Table of Contents

Car Information Computer

Subject **Page**

Subject **Page**

Car Information Computer (CIC)

Model: E82/88, E90/92/93

Production: From September of 2008

OBJECTIVES

After completion of this module you will be able to:

- Describe the differences between the CCC and the CIC systems.
- Describe the different functions available with the CIC system.
- Identify the components that make up the CIC system.
- Service and repair the CIC system.

Introduction

The Car Information Computer (CIC) is incorporates many innovations and new features. The system has been introduced to the US market on the 1 Series and the 3 Series from September of 2008 production. The 7 Series (F01/F02) will soon follow.

The CIC replaces the Car Communication Computer (CCC) and will be offered as part of the navigation system option.

iDrive system with CIC on an E90 vehicle

New Features

The Car Information Computer (CIC) continues the path laid out by the earlier CCC system and takes it to the next level of development. The main noticeable feature of this iDrive system is the newly designed controller that is now equipped with seven direct access buttons. These buttons provide shortcuts to the menus in the redesigned layout of the user interface.

Compared to the CCC system, the number of CD/DVD drives in the CIC has been reduced to one optical drive.

The CIC overall screen dimensions have remained the same. However, the number of pixels have doubled from 640x240 (CCC) to 1280x480. This provides improved visual quality by generating a sharper graphic display.

The navigation system display has been enhanced with the following functions:

- Full screen mode
- Night view
- 3D models in the perspective map view

The use of an integrated HDD (hard disk drive) now allows navigation map data to be saved on the CIC hard disk. Previously, this map data had to be loaded from a navigation DVD for each destination entry. Maps can also be displayed much faster due to the increased processing power of the CIC.

The hard disk drive in the CIC also makes it possible to compile and store a personalized music collection. An 8GB section of the total 80GB hard disk is dedicated to store music files.

These files can be transferred from audio CDs, MP3 players or USB sticks. Along with the music data files, the music track database (Gracenote®) is also stored to be used for the music search function.

An address database has been included in the "Contacts" menu, which can also be accessed from the Telephone and Navigation menus. This feature offers a single “location” for accessing contact information. The information contained is more comprehensive than before.

Many external receiver hardware devices such as IBOC and GPS are integrated in the CIC. This adds flexibility and expands the system’s functions.

The voice recognition system has been further developed to now enable even simpler and more fluid voice command inputs.

The communication service BMW Assist has been adapted to the new layout of the user interface and expanded with additional services.

Additional services available in BMW Assist effective September of 2008:

- My info
- BMW Search with Google Map database access

WMA File

A Windows Media Audio file (WMA) is an audio data compression technology.

With WMA technology, audio signals that are deemed to be imperceptible to the hum an ear (heating limit) are deleted. Compared to MP3 at low data transmission rates of 128 kbit/s, this technology offers a rich and detailed sound quality.

Despite its very compact size (1 MB per song minute), a WMA file of 128 kbit/s is comparable in terms of sound quality, to an MP3 file of approximate 160 kbit/s.

This compression technology was developed by Microsoft® and because of its DRM (Digital Rights Management) capabilities, it is the preferred platform for the majority of the online music industry.

Hard Disk Drive (HDD)

The HDD is a ferromagnetic storage medium, which uses a write/read head to write binary data on to the surface of a rotating disk. This device is comparable to the hard drive on a home computer or laptop.

Music Track Database (Gracenote®)

This is a music track identification technology created by the company Gracenote®. It makes available the data associated with the music tracks (metadata). Gracenote® is the industry standard in the field of music identification technology that provides associated content.

The metadata contains the following information:

- Artist
- Track title
- Album
- Release year
- Genre classification

Note: These metadata are managed and distributed by Gracenote® (www.gracenote.com/music). Non-commercial users have free access.

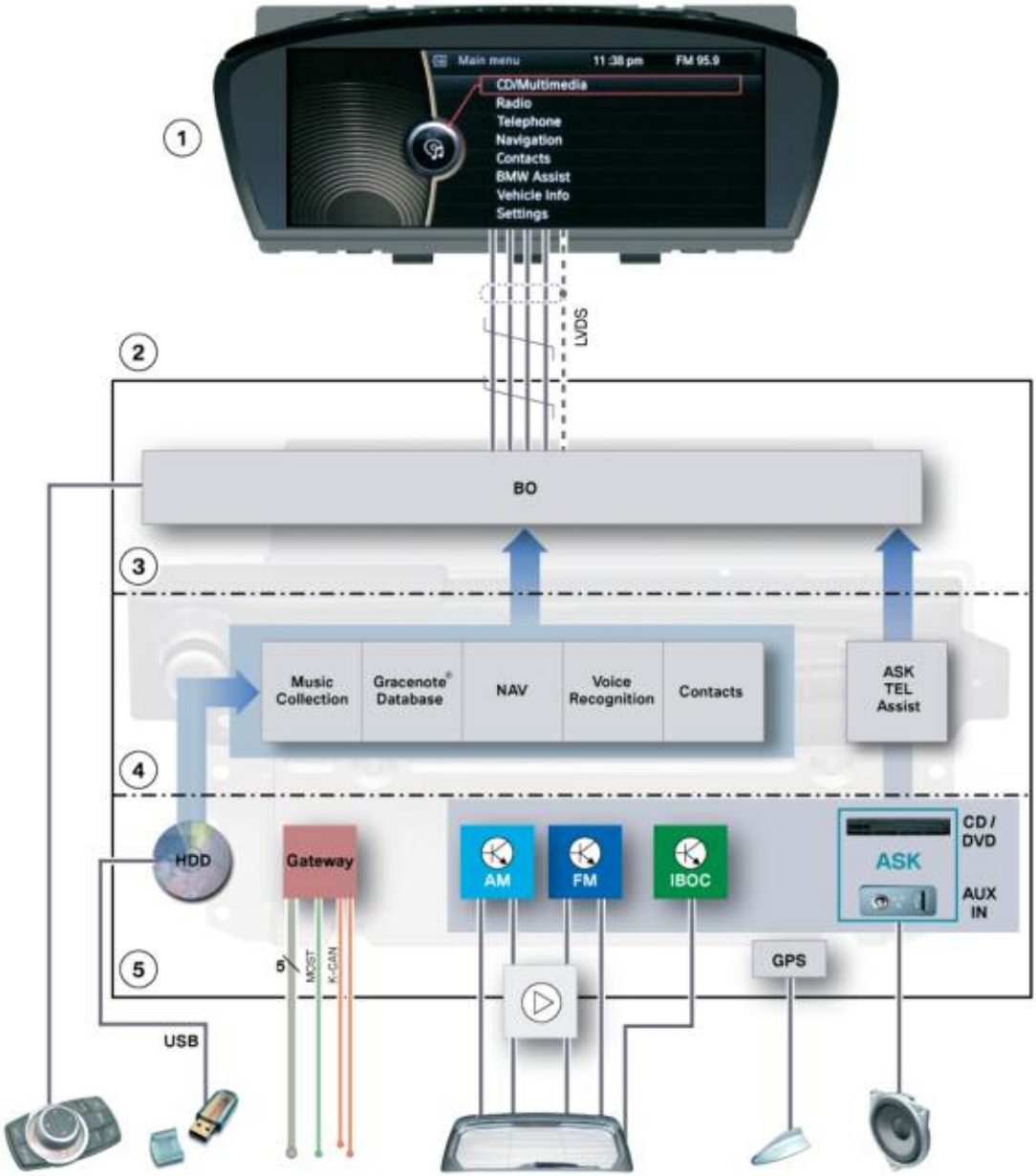
ID3-Tag

The ID3-Tag is the identification byte of an MP3 file.

A format for additional information (metadata) that can be contained in reserved parts of the storage space of an MP3 file. This metadata is used exclusively for displaying track title, artist, genre etc., in the display of MP3 players or vehicles.

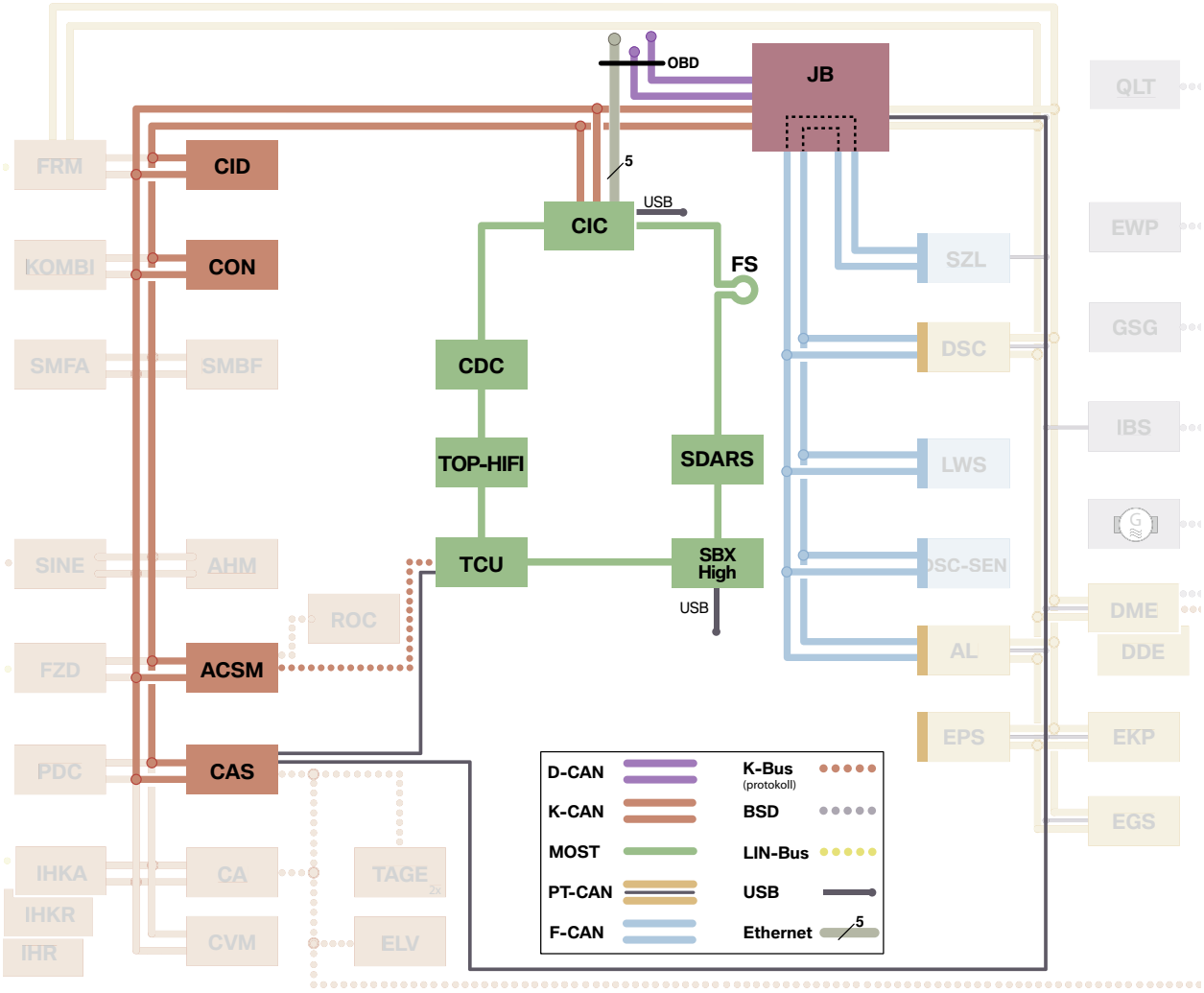
System Overview

Block Diagram of CIC System



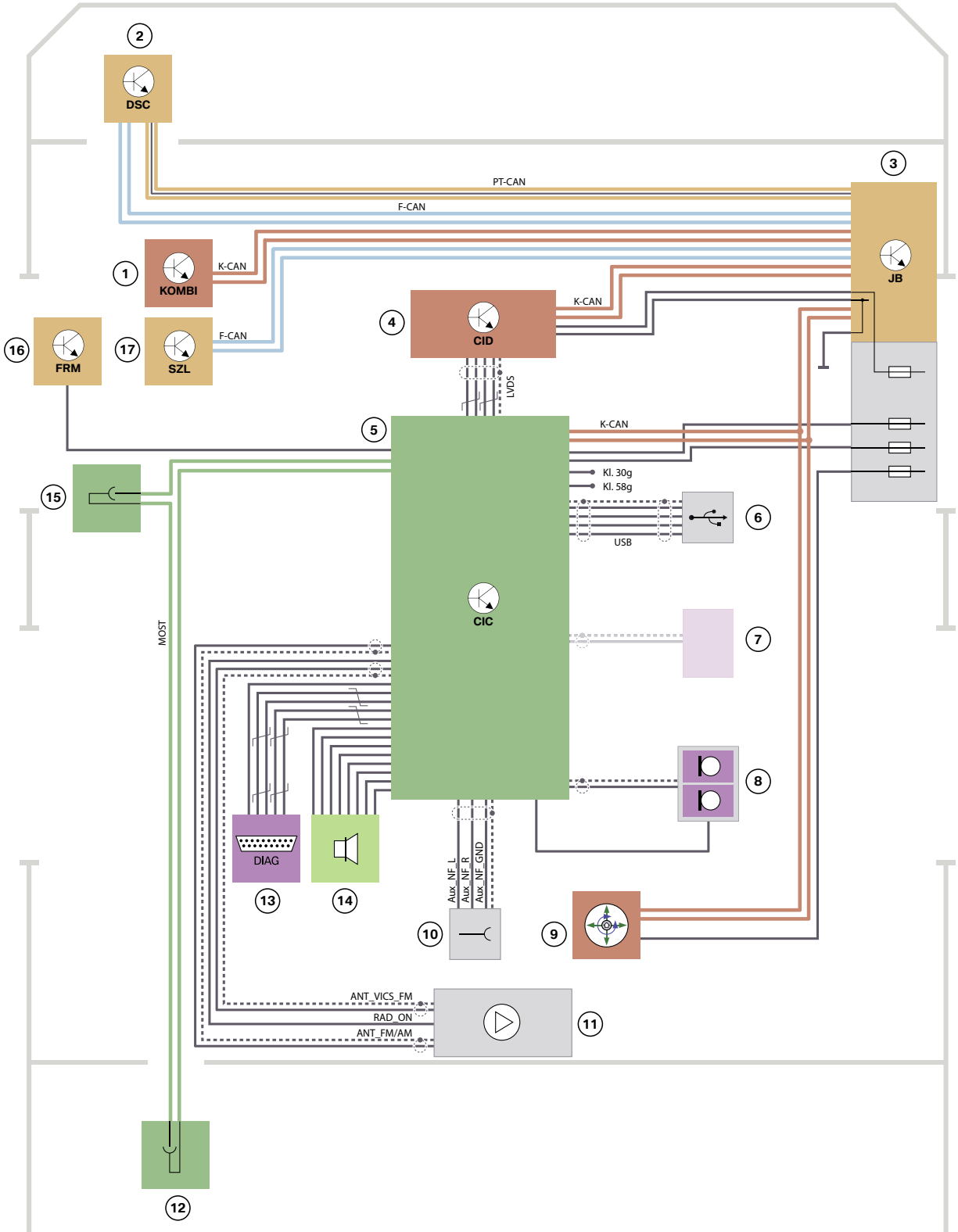
Index	Explanation	Index	Explanation
1	Central information display (CID	4	Application software
2	Car Information Computer (CIC)	5	Hardware
3	User interface (BO)		

Bus overview E9x and E8x (not including E83, E85, E86) model series, CIC



Index	Explanation	Index	Explanation
ACSM	Advanced crash and safety management	FS	MOST direct access
CAS	Car access system	JB	Junction box
CDC	CD changer	SDARS	Satellite radio tuner
CID	Central information display	TCU	Telematics Control Unit
CIC	Car Information Computer	TOP-HiFI	Top-HiFi amplifier
CON	Controller	SBX-High	USB interface box High

CIC System circuit diagram, in E9x and E8x model series (not including E83, E85, E86)



Index	Explanation	Index	Explanation
1	Instrument cluster	10	AF output for audio jack (standard equipment) if no USB Audio interface is installed
2	Dynamic stability control	11	Antenna diversity module with antenna amplifier
3	Junction box	12	MOST distributor in rear area
4	Central information display	13	OBD interface (including Ethernet connection to CIC)
5	Car Information Computer	14	AF signals to speakers
6	USB Import/Export jack, glove compartment	15	MOST direct access
7	Future antenna expansion	16	Footwell module
8	Microphone for hands-free facility	17	Steering column switch cluster
9	Controller		

System Components

Car Information Computer

Front View of the CIC

The design principle of the CIC is similar to a personal computer, the Car Information Computer contains a processor, RAM (memory) modules and other peripheral components.

The following CIC applications are stored on the integrated hard disk drive:

- Music collection
- Music track database (Gracenote®)
- Navigation software (application)
- Navigation (map material)
- iSpeech (voice recognition system)
- Contacts (database with address data)
- System operating software

The CIC is the central control unit for the listed applications. It is linked to the central information display (CID) for the purpose of transmitting and displaying information.

The Car Information Computer is also connected to the controller. The controller serves as a selection and input device for the user interface.

The CIC is based on a modular design. The most important systems of the communication network are integrated in the CIC in the form of modules.

The CIC combines the following control units in one enclosure:

- Navigation computer, HIP module and yaw rate sensor
- Tuner (FM)
- Tuner (AM)
- Tuner (FM-TMC)
- IBOC decoder
- Audio system controller, and music search database
- MOST-CAN gateway
- Interface to control display (LVDS)

The upper half of the CIC consists of the optical drive player where CDs and DVDs of digital audio media can be played. The player also has ability to playback video DVDs on the front CID. The video signal is only displayed when the vehicle is stationary and the transmission selector is in the “Park” position.

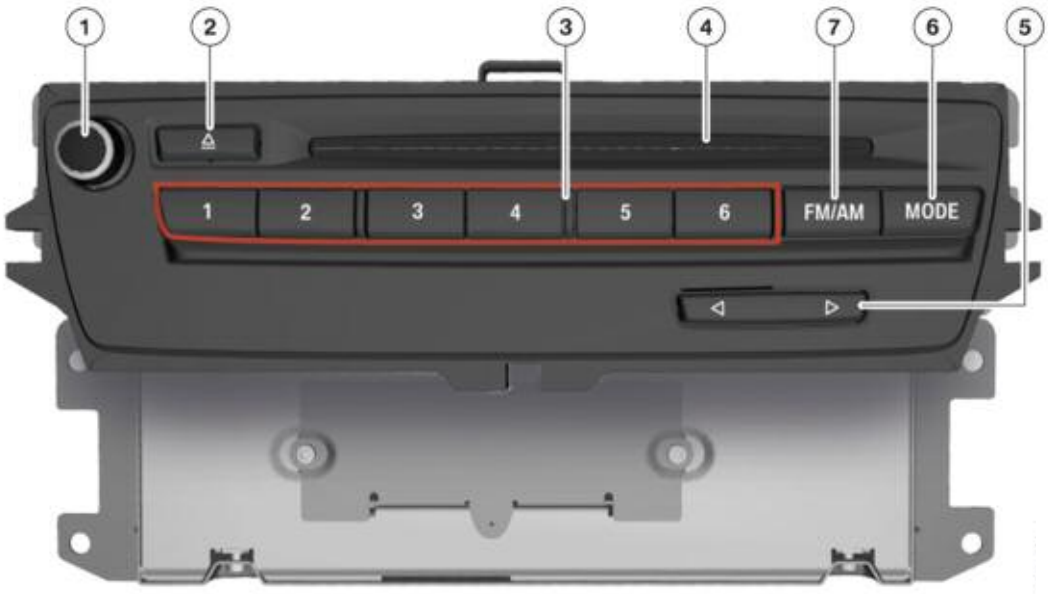
For the navigation system, the optical drive can be used for updating the map material stored on the hard disk.

The processors for the main board and application board are located in the lower half of the CIC. This section also contains the main memory, the individual modules as well as the hard disk drive. The CIC together with the controller and CID, make up the iDrive system.

Advantages of the Car Information Computer

Combining several modules in one enclosure provides the following advantages:

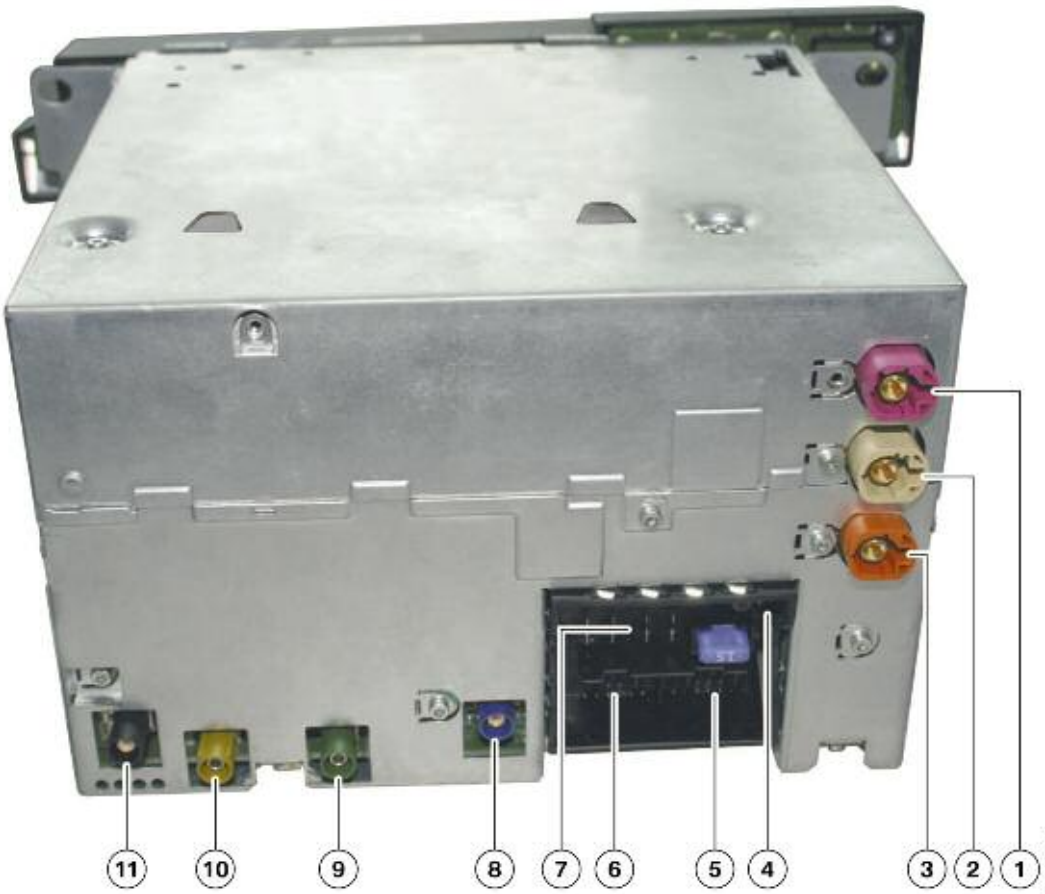
- The combination of several systems enhances the functionality
- Outstanding software expansion options through suitable software interfaces
- Fewer plug connections increases reliability
- Less overall package space required for control units



Front View of the CIC on the E9x and E8x (not including E83, E85, E86)

Index	Explanation	Index	Explanation
1	Rotary/push button for (ON/OFF) and controlling the volume of audio system	5	Station/track "forward-back" search button
2	Eject button for DVD/CD player	6	MODE button (Radio, CD/DVD
3	Favorite buttons 1-6	7	FM/AM button selects between the two frequency bands
4	Slot for DVD/CD player		

Rear view of Car Information Computer



Index	Explanation	Index	Explanation
1	LVDS signal for CID Connector color code: violet	7	16-pin connector (K-CAN, audio output AF; power supply, Rad-on signal)
2	USB connection for glove compartment connector color code: beige	8	GPS antenna signal Connector color code: blue
3	Ethernet connection Future expansions connector color code: pastel orange	9	(Not for US)
4	MOST connector	10	(Not for US)
5	12-pin connector; right-hand chamber (Ethernet, TEL_AF, AUX_In)	11	AM/FM tuner signal Connector color code: black
6	12-pin connector; left-hand chamber (video input signals - CSCC)		

The transmission of picture data from the CCC to the CID was performed by means of an 8-wire LVDS line. With the introduction of the Car Information Computer, the video signal is now transmitted through a 2-wire LVDS line.

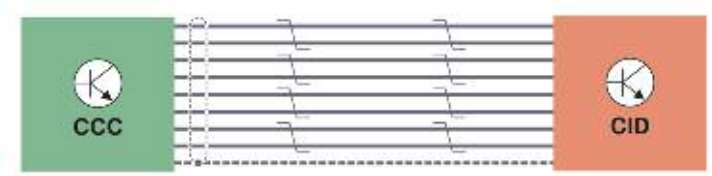
The change in picture data transmission in the vehicle reflect the changes made in PC technology. While the printer was formerly connected to the PC via a parallel cable, data transmission now takes place using serial USB technology.

In the following graphics, 8-wire LVDS technology is compared to the new 2-wire LVDS technology:

8-wire LVDS

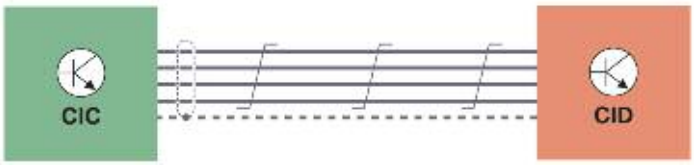
Transmission of video signals via 8-wire LVDS technology with CCC and CID.

(LVDS+ and LVDS- for each of the four signal lines and an additional synchronization line)



2-wire LVDS

Transmission of video signals via 2-wire LVDS technology with CIC and CID.



Signal transmission through this 2-wire LVDS line offers four distinct advantages:

- Higher data transfer rate
- Simplified wiring
- Runtime differences between the individual lines are avoided
- Serial 2-wire LVDS data transmission is now much more cost-effective than 8-wire LVDS technology

The main advantage of using serial 2-wire LVDS is the resulting high picture resolution.

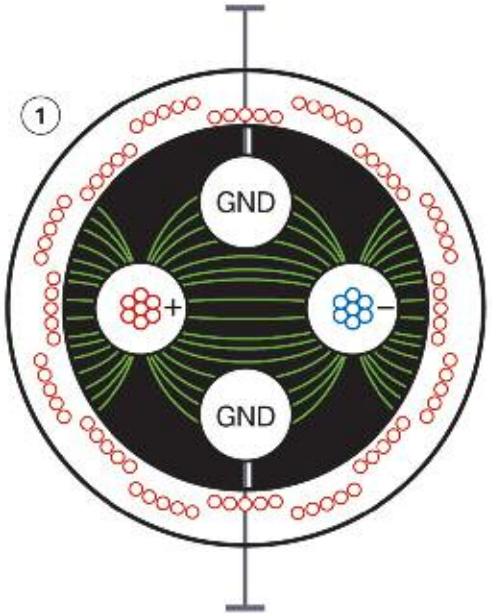
A 4-core, shielded cable is used for the 2-wire LVDS technology. The cable consists of the four cores, LVDS+, LVDS-, 2x ground and shielding.

For Electromagnetic compatibility (EMC) reasons, the unused wire is also connected to ground.

In the illustration to the right, the advantages of both cores connected to ground are shown with the aid of field lines.

The capacitive interference of the signals is deflected to ground. The wires connected to ground form a defined potential and cannot act as antennas.

This ensures that additional interference is avoided.



Graphical Illustration of EMC protection using 2-wire LVDS technology

Index	Explanation
1	Two signal-carrying cores, two cores connected to ground

Modular Design of CIC Components

Individual replaceable components of the Car Information Computer

Index	Explanation	Index	Explanation
1	Replaceable device CIC	3	Front panel
2	DVD/CD player including CIC housing cover	4	Hard disk drive

The components listed above are defined as separate or modular. These components are attached to the main/complete head unit.

Of these components, only the faceplate remains a serviceable and replaceable component. Failure of any other internal component will necessitate the replacement of the entire CIC unit once proper authorization has been obtained through PuMA.

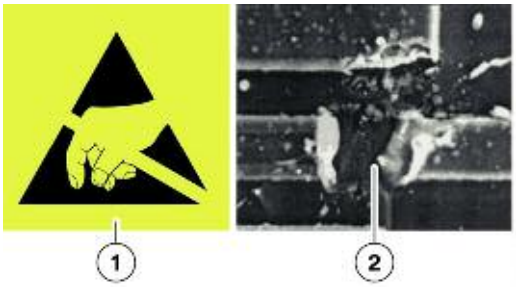
The functions of the individual components are briefly described in the following pages.

The installation and removal instructions for the individual components and the complete CIC control unit are available in TIS (Technical Information System) or the workshop system ISTA.

It is essential to follow ESD (Electrostatic Discharge) guidelines when replacing individual components in order to avoid damage to internal components of the CIC. These requirements also apply when storing or sending back components.

Special packaging (ESD bags, ESD boxes with film or foam material cladding) is available for this purpose and should be used instead of conventional packaging materials.

The following picture illustrates the effects of electrostatic discharge (ESD) on electronic components.



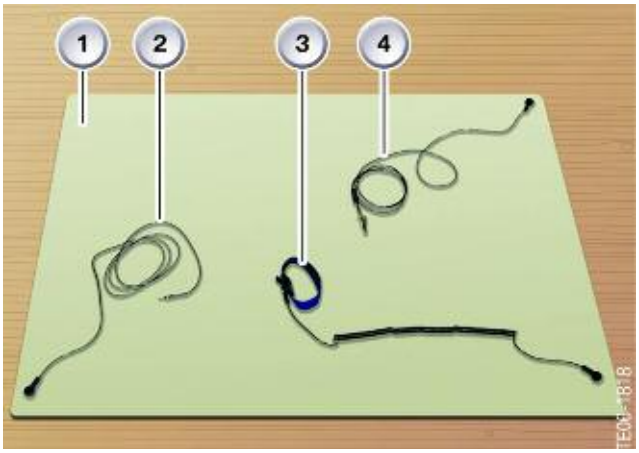
Index	Explanation
1	ESD symbol (protection measures necessary)
2	ESD damage to a conductor (magnified 5000 times)

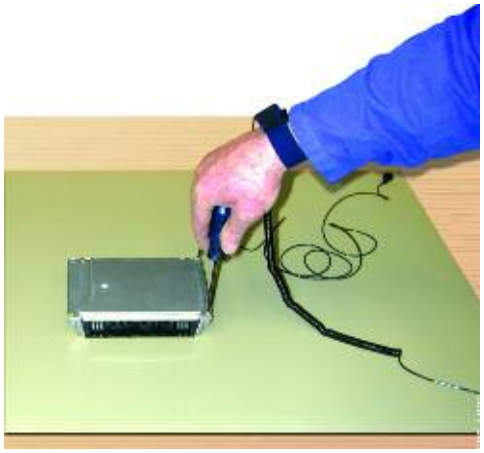
Effects of ESD (Electrostatic Discharge) on electronic components

Working on Electronic Components

The following requirements must be observed when working on electronic components on the Car Information Computer.

- The work must be performed on a conductive and grounded workbench (special tool 12 7 192 is used for this purpose).
- The grounding cable must be connected to a secure grounding point (water pipe, heating pipe, electric socket ground).
- The person carrying out the work must first put on the grounding cuff in order to ground himself before removing the components from the packaging.
- The electronic components are placed on the anti-static mat which is also connected to a grounding cable.





Anti-static mat Special tool 12 7 192

Index	Explanation
1	Anti-static mat
2	Grounding cable for the mat
3	Anti-static cuff
4	Grounding cable for the component

Optical Drive (CD/DVD Player)

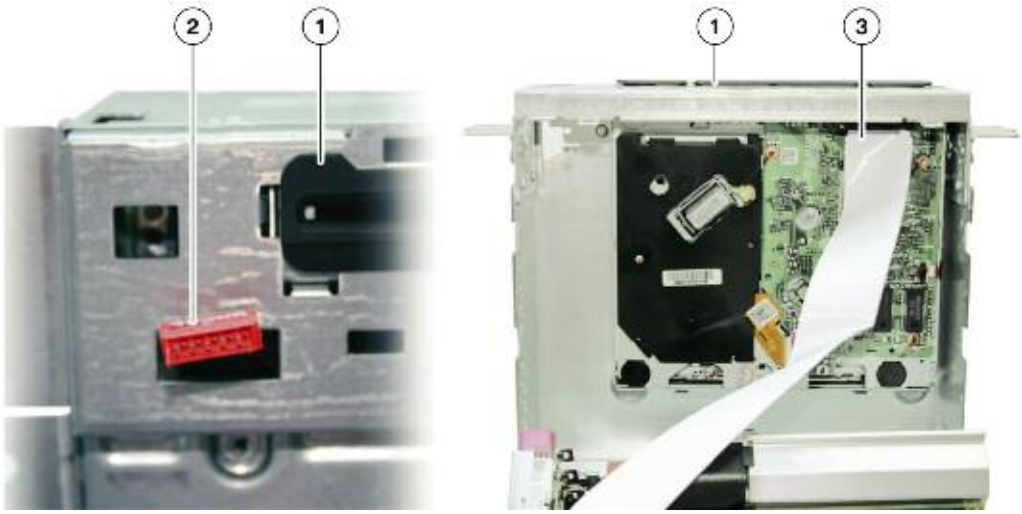
The Car Information Computer is equipped with a DVD-ROM player.
The optical drive is used for playing audio and video media.

This drive makes it possible to play the following media file formats:

- Audio CDs (CD Digital Audio)
- Audio CD-ROM with MP3, WMA or AAC files
- DVD Audio (only stereo track if contained on the data medium)
- Audio DVD-ROM with MP3, WMA or AAC files
- Video DVD

Playing video on the (front) CID display is only possible when the vehicle is stationary and the transmission gear selector is in the "Park" position. When the vehicle is moving or the transmission gear selector is **not** in the "Park" position, only the audio track of the video will be played.

Although the CD/DVD drive is no longer used for the navigation system (as in CCC), it may be used to update navigation map data from a navigation DVD.



Key components of DVD player used in the CIC system

Index	Explanation
1	DVD player
2	Front panel connection
3	Ribbon cable connection, DVD player to CIC head unit

Hard Disk Drive

With the development CIC, a hard disk for storing applications (programs) and data is used in a head unit of a BMW vehicle for the first time.

A 2.5" hard disk drive with a storage a capacity of 80 GB is installed.

This makes it possible to display complex graphics like 3D models in the perspective view of the navigation system.

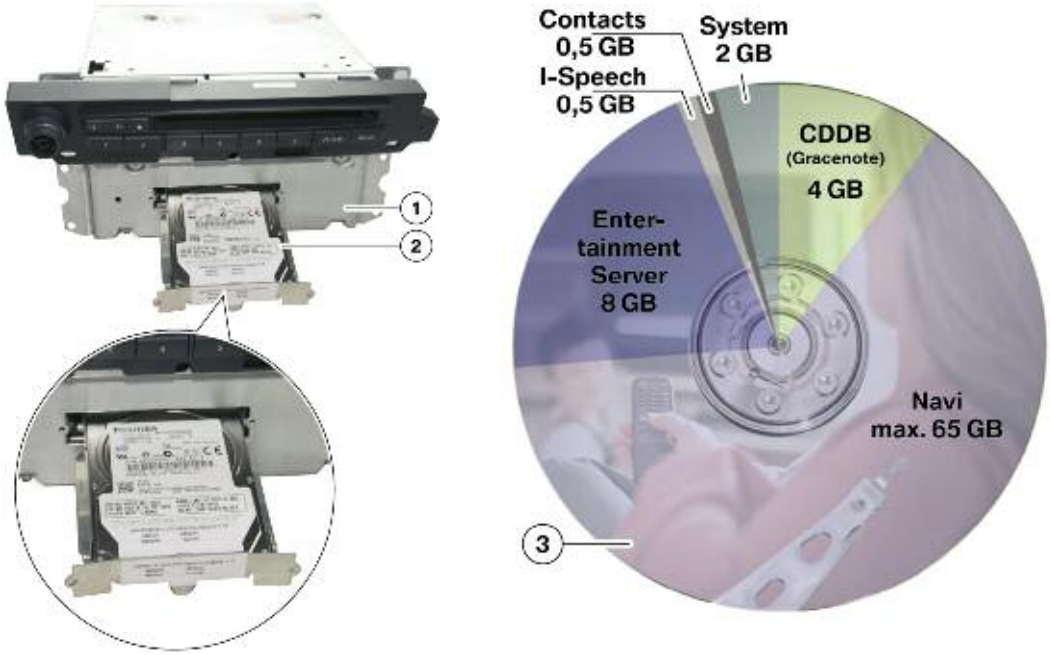
This system provides the option of converting, storing and playing music tracks. The hard disk makes it possible to maintain a music collection with a music track database (Gracenote®).

The HDD (hard disk drive) also provides a data storage option for the three languages of the voice recognition system.

The hard disk drive is a replaceable component of the CIC. Proper repair instructions and ESD guidelines must be followed when replacing the unit.

The Music collection backup should only be performed by the customer and not the service technician. For more information refer to “Music Collection Backup” in the Principles of Operation section of this training material.

The following illustrations show the hard disk location and the individual partitions.

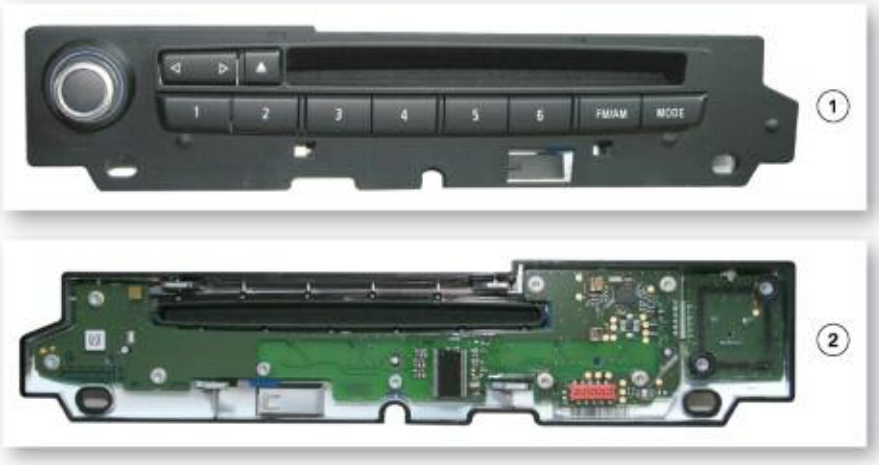


Hard disk location and the individual partitions

Index	Explanation
1	Car Information Computer
2	Hard disk (slide-in tray)
3	Pie diagram with individual storage units on the hard disc (partition)

Front Panel

The front panel of the CIC can be replaced separately.



Front and rear view of the CIC system front panel E6x vehicle

Index	Explanation
1	Front panel - front view
2	Front panel - rear view

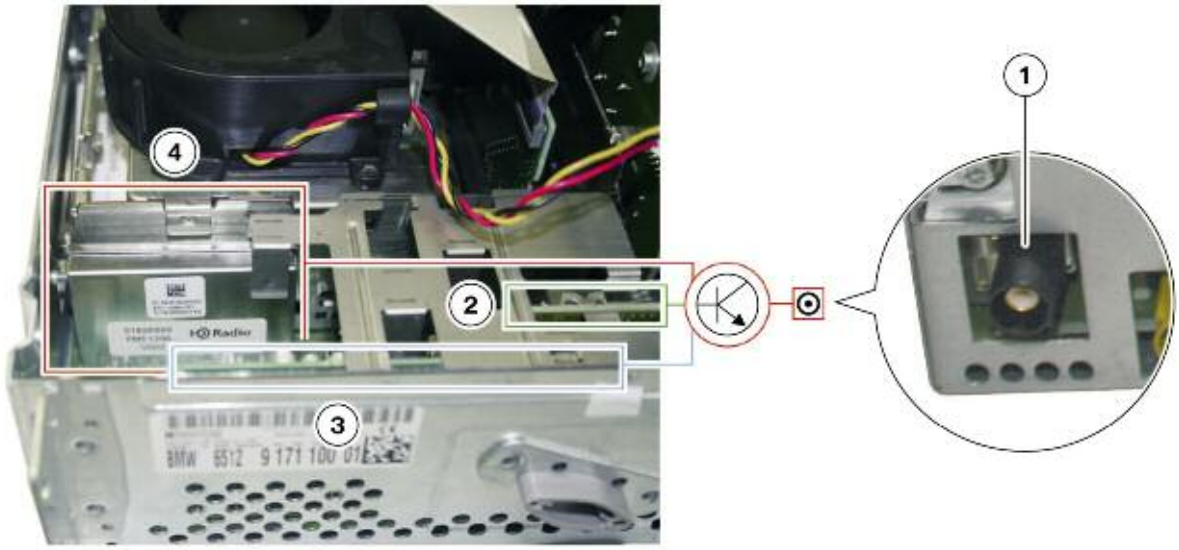
Note: Currently only the faceplate is a serviceable and replaceable component.

Failure of any other internal component will necessitate the replacement of the entire CIC unit once proper authorization has been obtained through PuMA.

Fixed Components

Some of the components that were modular in the Car Communication Computer are now integrated into the CIC as solid state components.

In the event of defects to some of the components, it may be necessary to replace the entire head unit after submitting a PuMA case.



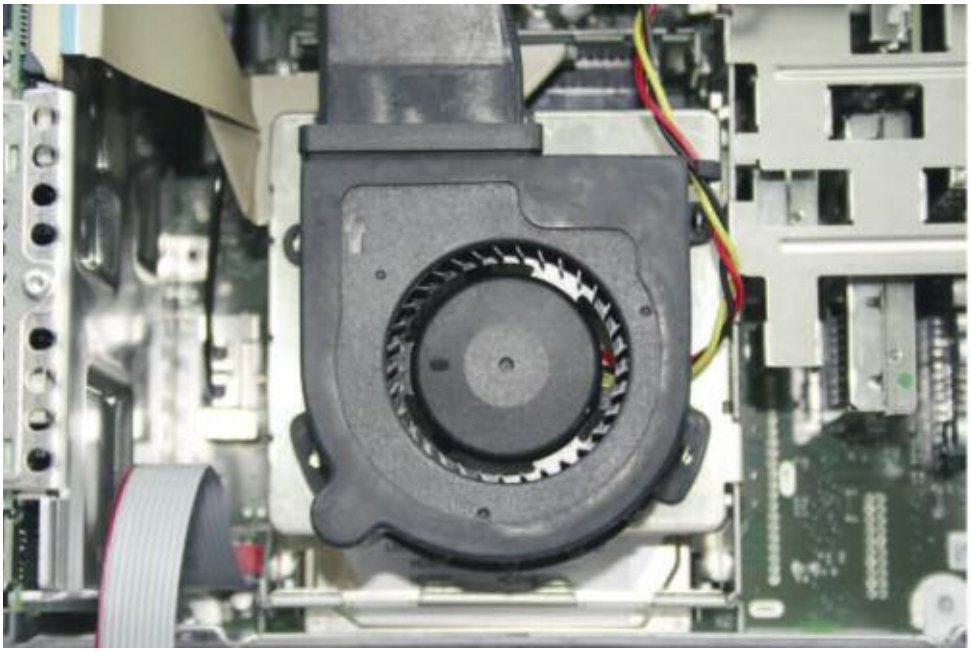
Bottom open view of the CIC components

Index	Explanation	Index	Explanation
1	FM/AM aerial connection	3	FM/AM double tuner module
2	FM - TMC module	4	IBOC decoder

Fan

Unlike with CCC, it is not possible to replace the fan of the Car Information Computer separately as part of a service procedure.

The fan provides cooling for the entire hardware assembly, including the hard disk drive and the gateway processor (located directly below it). The exhaust air cools the cooling fins of the HiFi output stage in the power board as it is routed through a cooling channel out of the unit.



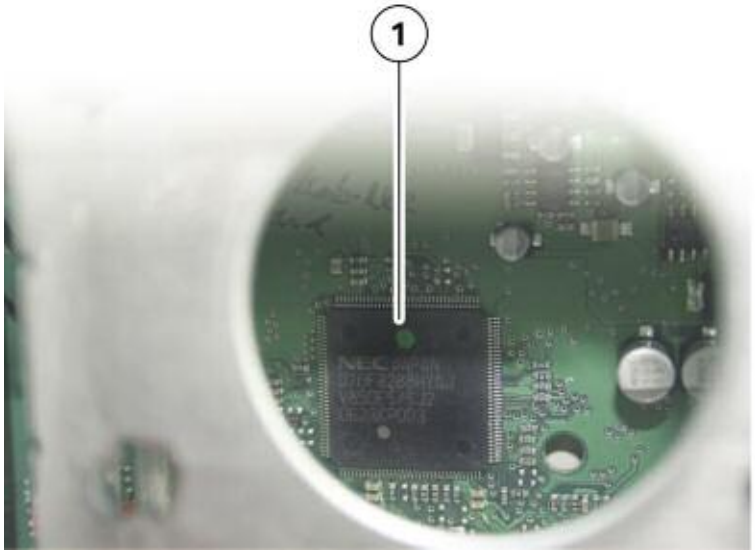
CIC system's Cooling Fan location

Gateway Processor

The gateway processor converts all relevant data of the K-CAN system into MOST-bus telegrams and vice versa.

The electronic module is soldered into the board directly under the hard disk drive and cannot be replaced separately.

The gateway processor has its own control unit address in the BMW diagnosis system.



CIC system's Gateway Processor location

GPS Receiver Module

The GPS receiver module is also known as the HIP module (Host Independence Positioning).

Location and route of the vehicle are calculated in the navigation system with the data from the GPS receiver module.

This module was already integrated in the head unit with the CCC system. It has the task of converting the signals received from the GPS antenna together with the data from the DSC control unit and yaw rate sensor.

The following information is calculated in the GPS receiver module:

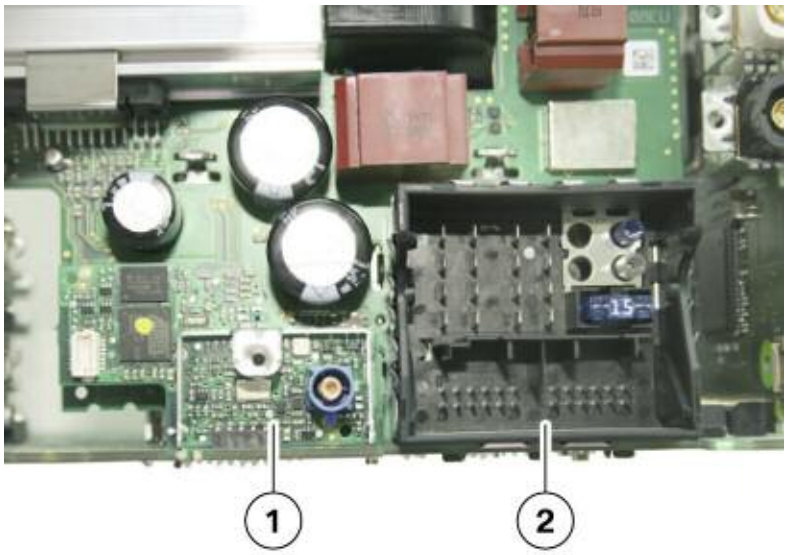
- Longitude
- Latitude
- Altitude above sea level
- Direction (bearing)
- Speed

This information is known as Almanac data and it is transferred to the navigation system for further processing. The Almanac data must be permanently stored for future reference. One of the reasons for this is that it takes a long time for data to be received again from satellites after switching to terminal 15 from terminal status ignition "OFF".

This Almanac data ensures the position of the vehicle is recognized immediately after starting the vehicle. Therefore the navigation system can also be used immediately.

Compared to the GPS receiver module of the Car Communication Computer the GPS receiver module in the CIC has been greatly reduced in size while maintaining the same functionality.

The graphic shows the size of the GPS receiver module compared to the main connection plug of the head unit.



CIC system's GPS receiver size compared to the Main Connector

Index	Explanation
1	GPS receiver module
2	CIC main connection plug

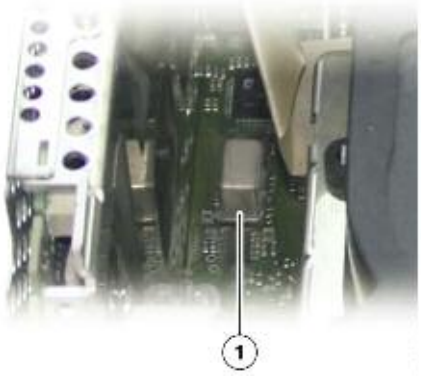
Yaw Rate Sensor

The Car Information Computer features a yaw rate sensor. It supplies the data relating to changes in driving direction for the navigation system.

This data is required for the purpose of determining the exact position as satellite signals cannot be received everywhere (tunnels, underground parking lot etc.).

The yaw rate sensor is a separate module soldered on the main board. It has been greatly reduced in size compared to the yaw rate sensor in the Car Communication Computer.

Unlike with CCC, it is no longer possible to replace the yaw rate sensor separately from the entire unit.



Location of the yaw rate sensor soldered to the CIC main board

Analog Tuner Modules

The tuner modules in the Car Information Computer have enhanced functions compared to the tuners used in the CCC system. The FM/AM and the traffic information (RTTI) range have been expanded.

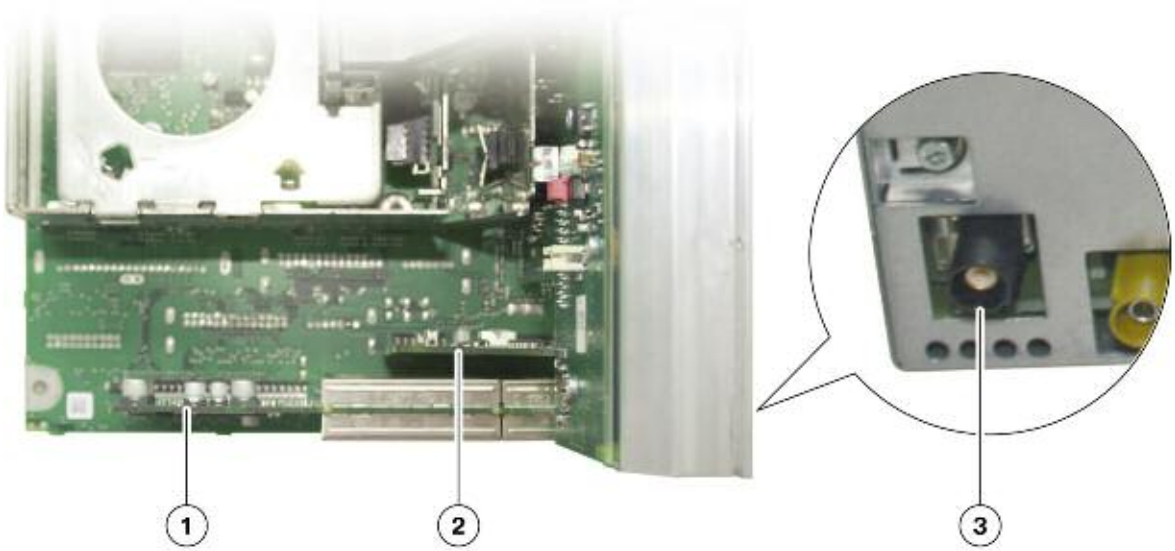
FM and AM Station List

A double tuner module (see item 1) is installed in the CIC for the FM/AM range.

While one tuner in the network receives the required station and outputs the music signal, the other tuner works in the background searching the station landscape for additional signals and shows them on the display. ("All stations" menu item).

This function in the FM range is already known from the CCC and is now available in the AM range.

The third module in the tuner network enables expansion of the FM-TMC (Traffic Message Channel) functions. The FM/AM double tuner module and the FM-TMC module combine to form the triple tuner.



FM tuner module component location in the CIC

Index	Explanation
1	FM/AM double tuner module
2	FM-TMC module
3	Black FAKRA connector below the CIC heat sink

IBOC System/HD Radio

The IBOC (In-Band- On-Channel) system is offered as the digital radio. With the introduction of the CIC, the control unit of the IBOC system has been integrated in the head unit as the IBOC decoder.

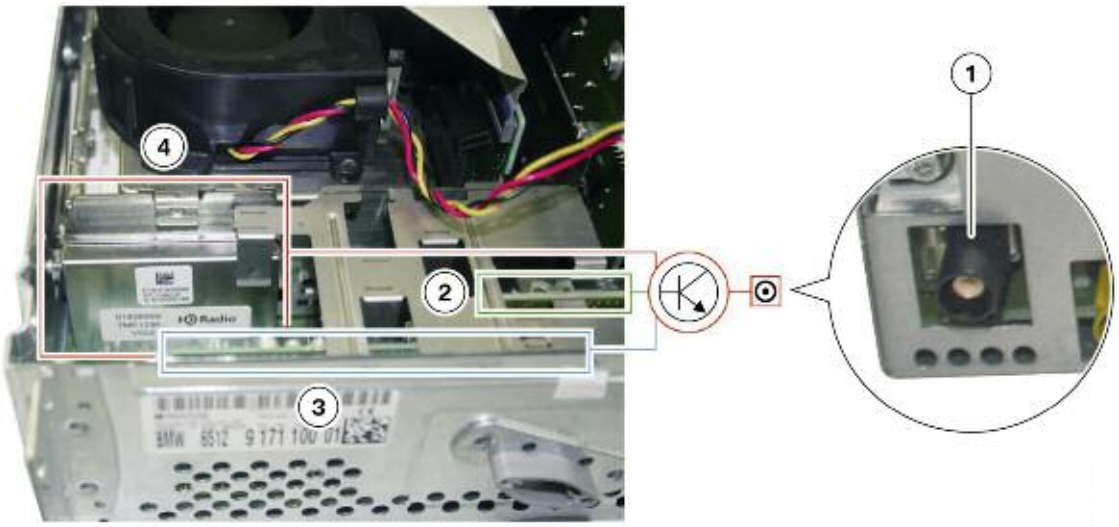
The IBOC system was developed by the company Ibiquity and, with the aid of a decoder, enables the reception of HD (High Definition) radio through the FM/AM double tuner.

This system simultaneously broadcasts an analog and digital signal.

A special oscilloscope (spectrum analyzer) would show the digital components at both sides of the analog wave of the FM frequency (step shape).

The IBOC system receives the signals with the aid of the FM double tuner module.

These signals are then routed to the IBOC decoder which adds the digital data stream to the audible music signals.



Location of the IBOC decoder in the CIC

Index	Explanation	Index	Explanation
1	FM/AM antenna connection	4	FM/AM double tuner module
2	FM-TMC module	5	IBOC decoder

IBOC Station List Menu

There are two types of broadcast services:

- MPS = Main Program Service
- SPS = Secondary Program Service

Both services differ to the effect that the signal previously broadcast analog in the MPS is now used in digital form.

The decoder delays digital reception for several seconds until it is synchronous again with the analog signal previously heard.

SPS offers additional radio stations that are only broadcast in digital form. Using the multicast method, it is possible to accommodate up to seven digital stations in the submenu of the SPS main station. Normally, however, a maximum of 3 sub-menu are offered in the SPS.

Sub-menu of the IBOC main station

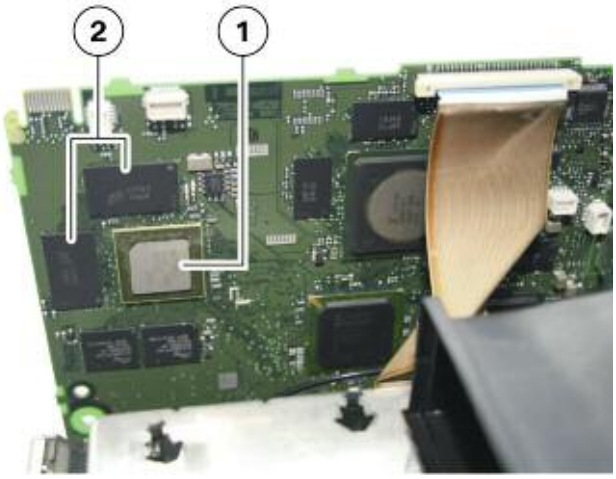
The system automatically switches over to analog FM reception if the digital signal is no longer available.

HD radio is also available in the AM frequency range. In this case, the digital signals are transmitted on directly adjacent frequencies of the analog station. Multicast is not supported on AM. The content of the digitally broadcast station is the same as that of the analog station.

HD radio plays AM radio stations in near-FM quality and FM radio stations in near-CD quality.

CIC Application Board with Processors

The application board accommodates the main processor (CPU = Central Processing Unit) and the main memory modules (RAM = Random Access Memory) for the CIC. These components are soldered into the board and cannot be replaced.



CPU) and Main Memory Location

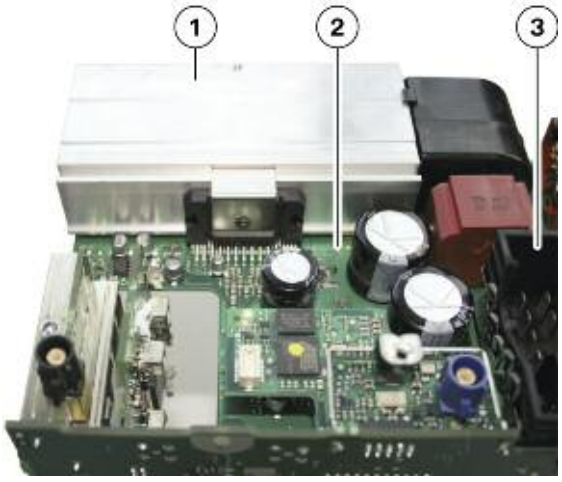
Index	Explanation
1	CPU - Central processing unit
2	Main memory (RAM) of the CIC

Power Board

The power board is located beneath the CIC heat sink and on the left next to the CIC main connector. It contains both the audio output stages for the speakers of the stereo system as well as the power supply unit for the CIC.

The heat sinks and CIC fan cool the system by dissipating the heat from the power supply unit and amplifier.

The unit interfaces with the vehicle's electrical system (power supply, MOST link, etc.) through the main connector.



CIC Main Board and Heat Sink Location

Index	Explanation
1	Heat sink
2	Power board
3	Main connector of the CIC

Principles of Operation

Central Information Display (CID)

The display used on the CIC system in known as CID (central information display) and is similar to the one used for the CCC. The diagonal measurement for the CID on the 1 Series and 3 Series remains the same as on the CCC equipped vehicle at 8.8 inches.

The number of pixels of the CID has doubled from 640x240 in CCC to 1280x480 pixels in CIC. This improves picture quality by enhancing the display resolution.

In addition to the display enhancements the graphic layout of the CIC user interface has also been totally redesigned.

Graphic User Interface on CID with a CIC equipped vehicle

Graphic User Interface on CID with a CCC equipped vehicle

Note: For detailed description of how the individual functions of the CIC operate, refer to the respective Vehicle Owner's Manual.

Controller

The new controller has been completely redesigned. The most noticeable feature of the new CIC controller is the seven direct access buttons.

It is now possible to access the following menus directly:

- Main menu
- CD/Multimedia
- Radio
- Navigation
- Telephone

The following menus can still only be selected from the main menu, with no direct access:

- Contacts
- BMW Services
- Vehicle information
- Settings

The "Back" button is pressed to go back to the last display view. Up to 30 "back" steps are possible with this button.

The “Option” button makes it possible to make fine adjustments or carry out special functions in the previously selected sub-menu.

The direct access buttons replace the CCC "long push" function.

Note: With the “Long Push” function is was possible to change from a sub-menu directly to another sub-menu in the CCC by pushing the controller in the corresponding direction for at least two seconds.

The respective sub-menus are now selected directly by pressing the CD/multimedia, radio, navigation or telephone buttons twice.

CIC Controller with sub-menu buttons

Index	Explanation	Index	Explanation
1	Direct access button for Main menu	5	Direct access button for Options sub-menu
2	Direct access button for CD/Multimedia	6	Direct access button for Navigation
3	Direct access button for Radio	7	Direct access button for Telephone
4	Direct access button to go Back		

The star-shaped operating concept of "Turn-Press-Push" of the CCC has been redesigned for CIC. The sub-menus in the main menu now have been arranged in lists.

One of the listed sub-menus can now be marked with the "turn" function in the start window menu. The selected sub-menu is accessed with the subsequent "press" function.

Several sub-menus can now also be selected by means of the direct access buttons on the controller. The "push" function is now used to further navigate in the selected sub-menu. The windows of the selected sub-menu are arranged horizontally one above the other.

The following table shows a comparison between the previous menu items of the CCC and the menu items structure of the CIC.

CCC main menu	CIC main menu
	
Communication	**Telephone**
Telephone	Telephone
A-Z	Telephone/Phonebook
Telephone => Phonebook Navigation => Address Book	**Contacts** (imported/self-entered contacts)
Communication	**BMW Services**
Assist services	BMW Services
Navigation	**Navigation**
Navigation, onboard information, BC	**Vehicle information**, onboard computer
Air conditioning (climate control)	Settings (limited)
Entertainment	**CD/Multimedia**
CD, DVD, CDC	CD/DVD
Radio (FM, AM, IBOC)	**Radio** (FM, AM, IBOC)
	Music collection
Settings (5th menu)	Settings
Audio	Sound
Display screen	Central screen
Time/Date	Time/Date
Language	Language/Units
Vehicle/Tires	**Vehicle information**/Vehicle status
Service	**Vehicle information**/Vehicle status

CD/Multimedia Overview

The CD/DVD, external devices and sound sub-menus are listed under CD/Multimedia in a similar configuration to the iDrive "Entertainment" menu of the CCC.

This Product Information mainly deals with the Music collection sub-menu.

An innovative feature of this system is that video DVD can be played in the front CID. This function is only available with the vehicle stationary (transmission in Park position) and is enabled in the corresponding vehicle order. It provides the control option with which the video function is activated.

Music Collection

For the first time in a BMW vehicle, a music collection can be saved on an internal hard disk drive and accessed through its own sub-menu. The music collection feature is found under the CD/Multimedia menu of the CIC.

A music search function has been implemented, which searches for information (metadata) on the individual music tracks (artist, album, etc.). A hard drive-based track database (Gracenote®) provides further information to the music track (metadata).

Note: Metadata storage is a separate function to the conversion process from Digital Audio CD to a WMA file format which allows the system to perform a music search.

CD/Multimedia sub-menu with “Music collection” checked

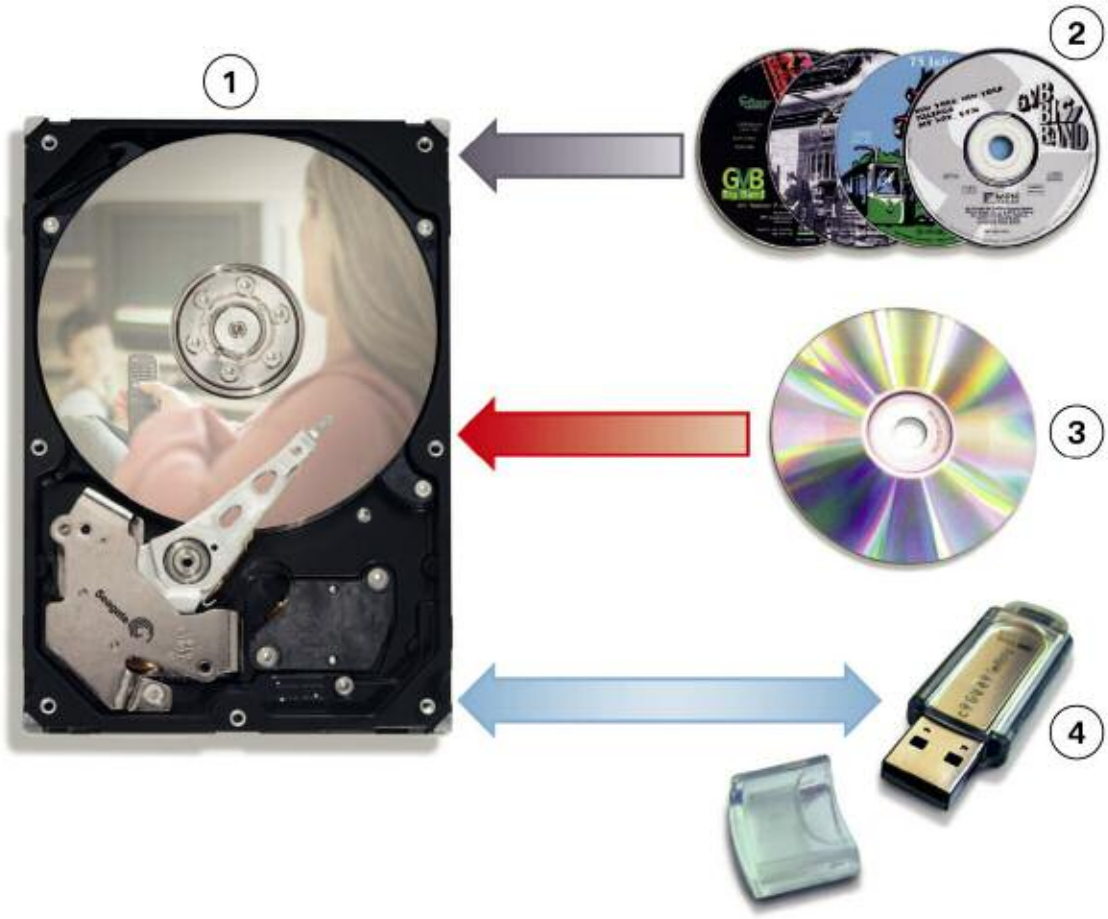
Storing Music Data on the HDD

The music collection is stored in a partition on the internal hard disk drive (HDD) of the CIC. This device makes it possible to store a large selection of music data in the vehicle, while allowing the option to retrieve it when necessary.

Up to 8 GB of the total 80 GB hard drive is set aside for the music collection.

The following three options can be used to store music data on the hard disk:

- Rip function from Compact Disc Audio format
- Copying data via the CD/DVD drive
- Copying data from the USB



Index	Explanation	Index	Explanation
1	Hard disk (HDD)	3	DVD/CD ROM with compressed audio data (WMA, CDA, MP3, AAC)
2	Commercially available audio CDs (Compact Disk Digital Audio CDA)	4	USB stick

Rip Function

This function rips commercially available audio CDs (marked with the Compact Disk Digital Audio logo) and converts them to compressed music files.

This function can be performed when the vehicle is stationary or while driving.

The music on the CD can also be played back during the conversion and storage process of the rip function.

The music data is converted at a speed between 3 and 12 times the playback speed. Following the conversion the music data is stored on the hard disk in WMA file format.

The data is then displayed in the form of file folders in the music collection menu. These folders are identified with the corresponding title and with a round CD icon.

After the conversion process the files will be displayed and can now be selected individually by using the music search function.

Start of rip function for a loaded Digital Audio CD

Music data (WMA) of a Digital Audio CD stored in the music collection

Copying Data via the CD/DVD Drive

Self-recorded CD/DVD ROMs with audio files in MP3, WMA or AAC (M4A) format can be read, copied and stored using the DVD player (drive).

All CD/DVD formats (from CD-R to DVD Double Layer) are supported, except for CD-RAM and DVD-RAM.

The audio data is then stored in the form of file folders in the music collection together with the title of the respective CD/DVD ROM.

If the CD/DVD ROMs are untitled, they will be stored as "Audio-CD 1", "Audio-CD 2", etc. To facilitate identification, a folder icon is shown next to the file folder.

Copying a music file from a CD-ROM

Copying Data from the USB

Data contained on a USB stick (music files in MP3, WMA or AAC format) can be imported via the import/export USB port located in the glove compartment.

Copying USB music file using the import/export music feature

Import/ export USB port in glove compartment

Type A USB / symbol for USB 2.0

Copying music data from audio devices such as an MP3 players or iPods using the USB connection is possible although not advisable. The folders and file structure of the MP3 player are also copied when copying music files from these devices.

In this case, the copied folder names are represented by means of cryptic characters instead of an album title. This makes it virtually impossible to search for a music file.

Note: It is not possible to import music data via the USB-audio interface (SBX High) in the center console. The USB audio interface is intended only for the playback of external audio sources.

The imported USB music data is stored in file folders with USB 1, USB 2 etc. in the music collection. These folders are also shown together with a folder icon as the files copied through the DVD drive.

Copied USB1 folder Stored in the Music Collection Menu

Compatible USB sticks must be FAT formatted and must support the Mass Storage Class USB protocol. The format can be easily checked on any PC running the Windows operating system.

USB hard drives, USB hubs and USB memory card readers with several slots cannot be read when connected to the USB jack in the glove compartment and therefore can not be used.

The USB interface powers the USB stick with maximum 500 mA.

The file system (FAT 16, FAT 32 or NTFS) is shown under properties of the USB stick in the Windows Explorer. The protocol which is used is shown by clicking the hardware icon in the windows information area.

When using a USB stick device with several partitions, the music data files must be located in the first partition in order to be recognized and processed.

Note: Simultaneously connecting a device to the USB import/export jack and a second interface to the (12 V socket, USB audio auxiliary interface) can cause damage to both the external devices and the connected control units.

File System
The folders of the converted or copied music files can subsequently be renamed in the Options menu.

For this purpose, the corresponding album entry must be marked in the music collection and then the “Options” menu selected.

It is important to note the following when coping music files with Digital Rights Management (DRM) protection to the music collection:

- AAC music data in the M4P format (P = Protected) cannot be copied to the hard disk.
- Only music data in WMA format with copy protection can be copied.

This data will be shown in the music collection and in the music search. However, these protected tracks **cannot** be played. The track will be “skipped” or ignored and a different non-protected music track will be played.

The reason for this is that it is not possible to provide purchaser authentication in the CIC because a link to the online provider cannot be established. It is suggested that the customer import the audio files using a self recorded Digital Audio CD.

All music download portals allow the creation of a Digital Audio CD for the downloaded music track. However, the number of copies that can be created is limited by licensing legislation.

Data Saving (Backup)
The customer has the option of saving his/her complete music collection under the "Options" sub-menu. This is achieved by copying it back to a USB stick installed in the glove box port. It is necessary to ensure that the USB stick has sufficient storage capacity. A maximum storage capacity of 8 GB is required for saving the music collection data.

Import/export submenu screen shot showing how to back up music files

The process is similar to the data saving procedure on a PC. This function makes it possible to import data when changing vehicles or when replacing a head unit or hard disk.

Data saving will only be possible if the hard disk of the CIC has not been damaged and the interfaces to the CIC are still fully operational.

Data back up should be done prior to programming the vehicle after replacing control units. Without data saving (backup), all of the music data could be lost. However, this can only be done by the customer prior to bringing the vehicle in for service. Detailed instructions on how and where the data backup can be performed are provided in the Vehicle Owner's Manual.

WARNING!!!

For copyright reasons, the service personnel are not permitted to perform the data backup for the customer. The service personnel, can, however, instruct the customer on how to perform the backup procedure.

Music Search

The "Music search" sub-menu is provided in the music collection for the purpose of managing a large quantity of music files.

The music search takes place in accordance with a special filtering process. The search can be started at any menu item in the music search. For example, if the menu item "Genre" is selected as the starting point, all albums of all artists together with all the tracks in this music direction will be made available for selection.

In the next step, only the artist is selected and all his/her albums are displayed.

The search is now filtered further with each step until at the end, only the required entry remains.

The information for the music search is stored in the form of a metafile, similar to the ID3 tags of an MP3 file.

An example of how these metafile or meta information could appear is shown below:

Music search	Search for:	Example
1	Genre	Rock
2	Artist	Queen
3	Album	Greatest Hits II
4	Track	A Kind Of Magic

Music collection menu with a stored album selected

“Genre” selected in the Music Search sub menu

Data management is achieved with the aid of a music track database.

The music track database information is stored on the hard disk of the CIC for the purpose of managing the music file’s metadata. A 4 GB partition is allocated to the music search function.

The CIC is equipped with special software provided by Gracenote® for the purpose of identifying the complete albums of ripped Digital Audio CDs. It provides additional information about the music track on the respective Digital Audio CD converted to WMA files.

This music track database (Gracenote®) uses TOC (Table of Content) as the identification pattern. This means, complete albums on Digital Audio CDs are identified based on the number of tracks and the track length.

The corresponding data (track, artist, etc.) is then accordingly assigned to the music files in the music search database.

On conclusion of the conversion procedure to WMA files, the new metadata is automatically added to the directory structure in the music search. It is not possible to rename or edit this metadata after it is in the hard disk.

Note: Albums with newly released metadata at the time of vehicle delivery will no longer be identified. The music track database would require a permanent link with the server in order to keep this data up to date and this is not possible.

Unrecognized metadata of Digital Audio CDs is stored in the music collection as "Audio-CD 1", "Audio- CD 2", etc., together with the CD icon.

The metadata for the music track database from copied CD/DVD-ROMs or USB sticks is adopted identically in the music search function. This metadata does not stem from the music track database but rather from the user/customer himself.

The metadata, copied from a USB stick or CD/DVD ROM, cannot be renamed in the CIC.

In order to correct the faulty metadata on a track or file, the file must first be deleted from the hard disk in the CIC.

The user can then rename or add to these metadata files corresponding to the music track database structure (genre, artist, album and track) by using software on a personal computer.

When the file is imported back into the CIC hard disk, the correct metafiles will be displayed. This procedure also ensures that the music search will also find the copied music data with the music track, artist, etc.

Updating unknown music tracks is only possible with WMA files from ripped Digital Audio CD. If the user/customer does not follow this procedure, in time the music search will become unusable.

A “current” version of the music track database is stored in the vehicle on delivery.
The information about music CDs (Digital Audio CDs) released after the vehicle delivery will not be found in the vehicle's music track database.

Note: If the metadata is not found because the Gracenote database in the CIC is outdated, the tracks will not be recognized.

Updating the Music Track Database (Gracenote®)

To keep the entire contents of the music track database (Gracenote®) up to date, BMW Service is equipped with the latest CD of the music track database (Gracenote®).

This update takes place in connection with the media package, which also contains the Gracenote Update CD.

The CD can be loaded directly in the CIC drive and updated via the Service menu of the CIC (See Service Information).

The update of the music track database (Gracenote®) will become effective in the WMA music files only after subsequent conversions (rip function) of Digital Audio CD.

Metadata will no longer be added to files that were ripped before the update of the music track database (Gracenote®).

The reason for this is that the music track database is only accessed when a Digital Audio CD is loaded and subsequently ripped.

Gracenote Update CD

Radio

FM Stations

The layout of the "FM stations" in the Radio menu has been adapted to the new operating concept.

The former layout of the “All stations" list in the form displayed by the CCC has been replaced in the CIC by a list layout.

FM menu "All stations" in CCC

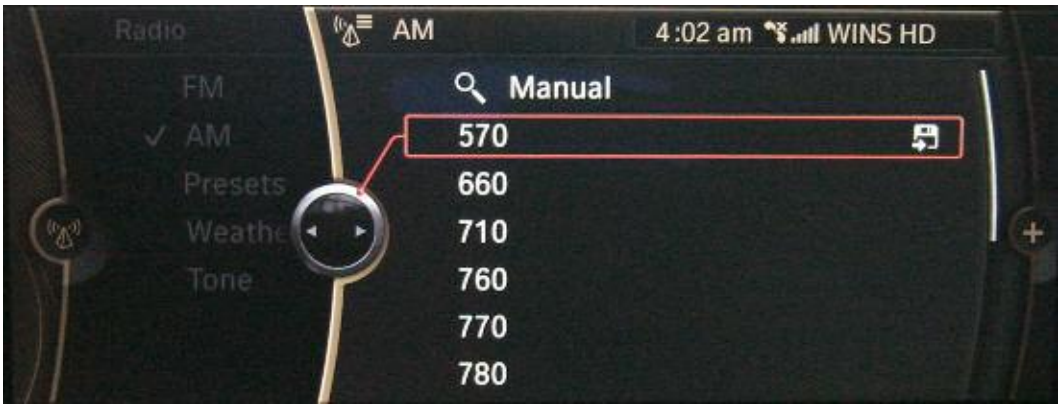
FM menu "All stations" in CIC as list

Manual station search in a CCC system

Manual station search in a CIC system

AM Stations

A double tuner has now made it possible to receive the "All stations" list in the AM range. However, no station information can be displayed because the RDS data is not transmitted for AM.



AM stations list

AM stations manual setting

IBOC

The IBOC functions in connection with the IBOC decoder which is now installed inside the CIC. IBOC makes it possible to receive digital radio signals. The IBOC components are described in detail in the "System Components" section of this training material.

SDARS

The Satellite radio service is available with a subscription to Sirius satellite radio. An example of how a station list would look like in the CIC with channels that have not yet been subscribed to is shown in the illustration below.

Station list with SDARS channels still disabled

Stored Stations

Under the menu item "Stored stations", the required stations from all frequency ranges can be stored in a common menu and then selected at a later time.

The following frequency bands are available for storage:

- FM
- AM (SW, MW, LW)
- IBOC

Stored stations

Telephone

The pairing assistant for the Bluetooth® connection can be found under "Bluetooth" in the Telephone menu.

Up to four mobile phones can be paired. One of the mobile phones already paired must be removed from the displayed list in order to pair a fifth mobile phone.

Follow the steps below to pair a Bluetooth telephone:

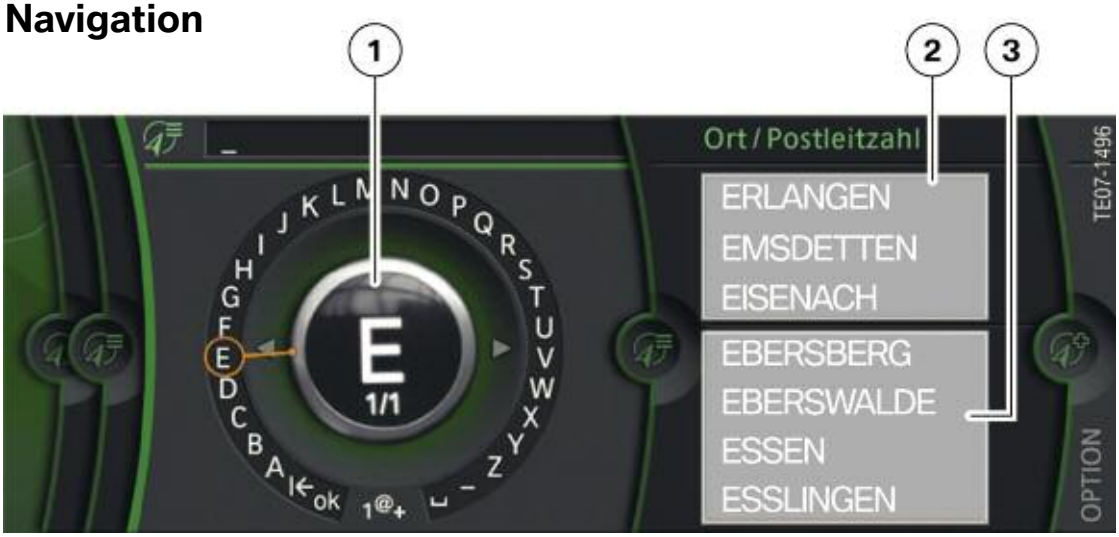
- After selecting "Add new phone" the identification number of the vehicle is shown in the display.
- The pairing assistant now receives the message that it is necessary to proceed with the mobile phone.
- A search for new Bluetooth devices should now be conducted on the mobile phone.

- If the search was successful, the identification number of the vehicle will be shown in the mobile phone display.

- A free random PIN-CODE must now be entered in the mobile phone which must then be repeated in the vehicle.

Following successful pairing, the data of the paired mobile phone device is now displayed in the phonebook or contact. This procedure can take from several seconds up to several minutes to complete depending on the amount of entries stored.

Navigation



View of the Navigation System's "Speller" for Entering Destinations

Index	Explanation	Index	Explanation
1	Speller	3	Selection menu
2	Fast access		

To simplify the destination entry procedure, the speller entry interface has been developed for the navigation system of the CIC.

The menu located at the top right, next to the speller, shows the last three place names entered, which can also be selected at any time.

Navigation destinations can also be entered based on their ZIP code using the speller symbol 1@+.

After entering several letters, a preview map will be shown in the assistant window. This makes it easier to select the desired destination. This function is particularly useful for identifying place names that share the same name and/or appear several times in one town, city or country.

The map shown in the assistance window is independent of the main map. Both the scale as perspective can be adjusted separately from each other. This setting is made under the Options menu.

Compared to the CCC, entering the destination using the voice recognition system has been made considerably easier. Many new commands are now possible using the voice recognition system.

Assistance Window with Different Zoom Factor Compared to the Main Window

Interactive Map

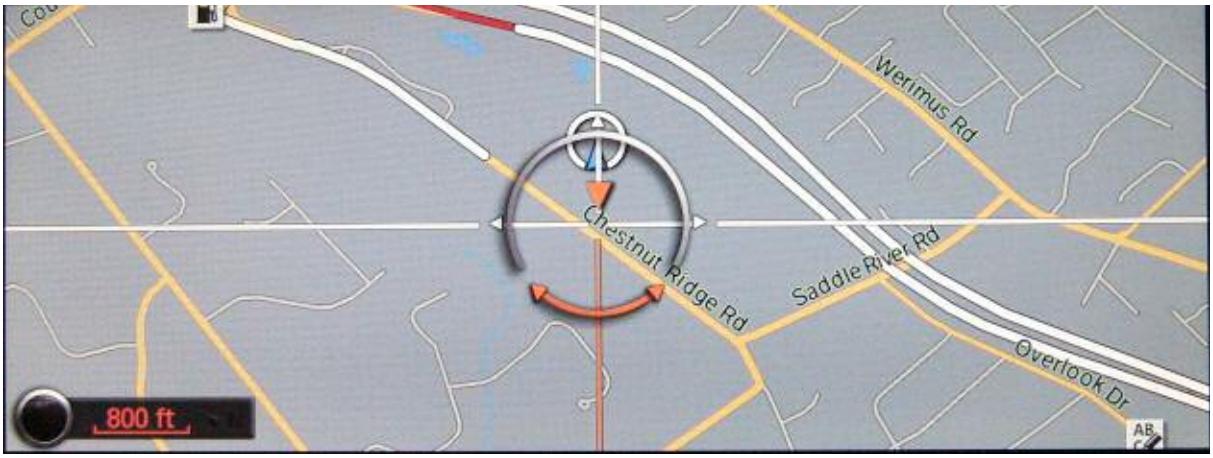
The interactive map is another option for entering destinations.

In addition to horizontal and vertical navigation there is also the option of diagonal navigation. Since the CIC does not directly have a diagonal sliding option, the following solution was found.

The auxiliary line for entering the destination can also be moved diagonally by pushing, pressing and turning the controller.

Various diagonal graduations can now be selected to facilitate destination selection.

A destination location appears in the crosshairs, it is shown highlighted and now it can be selected as the destination.



Interactive Map View

Note: The interactive map is an excellent tool for checking the controller functions. Since the controller can be moved in all directions, it is possible to detect if there are any defects in the controller or CIC head unit.

Map Data

The navigation Map material data is already pre-installed and enabled in all US vehicles.

The maps data can be updated in two different ways:

- **Updating the BMW programming system**
  In this case, the map data in the CIC is updated through the Ethernet connection in the diagnostic connector. The data is enabled by means of an enable code that needs to be downloaded and entered into the BMW programming system.
- **Using a complete DVD set**
  The DVD is loaded directly into the head unit. The enable code can then be entered directly into the iDrive system by the customer or service technician using the "speller". The customer can still continue navigating with the old map material after loading the CD and starting the update procedure. A reset is triggered in the CIC immediately on completion of the update procedure and the customer continues to navigate with the new map material. The navigation destination, last destination and contact data are retained. The update can be interrupted at any time and continued when ever the trip is resumed.

Map Views

Separate map views are possible in the main window and assistance window. The scale for each of the two maps can be selected individually. The map view can be selected in the icon bar on the left half of the screen.

The following maps can be selected:

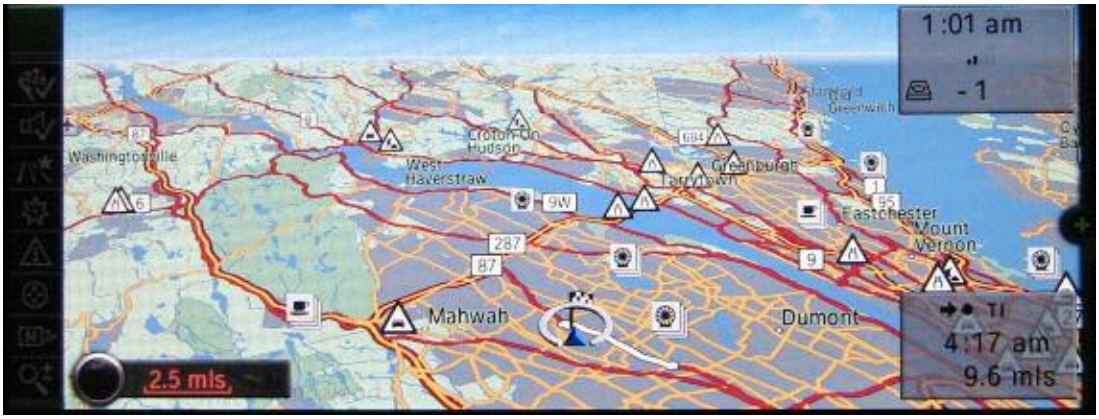
- North-up
- Perspective
- Direction-up
- Arrow view

Full screen mode can be activated by pressing the "Scale" icon twice or via Options while in the Navigation menu.

The assistance window can be activated under the "Options" menu.

The various map views for the main window and further display options are available in this assistance window.

The increased display resolution of the CIC display (1280 x 480) is particularly noticeable in full screen mode.



Full Screen Mode

Night View

A night view for map presentation can be activated under Options - Map Options. This view uses colors that are easy on the eye in darker conditions.

Night View of the Navigation Screen

Points of Interest (POI)

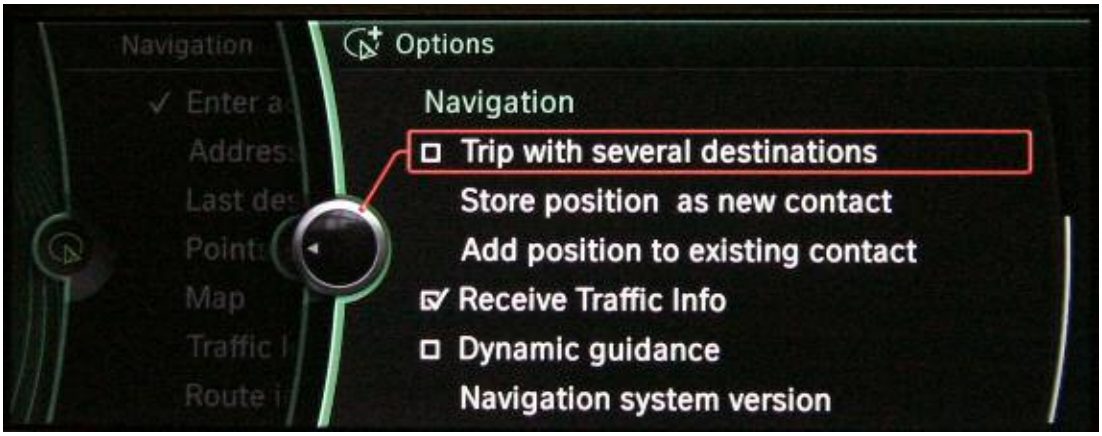
Addresses of navigation destinations as well as service stations, service areas, cinemas etc. can be selected via the "Special destinations" (Points of Interest) menu or by using the icon bar in the map view.

The Points of Interest pictograms can be selected under the "Options" menu item.

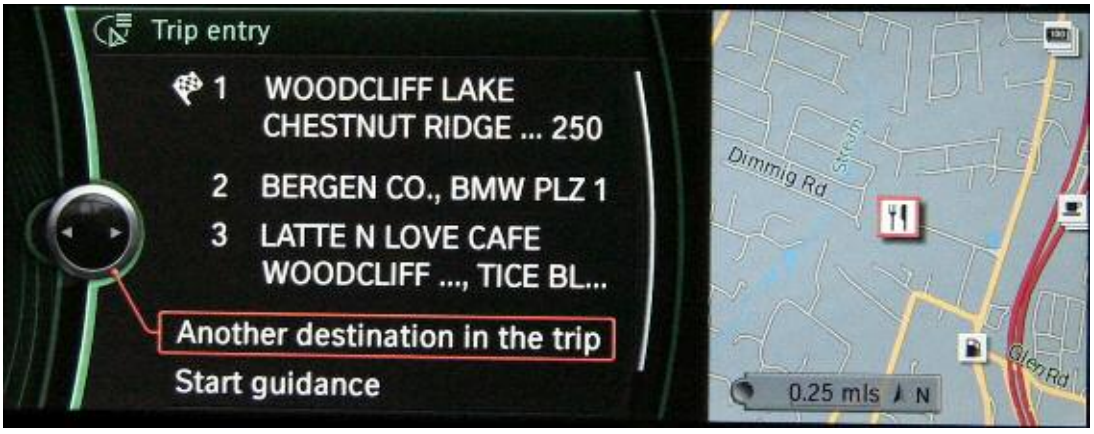
A POI search is possible while displaying the traveled route with the system in full screen mode.

Route Planner

Up to 30 stages can be entered when selecting a destination with the route planner. The trip or route planner is located in the Options menu of the navigation system. The entry "Trip with several stages" must be selected to activate this function.

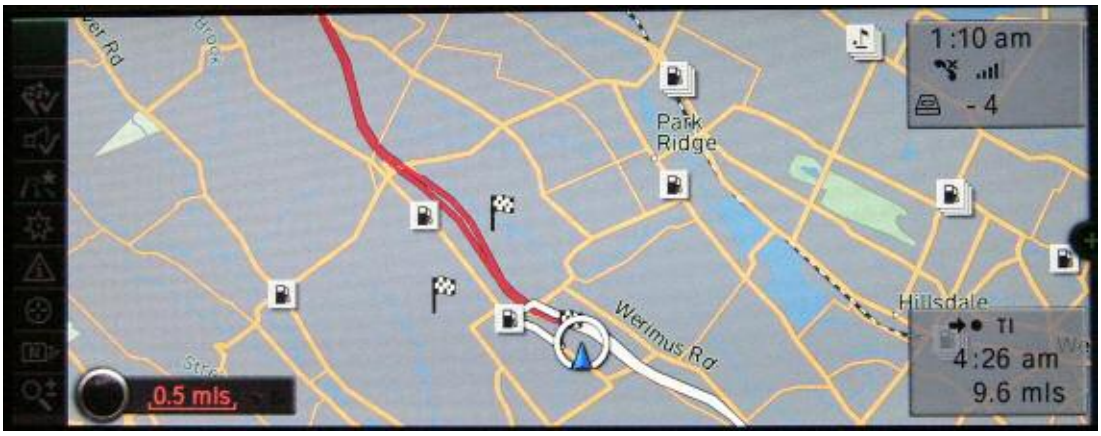


Trip/route Planner in Options Menu of the Navigation System



Trip/route Planner in Options Menu of the Navigation System

The individual stages are then marked with their own flag in the map views. These on-route destinations can be rearranged at any time.



Trip/route Planner Screen

Contacts

The Contacts menu is a database for managing names, addresses and telephone numbers.

Data that is displayed both in the phonebook as well as in the navigation system is stored in this central address database.

The phonebook data is transferred through the currently paired mobile phone using a PBAP protocol (Phonebook Access Profile).

New Contact Menu Option Selection

The imported entries from a paired bluetooth phone are identified by the Bluetooth icon next to the telephone entry.

An option for exporting all contact data back into the mobile phone is not provided.

Entries made under "New contact" are retained even after uncoupling the telephone and can be edited at any time. Initially, these contacts are shown without a symbol. A navigation symbol is added at the end of the entry when an address has been added.

BMW Assist

With the introduction of the CIC several innovations have been implemented in the vehicle regarding the BMW Assist.

The system has been changed to a push services, where an incoming message is shown in the display immediately.

These push services make it possible to immediately view receipt of the following data packages:

- BMW Search
- Destination addresses from Google Maps
- Destination addresses sent from the BMW Assist information service and their immediate display

Under the Assist menu, the Service status option lists the services that are available.

Service status sub-menu in the BMW Assist Menu

Available services availability

Vehicle Information

There are three sub-groups that can be selected in the "Vehicle info" menu:

- Onboard computer
- Trip computer
- Vehicle status

Onboard Computer

The onboard computer takes the place of the trip computer previously known from the CCC.

The information available:

- Range
- Distance to destination
- Arrival time
- Average fuel consumption
- Average speed

Trip Computer

The onboard computer 2 takes the place of the trip computer previously known from the CCC.

The information available:

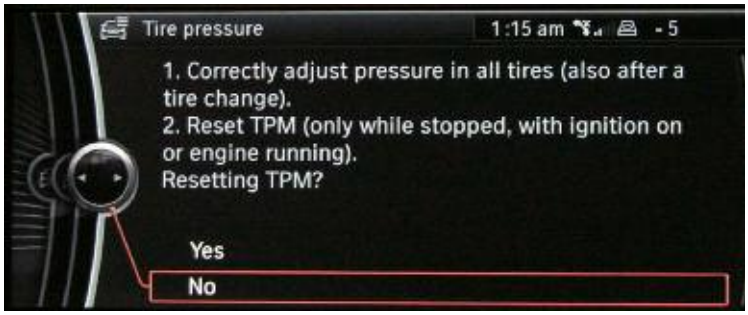
- Departure time
- Time remaining
- Distance remaining
- Average fuel consumption
- Average speed

Vehicle Status

The functions found under Vehicle Status are:

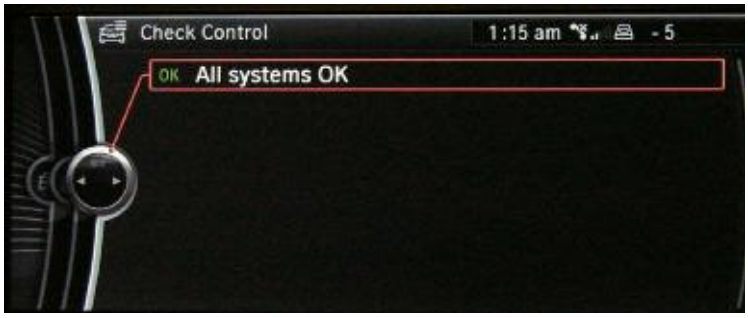
- TPMS (tire failure indicator)

- TPMS initialization



- Service Required

- Vehicle Information - Check Control Messages



Settings

The following settings can be edited under the Settings sub-menu:

Component	Setting
Head-up display	Brightness
Central screen	Brightness
Time/Date	Time, date, format
Language/Units	Languages
	Voice dialog: Standard/Short
	Fuel consumption: l/km, km/l, mpg
	Distance: km, mls
	Temperature: °C, F
Sound	Treble, bass, etc.
	Volume adjustment: Speed Volume
	Volume adjustment: Navigation
	Volume adjustment: PDC
	Volume adjustment: Gong
Limit	Setting limit, acceptance limit
Air conditioning (climate control)	Parked Car Ventilation
Lights	Home lights
	One-touch indicators
	Daytime driving light
	Welcome light
	High beam assistant
Door locking	Remote control key, lock automatically etc.
Trunk lid /Tail gate	Adjust opening angle

Language/Units

There are three different languages that can be selected:

- English US
- French
- Spanish

Language options in the Settings menu

Voice Recognition

The CCC command "Options" in the voice recognition system has been renamed to "Language options". The reason for this is that the newly created "Options menu" is accessed with the "Options" command.

In addition to the display language, the input and output language used in the voice recognition system can also be selected. Beeps are no longer heard between the individual dialog steps and it is possible to choose between “Default” and “Short” voice dialog commands.

Default dialog:

SYSTEM: "Please name the town"

USER: "Munich" - shown on display

SYSTEM: "Name the number of the correct entry and say new entry"

USER: "Entry one"

Short dialog:

SYSTEM: "Town"

USER: "Munich" - shown on display

SYSTEM: "Which entry"?

USER: "One"

Favorite Buttons

There are six favorite buttons available in the CIC.

The favorite buttons have the following operating modes:

- Short press, activates the button’s assigned function
- Long press, storage of functions currently displayed and selected in the CID

The Long press function is capable of storing the following selections:

- Radio stations
- CD, DVD player
- DVD changer access
- Phone numbers
- Navigation destinations (these must already be stored under "Contacts" or entered from "Last destinations")

A new feature in this system is the option of assigning any of the sub-menus such as "Navigation" or "Vehicle info" to the favorite buttons.

Demonstration of the Long press favorite button function

Service Information

Unlocking the Service Menu Option

Several important functions can be checked directly at the CIC with the aid of the Service menu. This menu can be used to select and adjust settings that are not visible for the customer.

The procedure for starting the Service menu with the "safe grip" has changed compared to the CCC system:

- Call up Start menu
- Push controller in up direction for at least 10 s
- Controller 3 notches to the right
- Controller 3 notches to the left
- Controller 1 notch to the right
- Controller 1 notch to the left
- Controller 1 notch to the right
- Press controller once
- The Service menu is now added as the last submenu to "Settings"

Four selection menus are available in the Service menu of the CIC:

- Navigation
- Telephone and BMW Service
- TV (Not for US)
- Gracenote

Service menu hidden

Service menu “unlocked”

Note: Although it appears in the Service menu,TV is not available on US vehicles.

Navigation

CIC Service menu with Navigation item selected.

Navigation	Screen content (example)	Explanation
GPS		
GPS	Status Latitude: 12°34'56"N	GPS position data
GPS	Tracking 01: 03 14,3, 02 xx, yy, z	GPS satellites
GPS	Version Receiver SW Version/Date	Software version and date of manufacture of GPS receiver
Sensor test	Wheel sensors, GPS satellites, Gyro	Check of input signals
Map version	Map Database: 1.067	Map version number Database: 1.067
Location entry	Location Entry: Entry	loop same as destination entry
Voice output test		

Note: Although it appears in the Service menu, TV is not available on US vehicles.

Telephone and BMW Service

CIC Service menu with Telephone and BMW Service selected

Telephone	Screen content (example)	Explanation
BT Name	BMW 57502	Bluetooth name of BMW vehicle for pairing
NAD	51 dBm	GSM signal level of built-in telephone module
MCC/MNC	262 01	Mobile Country Code + Mobile Network Code; unique code for country and network provider with which the phone is currently registered.
ICC ID	89490200000537151529	Integrated Circuit identifier = Identifier of SIM card
IMEI	351231004373763	International Mobile Equipment Identity (IMEI) is a unique 15-digit serial number of the telephone transceiver
Registration status	Registered	Registered = SIM card enabled and logged into network; Not registered = SIM card enabled but currently no
Reception		
Signal strength	20/100	Relative signal strength of the built-in telephone module in percent (max 100 %)
GPS T/D	14:41:57 27.05.2008	Assist cannot be enabled if time and date are incorrect

Note: Although it appears in the Service menu, TV is not available on US vehicles.

TV

Screen Shot of the TV Sub-menu in the Service Menu

There are five sub-menus which can be selected under the TV sub-menu:

- Ch = channel currently tuned in
- Frequency in MHz
- Channel information (transmission standard, bandwidth and program name)
- DVB-T parameter (modulation type, analog, digital TV distinction)
- Antenna information (field strength in **dBµV** (Decibel micro Volt)

Note: Although it appears in the Service menu, TV is not available on US vehicles.

Gracenote®

The sub-menu for Gracenote under the Service menu

The music track database can be updated under the menu item Gracenote.

Once the update CD has been loaded in the CIC drive, it is possible to compare the currently installed data status with the data status of the CD in the Service menu selection (See illustration below).

If the CD corresponds to the current status, the latest version of the Gracenote® music track database is downloaded after selecting "Start installation". The previous version is overwritten.

No data is added to unrecognized music tracks. The update only serves the purpose of identifying music tracks in connection with future music data storage converted with the aid of the rip function.

The sub-menu for Gracenote/Start installation under the Service menu

Resetting the CIC

The Car Information Computer can be reset by pressing the rotary push button (ON button) for 25 seconds. After 25 seconds, the control display becomes blank as a confirmation that the CIC is being restarted.

CIC Start Screen After a Successful Reset

Note: When resetting the MOST control unit, the MOST gateway is muted for 2 seconds.

Programming

Programming the CIC is done with the use of the respective optical testing and programming interface modules.

The interface modules OP(P)S or ICOM (A+B) are simultaneously connected to the OBD interface and to the MOST interface of the vehicle.