Danish) by the Bluetooth® software developers. As the Danish and later Norwegian king, he pushed for the Christianisation and unification of the north and was considered to be very communicative.
The use of the name Bluetooth also underlines the large number of Scandinavian companies involved in the development of Bluetooth®.

S422_068

The self-study programme portrays the design and function of new developments. The contents will not be updated.

For current testing, adjustment and repair instructions, refer to the relevant service literature.

Important Note

Contents

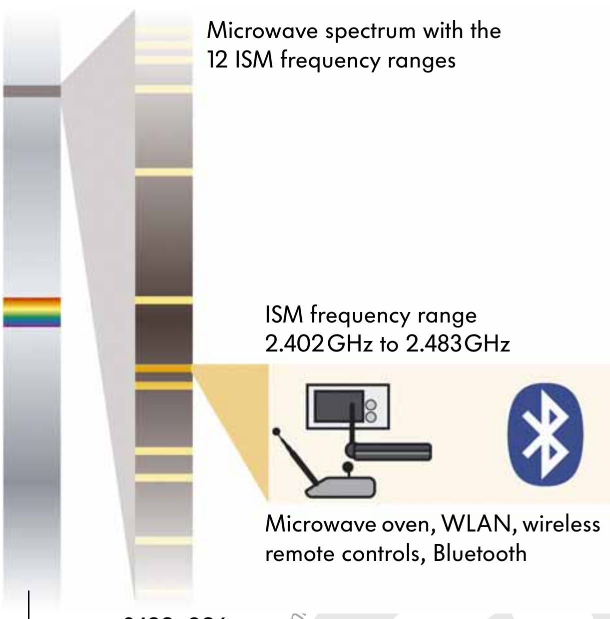
Basics

More and more electronic devices accompany us in everyday life — personal computers (PC), mobile phones, Personal Digital Assistants (PDA), MP3 players, headsets, digital cameras and iPods.
They have the task of ensuring we can be reached at all times, entertaining us and helping us organise our daily schedule.
They are therefore also increasingly being combined with the electronic equipment used in today's cars.
These devices need to be integrated into the technology system of the equipment so that you can operate them using the controls provided in the vehicle, for example, the multifunction steering wheel and the central display and operating module of the radio.
This is the only way to reduce the risk of the driver being distracted from driving when he operates these devices.

Due to the wide range of connectors and interface types used by the different manufacturers, it was a good idea to use a standardised, wireless connection to connect these devices.
The industry standard Bluetooth®, which was developed in the nineties, has established itself as a short-range wireless networking system thanks to its high flexibility and robustness. These networks, which have a very limited coverage, are also known as WPANs (Wireless Personal Area Network).

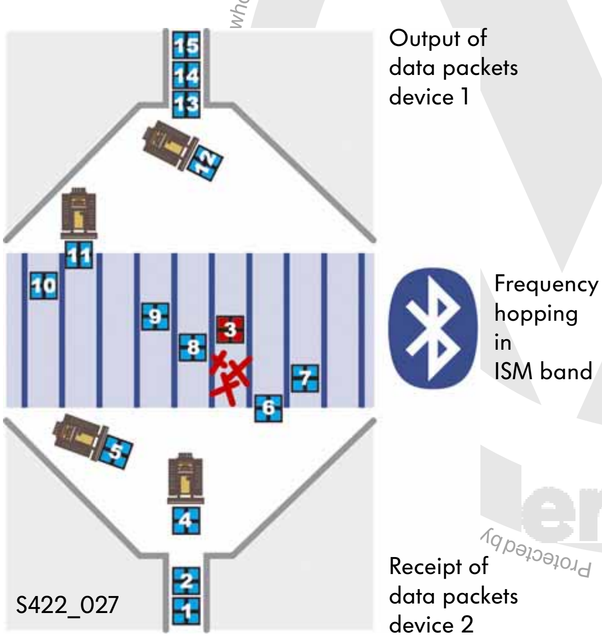
S422_001

The number of mobile phones on the market is large as is the range of telephone preparations supplied by Volkswagen for specific vehicle models and equipment. Therefore we cannot cover all variants in the operating instructions provided in this self-study programme. All information therefore refers to the Nokia 3109 mobile phone and should be considered as an example. For exact details and information on the compatibility of devices and their operation, please consult the corresponding customer service literature, the online information in Volkswagen Service and the operating manuals for the devices used.



S422_026

Bluetooth® transmits and receives in one of the twelve globally approved ISM frequency ranges (Industrial Scientific and Medical Band) within the microwave spectrum. These special frequency ranges may be used without radio licenses and authorisation. A frequency range that is defined for a specific purpose is also called a band. Therefore we also talk about ISM bands. The ISM band in the frequency range from 2.402 to 2.483GHz is used for Bluetooth® operation.



S422_027

The robustness of the Bluetooth® data connection when exposed to electromagnetic interference results from a frequency hopping process.
The available frequency range of the ISM band used is divided into 79 channels for this process.
The connected devices hop back and forth between these channels 1,600 times per second while transferring the data packets. Before starting the transfer, the devices automatically decide which channels they will use in which sequence to transfer the data.

As long as the whole width of the ISM band is not affected by interference, the effect of interference on the data transfer is limited because the impairment can only take affect for a fraction of a second due to the constant change of frequency.

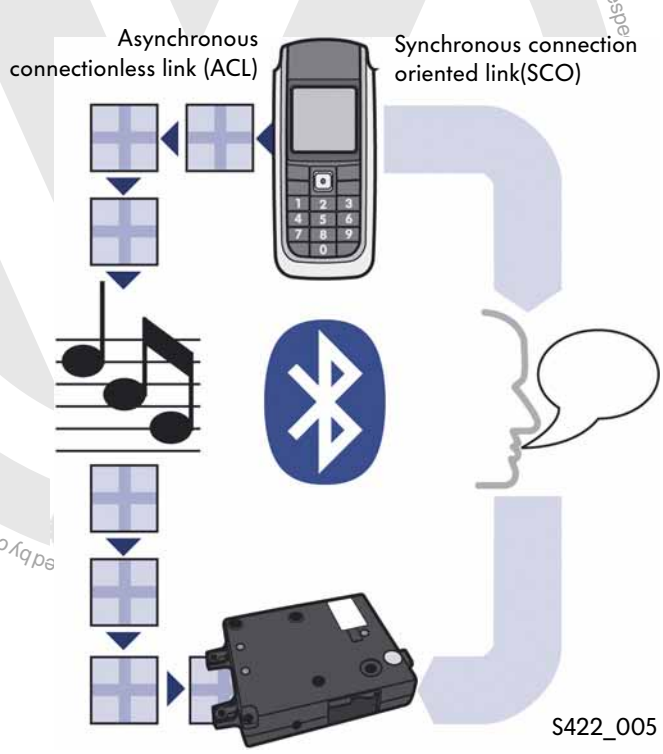
You will find detailed information on the technical basics of Bluetooth® in self-study programme 345 “Universal Mobile Phone Preparation”.

Basics

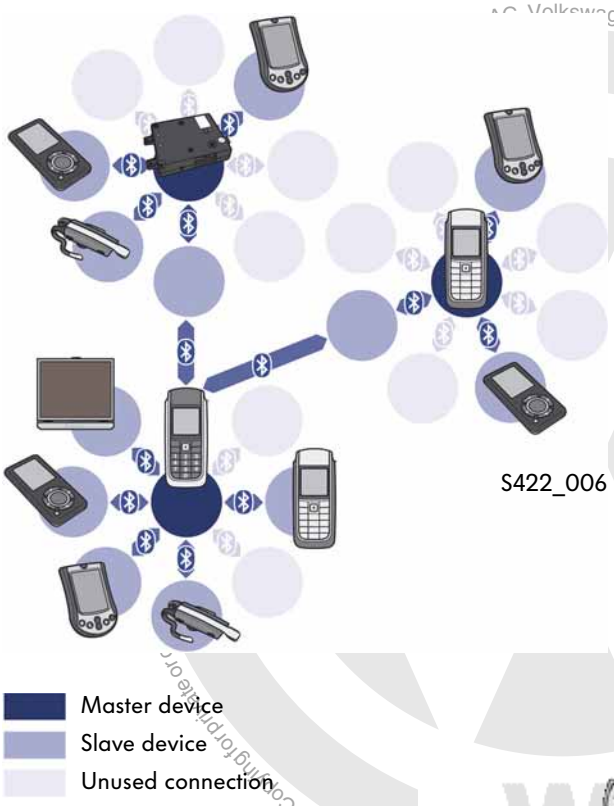
Up to eight devices can be connected in a small network using data transfer on the basis of Bluetooth®. These networks are also known as piconets. Within a piconet, one device acts as the master and the other (up to seven Bluetooth® devices) as slaves, i.e. they are subordinate to the master.

S422_003

Within a piconet, the devices use two different transmission types. A circuit-switched, synchronous connection-oriented link (SCO) with a data rate of up to 64kbit/s is used exclusively for transmitting speech. For other data, for example, music data where it is possible to transfer all information in small data packets, packet switching or an asynchronous connectionless link (ACL) is used. This means that the receiving device can store the data packets as they arrive one after the other and then finally reassemble all information to deliver it as a whole.



S422_005

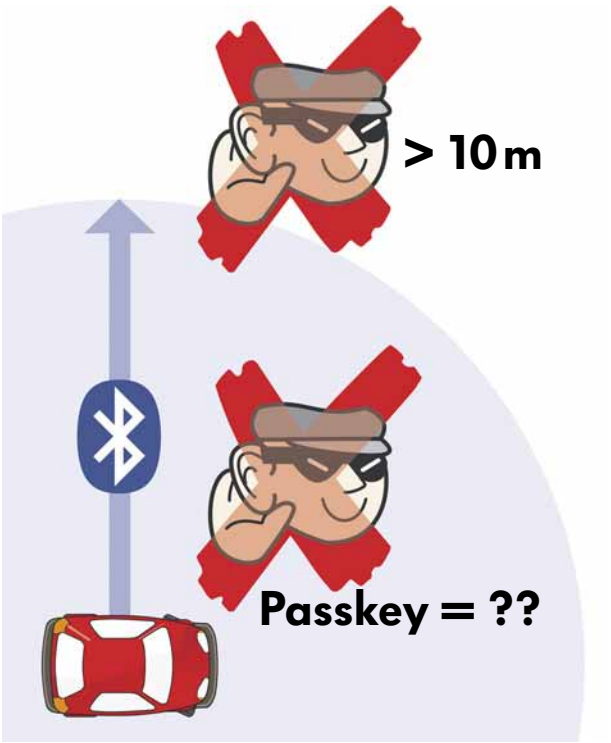


S422_006

A Bluetooth® device can be logged onto several piconets, but can only operate as the master in one network. It is also technically possible to link up to eleven piconets. This is referred to as a scatter network. Since this function has not yet been standardised, it is currently not used in the motor industry.

Only one channel is set up at a time. One of the slave devices can communicate with the master device through this channel.

Bluetooth® piconets have a high level of protection against tapping and unauthorised access to the networked devices by third parties.



S422_007

On the one hand, the transmission power of 1mW (TRANSMISSION CLASS III) limits the range to approximately ten metres so that hackers need to be within this distance. On the other, they need to know the Bluetooth® address of a connected unknown device. When a connection is set up, a passkey is also required, which is made visible only to direct users.

How do you recognise Bluetooth®-compatible devices?

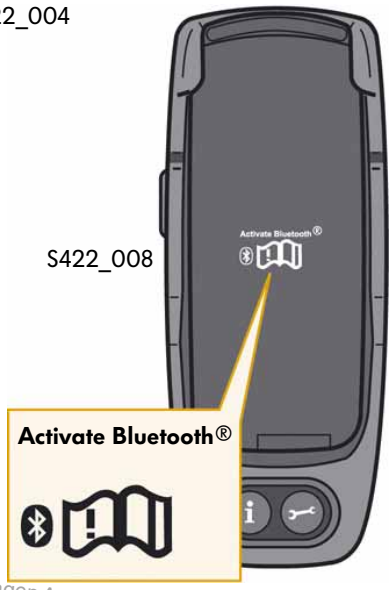
Bluetooth® is a registered trademark that also has its own logo.
In most cases, the manufacturers of mobile phones, PDAs and consumer electronics use this logo on their products to indicate that they are Bluetooth® compatible.

In addition, there are also further indications on the devices, for example, on the Volkswagen “3C0 Premium” adapter set, which has the “Activate Bluetooth®” label alongside the Bluetooth® logo to show that it is compatible.

S422_004

Bluetooth® logo

S422_008



Indication that the device is suitable only for Bluetooth® networking.

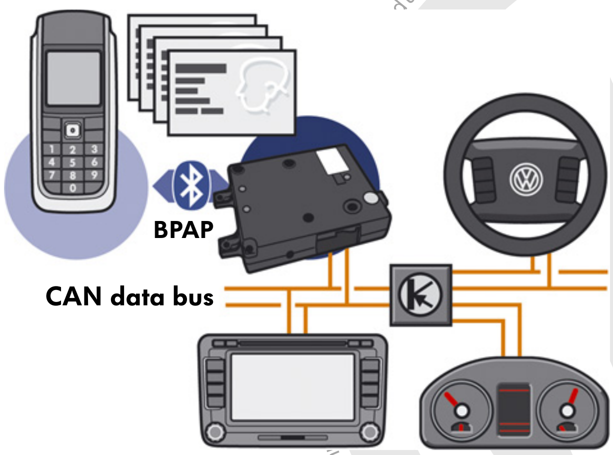
Bluetooth® profiles

Since Bluetooth® was and will also continue to be subject to development, Bluetooth® compatibility alone is not a one hundred percent guarantee that a device can actually be paired with the mobile phone preparation. And, even if it does work, not all functions will necessarily be available.
To achieve this, a Bluetooth® device like, for example, a Bluetooth® mobile phone also needs to support different software profiles, which regulate data transfer between itself and the paired devices and make functions available.

The following table shows you which profiles a mobile phone needs to at least support for use with the “UMPP Standard” or “UMPP Premium”. The profiles specified under “optional” expand the functions of the mobile phone allowing them, for example, to be selected with the vehicle controls.

UMPP / Profile	Standard		Premium	
	Required	Optional	Required	Optional
HFP	●			
rSAP			●	
A2DP		●		
PBAP				●

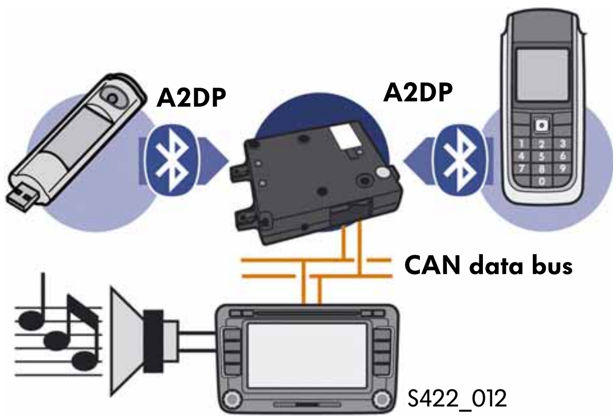
You will find descriptions of the HFP and rSAP profiles in self-study programme 345 “Universal Telephone Preparation”.



Example UMPP Premium

PBAP (Phone Book Access Profile)

PBAP allows you to select and use individual phone numbers or any telephone books that are stored in the mobile phone. Individual entries are transferred as electronic business cards (vCard). The data format used for the business cards is “vcf” (vCard file) and is also used by many e-mail programs and organizers.



Example UMPP Standard

A2DP (Advanced Audio Distribution Profile)

This profile allows music to be transferred on an audio channel in stereo quality, for example, from an MP3 player via the mobile phone and the universal mobile phone preparation to the vehicle audio loudspeakers, only in one direction (unidirectional transmission).

Depending on the manufacturer, it is also necessary to activate the data protocol or also the profiles used via the device menu.
The operating manuals from the manufacturers provide information on this.

Depending on the device type, current profiles can also be installed later on.
Please also refer to the manufacturer information about this.

Bluetooth® mobile telephones from Volkswagen

Nokia 3109 Bluetooth® mobile phone

The Nokia 3109 is one of four Bluetooth®-compatible mobile phones from the Volkswagen accessories range.

Technical features (extract)

- Tri-band mobile phone (supports GSM 900, GSM 1800 and GSM 1900)
- Colour display with 128 x 160 pixels
- Integrated browser for mobile Internet access
- Integrated music player for MP3, MIDI, AAC and WMA among others
- Integrated video player for MP4, H.263 and H.264
- Approx. 8.5Mb internal memory for user data
- Up to 2Gb memory with microSD memory card

All information on operation, for example, pairing Bluetooth® devices, that is provided in this self-study programme refers exclusively to this specific mobile phone.

S422_015

Further Bluetooth® mobile phones from the Volkswagen accessories range

- Nokia 6300/Nokia 6500 classic
- Nokia 6021
- Sony Ericsson W890i

Nokia 6300/ 6500 classic

S422_016

Nokia 6021

S422_021

Sony Ericsson W890i

S422_017

Make sure that all devices that are to be used together via the Bluetooth® interface, for example, mobile phone preparation (UMPP), mobile phone and headset, are compatible with each other. You will find more detailed information about this under Volkswagen Accessories.

Mobile phone preparations

Volkswagen currently supplies two types of mobile phone preparation:

- “UMPP Standard” and
- “UMPP Premium”.

The basic difference between the two is which device acts as the master in the piconet and carries out the pairing with the other devices (slaves) within the network.
If you are using the “UMPP Standard”, pairing is performed on the mobile phone. This means the telephone searches for the UMPP and sets up the connection. The mobile phone is therefore the master.
If you are using the “UMPP Premium”, the control unit searches for available mobile phones or other Bluetooth® devices. This means the control unit sets up the connection and is the master in the vehicle piconet.

A mobile phone preparation (UMPP) consists of:
- the mobile telephone operating electronics control unit,
- the base plate,
- the cradle or the universal pairing adapter and
- the telephone aerial system.

The mobile phone communicates with the vehicle electronics via the mobile telephone operating electronics control unit.

If the necessary profiles are supported by the Bluetooth® devices involved, limited operation of these devices via the vehicle controls depending on the equipment or via the radio or radio/navigation unit in the vehicle is possible.
In this context, limited means that it may not be possible to access all menus and configuration options in the paired Bluetooth® device with the vehicle controls.

The battery of a Bluetooth® device can only be charged from the vehicle onboard voltage supply, e.g. a Bluetooth® mobile phone with the Premium mobile phone preparation, if it is placed in the cradle (available as an option only for Passat, Passat CC and Touareg).

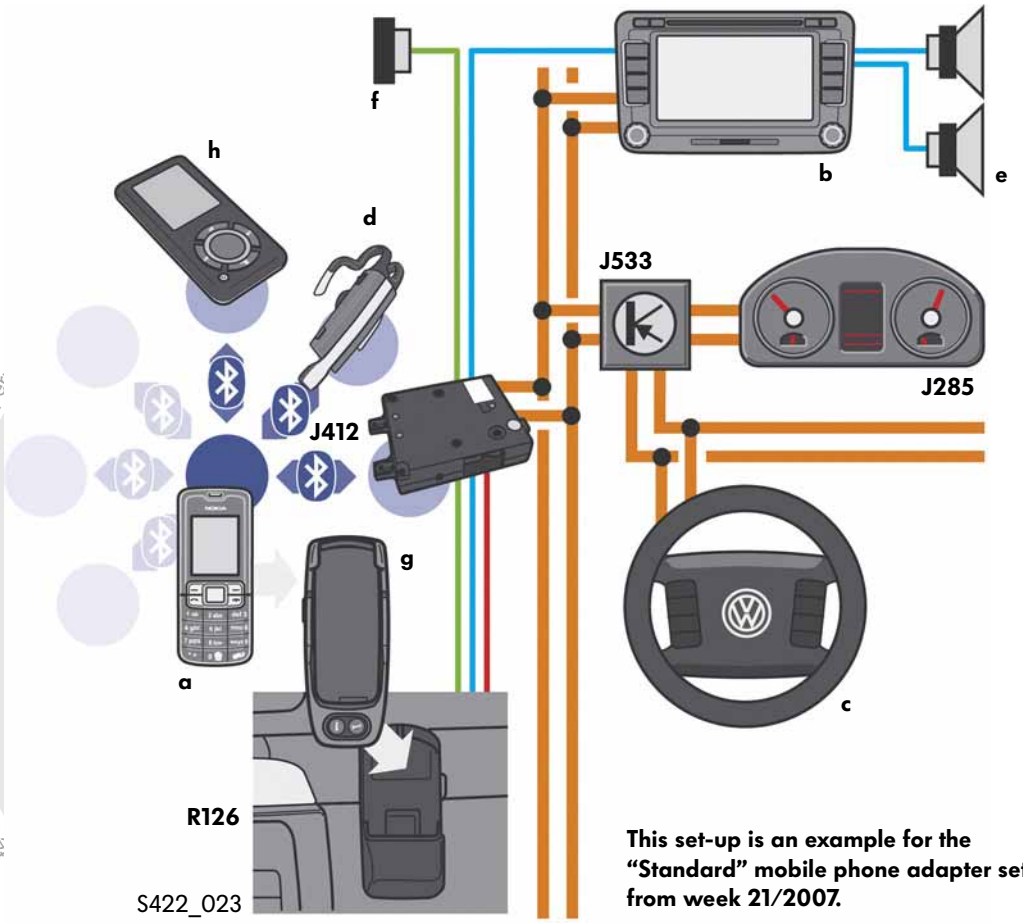
The Volkswagen accessories brochure “Volkswagen Mobile Phone Preparation and Bluetooth®” provides a detailed overview of the possible device combinations for cradles and mobile phones. Furthermore you will also find information about this topic on the Volkswagen accessories website.

Connecting the Bluetooth® network to the vehicle electronics

Depending on which mobile phone preparation (UMPP) is fitted in the vehicle, the mobile phone or the UMPP can function as the master to which further devices can be assigned as slaves.
This could, for example, be a headset used as a hands-free system, an MP3 player as a music source and/or a PDA as additional telephone book.
Since the equipment options related to the UMPP vary, the networks set up with the different telephone preparations may use different controls and display units in each vehicle.
The system connections set up with the “UMPP Standard” and “UMPP Premium” are used as examples in the following section.

Bluetooth® network with the “UMPP Standard” mobile phone preparation

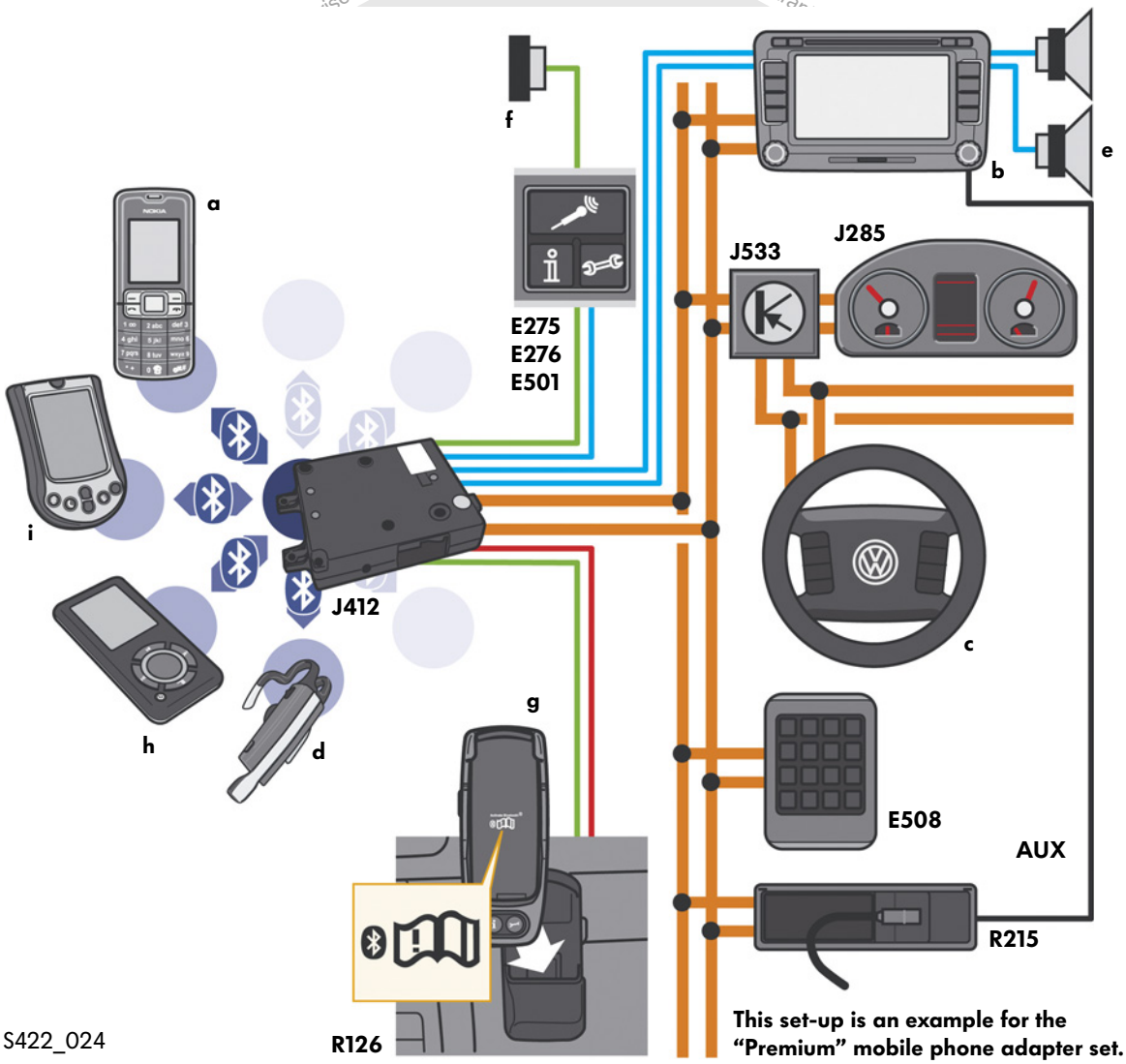
The control unit J412 logs onto the mobile phone as a slave with this UMPP.
The mobile phone takes on the role of master in the Bluetooth® piconet.



This set-up is an example for the “Standard” mobile phone adapter set from week 21/2007.

When talking to customers, please note that laws regarding, for example, the use of headsets in vehicles vary from country to country. Please find out which equipment is legal.

Bluetooth® network with the “UMPP Premium” mobile phone preparation



Legend for pages 12 and 13

E275 Breakdown assistance call button
E276 Emergency assistance call button
E501 Hands-free system button 1
E508 Operating unit for preparation for mobile telephone (optional and depending on vehicle)
J285 Control unit in dash panel insert
J412 Mobile telephone operating electronics control unit
J533 Data bus diagnostic interface
R126 Telephone bracket (optional and depending on vehicle)
R215 Interface for external multimedia devices

a Bluetooth® mobile phone
b Radio or radio/navigation system
c Multifunction steering wheel
d Bluetooth® headset
e Vehicle loudspeaker
f Vehicle microphone
g Adapter set
h Hand-held device (example)
i Bluetooth® navigation unit (example)

CAN data bus
Voltage supply/charging
Input signal
Output signal
Bluetooth® connection

Bluetooth® accessories

There are two adapter sets depending on the model year of the vehicle.
These are:
- the 3C0 Standard adapter set up to model year 2007 and
- the 3C0 Premium adapter set (includes standard scope from model year 2007).

The universal pairing adapter set from Volkswagen accessories can be used by users of Bluetooth® mobile phones that do not fit in the 3C0 adapter sets, but do support the hands-free profile.

3C0 Standard adapter set

There are two versions of this cradle with and without integrated voltage transformer for charging the mobile phone battery. It converts the onboard supply voltage from 12V to the 6.5V Nokia charging voltage. The cradle with integrated voltage transformer is required only for Nokia mobile telephones and vehicles produced from week 44/2007. This is because the UMPP after this date no longer supplies the special Nokia charging voltage, but 12V instead.
Up to week 44/2007, the UMPP supplies the special Nokia charging voltage via a separate output so that the cradle does not need an integrated voltage transformer. The cradle without integrated voltage transformer is therefore required for these Nokia mobile phones.
In addition, there are further distinguishing features that depend on the production date of the vehicle and the UMPP.

For vehicles up to week 21/2007

The mobile phone can only be used with the UMPP if the mobile phone is inserted in the adapter set. The connection between the mobile phone and UMPP is made via the contacts on the adapter set, i.e. by wire. Connecting the telephone via Bluetooth is not supported with the exception of the cradle for the Nokia 6310. If you do not place the telephone in the adapter set, it cannot be used with the telephone preparation.

Cradle

S422_010

For vehicles from week 22/2007

Mobile phones without Bluetooth® can no longer be used as standard in vehicles from week 22/2007.
The audio data and control information is no longer transferred between the mobile phone and UMPP via the contacts in the phone cradle supplied with the adapter set, but only wirelessly via Bluetooth®. Only the info and breakdown call functions are still performed over a wire connection between the adapter set and UMPP.

3C0 Premium adapter set

In the 3C0 Premium adapter set, the plastic housing that clicks into the base plate serves only as a phone cradle and charging holder.

The info call and breakdown call functions are performed via the contact pins in the adapter set as on the 3C0 “Standard”. The telephone functions can be controlled on the mobile phone or, if you have the UMPP “Premium”, also via external controls like the multifunction steering wheel, the button panel or the radio/navigation system controls. The Bluetooth® mobile phone also works if it is not placed in the cradle. Technically it is preferable, however, to place the telephone in the cradle because there will then be a wire connection to the GSM module.

The GSM module is integrated in the mobile telephone operating electronics control unit and connected to the more powerful external aerial. In this way, a considerably more interference-free reception will be achieved. The mobile phone needs to be logged onto UMPP correctly, however. (see Bluetooth® pairing)

The mobile phone will not be charged during use in the vehicle if it is not placed in a suitable holder or charging cradle.

Hardware Components

Vehicle-specific adapter sets

There are specific adapter sets or mobile phone charging cradles for numerous vehicles and vehicle equipment lines like, for example, the Passat model year 2006.

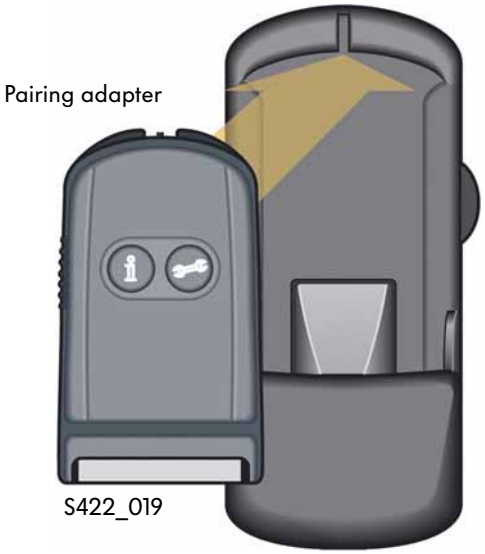
The Bluetooth®-compatible mobile phone is kept in the storage compartment under the centre armrest depending on the equipment and is also controlled from there.

S422_072

Universal pairing adapter from Volkswagen

The adapter can be used to connect Bluetooth® mobile phones to the “UMPP Standard” if no special brackets or charging cradles, which fit on the base plate of the mobile phone preparation, are available for them.

In order to use the Bluetooth® function with the “UMPP Standard” in vehicles from week 22/2007, the universal pairing adapter from Volkswagen is required. It is fitted in place of the adapter set into the base plate of the mobile phone preparation. Inserting it activates the Bluetooth® function of the UMPP so that the UMPP can log onto the mobile phone. The info and breakdown functions are available via the buttons on the pairing adapter. It is not possible to charge the mobile phone when using this adapter.



S422_019

Base plate of mobile phone preparation

The universal pairing adapter from Volkswagen can only be used for the “UMPP Standard” mobile phone preparation.

Pairing Bluetooth® devices

To operate a mobile phone or other devices on the piconet with or from the UMPP, these devices need to be logged onto the Bluetooth® network. You can also say: “The devices need to be paired.”
This procedure involves the following steps:

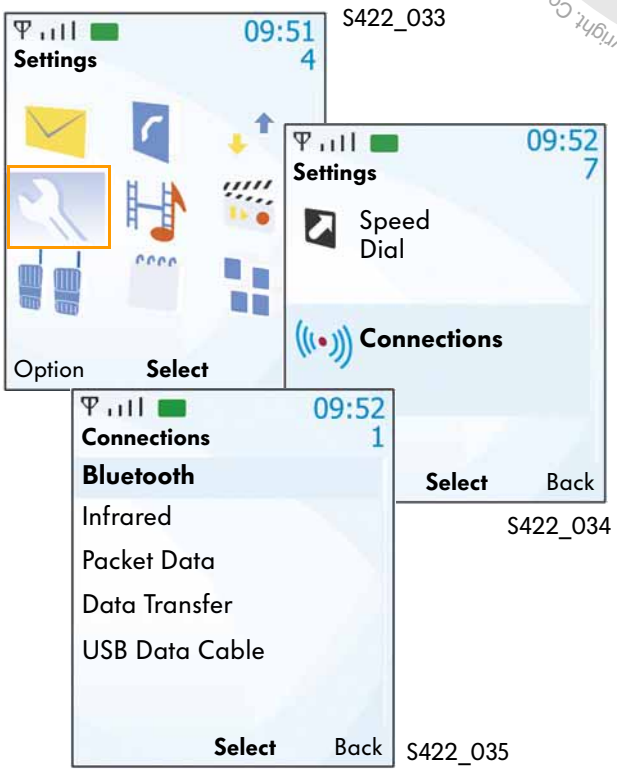
- Activating the Bluetooth® interface on the devices
- Making the devices visible for the pairing process
- Pairing the devices by entering the passkey

Before the first or subsequent pairing, the following conditions need to be met always and regardless of the UMPP type:

- The vehicle is stationary.
- The ignition key is inserted.
- The ignition is switched on.

Activating the Bluetooth® interface on the mobile phone

Electronic devices like mobile phones, PDAs etc. do not necessarily have to use Bluetooth® to exchange data since they also have other interfaces, for example, USB. Therefore you normally need to enable the Bluetooth® interface manually in these devices. This is done in the settings menu of the device you want to pair.



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S422_034

S422_035

In the Nokia 3109 mobile phone, you will find this option in the main menu under “Settings” and then the “Connections” entry.

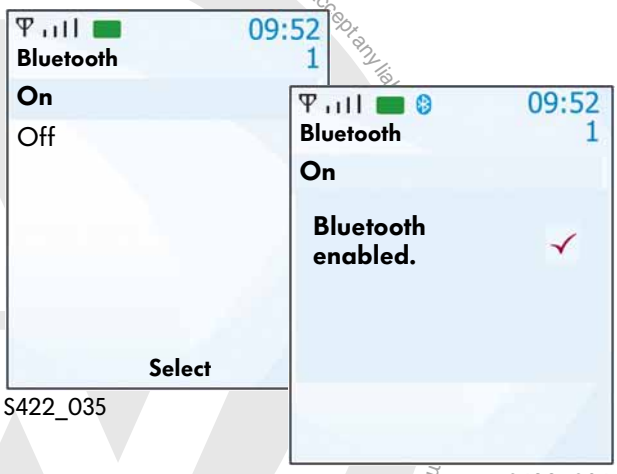
Select the “Bluetooth” entry.

The rSAP profile needs to be activated separately on the telephone if you are pairing it with the “UMPP Premium”. Please refer to the operating instructions for the mobile phone about this.

Using Bluetooth®

Select “On” and confirm the selection.
Bluetooth® is now enabled on the mobile phone as on the “UMPP Standard”.

On the “UMPP Premium”, the Bluetooth® interface is permanently enabled so you do not need to activate it manually when pairing the mobile phone.



S422_035 S422_036

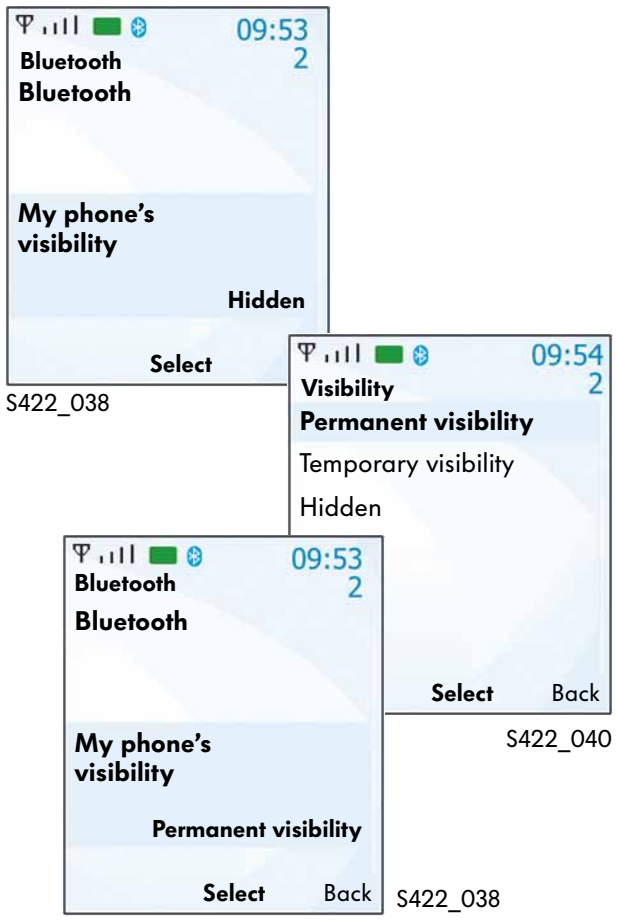
Making the devices visible for the pairing process

Bluetooth® devices can only be discovered by other Bluetooth® devices and displayed as new communication partners if they are “visible”. This also applies to the mobile phone and the mobile phone preparation. However, the devices need to be set to visible only for the first pairing procedure in a piconet.

Setting the Nokia 3109 to visible

Once you have enabled the Bluetooth® interface, the mobile phone indicates whether it is currently visible in the “Bluetooth” menu.

Selecting “My phone’s visibility” takes you to a list of options where you can choose from “Permanent visibility”, “Temporary visibility” and “Hidden”.
If you select “Temporary visibility”, the user will have two minutes to carry out the pairing process.
If you select the “Permanent visibility” entry, there will be no time limit for the pairing procedure. However, for security reasons, you should not forget to set the mobile phone to “Hidden” again once you have completed pairing.



S422_038 S422_040 S422_038

Making “UMPP Standard” visible

There are three ways to set the “UMPP Standard” to visible.
Before you start pairing the vehicle needs to be stationary.
This requirement also applies to the “UMPP Premium”.

S422_028

Ignition “on” | Visible in Bluetooth® network | for 5 minutes

1st possibility

The Bluetooth® connection of the UMPP is visible for five minutes after you switch on the ignition. After this time or if you start driving, the Bluetooth® connection of the UMPP will be set to hidden again.

S422_029

One after the other within 5 seconds | Visible in Bluetooth® network | for 5 minutes

2nd possibility

Press the info button first and then the breakdown button in succession within five seconds.
The Bluetooth® connection of the UMPP will now be visible again for 5 minutes.
This is signalled by a confirmation tone.

S422_030

In quick succession | Visible on Bluetooth® network | for 5 minutes

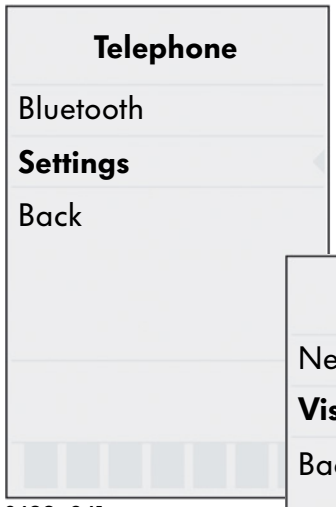
3rd possibility

Alternatively you can also press the telephone button on the multifunction steering wheel twice in quick succession to set the Bluetooth® connection to visible. Again the visibility is signalled by a confirmation tone.

Making “UMPP Premium” visible

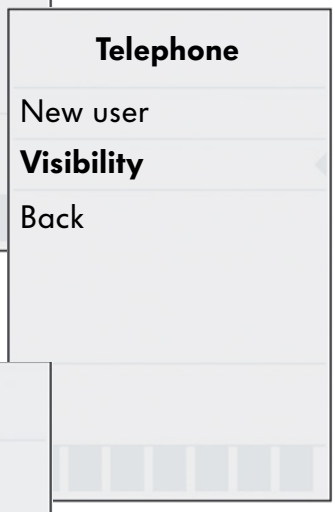
In addition to the three possibilities described, the “UMPP Premium” can also be set to visible for three minutes via the telephone menu.

Open the telephone menu in the dash panel insert display and then select “Settings”.



S422_041

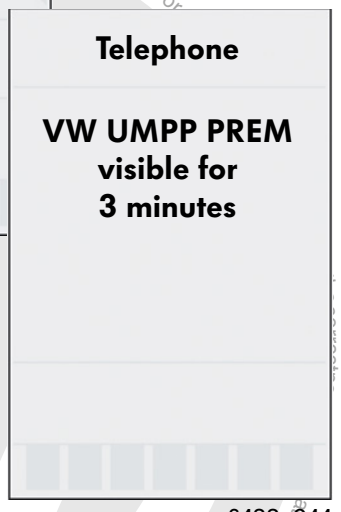
After you confirm the selection with the OK button, the menu item “Visibility” will take you to the appropriate menu.



S422_041

There you have the two options “Yes” and “No” under the “Switch on visibility” question. You can make the UMPP temporarily visible with “Yes” and the OK button.
It is not possible to make the UMPP Premium constantly visible like a mobile phone. This ensures the security of the “UMPP Premium” Bluetooth® network.

S422_042



S422_044

The “UMPP Premium” is automatically set to visible when you start Bluetooth® pairing. The manual visibility setting is available in the menu only as an additional option.

Initial pairing via Bluetooth®

When you pair a mobile phone, a passkey is transferred that authenticates the devices on the UMPP. This means that the mobile phone checks whether the device that is attempting to log onto the UMPP network is authorised to do so. The passkey is generated by the UMPP and displayed in the dash panel insert (Premium).
The pairing process between the mobile phone and telephone preparation can take up to three minutes.
The personal identification number (PIN) needs to be transferred to the UMPP if the UMPP is to assume the role of the paired mobile phone in the mobile communications network (only concerns “UMPP Premium”).

In the following section, we will explain the initial pairing of the “UMPP Standard” and “UMPP Premium” using the Nokia 3109 as an example.

Pairing with the “UMPP Standard”

Hardware requirements

- Working radio or radio/navigation system
- Correctly installed mobile phone preparation with base plate
- Bluetooth®-compatible adapter set or universal pairing adapter fitted
- Bluetooth® mobile phone switched on
- If necessary, further compatible devices, for example, a headset, (max. seven devices in a network)

Software requirements

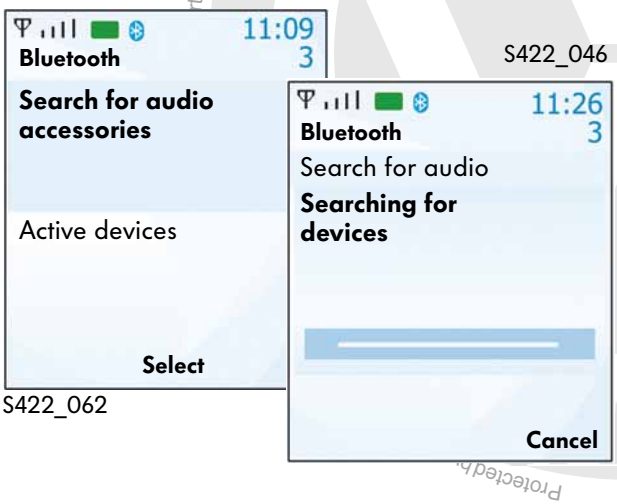
- All devices being paired are Bluetooth®-compatible
- The mobile phone needs to support at least the HFP profile and other profiles, if needed, e.g. A2DP

Before you start

- Click the compatible adapter set or universal pairing adapter into the base plate
- Switch on and unlock the mobile phone
- Turn on the ignition and wait around 10 seconds
- The vehicle is stationary

Pairing mobile phone via Bluetooth®

Start the search for nearby Bluetooth® devices on the mobile phone by selecting “Search for audio enhancements” from the “Bluetooth” menu.
The mobile phone will now search for visible Bluetooth® devices in its range.
This process can take a few minutes.



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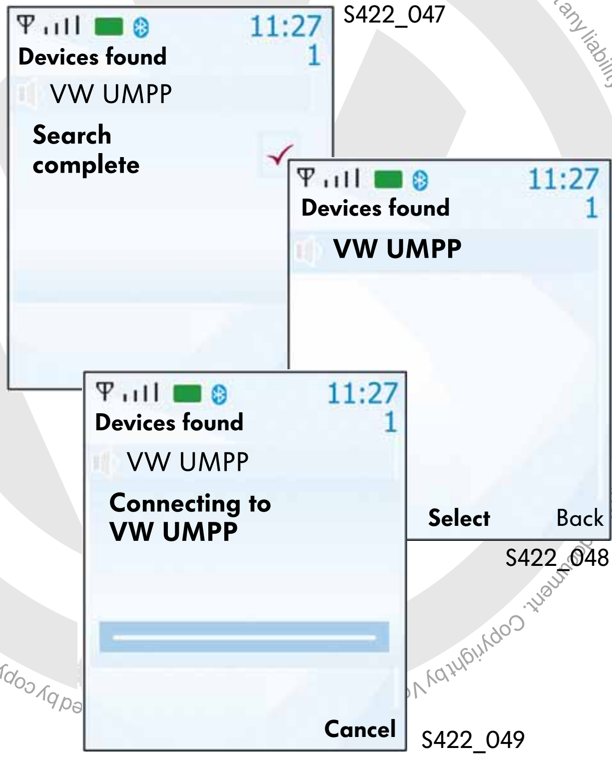
Using Bluetooth®

The mobile phone displays a list of the Bluetooth® devices that it has found.
Select the device “VW UMPP” from the list.

Confirm the Bluetooth® connection on the mobile phone with “Select”. The mobile phone now sets up the Bluetooth® connection with the UMPP.



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S422_048

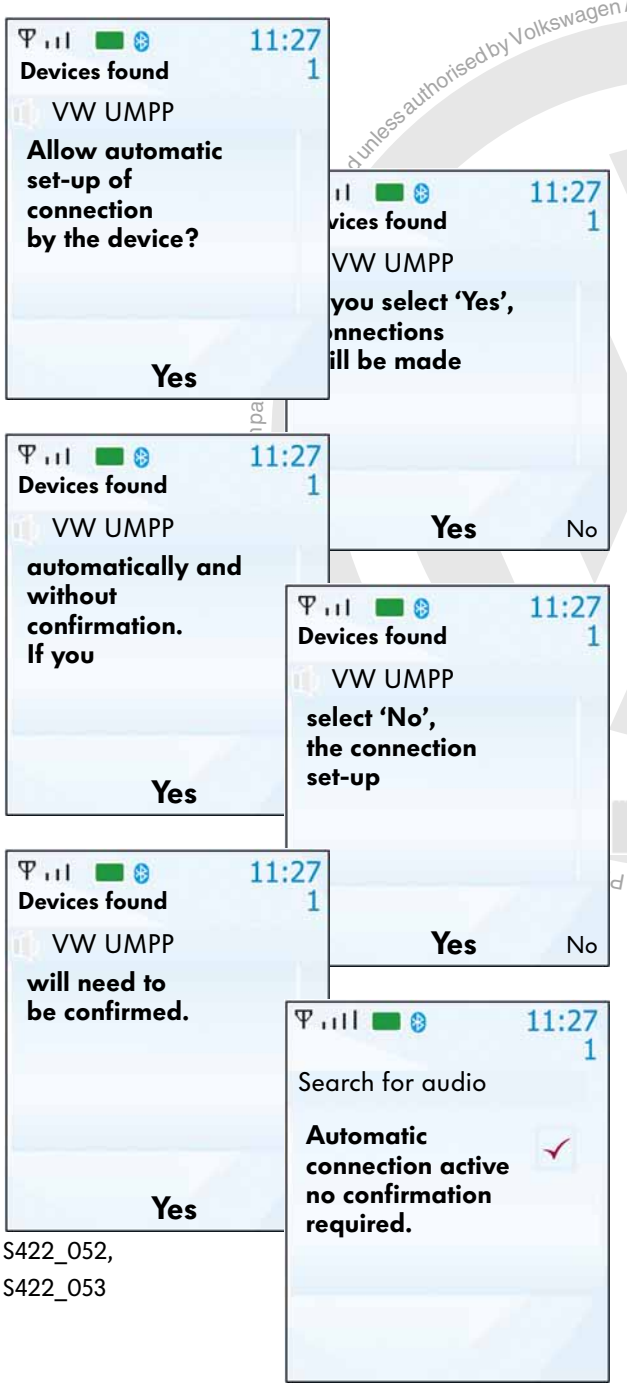
S422_049

If you are using the “UMPP Standard”, the digits “0000” need to be entered on the mobile phone within 30 seconds as the default passkey set at the factory. Confirm the entry with “OK”.
The mobile phone saves the Bluetooth® device identification number (ID). The UMPP also saves it in a list for future Bluetooth® connections with this mobile phone.

When you turn on the ignition, the UMPP automatically searches for the mobile phone that it was most recently paired with.
If this is not available, the UMPP works through the list of previously paired devices in reverse order.

S422_051

S422_047



S422_052,
S422_053

Depending on the mobile phone, you can select the option that the passkey does not need to be entered again when the Bluetooth® connection is resumed in future. The connection is then made automatically when the ignition is switched on and as long as the mobile phone is within the reception range of the Bluetooth® network.

After the mobile phone connects to the UMPP, it will ask you whether the connection should be set up automatically in future.
If you reply "Yes", you do not have to confirm the selection with the OK button on the mobile phone.
If you select "No", you will need to confirm this by pressing the OK button.

The pairing process needs to be completed within the five minutes that the Bluetooth® connection of the UMPP is visible. If this is not possible, the pairing attempt will fail and needs to be repeated.

If you enter the wrong passkey or do not enter a passkey, you will need to start the pairing process again by setting the Bluetooth® connection to visible.
A low-frequency signal sounds to indicate that the pairing has been cancelled.

If you want to pair a mobile phone to the same type of UMPP in a different vehicle, you may have to change the device name of the UMPP to avoid confusion.

Using Bluetooth®

Pairing with the “UMPP Premium”

Hardware requirements

- Working radio or radio/navigation system
- Correctly installed mobile phone preparation with base plate (optional)
- Correctly fitted adapter set for charging the mobile phone (optional)
- Bluetooth® mobile phone switched on
- If necessary, further compatible devices, for example, a headset (max. three devices at the same time on the “UMPP” piconet)

Software requirements

- All devices being paired are Bluetooth®-compatible
- The mobile phone supports at least the rSAP profile

Before you start

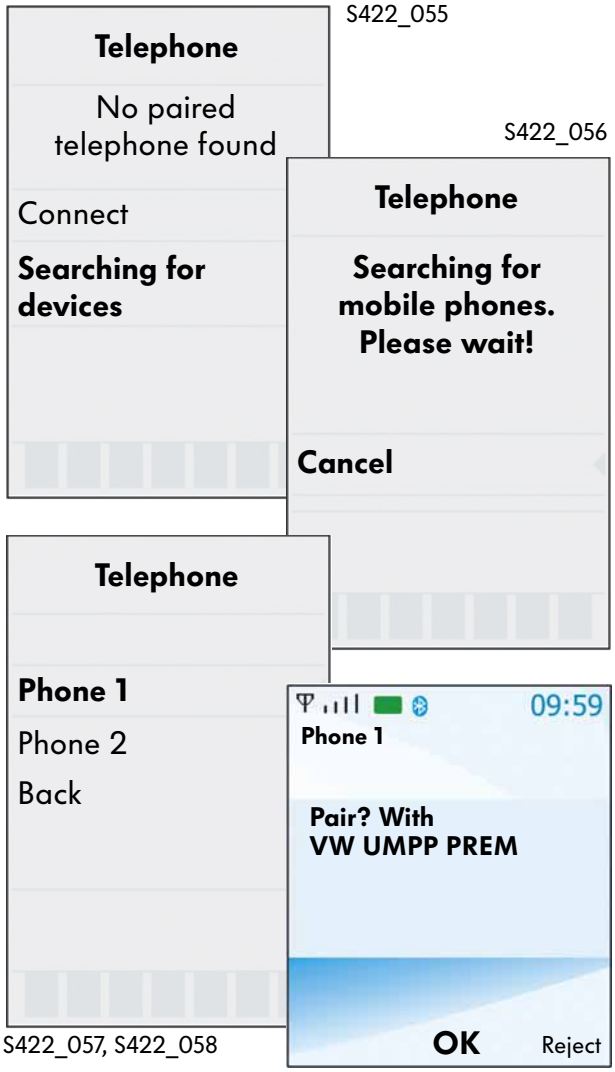
- Place the mobile phone in the reception range of the UMPP Bluetooth® connection
- Switch on and unlock the mobile phone
- Enable Bluetooth® on the mobile phone
- The vehicle is stationary

Pairing mobile phone via Bluetooth®

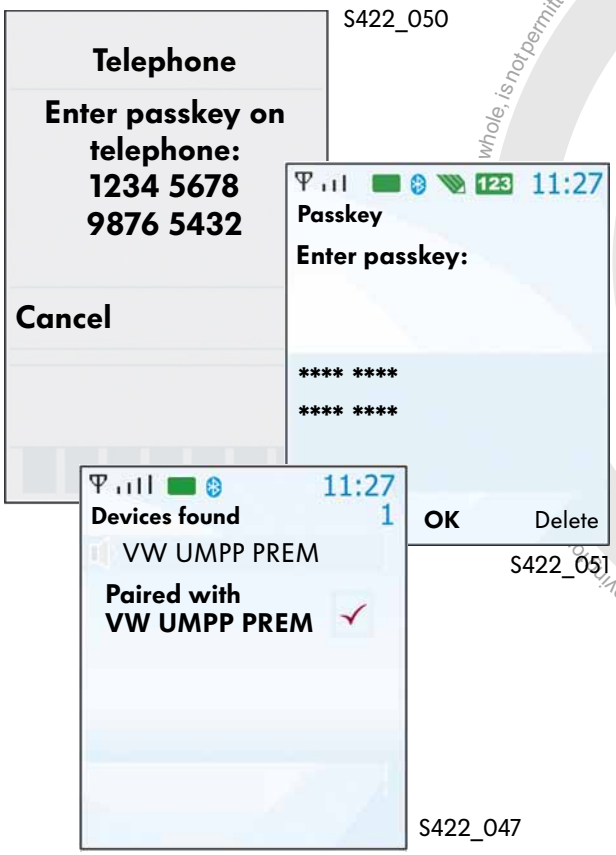
Open the telephone menu in the dash panel insert, for example, by pressing the telephone button on the multifunction steering wheel.

Select the “Find devices” option from the telephone menu. The UMPP now searches for active Bluetooth® devices in its range.

Select the desired mobile phone from the list of devices and confirm with the OK button. The UMPP now tries to set up a connection with the selected device.
This recognises the connection request and asks the user on his own display whether the connection to the “VW UMPP PREM” should be set up.
Confirm with the OK button on the mobile phone.



S422_057, S422_058



S422_050

S422_051

S422_047

A 16-digit passkey with four blocks of four digits will now be displayed in the dash panel insert. The mobile phone asks you to enter the passkey on its display and confirm it. You have 30 seconds to do this.

If you complete the entry within this time, the mobile phone display will show that the connection to the "UMPP Premium" has been set up.

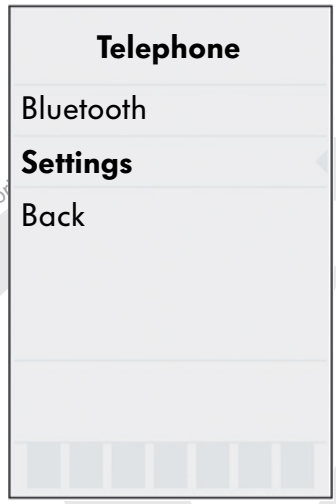
Similar to pairing with the "UMPP Standard", you can also specify whether connections should be set up automatically in future whenever the mobile phone enters the range of the active UMPP. After you turn the ignition on, the "UMPP Premium" will try to connect to the three devices that it was last paired with if they are available.

S422_058

The "UMPP Premium" imports the address book from the SIM card in the mobile phone as well as the telephone memory and stores the data in its own memory. This needs to be selected by the user on the UMPP. The mobile phone informs you about this with the message "External SIM access". This procedure takes place automatically each time a connection is set up between the mobile and UMPP.
A maximum of three telephone books can be managed independently of each other by the UMPP.

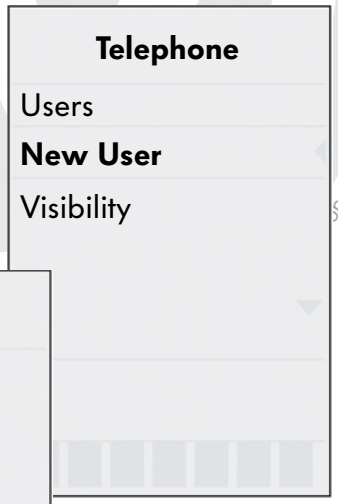
Using Bluetooth®

The “UMPP Premium” allows you to create user profiles for the devices connected via Bluetooth®. You start this by selecting “New user” from the telephone menu. The user profile assigns a user name to the logged on Bluetooth® device that is stored together with the passkey used for the connection. All devices that have been paired with the “UMPP Premium” and for which a profile has been saved are listed in the “Users” menu. This allows a Bluetooth® device to also be connected to the UMPP if, for example, the option for automatic connection set-up is disabled.

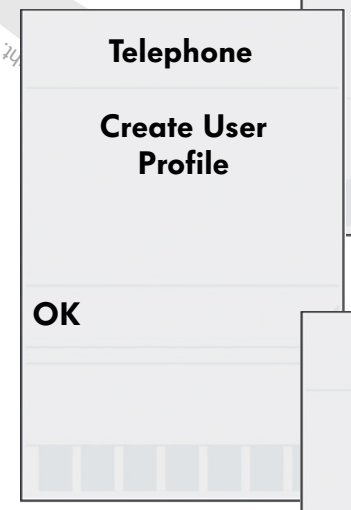


S422_041

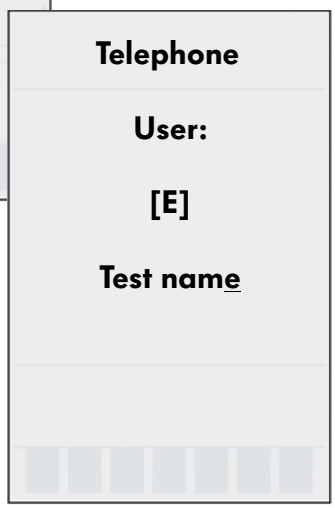
To create and save a new user profile, select “Create User Profile” under “New User” in the telephone menu. Now you have to enter a name for the user. To do this, you need to select and confirm the individual letters one after the other. The current letter is displayed in the dash panel insert inside the square brackets. You can, for example, navigate through the alphabet using the forwards and backwards buttons on the multifunction steering wheel to enter the user name. Press the OK button to select the displayed letter for the user name.



S422_059



S422_060



S422_061

If you are using the Premium mobile phone preparation, the mobile telephone operating electronics control unit loads the contents of the SIM card into its own memory. It takes over the function of the mobile phone, which switches to sleep mode while it is being used in the car. The mobile phone performs only monitoring functions in this mode.
The mobile phone logs out of the mobile communications network initially while the functions are taken over by the UMPP. Only then can the UMPP log onto the mobile communications network again with the data from the SIM card in place of the mobile phone since it is not technically possible to log onto the GSM network twice with the same SIM identification.

Mobile phones without Bluetooth® are not supported by the “Premium” mobile phone preparation even if they are inserted in the adapter set. They cannot be used in this device configuration.

If you do not switch on the mobile phone until after you have turned on the ignition, the pairing process must be started manually.

An entry-level version of the “UMPP Standard” is being prepared for special markets, for example, South America, South Africa and the Baltic States, for vehicles from MY2010. This UMPP will not have an external aerial, wiring or base plate. Instead it will have a three-button module with the info button, breakdown button and a button for controlling the Bluetooth® pairing.

Pairing further Bluetooth®-compatible audio devices

Bluetooth® hands-free system with MP3 playback

To use this type of hands-free system, the participating Bluetooth devices need to support the HFP protocol.

You can receive, end or also reject calls with this. It is still possible to receive an incoming call in "privacy mode". The sound is then heard only through the headset, not over the vehicle loudspeakers, so passengers cannot hear the person at the other end. When you use the headset, the connection between the mobile phone and UMPP is interrupted and a Bluetooth® connection is set up between the mobile phone and headset.

S422_063

Closing Bluetooth® connection

If a device leaves the transmission and reception range of the Bluetooth® network onto which it is logged, the connection to the UMPP will be closed. The same applies if the ignition is turned off and the ignition key removed or the device paired with the UMPP is switched off.

If the passkey was saved in the list of paired devices and you enabled automatic connection in the menu during the initial pairing, there is no need to carry out manual pairing again because the connection will be set up automatically.

If the device returns to the reception range or if the ignition or device are switched on again, the device will need to log onto the UMPP Bluetooth® network again in an additional pairing process if "Automatic connection set-up" has not been enabled.

Customer support

Customers who already have a mobile phone expect that customer support will explain to them whether and to what extent their mobile phone can be operated via the vehicle UMPP.
The schematic diagram on the next double page shows you one possible way of providing the information that the customer needs.

Questions that you have to clarify

1. What kind of mobile phone does the customer have?

Not all customers use mobile phones from the Volkswagen accessories range. To clarify whether and to what extent the customer's mobile phone can be connected to the vehicle telephone preparation, various information on the mobile phone needs to be taken into consideration (Bluetooth® function, supported profiles: rSAP, HFP, A2DP, ...). If necessary, consult the manufacturer's pages on the Internet if your customer does not have the required information to hand.

2. Is the vehicle equipped with a mobile telephone preparation and, if so, which one?

"UMPP Standard" and "UMPP Premium" basically differ in the possibilities to connect mobile phones to them.

3. How old is the vehicle?

It is not only the UMPP that decides whether and how a mobile phone can be connected to the UMPP, but also the model year of the vehicle.
In vehicles produced from week 22/2007, for example, only mobile phones with Bluetooth® function can be connected to the UMPP even if the "UMPP Standard" is fitted.

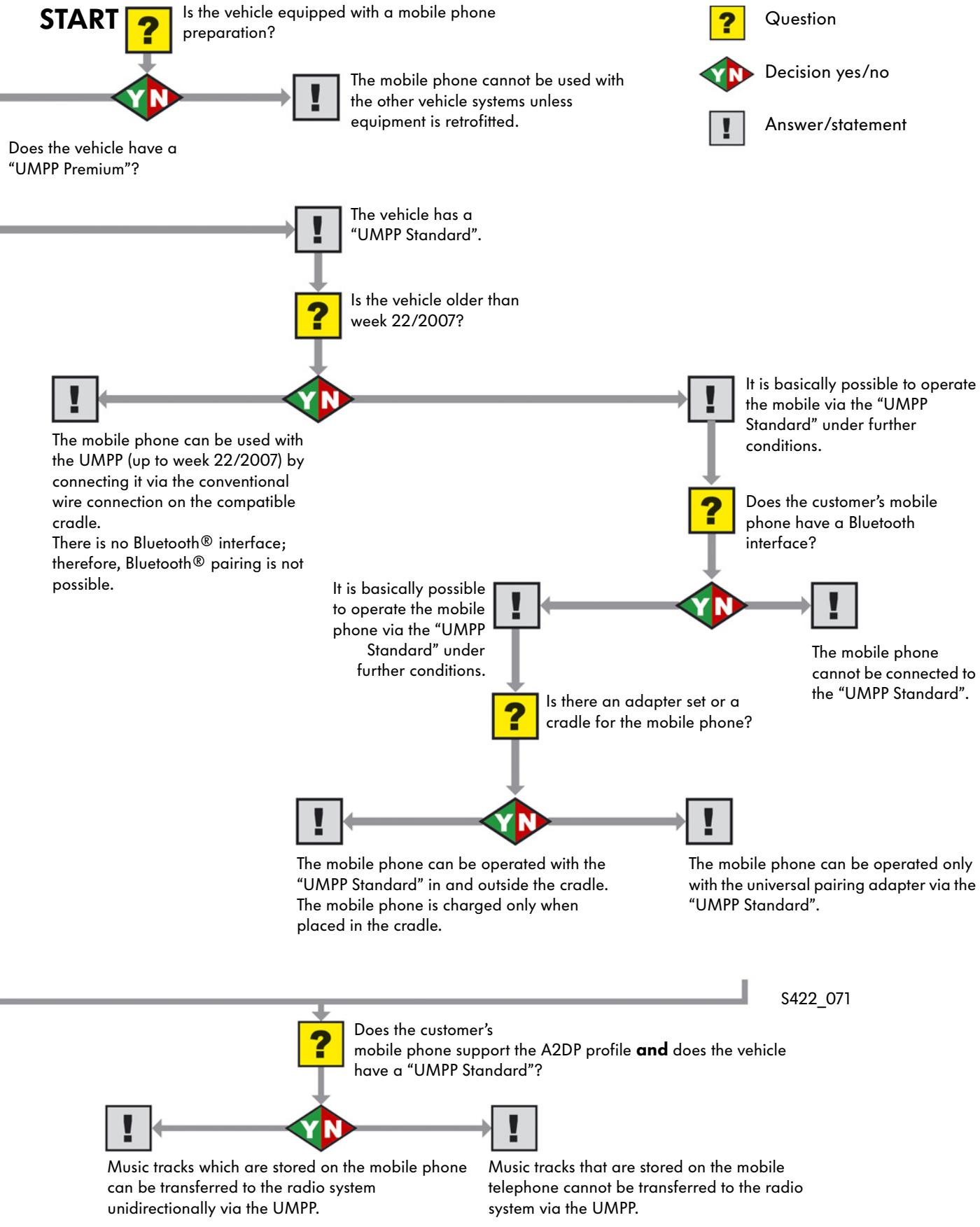
4. Does the vehicle have a cradle that is clicked into the telephone preparation base plate? Is a cradle available for that specific mobile phone?

The type of cradle decides whether the customer's mobile phone can be operated and charged in the cradle and whether it can also be connected to the UMPP without being placed the cradle. It may be possible to set up the connection to the UMPP if the customer has a Bluetooth® mobile phone and a vehicle with the "UMPP Standard" by using the universal pairing adapter.
Use the information provided by the Volkswagen accessories service for these questions.

Schematic diagram

Situation:
A customer wants to operate a mobile phone using the controls in his vehicle.

A better transmission quality is achieved if a Bluetooth® mobile phone is placed in the proper cradle as this is the only way to connect to the mobile communications network via the vehicle's external GSM aerial (only concerns "UMPP Standard").


START
Is the vehicle equipped with a mobile phone preparation?
Y N
The mobile phone cannot be used with the other vehicle systems unless equipment is retrofitted.
Does the vehicle have a "UMPP Premium"?
The vehicle has a "UMPP Standard".
Is the vehicle older than week 22/2007?
Y N
The mobile phone can be used with the UMPP (up to week 22/2007) by connecting it via the conventional wire connection on the compatible cradle.
There is no Bluetooth® interface; therefore, Bluetooth® pairing is not possible.
It is basically possible to operate the mobile via the "UMPP Standard" under further conditions.
Does the customer's mobile phone have a Bluetooth interface?
Y N
It is basically possible to operate the mobile phone via the "UMPP Standard" under further conditions.
The mobile phone cannot be connected to the "UMPP Standard".
Is there an adapter set or a cradle for the mobile phone?
Y N
The mobile phone can be operated with the "UMPP Standard" in and outside the cradle. The mobile phone is charged only when placed in the cradle.
The mobile phone can be operated only with the universal pairing adapter via the "UMPP Standard".
Question
Decision yes/no
Answer/statement
S422_071
Does the customer's mobile phone support the A2DP profile and does the vehicle have a "UMPP Standard"?
Y N
Music tracks which are stored on the mobile phone can be transferred to the radio system unidirectionally via the UMPP.
Music tracks that are stored on the mobile telephone cannot be transferred to the radio system via the UMPP.

Glossary

A2DP
(Advanced Audio Distribution Profile)
Profile for unidirectional transfer of audio data.

AAC
(Advanced Audio Coding)
AAC is an audio data compression method developed by the Moving Picture Experts Group that is used in the MPEG-2 standard (MP2).

ACL
(Asynchronous Connectionless)
ACL is a data protocol that is used for transferring music, for example. The data are divided into data packets and transferred asynchronously.
All data packets therefore have to be received and reassembled as a whole again before playback can be started.

PBAP
(Phone Book Access Profile)
Profile for transferring electronic business cards from the telephone book in the mobile phone to a paired device.

ELECTROMAGNETIC SPECTRUM
The electromagnetic spectrum is the range of all radiation types that are considered to be electromagnetic waves or their particle radiation. We are surrounded by electromagnetic radiation in all areas of life. The spectrum covers an enormous frequency range from very low energy radiation at a few hertz and wavelengths of several 10,000 km to extremely high energy radiation in the zetahertz range with wavelengths of a few billionths of a metre (femtometre, 10^{-15} m). Examples of electromagnetic radiation include, for example, visible light, heat radiation, X-ray, radio waves, cosmic background radiation etc.

GSM
(Global System for Mobile Communication)
GSM is an international standard for fully digital mobile telecommunications networks. It is the most widespread mobile communications standard in the world and forms the basis for the D and E networks in Germany.

H.263, H.264
Special video encoding systems (Codec)

HFP
(hands-free profile)
Profile that allows communication between a mobile phone and the vehicle hands-free system.

ISM
(Industrial, Scientific and Medical Band)
Bands in the microwave spectrum that are approved for general usage and can be used without a licence. There are currently twelve different ISM frequency bands.

MP4
(Motion Pictures expert group layer 4)
The latest data standard from the Moving Picture Experts Group, which is based on the Apple QuickTime file format. MP4 files can have multimedia content, for example, several audio and video tracks as well as subtitles, 2D and interactive 3D graphics.

PDA
(Personal Digital Assistant)
Small hand-held computer in "jacket pocket format" that has a range of functions, for example, calendar, schedule, address management and also Internet access, depending on the type and manufacturer.

PIN
(Personal Identification Number)
When referring to mobile phones, the PIN is a numerical password that the owner uses to enable his phone.
He authenticates himself on the mobile phone in order to use it and access the data it contains.

rSAP
(remote SIM Access Profile)
Profile that allows the UMPP to read the SIM card.

SCO
(Synchronous Connection Oriented)
SCO is a data protocol that is used to transfer speech using a circuit-switched, synchronous connection.

TRANSMISSION CLASSES
Three standard transmission classes are defined for Bluetooth® devices:
class I with a transmission power of 100 mW,
class II with a transmission power of 2.5 mW and
class III with a transmission power of 1 mW.

UMPP
The abbreviation UMPP or universal mobile phone preparation is a common term for the “mobile telephone operating electronics control unit J412” or “telephone preparation”.

USB
(Universal Serial Bus)
A very widespread, standardised interface between various electronic devices, for example, computers, printers, scanners, digital cameras, storage media etc.

WLAN
(Wireless Local Area Network)
Wireless local network.

WMA
(Windows Media Audio)
Windows audio data format.

WPAN
(Wireless Personal Area Network)
Wireless local network with very limited coverage.

Test Yourself

Which answers are correct?

One or several of the answers could be correct.

1. Which profile must a Bluetooth® mobile phone always have to allow it to be paired with the “UMPP Premium”?

☐ a) The mobile phone just needs to support the A2DP profile.

☐ b) The mobile phone needs to support at least the rSAP profile.

☐ c) The mobile phone just needs to support the HFP and A2DP profiles.

2. How do you activate the Bluetooth® interface on the UMPP Premium?

☐ a) By entering the PIN code.

☐ b) By activating the Bluetooth® interface in the telephone menu.

☐ c) The UMPP Premium does not have a Bluetooth® interface.

☐ d) The Bluetooth® interface is constantly activated and does not need to be activated manually.

3. How can the UMPP Standard be set to visible for the pairing process in a Bluetooth® piconet?

☐ a) The UMPP is set to visible for 5 minutes when you turn on the ignition.

☐ b) Pressing the info and breakdown buttons within five seconds sets the UMPP to visible for 5 minutes.

☐ c) Pressing the telephone button on the multifunction steering wheel twice sets the UMPP to visible for 5 minutes.

☐ d) The UMPP is constantly visible so that a mobile phone can log onto the UMPP at anytime.

4. Which basic steps for pairing a Bluetooth® mobile phone to the UMPP Premium are also responsible for the security of the piconet?

☐ a) Switching on the mobile phone.

☐ b) Setting the devices to be connected to visible and entering the passkey on the mobile phone being paired.

☐ c) Enabling the “connect automatically” option.

5. Where do you obtain the passkey for pairing a Bluetooth® mobile phone to the UMPP Premium?

☐ a) The passkey is stamped on a card that comes with the UMPP.

☐ b) The passkey needs to be thought up, entered and confirmed by the user.

☐ c) The passkey is supplied together with the mobile phone.

☐ d) The passkey is generated in the UMPP for the pairing process and is displayed in the dash panel insert.

☐ e) The passkey is generated in the mobile phone for the pairing process and is displayed on its screen.

Answers
1. b); 2. d); 3. a), b), c); 4 b); 5d)

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