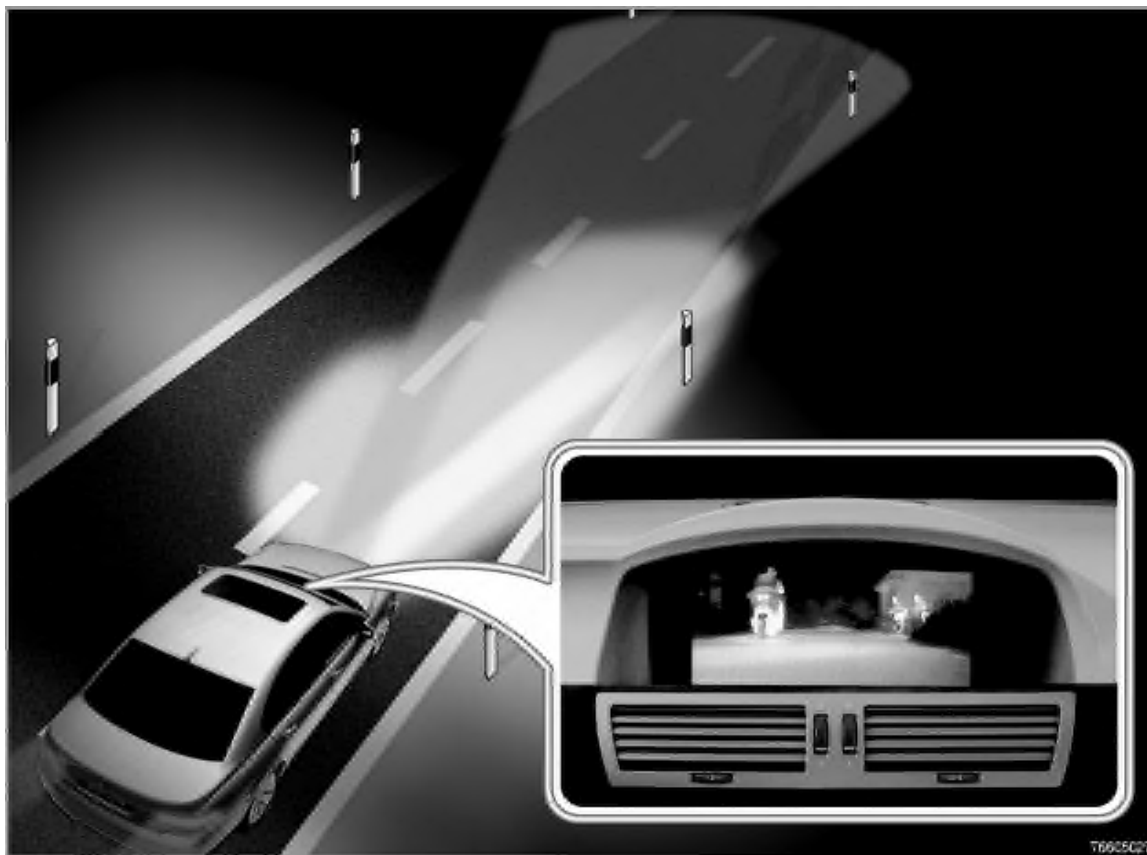


## BMW Night Vision

E60, E61, E63, E64, E65, E66



### Important: BMW Night Vision is not a substitute for the personal appraisal of the traffic situation.

BMW Night Vision is not able to replace the personal appraisal of visual conditions or the traffic situation. Objects outside the camera's field of vision cannot be detected. Objects already indicated may no longer be in the camera's field of vision. Decisions must always be made on the basis of personal appraisal - anything else constitutes a safety risk.

BMW Night Vision shows a frozen image for a short time at given intervals. The frozen image is marked with a small square on the left-hand edge of the screen. During this time, it is not possible to display the current image. For this reason, decisions must always be made on the basis of the personal view to the front - anything else constitutes a safety risk.

### Introduction

Option 611 "BMW Night Vision" is available for the first time in the BMW 7-Series from 10/2005.

BMW Night Vision is a driver support system providing assistance in night vision.

BMW Night Vision aims to enhance active safety in darkness. In this way it augments the main-beam assistant and the adaptive headlights. BMW Night Vision makes it possible to look further ahead at night and in twilight conditions.

With a range of up to 300 metres, objects are detected very early. The system's range depends on weather conditions.

BMW Night Vision works using "long-range infrared". In contrast, other automobile manufacturers use "short-range infrared".

Studies have shown that "long-range infrared" best satisfies the following requirement: Early detection of persons and objects on the display in darkness.

BMW Night Vision is a passive system **without** active infrared lighting. This means that no additional headlights are needed.

The night-vision camera generates an abstract but clearly more symbolical black-and-white image. The selection of a passive system was a strategic decision by BMW.

Additional functions such as zoom and panning increase comfort.

- > E60, E61, E63, E64 from 03/2006 [system overview ...]
- > E65, E66 [system overview ...]

Vehicles with rear entertainment system: No provision is made for BMW Night Vision on the rear display.

### **BMW Night Vision offers the following customer benefits:**

- Improved vision in twilight and darkness
- Display not dazzled by the headlights of oncoming vehicles
- Pronounced highlighting of persons, animals and warm objects
- Greater overview of driving situation due to display of course of road beyond that illuminated by headlights
- Magnified image of distant objects when driving fast through zoom function
- Improved recognition of objects on bends in the road through horizontally adjustable image section
- Enhanced personal safety on dark driveways and garage entrances through display of living creatures

### **Brief description of components**

The following BMW Night Vision components are described:

- **Night-vision camera**

The night-vision camera is located at the front left in the bumper.

The night-vision camera is a "heat detector camera".

An image sensor in the night-vision camera picks up infrared radiation emitted by objects.

Software processes the signals in into a visible image on the Control Display or Central Information Display. The night-vision camera transmits analogue video signals to the night-vision electronics through 2 wires.

The night-vision camera is connected to the night-vision electronics by a LIN bus.

[more ...]

- **Night-vision electronics**

The night-vision electronics form the actual control unit for the system. The night-vision electronics convert the image signals from the night-vision camera into an FBAS signal (Composite Video Burst Synchronisation).

- > E60, E61, E63, E64 - Depending on the equipment fitted, the FBAS wire is connected to the Car Communication Computer or the video module.

- > E65, E66: Depending on the equipment fitted, the FBAS wire is connected to the navigation system or the video module.

The night-vision electronics activate the power supply for the night-vision camera.

[more ...]

- **Button for BMW Night Vision**

The button for BMW Night Vision is used to switch the system on and off. The button is located next to the light switch.

[more ...]

- > E60, E61, E63, E64

On vehicles with iDrive, the system can also be switched on and off with one of the programmable buttons on the steering wheel.

BMW Night Vision can also be activated using the voice recognition system (SVS).

The following control units are involved in BMW Night Vision:

- **Display**

- > E60, E61, E63, E64: Central Information Display (CID)

The image recorded by the night-vision camera appears on the Central Information Display (black-and-white image).

- > E65, E66: Control display (CD)

The image recorded by the night-vision camera appears on the Control Display (black-and-white image). The scale of the display is computed by the Control Display: split screen display <-> full screen display.

A menu for BMW Night Vision can be called up on the Display. Personal settings can be made in this menu.

[more ...]

- **CCC: Car Communication Computer**

> E60, E61, E63, E64

The scale of the image on the Central Information Display is calculated by the Car Communication Computer: split screen display <-> full screen display.

- **NAV: Navigation system**

> E60, E61, E63, E64

If no video module is fitted, the FBAS wire from the Night-Vision electronics is connected to the Car Communication Computer. The Car Communication Computer then transmits the image signals to the Central Information Display via an LVDS data wire.

> E65, E66

If the vehicle does not have a video module, or does have a rear entertainment system, the FBAS wire from the night-vision electronics will be connected to the navigation system. In such cases, the navigation system will transmit the image signals to the Control Display via an RGB wire.

- **VM: Video module**

On vehicles with television, the FBAS wire from the night-vision electronics is connected to the video module.

> E60, E61, E63, E64 (EURO version)

The video module transmits the image signals to the Car Communication Computer (CCC) via an FBAS wire.

> E60, E61, E63, E64 (Japan version)

The video module transmits the image signals to the Car Communication Computer (CCC) via an RGB wire.

> E65, E66

The video module transmits the image signals to the Control Display (CD) via an RGB wire.

> E65, E66 (US version)

The video switch supersedes the video module.

- **DSC: Dynamic Stability Control**

The DSC control unit transmits the following signals through the PT-CAN:

- Vehicle road speed
- Steering angle
- Yaw rate

The night-vision electronics needs these signals, for example for the zoom function and to pan an image section.

- **LM: Light module**

> E60, E61, E63, E64

The light module transmits a message through the K-CAN as to whether or not the driving lights are switched on.

> E65, E66

The light module transmits a message through the K-CAN SYSTEM as to whether or not the driving lights are switched on.

On vehicles with Night Vision, the load status is also transmitted to the night-vision electronics. The light module calculates the load status from the ride-height sensor signals.

- **RLS: Rain-light sensor**

The rain-light sensor detects the brightness of the ambient light and precipitation.

> E60, E61, E63, E64

The rain-light sensor transmits its signals to the night-vision electronics via the K-CAN.

> E65, E66

The rain-light sensor transmits its signals to the night-vision electronics via the K-CAN SYSTEM.

## System functions

The following BMW Night Vision system functions are described:

- Power supply and earth
- Heating for protective glass on the night-vision camera
- Cleaning the protective glass on the night-vision camera
- Zoom function
- Panning image section
- Function limitations

### Power supply and earth

> E60, E61, E63, E64

The rear power distributor supplies the night-vision electronics with terminal 30g.

> E65, E66

The front power distributor supplies the night-vision electronics with terminal 30.

The night-vision camera, including the heating, receives its power from the night-vision electronics.

The night-vision electronics and the night-vision camera share a common earth point. This reduces the system's susceptibility to malfunctions.

### Heating for protective glass on the night-vision camera

To prevent the protective glass from misting or freezing over, a heating element is installed in the housing of the night-vision camera. The heating is switched on under the following conditions:

- Ambient temperature between 5°C and -15°C

### Cleaning the protective glass on the night-vision camera

The night-vision camera is equipped with a cleaning system.

The washer jet is bolted to the night-vision camera with a bracket. The washer jet is connected to the headlamp cleaning system. The cleaning of the protective glass is actuated together with the headlamp cleaning system.

### Zoom function

The zoom function can be selected as needed. To do this, select "Zoom" in the BMW Night Vision menu.

The zoom is calculated by the night-vision camera. The zoom function can only be selected when the "Full image" display is **not** selected.

When zoom is active, the display is automatically enlarged 1.5-fold at speeds of 70 km/h upwards. Here, the viewing angle of the night-vision camera is reduced from 36° to 24°.

Zoom is automatically deactivated when the vehicle's speed drops below 60 km/h. The viewing angle of the night-vision camera is restored to 36°.

(zoom IN over 70 km/h and zoom OUT under 60 km/h: currently only encoded for Europe version)

### Panning image section

The image section can be panned when "Cornering mode" is selected in the BMW Night Vision menu. "Cornering mode" is only executed when zoom is activated.

The image section then follows the vehicle's path through a bend (signals: steering angle, yaw rate).

The night-vision camera calculates the panning angle needed for the image section.

"Cornering mode" can only be selected when the "Full screen" display is **not** selected.

### Function limitations

#### On vehicles with rear entertainment system (rear display):

It is not possible to run the following simultaneously:

- BMW Night Vision in the front
- and navigation or BMW Assist in the rear

If navigation or BMW Assist is selected on the rear display: BMW Night Vision is switched off on the Control Display in the front.

When BMW Night Vision is switched back on again, an appropriate message appears on the rear display.

*Note: Note system limitations.*

In certain situations, e.g. precipitation, steep crowns or hollows in road, the system works with limitations. Please note the instructions in the Owner's Handbook.

### **Preconditions for activation**

BMW Night Vision is operational from terminal R.

Press the BMW Night Vision button.

BMW Night Vision will switch on in the following conditions:

- The rain-light sensor detects sufficient ambient light. Driving lights are off:  
BMW Night Vision is operational 2 seconds after the button is pressed. At the earliest 30 seconds after the vehicle is activated (navigation system booted). During these 2 seconds, a warning appears on the Control Display or Central Information Display.
- The rain-light sensor detects insufficient ambient light. Driving lights are on:  
BMW Night Vision is operational immediately after the button is pressed.
- The rain-light sensor detects insufficient ambient light. Driving lights are off. Road speed is less than 5 km/h (e.g. in dark driveways or garage entrances):  
BMW Night Vision is operational immediately after the button is pressed.

BMW Night Vision is **not** switched on in the following conditions:

- The rain-light sensor detects insufficient ambient light. Driving lights are off. Road speed greater than 5 km/h at the same time.  
A corresponding warning appears on the Control Display or Central Information Display.

### **Notes for service staff**

Service staff should note the following points:

- General note: [more ...]
- Diagnosis: [more ...]
- Encoding/programming: [more ...]

Subject to change.