

DIGITAL EYE



ADL is the first British vehicle manufacturer to have its products on the road fitted with camera monitor systems instead of traditional wing mirrors, and it's winning hearts and minds, reports Kevin Swallow

On 18 June 2016 the United Nations Economic Commission for Europe (ECE) passed an amendment to Regulation 46 allowing camera monitor systems (CMS) to replace wing mirrors. There are strict guidelines regarding the amount of light CMS must generate in all conditions from daylight to night-time, its ability to deliver a suitable image in all weather conditions, positioning, and independence from driver interference – namely switching it off.

Daimler launched the first CMS for trucks, dubbed MirrorCam, last September (pictured, right). Its supplier, Bosch/MEKRA Lang, will also deliver MirrorCam to Nikola Motor Company for its new Nikola Two truck. A spokesperson for Bosch says that the “digital mirror camera system is going into production” this summer.

In the UK, the first and, so far, only, manufacturer to use CMS in a commercial setting is Scotland-based bus and coach builder ADL (Alexander Dennis). It introduced SmartVision, produced by French company Vision Systems, in October 2018.

Back in 2016 Mike Sixsmith, a key account manager for passenger systems supplier 21st Century Technology, was in discussion with ADL and transport services provider FirstGroup about the feasibility of cameras replacing external



mirrors. The remit was to reduce damage costs and insurance claims caused by the mirror, particularly on the nearside.

While a standard closed-circuit monitoring system was initially considered, it didn't meet the newly established amendments set out by ECE R46. He says: “That goes into great trigonometrical detail as to what is required if you are going to replace external mirrors with a CMS.”

Already familiar with Vision Systems' products, in 2017 Sixsmith discovered the company had developed SmartVision. It had already been approved by vehicle standards body UTAC Ceram in France, and used

by French authorities to carry out all conformity tests to meet directives enacted by the European Commission. What is more, SmartVision had been fitted to buses in Switzerland since late 2017. A solution was found.

SmartVision uses analogue high definition (AHD) cameras that convert a digital signal to an analogue one, so the driver sees on the monitor exactly what the camera sees, without delay, for the Class 2 and wide-angle Class 4 mirrors used together in both bus and truck.

Last year, VCA (Vehicle Certification Agency) approved the unit for new-build units across ADL's range of Enviro buses, including the E200 single-deck

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and E400 double-deck products, to operate in the UK. The next stage is to type approve SmartVision across its much more varied coach range. (Retrofitting is not allowed.)

The driver cannot change the position of the camera, or what is seen on the monitor, save for a minor adjustment to brightness; all other light adjustments for the elements are done automatically.

However, a failure could bring the vehicle to a halt. Sixsmith explains: “If one camera goes off, the picture will be replaced by a red cross. That indicates the feed is not working. If that happens to a Class 4 picture, the bus is entitled to carry on. If it is a Class 2, it is the same as if the driver had broken the wing mirror. The driver would have to stop and have the camera replaced or fixed.”

A Daimler spokesperson confirms that if the MirrorCam’s Class 2 screen or camera fails en route, the driver must stop the vehicle and call for back-up, which is the same advice that is given to the driver breaking a (Class 2) mirror.

The Driver and Vehicle Standards Agency has also given guidance should a Class 2 camera feed fail. A driver can fit a temporary mirror to get the bus back to base, but the replacement has

to meet the original R46 legislation in order for it to be legal.

Practically speaking, this means that a bus would need to have pre-fitted brackets to house a replacement mirror. But Sixsmith points out that this is unnecessary for urban buses, whose route is easily accessible by technicians. But he adds: “We see an emergency kit a more likely option for long-distance coaches.”

DIFFERENT POINTS OF VIEW

Because of the camera placement, digital mirrors offer a different angle of view than mirrors. The Construction & Use Regulations do not restrict the distance that a wing mirror can stick out from the side of a vehicle. Usually, it’s up to 300mm from the cab to the outer casing, whereas the SmartVision camera is approximately 200mm. This creates a straighter view down the side of the vehicle that can distort the driver’s view in two areas: the side of the bus can reflect the road, and the rear point of the bus is difficult to establish (see image).

Use of overlays to establish borders on the monitor is prohibited when moving forward, but can be used for


reversing on the Class 2 digital screen and with an indicator. Any overlay must be temporary. A spokesperson for Vision Systems explains: “Lines – only displayed on reverse – are an active indicator and are limited regarding time. Even if you keep the signal on, the lines will disappear.”

When reversing, there are three overlay lines on the monitor: one signifies the rear axle, a line that shows a metre behind the rear of the bus, and then, at the customer’s discretion, a third line up to 12m behind the vehicle. Likewise, MirrorCam employs similar overlays for reversing and indicating.

Part of the VCA approval was establishing where the nearside monitor would sit. For a bus fitted with an inward-opening door, a frame for passengers to hold when alighting and an assault screen, VCA was specific in wanting the monitor within the driver’s cockpit and free from interference or obstruction by passengers, Sixsmith explains.

For bus drivers, the main issue is change. From physically turning the head to see the nearside mirror the driver requires only a glance to see the monitor. “There is a problem for some drivers who will switch between [buses fitted with] the CMS and traditional wing mirrors, because the driver has to adjust and change their view,” he says.

ADL has already sold more than a dozen buses with SmartVision products to operators like First Glasgow, trentbarton and National Express. Two demonstrator buses are also available.

One early customer is Border Buses. Operations manager Lee Young states: “The main benefit of SmartVision compared to orthodox wing mirrors is that the images on the monitor are very clear, especially at night.” 



FURTHER INFORMATION

ADL SmartVision video: www.is.gd/umuhov
MirrorCam: www.is.gd/vuyouqu