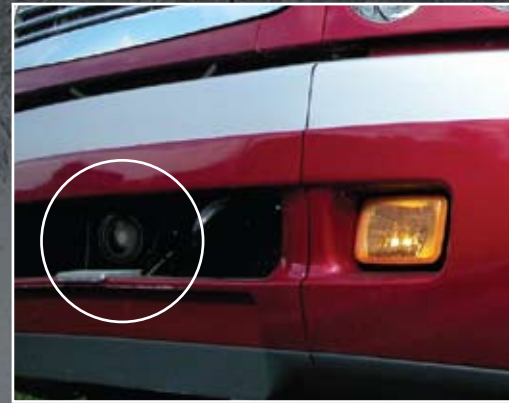




# APPLICATION STORY



The PathFindIR installed behind the grill of a truck.



A monitor displaying the images of the PathFindIR, can be easily displayed on the dashboard. It quickly becomes a natural checkpoint for the driver similar to side view or rearview mirrors.

## Trucks and buses can avoid deadly accidents

Thermal imaging for driver vision enhancement



PathFindIR™

*Road traffic has increased tremendously the last couple of years. More and more passenger cars are overwhelming our roads but also more trucks and buses are used. Large trucks play a critical role in many economies and their numbers are likely to increase even more in the coming years. Bus travel, both for short and long distances, is also increasing drastically.*

Modern trucks and buses have become real luxury vehicles. Buying one is a huge investment which needs to be protected at all times. Trucks and buses that are involved in an accident can cause huge damages. Not only can the vehicles themselves be ruined, in case of a truck accident, also the cargo can be lost. If the truck is loaded with dangerous goods, this can also damage the environment. But even more important, the possible loss of human life, definitely in accidents with buses that can carry 50 passengers or more, is impossible to calculate.

### Reducing the dangers of driving at night and in poor weather conditions

Professional drivers, like truck and bus drivers, experience tremendous stress when they are out on the road. They have to deal with poor and non-experienced drivers, heavy traffic and long hours behind the wheel every day. This can put them, their vehicle, goods and passengers in dangerous situations. Dealing with all these factors is already stressful and dangerous during daytime, in good

weather conditions. Driving at night or in poor weather conditions even increases the danger.

Nighttime driving presents serious risks to drivers of trucks, buses and other heavy vehicles. Many serious accidents occur at night, in fog, light rain, because the driver could not see the accident cause in time to prevent the collision. Each year, thousands of nighttime accidents occur with large vehicles, many due to adverse weather conditions. Drivers lack the ability to quickly reduce speed, fatigue can negatively affect reaction time, and vision gets severely impaired in the dark.

A new tool that can make driving during night time and in bad weather conditions safer is thermal imaging. By allowing drivers to see thermal images of the road ahead - well beyond what headlights illuminate - drivers are able to detect obstacles, curves in the road, ... much sooner and have more time to react.



Normal Vision



PathFindIR vision





Thermal imaging is the use of an infrared camera to “see” thermal energy emitted from an object. Infrared energy can not be detected by the eye because the energy of the photons is too low to stimulate the photoreceptors in the eye. Also, thermal IR light does not get to the retina, because it is highly absorbed by the eye’s lens and fluids. Infrared allows us to see what our eyes cannot - invisible heat radiation emitted by all objects regardless of lighting conditions. Thermal imaging cameras produce images of invisible infrared or “heat” radiation. Based on temperature differences between objects, thermal imaging produces a clear image.

### Thermal imaging for driver vision enhancement

Thermal imaging is a powerful driver vision enhancement system, which significantly reduces the risks of night time driving and allows the driver to see up to 5x further than with headlights. It needs no light whatsoever to operate. Thanks to thermal imaging, drivers can more quickly detect and recognize potential hazards and avoid deadly accidents.

Thermal imaging also helps drivers to see road edges better, see approaching curves earlier, to overcome momentary blindness from oncoming headlight glare, and to see through smoke, dust, light fog and light rain.

BMW started using this technology on its 7-, 6- and 5-series passenger cars to facilitate night time driving. Buses and trucks, vehicles that are used much more intensely than passenger cars, can therefore certainly benefit from this technology.

### PathFindIR™: thermal imaging camera for driver vision enhancement

The FLIR Systems PathFindIR is a compact thermal imaging camera that significantly reduces the hazards of night time driving. It enables drivers to see much further, with improved clarity, than with standard headlights. Drivers can detect and monitor pedestrians, animals, or objects on or near the road, allowing more time to react to any potential danger. Humans and other warm blooded animals offer significant thermal contrast to driving backgrounds and are easy to spot

with the PathFindIR. This way, accidents with pedestrians resulting in heavy injuries or even death, and crashes with animals, resulting in heavy damage to a vehicle, can be avoided.

PathFindIR helps to detect and recognize potential hazards in total darkness, smoke, rain and snow. The PathFindIR module can be integrated into truck and bus designs, or adapted for aftermarket commercial applications.

The PathFindIR incorporates an uncooled 320 x 240 pixels microbolometer. This maintenance free system delivers crisp video images which can be displayed on virtually any display that accepts composite video. It is equipped with an 19 mm wide angle lens which gives the driver a wide field of view (36°), resulting in excellent situational awareness.

Designed for use in harsh weather conditions, the PathFindIR is extremely rugged. Its vital core is well protected against humidity and water. It is sealed, and will endure road salts and extreme temperatures. The PathFindIR can be cleaned with a hose just like any other equipment. It operates between -40°C and +80°C and has a built-in heater to defrost its protective window. This heater is capable of defrosting a 2mm layer of ice frozen to the window within 15 minutes when ambient temperature is -30°C and wind speed against the window is 100 km/hr. The heater is automatically powered when window temperature is less than +4°C and powered down when window temperature is more than +6°C. This ensures a clear lens and perfect infrared images displayed on your monitor even in very cold environments.

### Easy to install and easy to use

The FLIR Systems PathFindIR is a compact camera (5.8 x 5.7 x 7.2 cm) and weighs only 360 grams. The PathFindIR can easily be installed behind a vehicle grill or in any other compact location. A 6 meter long cable is available for routing the PathFindIR’s power and video interface into a passenger compartment. On one side the cable connects to the PathFindIR. On the other end it has 2 wires that can be terminated, as required by the user, for hooking into the vehicle power bus

and a video cable that is terminated with a BNC connector.

The images produced by the PathFindIR can be displayed on most standard monitors which can be installed on the dashboard. There is no need whatsoever for the driver to look at the display continuously. The monitor becomes a natural checkpoint for the driver, similar to side view or rearview mirrors. A quick glance gives the driver all the information needed to react quicker and avoid deadly accidents.

### Affordable solution to save money

The increasing worldwide demand for thermal imaging cameras for a fast growing number of applications has resulted in the ability to bring down the costs considerably. The PathFindIR comes for a very affordable integrator price of 3,287 €.

Not only huge accidents involving injuries or death cost a tremendous amount of money. Driving over road debris and other obstacles can cause damages to a truck or bus. Repair cost and increased insurance rates can make even a small accident an expensive thing.

Risk mitigation is an important part of reducing operating costs for commercial vehicles. Using the PathFindIR as part of a crash prevention strategy can reduce the expense of repairs, productivity losses, and raised insurance rates. One accident avoided pays for the initial investment in a PathFindIR a multiple number of times.



#### Legal disclaimer:

FLIR Systems accepts no responsibility and can not be held liable for any error or accident resulting from the use of its thermal imaging systems or errors in the interpretation of the image by the user.

More information about the PathFindIR and how to install it in trucks or buses can be obtained from:

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