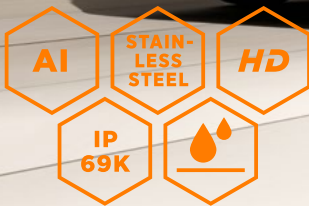


# CAMERA MONITOR SYSTEMS

FOR BODY BUILDERS & COMMERCIAL VEHICLES



# 10 ADVANTAGES



OWNER-MANAGED  
COMPANY



COMPREHENSIVE QUALITY  
ASSURANCE PROCESS



INNOVATIVE  
PRODUCTS



OEM & ODM SOLUTIONS  
IN SMALL BATCHES



ATTRACTIVE PRICE/  
PERFORMANCE RATIO



TOP PRODUCTS  
24 HOURS SHIPPING



TECHNICAL  
CUSTOMER SERVICE



ASSEMBLY ON  
ON-SITE POSSIBLE



INSURANCE DISCOUNTS &  
BG PROMOTION



## DELIGHTED CUSTOMERS

### OUR VALUE PROPOSITION

Dear business partner,

As an owner managed company, we value trust, fairness and cooperation in our working environment. We are committed to making certain that you are delighted with our products and services.

As a partner to our customers, we are constantly developing the best solution for the respective application area and, if required, manufacture customer-specific solutions in Germany – also in small series. We offer professional consultations focused on delivering solutions – the fundament for a productive cooperation. To ensure the consistently high quality of our products, we conduct extensive tests both prior to initial launch and once production has started. Additionally, we affirm our quality commitment with a 48 months warranty.

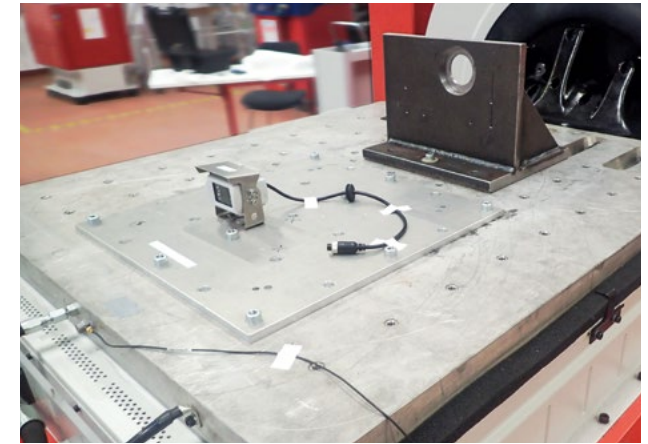
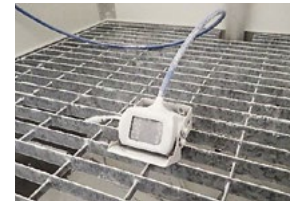
As a dynamic company with a streamlined organisation structure, we always aim to offer the best cost-benefit ratio. We look forward to collaborating with you to find solutions for your specific requirements.

Sincerely

Dr. Matthias Feistel

Martin Groschke





## A NETWORK OF PROFESSIONALS AUTHORISED DISTRIBUTORS

### LUIS Technology GmbH Head Office

Hammer Deich 70  
20537 Hamburg  
T + 49. 40. 897 27 84-0  
service@luis.de

### LUIS Technology GmbH Sales Office

Marktplatz 12  
91472 Ipsheim  
service@luis.de

**Aspöck France S.A.S., France**  
T + 33. 437. 5508 65  
office@aspoeck.fr

**Aspöck Ibérica, S.A., España**  
T + 34. 93. 759 80 39  
aspock@aspock.com

**Aspöck Systems Polska Sp. z o.o., Polska**  
T + 48. 34. 3430 600  
office.poland@aspoeck.com

**Aspöck UK Ltd., United Kingdom**  
T + 44. 1279. 655 220  
sales@aspoeck.co.uk

**Ing. A. F. Baeder GmbH, Österreich**  
T + 43. 1. 865 16 40  
sales@baeder-automotive.com

**COSMIC s.r.l., Italia**  
T + 39. 080. 424 07 93  
info@cosmicsrl.com

**Duchemin AGT, Belgium**  
T + 32. 71. 89 43 23  
info@ducheminagt.be

**Electro Maintenance S.A., France**  
T + 33. 4. 90 94 14 09  
adv@electromaintenance.fr

**Frits Dijk International BV, Nederland**  
T + 31. 40. 283 1815  
info@fritsdijk.nl

## LUIS CAMERA MONITOR SYSTEMS FOR USE IN CHALLENGING ENVIRONMENTS

LUIS products are designed for demanding applications. Only components are used that meet these quality requirements.

Special features are the robust stainless steel brackets and roofs of the cameras as well as the solid and internally potted die cast aluminum housings with bonded screws and washers. Accordingly, LUIS cameras meet the highest IP69k protection class for water and dust tightness. LUIS cameras can also withstand vibrations of 10–2,000 Hz and shocks of up to 100 G without any restrictions and still operate at extreme temperatures from -40 °C to +85 °C.

### QUALITY FEATURES

- › Solid die cast aluminum housing
- › Predominantly rugged stainless steel camera mounts and roofs
- › Camera housing potted and screws bonded
- › IP69k protection rating (certified according to ISO 60529:2014)
- › Shockproof up to 100 G (certified according to ISO 16750-3:2012)
- › Vibration resistant 10 to 2,000 Hz (certified according to ISO 16750-3:2012)
- › Temperature resistant -40 to +85 °C (acc. to ISO 16750-3:2012)
- › Operating voltage 9 to 32 V
- › CE, ECE R10 (E-Mark), RoHS and REACH certified







## MANDATORY SYSTEMS FROM 2022/24

### EU REGULATION 2019/2144

Regulation (EU) 2019/2144 aims to significantly reduce the number of fatalities and serious injuries on EU roads by introducing safety systems as standard vehicle equipment. This will make the following systems, among others, mandatory for type approval for new vehicle types (NT) and new registrations (NR), depending on the vehicle class (selection):

MANDATORY SYSTEMS (SELECTION ONLY)	LCVs	TRUCKS		BUSES	
	N1	N2	N3	M2	M3
› Reversing Detection (R158)	Phase A	Phase A	Phase A	Phase A	Phase A
› Blind Spot Information System (R151)	—	Phase A	Phase A	Phase A	Phase A
› Moving-off Information System (R159)	—	Phase A	Phase A	Phase A	Phase A
› Driver Drowsiness & Attention Warning	Phase A	Phase A	Phase A	Phase A	Phase A
› Advanced Driver Distraction Warning	Phase B	Phase B	Phase B	Phase B	Phase B
› Further					

Phase A: NT: July 6, 2022 and NR: July 7, 2024  
 Phase B: NT: July 7, 2024 and NR: July 7, 2026  
 ■ = LUIS offers a powerful solution

## REVERSING DETECTION (R158)

### REAR VIEW CAMERAS AND SENSORS

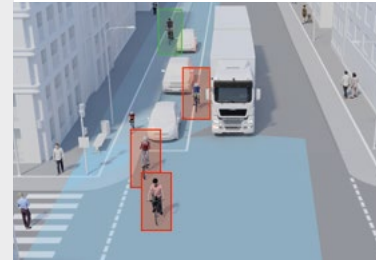
LUIS carries a wide product portfolio of different camera and sensor systems which meet the requirements of devices for reversing detection of unprotected road users (R158). Further information on pages 10-12.



## BLIND SPOT INFORMATION SYSTEM (R151)

### TURN ASSISTANT

As market leader in the area of turn assistance, we are developing an assistant that meets the requirements of R151. This is designed in such a modular way that it meets the different requirements of OEMs and bodybuilders and can be adapted to them, even in small quantities. Further information on page 17.



## MOVING-OFF INFORMATION SYSTEM (R159)

### MOVING-OFF ASSISTANT

The LUIS R151 turn assistant will be expandable to include a moving-off from standstill which complies with R159. The aim is to prevent accidents involving road users in front of the vehicle when approaching. Further information on page 20.



## INDIRECT VISION SYSTEMS (R46)

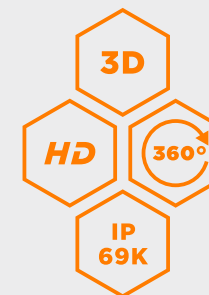
### MIRROR REPLACEMENT

In order to replace mirrors with camera monitor systems, these systems must be approved in accordance with Directive R46. A LUIS camera monitor system approved in accordance with R46 can be used instead of conventional mirror systems in Class V and Class VI areas. We are currently working on a solution for side mirrors. Further information on page 21.



# LUIS 3D HD 360° SURROUND VIEW PROFESSIONAL

HIGH-PERFORMANCE 360° SYSTEM



## QUALITY FEATURES

- › High resolution
- › 3D representation of the vehicle for better orientation
- › Multiple view modes depending on driving mode
- › Simple and fast auto calibration on the system
- › Camera with IP69k protection class (according to ISO 60529:2014)
- › Temperature resistant -40 to +85 °C (according to ISO 16750-3:2012)
- › Operating voltage 9 to 32 V
- › Variant with person detection (AI-based) 360° all around the vehicle in real time



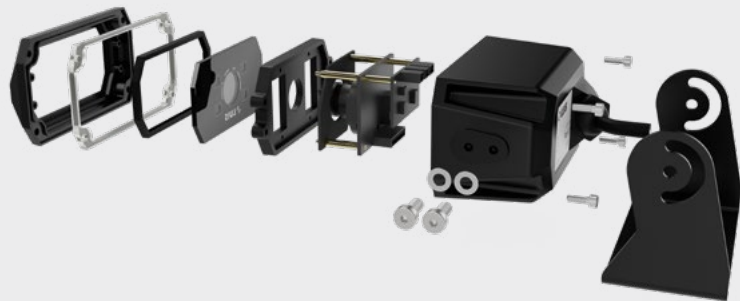


## LUIS DIGITAL CAMERAS

### FOR USE IN CHALLENGING ENVIRONMENTS

At our head office in Hamburg, we develop digital camera systems for demanding applications on commercial vehicles and mobile machines.

Our digital camera portfolio includes a wide range of different camera types. Our LVDS cameras transmit the raw data at a speed of up to several gigabits per second, allowing the uncompressed image to be processed without loss. Our Ethernet cameras are available as Fast Ethernet (100BASE-TX) and BroadR-Reach (100BASE-T1) versions. The image is low latency (<100 milliseconds), compressed (H264/ MJPEG) and processed (e.g. with white balance, gamma or color correction). All cameras are manufactured according to the automotive requirements with regard to temperature resistance, dust and waterproofness, vibration as well as vibration and shock according to corresponding ISO standards.



## LUIS ETHERNET CAMERA TX

### POWERFUL FAST ETHERNET CAMERA

- › Sensor 1/3" CMOS
- › Resolution 2 MP (1080P)
- › Viewing angle 110° horizontal (others on request)
- › Fast Ethernet 100BASE-TX
- › 100 Mb/s
- › Latency < 200 ms
- › Video out H264 and H265
- › IEEE 802.3, IP, TCP, HTTP, RTSP
- › Night vision up to 10 m
- › Temperature -30 to +70 °C
- › Water and dust proof IP69k
- › Heater (optional)
- › Microphone (optional)
- › DC 12 V / 24 V / IEEE 802.3af POE

## LUIS ETHERNET CAMERA TX ULTRA

### LOW LATENCY FAST ETHERNET CAMERA

- › Sensor 1/3" CMOS
- › Resolution 1.2 MP
- › Viewing angle 90° or 130° horizontal (others on request)
- › Fast Ethernet 100BASE-TX
- › 100 Mb/s
- › Latency < 100 ms
- › Video out MJPEG, H264
- › IEEE 802.3, IP, TCP, HTTP, RTSP
- › Night vision (optional)
- › Temperature -40 to +85 °C
- › Water and dust proof IP69k
- › Shockproof up to 100 G
- › Heater (optional)
- › DC 12 V / 24 V / IEEE 802.3af POE

## LUIS BROADR-REACH CAMERA ULTRA

### LOW LATENCY ETHERNET T1 CAMERA

- › Sensor 1/3" CMOS
- › Resolution 1.2 MP
- › Viewing angle 90° or 130° horizontal (others on request)
- › BroadR-REACH 100BASE-T1
- › 100 Mb/s
- › Latency < 100 ms
- › Video out MJPEG, H264
- › IEEE 802.3, IP, TCP, HTTP, RTSP
- › Night vision (optional)
- › Temperature -40 to +85 °C
- › Water and dustproof IP69k
- › Shockproof up to 100 G
- › Heater (optional)
- › DC 12 V / 24 V / IEEE 802.3af POE

## LUIS ETHERNET CAMERA 180°

### LOW LATENCY FAST ETHERNET CAMERA 180°

- › Sensor 1/3" CMOS
- › Resolution 1.2 MP
- › Viewing angle 180° horizontal
- › Fast Ethernet 100BASE-TX
- › 100 Mb/s
- › Latency < 100 ms
- › Video out MJPEG, H264
- › IEEE 802.3, IP, TCP, HTTP, RTSP
- › Night vision (optional)
- › Temperature -40 to +85 °C
- › Water and dustproof IP69k
- › Shockproof up to 100 G
- › Heater (optional)
- › DC 12 V / 24 V / IEEE 802.3af POE





## LUIS HD CAMERA PROFESSIONAL

ROBUST CAMERA WITH HIGH RESOLUTION

- › 1/3" CMOS sensor with 600 TV lines (CVBS) or 1,920 x 1,080 pixels (AHD)
- › 105° horizontal viewing angle
- › Automatic backlight compensation
- › Rugged die cast aluminum housing with stainless steel sunshield and stand
- › Protection class IP69k
- › Shock resistance up to 100 G
- › Vibration resistance up to 10 G
- › Night vision capability up to 15 m
- › Operating temperature -40 to +85 °C
- › Integrated heater
- › Operating voltage 9 to 32 V



## LUIS R7-S COMPACT STAINLESS STEEL CAMERA

SHUTTER COVER TO PROTECT THE LENS

- › 1/3" CMOS sensor with Full HD (1,080P) or optional 600 TV lines (PAL, NTSC)
- › Viewing angle 120° horizontal (70°, 130° optional)
- › Electronic shutter cover to protect the lens from dirt
- › Rugged die cast aluminum housing with stainless steel sunroof, -shutter and stand
- › Mirror function on camera
- › IP69k protection class
- › Shock resistance up to 100 G
- › Vibration resistance up to 10 G
- › Night vision capability up to 15 m
- › Integrated heater
- › Operating voltage 10 to 32 V



## LUIS CAMERA 170° FULL HD

FOR A PARTICULARLY LARGE FIELD OF VIEW

- › 1/3" CMOS sensor with Full HD (1,080P)
- › Viewing angle 170° horizontal
- › Fisheye correction
- › Rugged die cast aluminum housing with powder coating
- › Night vision capability up to 15 m
- › Protection class IP69k
- › Shock resistance up to 100 G
- › Vibration resistance up to 6 G
- › Operating voltage 12 V



## LUIS BALL AND SIDE VIEW CAMERA

FLEXIBLE USE AS SIDE OR REAR CAMERA

- › 1/3" CMOS sensor with Full HD (1,080P) or optional 600 TV lines (PAL)
- › 120° horizontal viewing angle
- › Automatic backlight compensation
- › Rugged die cast aluminum housing
- › IP69k protection class
- › Night vision capability up to 15 m
- › Operating temperature -30 to +70 °C
- › Integrated heater
- › Operating voltage 12 V (optionally 24 V)
- › Angle flexibly adjustable
- › NTSC and front version available

## LUIS TOUCH MONITORS

HIGH FUNCTIONALITY AND BEST PICTURE

The new LUIS 7" und 10" touch monitors combine maximum functionality with a slim and robust design. The development is based on the knowledge and experience of the last 20 years, with the claim to develop the leading monitor in the market.

Particularly noteworthy are the very high resolution and brightness. In addition the monitor automatically detects which camera signal is connected and allows signal is connected and enables the simultaneous display of AHD and classic analog cameras (CVBS). In the menu, a multitude of (split) views as well as the triggering can be individually set and stored in specific driver profiles.

Four freely programmable buttons and four I/O outputs can be used to integrate additional functions into the monitor.

- › LUIS 7- or 10-inch display with touchscreen
- › Optional: (Quad)-split screen
- › Resolution 1,280 x 768 pixels (7-inch) and 1,280 x 720 pixels (10-inch)
- › Brightness 500 cd/m2
- › Operating voltage 9 to 32 V
- › Controllable LED warning stripes (red/green)
- › Automatic switching PAL/NTSC and AHD/CVBS
- › 4 video inputs with audio function
- › Built-in loudspeaker
- › 4 freely programmable keys
- › 5 I/O inputs and 4 I/O outputs freely customizable



## LUIS MONITOR PROFESSIONAL

HIGH FUNCTIONALITY AND BEST PICTURE

- › 7-inch TFT display
- › Optional: quad-split screen
- › High resolution of 1,024 x 600 pixels
- › High brightness of 500 cd/m2
- › Auto dim
- › Integrated loudspeaker
- › 3 video inputs
- › Operating voltage 9 to 32 V
- › 4 I/O inputs
- › Tested according to UNECE-R118
- › Housing flame retardant according to FMVSS 302



## LUIS MONITOR PROFESSIONAL WATERPROOF

FOR MOUNTING ON OPEN CABINS

- › Waterproof variant of the LUIS Monitor Professional
- › Protection class IP68
- › Eligible for funding by BG Bau, among others







## LUIS ADAPTER

### CONNECT LUIS CAMERA TO EXISTING DISPLAYS

With the appropriate adapter, LUIS cameras can be easily integrated into an existing OEM on-board display or navigation device.

LUIS has the right adapter solution for all current vehicle models - including adapter solution for all common vehicle models - even for shutter cameras.

Also for the use of competitor cameras, monitors or cable systems LUIS carries the appropriate adapters, so that existing infrastructures can be used and a changeover to LUIS can be made smoothly.

If, however, an adapter is not available in the standard range, our technicians are usually in a position to offer a solution. Please do not hesitate to contact us. We are happy to help.

#### OEM-ON-BOARD SYSTEMS

- › Mercedes Actros, Antos, Arocs, Artego, Axar Navi (J9J) or Sprinter Audio (FR7)
- › MAN MMT
- › IVECO Iveconnect
- › SCANIA RADIO PREMIUM
- › VOLVO SID Display (FH 4 / FM 4)
- › DAF Truck Navigation
- › VW Crafter
- › FIAT Ducato
- › John Deere
- › Fendt
- › Case / New Holland
- › Trimble
- › Opel Movano/Renault Master
- › MB Sprinter MBUX

## LUIS TRAILER CABLE SET

### TRAILER CONNECTION

- › ABS socket and spiral cable set for connection of a rear view camera (also shutter cameras)
- › 7-pin connectors
- › Non-interchangeable due to special coding
- › Very stable spiral cable with ABS connectors, IP69K, ADR tested
- › Trailer detection for switching to the rear camera (optional)



## LUIS DIGITAL TRANSMITTER SET

### HIGH RELIABILITY AND LOW LATENCY

- › Wireless connection of camera and monitor
- › Stable and low-interference digital radio
- › End-to-end encrypted
- › Simple pairing
- › Waterproof housing (IP65)
- › I/O for drive mode-dependent control
- › Low latency (< 200 ms)
- › Operating voltage 9 to 32 V



## LUIS WIFI TRANSMITTER PROFESSIONAL

### VIDEO TRANSMISSION TO ANDROID AND IOS DEVICES

- › Transfer of the camera image to smartphone, tablet or navigation device with WiFi function (Android and iOS)
- › End-to-end encrypted
- › Rugged, waterproof and dustproof case (IP69k)
- › I/O for automatic activation of the app (Android only)
- › Low transmission latency (< 200 ms)
- › Operating voltage 9 to 32 V



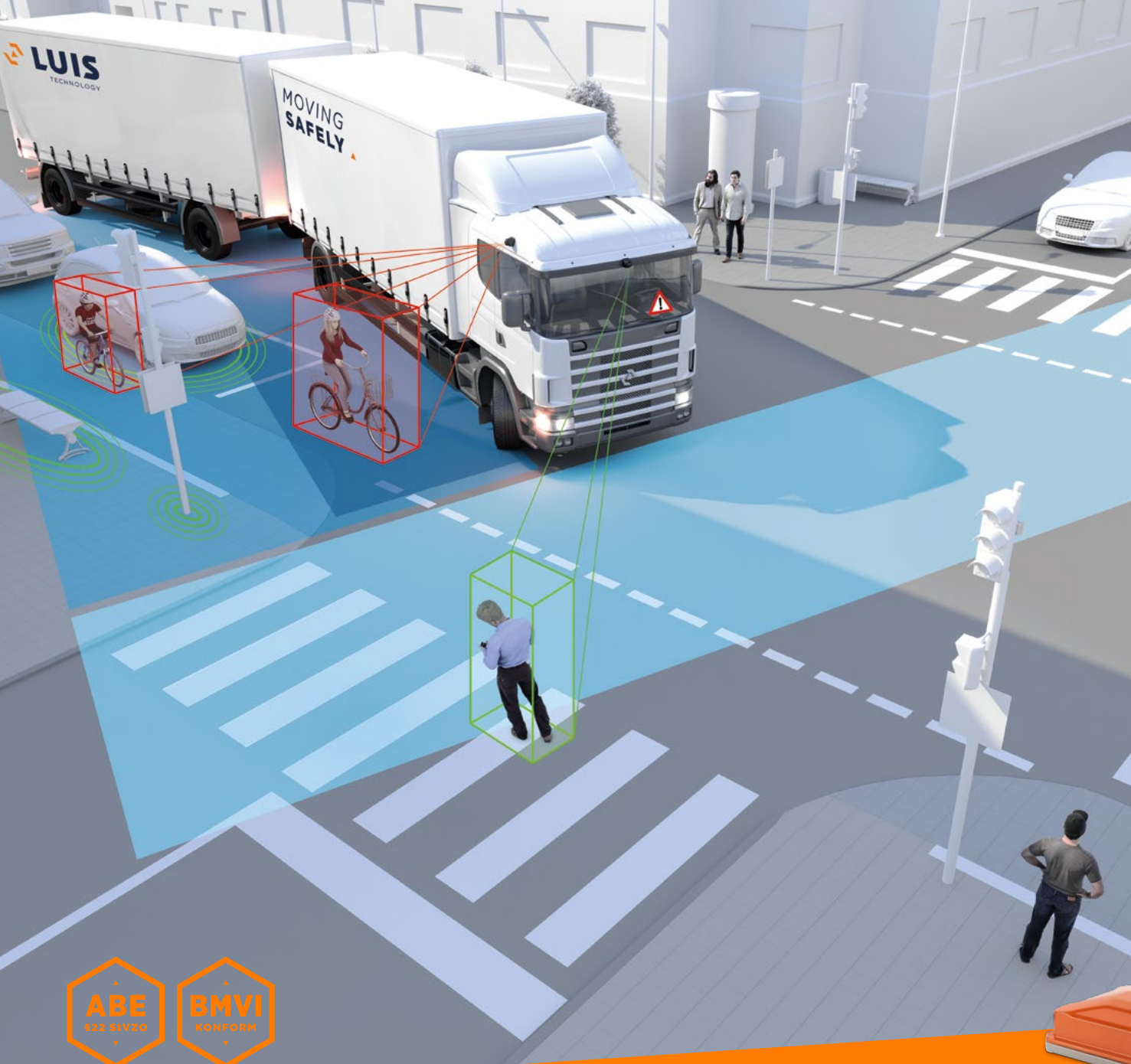
## LUIS AVAS & REVERSE WARNING DEVICES

### AUDIBLE WARNING DEVICES

Specially designed for electric vehicles, the LUIS AVAS meets the requirements set forth from the EU. The AVAS module receives its control data directly from the CAN bus of the vehicle. The specification of the sound can be designed with you. Furthermore, the sound module is self-adjusting and adapts to the ambient volume.







# LUIS TURN DETECT®

## TURN ASSISTANT

### BENEFITS

- › Clear identification of static objects to minimize the number of false alarms
- › Clear identification of cyclists even if concealed behind other objects such as parking cars
- › Also suitable for transporter vans and when coupling/decoupling trailers
- › Full functionality even in the dark
- › Swift installation
- › Vehicle type approval has been obtained; the system is eligible for grants
- › Optional extension with a front camera to identify crossing pedestrians and help prevent accidents

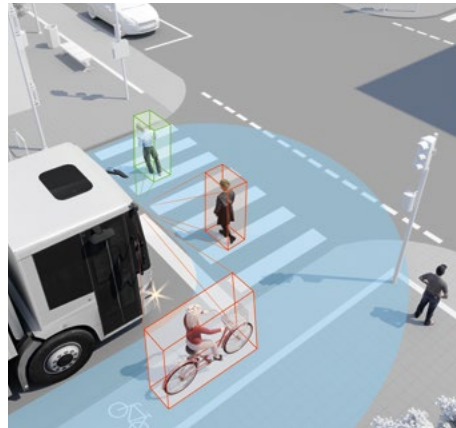
### FUNCTIONALITY

- › Camera- and software-based turn assistant
- › Wide angle camera captures a wide viewing angle to the side and rear of the vehicle
- › Algorithm-based image analysis in real time
- › Activated based on speed, use of direction indicators or turning angle of the steering wheel (optionally)
- › Further I/O trigger outputs, e.g. for activation of side marker lights

### AVAILABLE OPTIONS AND ACCESSORIES

- › A choice of 7, 8 or 10 inch monitor
- › Steering angle sensor
- › Mounting bracket for camera
- › Optional extension with a rear view camera
- › Display of lateral camera image when reversing
- › LED warning light (in the planning stage)
- › Optional extension with a front camera to monitor front field of vision VI
- › Optionally available for vehicles with right-side steering (detection to the vehicle's left)





## LUIS TURN DETECT® DUO AND 270°

### EXTENSION OF THE TURN ASSIST WITH A MOVING-OFF ASSIST

The LUIS TURN DETECT® can be extended by a FRONT DETECT to prevent accidents with persons when starting from standstill. Particularly with high vehicle cabs, a blind spot is created directly in front of the vehicle (field of vision VI), which can become a hazard when moving-off. Here, too, the driver is warned in two stages: a visual warning frame in the monitor signals persons in the hazardous area when the vehicle is stationary. When the vehicle starts, an additional acoustic warning sounds appears. LUIS offers this as an extension of its turn assist system. A second camera for the front and an ECU that evaluates both detection fields must be upgraded. This system is called LUIS TURN DETECT® DUO.

Alternatively, we are developing a LUIS TURN DETECT® 270°. In this case, only a single camera is used to actively evaluate both danger areas next to and in front of the vehicle, covering both mirror classes V and VI. The system combines turn and moving-off assist in one and also eliminates the blind spot created by the A-pillar thanks to the seamless 270° field of view. This system is currently under development and can be finalized to your specific situation on request. developed on request.

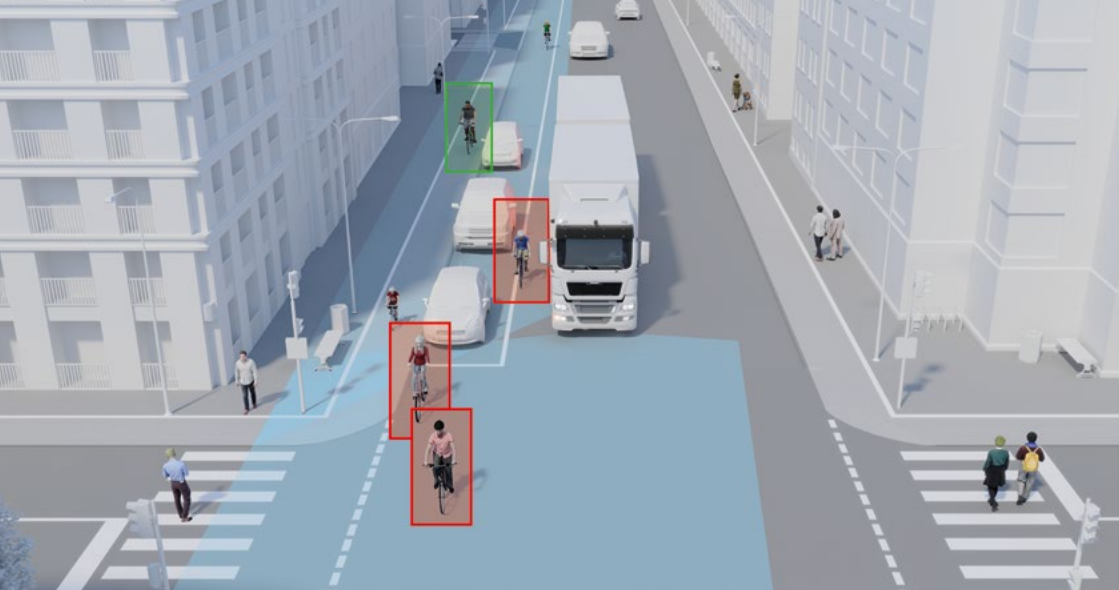
## LUIS TURN DETECT® LONDON DVS

### SYSTEM FOR THE ENTRY TO LONDON

The London Direct Vision Standard (DVS) requires trucks over 12 tons to have a permit to enter Greater London from October 2020. The legislation is based on a »star rating« that indicates how much a driver can see directly from the cab. The vehicle manufacturer provides a star rating for your vehicle for this purpose. If your vehicle has a 0 star rating, you must install additional devices for indirect vision.

For this purpose, the LUIS TURN DETECT® can be extended with a few additional devices for entry into London. You will then not only fulfill the increasing requirement of a turn assistant, but also upgrade your vehicle for London entry.

With the extension of the LUIS TURN DETECT® a system is installed, which fulfills the DVS requirements for a camera monitor system, sensor technology, acoustic warning of road users and warning stickers. The system is suitable for both left- and right-hand drive vehicle types.



## LUIS TURN DETECT® 4.0

ECE R151 BSIS AND ECE R159 MOIS

With the further development of the LUIS TURN DETECT® turn-off assistant (BSIS: Blind Spot Information System), it will also comply with UN ECE R151 requirements and can be extended to include a moving-off assistant (MOIS: Moving-Off Information System) in accordance with UN ECE R159. The LUIS TURN DETECT® 4.0 is designed for small commercial vehicles, so-called LCVs (class N1), as well as medium and heavy trucks (class N2 and N3) and for buses (class M2 and M3). It has been designed in such a modular way that it can also be fitted to special mounting positions.

The system consists of two high-resolution radar sensors that can distinguish cyclists and pedestrians from other objects up to a distance of 40 meters behind and 20 meters in front of the vehicle. As usual, the warning is two-stage: visual and audible. The LUIS TURN DETECT® 4.0 is controlled via a CAN interface or via vehicle signals (I/O) and can be updated. Optionally, a side camera and monitor with overlay of the radar signals can be added. For UN ECE R159 compliance, an additional front radar can be added.

All components meet automotive requirements for temperature, shock and vibration.



## LUIS VIRTUAL MIRROR

DIGITAL MIRROR REPLACEMENT IN A NEW DIMENSION

The LUIS Virtual Mirror is a digital mirror replacement system, in which mirrors are replaced by high-resolution digital cameras and monitors. Thanks to an enlarged field of vision and the use of high sensitive sensors which provide a significantly better visibility in the dark and against the light, safety is increased compared to conventional mirrors. Thanks to the compact design and the respective positioning on the cab, damage can be reduced and aerodynamic improved.

The viewing areas are displayed in combination on just one monitor per side in the cab. The environment can thus be grasped more quickly and hazardous situations better assessed. By superimposing overlays or using a digital zoom or changing the image section depending on the maneuver, the machine can be handled more efficiently.

The virtual mirrors are available in long and short arm versions for cabs with/without overhang. We also offer individual designs and adaptation to the respective machine in small series.

The system is currently under development. Functional samples on request.





## MOBILE DATA RECORDING

### DATA PRIVACY COMPLIANT AND COST-EFFICIENT

For mobile data recording, LUIS offers everything from hardware to the appropriate software, mounting, data management and cloud services. LUIS offers the right solution for each individual case. Data protection compliance can be met, thanks to the option of face pixelation, password management and event-related recording.

#### ADVANTAGES

- › Preservation of evidence in the event of damage
- › Proof of services rendered services provided
- › Averting fraudulent claims for damages
- › Promotion of careful driving
- › Deterrence of theft
- › Locating and live-connecting to the vehicle from headquarters
- › Effective management of the vehicle fleet

#### SPECIFICATION

- › Recording of up to 8 cameras and vehicle data simultaneously
- › 4G module for real-time recording, live transmission and remote maintenance
- › Integrated modules: GPS, WiFi, G-Sensor and Motion Detection.
- › Hard disk storage with parallel recording on SD card as backup copy
- › Data cannot be tampered with for reliable evidence

#### LUIS CLOUD PLATFORM

**LUIS offers its own cloud platform solution.**

- › No investment in server hardware
- › Fast and flexible integration of fleets
- › Worldwide access to your data
- › Remote maintenance without vehicle downtime
- › Low IT administration effort
- › Concentration on core business



## LUIS BACKUP BATTERY

- › Backup for the case that the data recorder is from the vehicle battery disconnected or switched off
- › Compact and lightweight design
- › Protected against overvoltage, short circuit and reverse polarity



## LUIS FIREPROOF DATA BOX

- › Fire and waterproof housing according to the requirements of aircraft black boxes (protection e.g. 30 min at 950 °C)
- › MLC memory technology with support for up to 5,000 recovering Cycles
- › Memory capacity of 32 GB / 64 GB / 128 GB (optional)



## STATUS DISPLAY WITH »PANIC-BUTTON«

- › Enables a simple overview for the driver about the status of the MDR and its accessories
- › »Panic button« for manual triggering of the event recording in case of emergency
- › 10 status LED indicators
- › and its accessories



## LUIS PASSENGER COUNTER

- › Professional passenger counter based on 3D image technology
- › Very high reliability of average > 97 %
- › Can distinguish between boarding and alighting of passengers



## LUIS IP-DASHCAM

- › IP 1080P camera for the Windshield
- › Powerful and sensitive sensor with high resolution (1,920 x 1,080 pixels) and WDR function
- › Anti-vibration mechanism for low shake video images



## LUIS IP DOME CAMERA

- › Indoor IP camera with 720P resolution
- › Rugged housing for protection against vandalism
- › Optional: Face recognition and database matching (also live via 4G)



## LUIS DRIVER STATUS-MONITORING

- › Detection of whether driver is on the phone, tired, smoking or not sitting in the right position
- › Output of warning tone and optional storage on data recorder
- › IP camera compatible with LUIS Data recorder





## LUIS SMART TRACK

### GPS TRACKING SOLUTIONS

The LUIS SMART-TRACK system enables tracking and viewing of vehicle data remotely. In addition to a simple and cost-effective solution for the localization of vehicles and other »assets« such as construction equipment and machinery (»LUIS SMART TRACK BASIC«), we also offer a powerful solution that can process a wide range of sensor data, is IoT-capable and also offers a digital tachograph (»LUIS SMART TRACK PRO«). Inputs/outputs offer versatile -use scenarios for vehicle fleets of all types.

#### LUIS FLEET PORTAL

Central portal for controlling and monitoring of your vehicle fleet

##### » TRACKING

With the real-time view of your vehicle locations and vehicle data you can view the status of your fleet at any fleet at any time

##### » MAP VIEW

Find your vehicle fleet quickly and easily on the map view and plan further orders in the plan other jobs in the vicinity nearby.

##### » GEOFENCING

Customizable points of interest allow you to stay informed whenever a vehicle enters or leaves a specific location.

##### » REPORTING

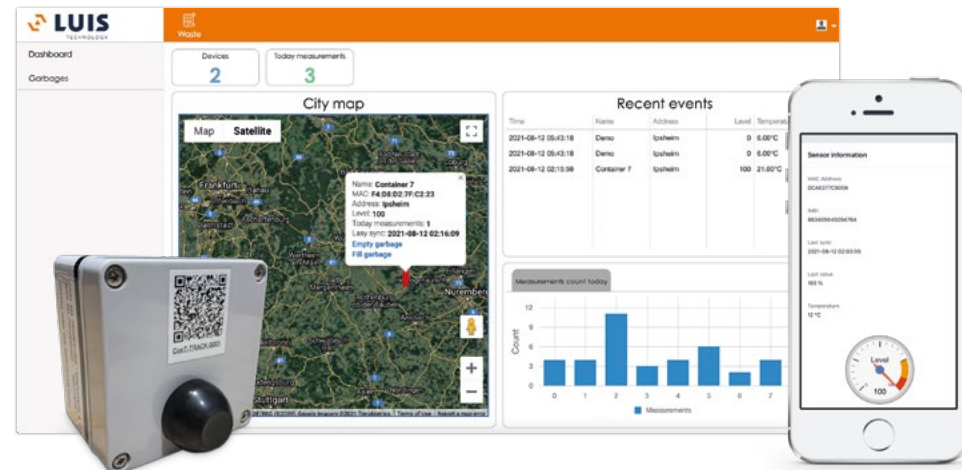
From a simple daily report, to a logbook, to the reporting of freely definable exception messages, you can carry out and export various reportings.

##### » INTEGRATION OF OTHER HARDWARE POSSIBLE

In addition to LUIS GPS trackers, the LUIS Fleet Portal already supports an extensive list of other hardware products such as temperature sensors, beacons and many more.

##### » OPEN INTERFACES

The connection of existing applications is supported by open interfaces or APIs.



## LUIS CONT-TRACK

### SMART CONTAINER MONITORING

The LUIS Cont-TRACK is a fully autonomous wireless sensor, which enables easy asset management such as containers. Due to the GPS-location, it is possible to track where the asset is located. Via a web application the current location and filling status of the container can be tracked at any time.

#### ADVANTAGES

- » Simple standalone device with GPS localization
- » Daily GPS localization
- » Temperature monitoring
- » Integrated button for reporting the container status (full/empty)
- » Planning and management of UVV inspection with reminder function by mail
- » Connection to your ERP system possible

#### QUALITY FEATURES

- » Wireless communication via the NB mobile network
- » Integrated 4FF nano SIM card
- » Built-in Li-SOCI2 battery
- » Battery life 5-8 years
- » Operating temperature -20 °C to +75 °C
- » Storage temperature -40 °C to +85 °C
- » Rugged housing with protection class IP65



## LUIS SMART COOL

### TRANSPORT IN COMPLIANCE WITH THE LAW

Climate-controlled transports and animal transports can be managed effectively and efficiently with a system that uses digital sensors for a simple printout of the data in the vehicle and a convenient transfer to your Fleet Portal or the LUIS Fleet Portal.

The LUIS COOL data logger includes a display and a telematics box with interfaces to multiple sensors.

#### ADVANTAGES

- › Connection of LUIS digital temperature, CO<sub>2</sub> and humidity sensors humidity sensors
- › Export of sensor data via USB
- › Live view of sensor data in the display
- › Alarm management in case of exceeding/falling below threshold values
- › Local storage of sensor data and transfer of data to backend
- › Viewing and tracking of sensor data also possible in web application



## LUIS SMART LOAD

### DETERMINE FREE LOADING SPACE WITH KI

LUIS SMART LOAD – a digital solution for determining the loading condition to improve utilization, increase profitability and reduce CO<sub>2</sub> emissions. With the combination of state-of-the-art camera technology, telematics and artificial intelligence, LUIS has succeeded in simply determining the free loading space in near real time and at low cost. Often this issue is interesting for trailers, vehicle bodies, partly for containers or stationary loading areas. In the field of mobile applications, the utilization of the fleet can be further improved, and route planning optimized.

#### QUALITY FEATURES

- › LUIS digital camera with 150° angle and 1080P resolution and intelligent IR function
- › Integrated 4G module and GPS
- › IP69K protection class for the camera
- › Temperature range -40 °C to +80 °C
- › API for customer integration available
- › Expandable with modules for detection of persons, evaluation of the free area according to pallet positions and much more





## LUIS EDGE AI CAM

### RUGGED CAMERA FOR THE DETECTION OF PERSONS

The LUIS EDGE AI CAM is an intelligent camera that can differentiate people from another obstacle in real time and can warn the driver in a multi-level manner in case of danger. It warns the driver only of collisions with persons or other trained object classes, without unnecessarily alerting the driver to other objects and avoid an associated loss of vigilance. In this way the LUIS EDGE AI CAM helps to effectively avoid collisions with people especially in tight driving situations.

The LUIS EDGE AI CAM has been designed to hold against harsh conditions and environmental influences. The object detection runs on the camera («embedded») without additional hardware and ECUs.

The detection zones and the warning mechanisms can be individually adapted to the respective vehicle and signals can be emitted to the outside.

For even more precise person recognition and localization we are further developing the LUIS EDGE AI CAM and adding a depth sensor (Sensor Fusion).



# EMBEDDED AUTOMOTIVE AI PLATFORM

DEEP LEARNING SOLUTIONS THAT FIT YOUR REQUIREMENTS



## RECOGNIZING OBJECTS AND PEOPLE

Classification of objects in real time, e.g. of persons. We use our high-performance networks based on many millions of annotated data.



## PREDICT DIRECTION OF MOVEMENT

Predicting the movement of people and objects e.g. to predict when they will enter a predefined zone to issue warnings as early as possible or warnings to calculate the time to collision.



## CALCULATE DISTANCES (2D AND 3D)

Calculation of distances between objects using the known camera position. For precise positioning, 3D data can also be assessed and the exact position of an objects can be determined.



## 3D OBJECT DETECTION AND POSITIONING

We use 3D ToF (Time of Flight) cameras, to detect objects and to precisely estimate the position. The positioning accuracy is so high that objects can then, for example, be gripped. Coordinates passed on to the gripping system, for example.



## MARK DWELL TIME

The length of stay-algorithm marks objects, e.g. with a different color of the bounding-box as soon as they exceed a certain dwell time.



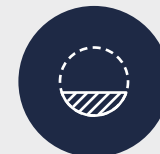
## LISTENING TO ANOMALIES

The detection of anomalies is based on an acoustic basis. Via a MEMS and our acoustic AI application deviations from normal operation can be detected at an early stage and further processed.



## DEFINE ZONES

Marking of objects entering a defined area (e.g. dangerous areas around a vehicle or the working area of a machine).



## SEGMENT OBJECTS

Pixel-precise detection and marking of defects, irregularities and objects or measuring the fill level.



## LUIS EMBEDDED VISION AND ARTIFICIAL INTELLIGENCE (AI)

Our embedded vision and AI solutions can be used not only for recognition of persons, a wide variety of other applications in different industries, also using 3D algorithms and sensor fusion can be solved.

In the field of logistics, for example, these are the measurement of the available loading space, label recognition or identification of containers and goods. For agricultural machinery the fill level can be monitored, rows of plants can be recognized for targeted fertilization and the quality of the harvest can be assessed in real time. On construction machinery our smart cameras and embedded AI solutions help to achieve (partially) automated milling and paving as well as digging and drilling. On municipal vehicles, for example, in addition to monitoring the loading and working area, garbage cans can be detected, conditions can be monitored and, for example, the suction power can be automatically increased for heavy objects.

For this purpose, we use real-time image processing, pattern recognition, object recognition as well as fusion of various environmental data from mono and ToF cameras and provide customer-specific data for (partially) autonomous machine control or insertion of overlays to support the machine operator. overlays to support the machine operator.







## OEM CUSTOMIZATION AND ODM DEVELOPMENT

INDIVIDUAL SOLUTIONS ALSO IN SMALL SERIES

### OEM CUSTOMIZATION

LUIS also offers OEM customization for specific requirements – even in small series.

### ODM DEVELOPMENT

LUIS also offers customized ODM development according to your specifications. The possibilities of an ODM development range from the modification of the camera or monitor housing, software programming (e.g. for monitor, app, client software) up to the complete redesign of a camera/monitor system according to your ideas.

The ODM development is based on your specifications.

### YOUR OPPORTUNITIES

- › Additional features of the camera like heating, microphone or voltage transformer
- › Alternative lens with specific aperture angle
- › Change of the image reflection (front insert) or the TV system (NTSC/PAL)
- › Modification of the connector plugs or open cable ends
- › Individual cable length
- › Customized auxiliary lines (design and vehicle-specific measurement)
- › Individual customer logo or customer-specific start screen
- › Individual housing color of the camera
- › Customized outer packaging and/or instruction manual
- › Custom software and AI networks

## INSTALLATION & SERVICE

WE INSTALL AT YOUR SITE

Systems and installations all in one hand – this is how we inspire our customers every day. Our service technicians are on the road all over Europe to carry out installations, test installations, training courses and consultations on your site. In order to respond in the best possible way to the most varied and vehicles in the best possible way, each installation is individually coordinated with you in advance. No matter whether special or refuse collection vehicles or construction machinery – we find the best possible solution. We take time for you, your ideas and your challenges. With us you speak personally with experts in the fields of commercial vehicles, hardware – especially electronics, optics and mechanics – software and artificial intelligence.

In addition, we maintain a broad service partner network. On our website you will find a competent service partner near your location.

### PLEASE REFER TO

- › [www.luis.de/montage/](http://www.luis.de/montage/)
- › [www.luis.de/servicepartner/](http://www.luis.de/servicepartner/)



**MOVING  
SAFELY ▲**



**WE ARE HAPPY TO HELP!**  
YOUR CONTACT

**LUIS Technology GmbH**

Hammer Deich 70  
20537 Hamburg

T + 49. 40. 897 27 84-0  
service@luis.de

