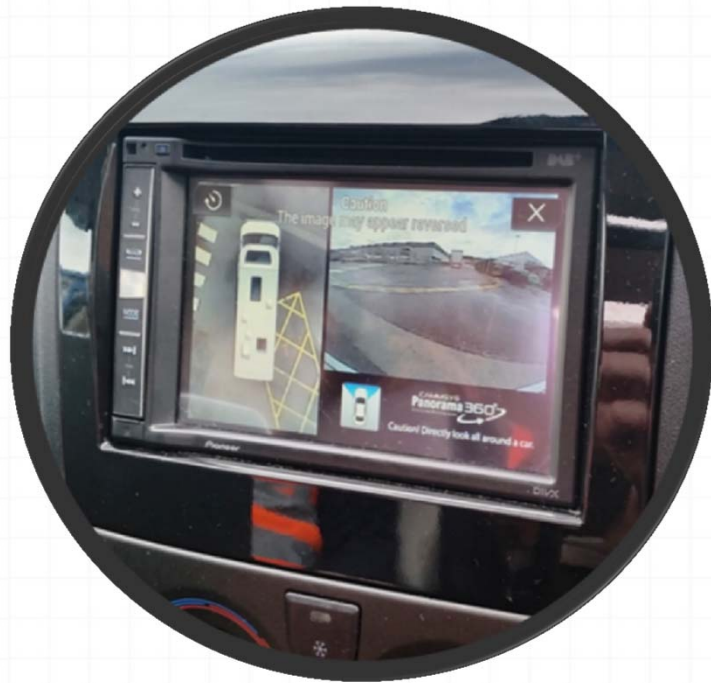




Advanced Driver Assistance System

Synergy - 360° AVM Proposal



CAMMYSYS





System Overview

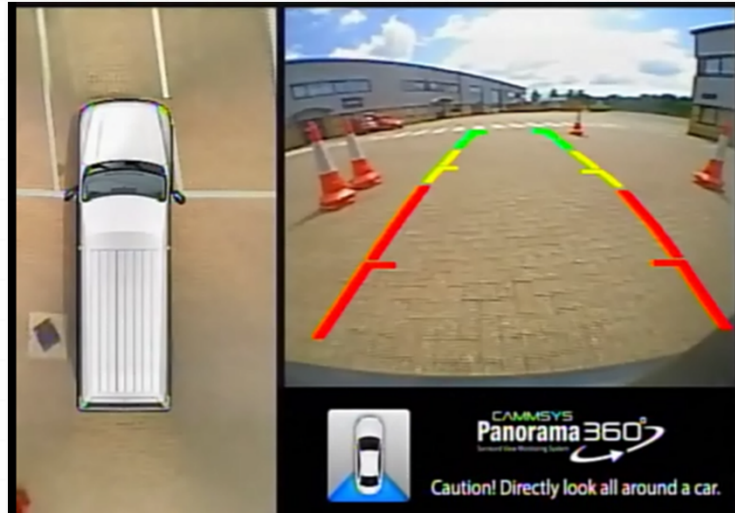
Synergy Smart Vision 360 : a state-of-the-art Parking Assistance System and AVM – Around-View Monitoring system. This innovative system utilises four individual wide-angle cameras mounted around the vehicle. The images are then processed to provide a full 360° video on your infotainment system to form a bird's eye view. Six different views are selectable through the control switch, some of which are automatically selected when the turn indicators or reverse gear is selected.



Default View on start-up: The 360° 'Bird's eye' view provides the driver with a complete view of the vehicle surroundings, offering assistance when parking or manoeuvring in restricted spaces. The system automatically switches view when the car is placed in reverse gear, or when the turn indicators are used.



System Overview



Reversing: Smart Vision is especially useful when reversing into or out of parking spaces, as it offers the driver the top view combined with a wide angle rear view, to negotiate even the tightest of spaces. If required the driver can switch to a full screen view of the front or rear cameras using the control switch.



Vehicle indicators on – Left or Right: When the indicators are used, the system will project the left or right camera images onto the screen in addition to the top view, providing the driver with a perfect view of hazards in the blind spots, such as cyclists and other low objects which cannot be seen in the side mirrors. This will also prevent kerbing of wheels, which can be costly.



System Overview

Full Screen ultra-wide 195°angle view (selectable by command switch):

The driver can manually engage full screen front or rear view, which provides a much wider camera image of the vehicle front/rear surroundings. This is very useful when visibility is restricted – for example at a junction with a hedge or wall blocking the view of the oncoming traffic, or reversing out onto a road, many accidents are caused this way, Smart Vision 360 will 'see what you cant' see'





Overview of CammSys

- ❖ Founded in 1993 in Korea, main areas of business include, Camera Module, Automotive Electronics, Biometric Security Solutions, EV Power Train Parts, we now employ nearly 3,000 people, including 120 R&D Engineers.
- ❖ Currently manufacture over 20 Million Camera modules a month and supply Global companies, Samsung, Sanyo, Vestel, Tata Daewoo, SsangYong, etc
- ❖ Vehicle-IT Convergence - Grounded in cutting-edge IT/new technologies, CammSys increases driver safety and convenience to provide the optimal driving environment and offers innovative product & service solutions including Drive Recorders under the Blacksys brand
- ❖ Based on its technical capabilities as a company specializing in camera image technology, one of our finest innovations include a 360-degree vehicle monitoring system; the ADAS 360 Around View Monitoring System redefines the market for this type of system, we have evolved this system rapidly over the last 6 months and will continue to introduce new safety features.
- ❖ Future roadmap for 360 AVM system include MOD – Moving Object Detection, 3D Visualisation, FCW – Forward Collision Warning, LDW – Lane Departure Warning and recording of the images.



Overview of Synergy AE

- ❖ Based in Chippenham & founded in 2012, with a background in Automotive Electronics, working for companies like LiteOn Corporation, Laserline Spa, Getronic Srl & Cobra Automotive Technologies (Vodafone Automotive)
- ❖ Projects include McLaren MP4-12C, designing the Security & Telematics sub-system architecture, carrying out the application engineering and project management, heading up a team of SW/HW and validation engineers.
- ❖ Experience in product development and project management of OEM and accessory programmes for VW Group, Hyundai, Mitsubishi, Lotus, McLaren & Nissan
- ❖ Development of Vehicle Specific, bespoke solutions, to include sheet metalwork, turned parts, injection & Vac Form moulding, 3D Printing, harness production and installation manuals for production & aftermarket.
- ❖ Expertise includes working at Design Concept Stage, to define Electronic Sub Assembly Architecture, working with other suppliers to ensure IT Protocols are compatible, working with HW & SW engineers to ensure compatibility with the vehicle system in its entirety.
- ❖ Project Management – ensuring project budgets, including P&L, timelines and managed effectively and development cost and tooling costs are amortised into sales of product over an agreed forecast
- ❖ Technical Training – of both product and specific vehicle application.
- ❖ Aftersales support – provided by email, telephone and onsite.



AVM Model line up

Model	Photo	Specification
AVM-110		<ul style="list-style-type: none"> ▪ 4CH VGA(800 x 480) Camera with IP67 ▪ 195° Wide Camera ▪ Brightness Correction ▪ Blind Spot Correction ▪ Dynamic Overlay ▪ Auto Calibration ▪ 3D AVM (Option) ▪ Coverage for Motorhomes up to 5.5m
AVM-120/121		<ul style="list-style-type: none"> ▪ Calibration programme for PC ▪ 4CH VGA(800 x 480) Camera with IP67 ▪ 195° Wide Angle Lens Cameras ▪ Blind-Spot Correction ▪ Brightness Correction ▪ 6 Different View Mode ▪ Dynamic Overlay ▪ Full Water Proof Cable Connector ▪ Expandable Cable ▪ MOD / 3D AVM (Option available Q3 2016) ▪ Coverage for large Motorhomes



AVM Specification

	Content	AVM-110/120/121
Electrical Standard	Typical Supply Voltage	12V & 24V (Free Voltage)
	Operating voltage Range	9V to 36V
	Power Consumption	> 13W (With Camera)
	Power Off Current	> 2mA @ 12V
	Operating Temperature Range	-30 ~ +75 °C
	Storage Temperature Range	-40 ~ 85°C
	ECU Dimensions (W x H x D)	115.4 X 34 X 158.4mm
	ECU Weight	300g
Video	Camera Input / Video Output	NTSC_CVBS(1Vpp_Typ)
Certificate Standard	Certification from Car manufacturers	Hyundai/Kia Original certification
Product Standard	Resolution	VGA [800 X 480]
	Frame Rate	30fps @NTSC
	Latency	≤ 130mS
	Booting Time	≤ 2S
	View Change Time	≤ 5mS
	Operation	≤ 30Km [Adjustable]
Interface (to AVN) & Automotive	Interface [Touch, Ack]	UART(RS-232)
	Automotive	Not Automotive but Available



AVM Specification

	Content	AVM-110/120/121 Camera
Electrical Standard	Typical Supply Voltage	5V ± 0.5V
	Operating voltage Range	4V to 6V
	Power Consumption	< 0.6W
	Power Off Current	< 500uA @ 5V
	Operating Temperature Range	-30 ~ +70 °C
	Storage Temperature Range	-40 ~ 85°C
Video	Camera Output	NTSC_CVBS(1Vpp_Typ) & PAL_CVBS(1Vpp_Typ)
	Frame Rate	30fps @NTSC
Optical	Resolution	VGA
	Optical Format	¼ inch
	Angle of View	148(V), 195(H), 200(D) ° ±3%
	IP classification	IP 67
Certificate Standard	Certification from Car manufacturer	Genuine product certification from Hyundai/Kia or depends on Buyer's needs
Dimension	Camera Dimensions (W x H x D)	21.0 x 21.0 x 24.5(H)mm
	Camera Weight	50g