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BERNARD Mobility Analyser

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Engineers you can trust

Intelligent Mobility Solutions

Cities and road networks are becoming increasingly complex. Intersections grow busier, streets and parking areas handle more vehicles, and the need to protect pedestrians, cyclists, and micromobility users has never been higher. At BERNARD Gruppe, we provide robust and reliable solutions that help cities and operators manage this complexity with confidence.

Our portfolio of products including the BERNARD Mobility Analyser (BMA) delivers continuous, accurate detection and classification of all traffic participants. From traffic volume counts to dynamic signal control and parking monitoring, our systems generate actionable data that supports efficient transport planning, optimised traffic flow, and improved safety.

Designed for permanent and temporary deployment, our solutions operate day and night with the highest classification accuracy, withstand harshest outdoor conditions (IP65), show low power consumption and provide secure, privacy-by-design data connectivity to an attractive cost-efficient value. Thanks to its installation simplicity, our products are easy to handle and a true plug and play solution. With intuitive dashboards and a centralised control system, operators can monitor, configure, and analyse traffic and parking in real time. This allows them to turn insights into immediate, effective action.

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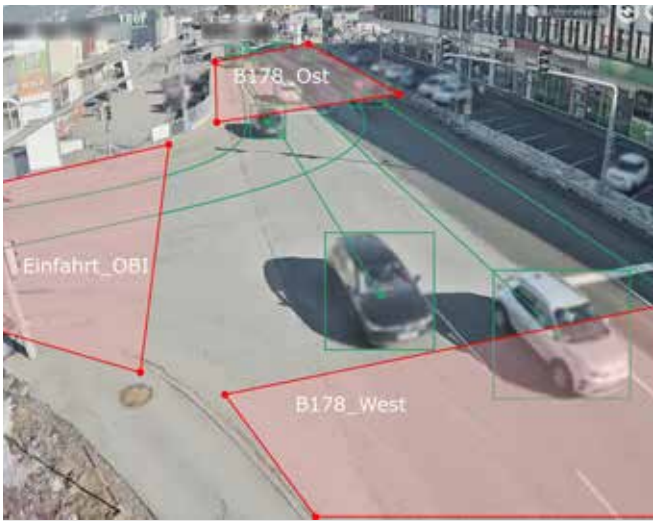
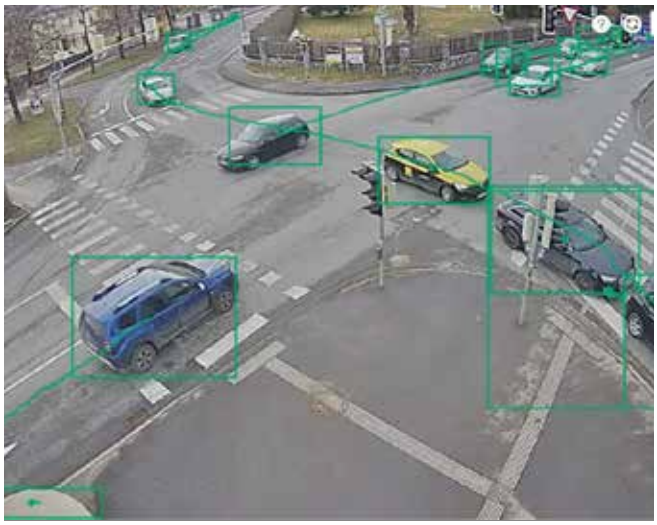
Traffic Monitoring





With BERNARD Gruppe products, traffic volumes are monitored exactly where it matters most: along road corridors, at intersections, or across entire areas. Our intelligent sensor technology delivers highly precise raw data, while advanced analytics transform it into meaningful time series, performance indicators, and actionable insights for planning, operational management, and performance evaluation. Thanks to its state-of-the-art accuracy rate from minimum x > 95 % counting and classification (x > 95 % main classes and x > 90 % sub-classes) planning and operations can be managed to an utmost level of precision. Use cases are:

Traffic volume counts: Captures and classifies different vehicle types – such as passenger cars, trucks, buses, cyclists, and pedestrians – that pass a pre-defined road section (counting point) within a specified time period.

Intersection traffic counts: Collects directional traffic flow data and turning movements which enables reliable turning movement analyses, identification of peak loads, signal timing optimisation as well as before-and-after impact assessments.

Traffic flow survey: Captures traffic flows and travel times, while using number plate recognition at multiple detection points. This enables origin-destination (O/D) analyses, identification of transit traffic and travel times, segmentation by vehicle class as well as differentiation by country or region of origin. Data protection is ensured through edge processing and anonymisation via hashing. Resulting insights support area-wide traffic analyses, strategic action planning, and targeted traffic optimisation measures

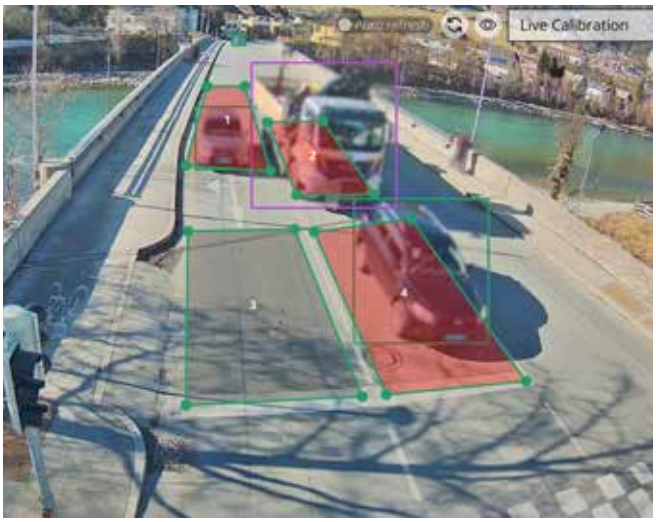
Products

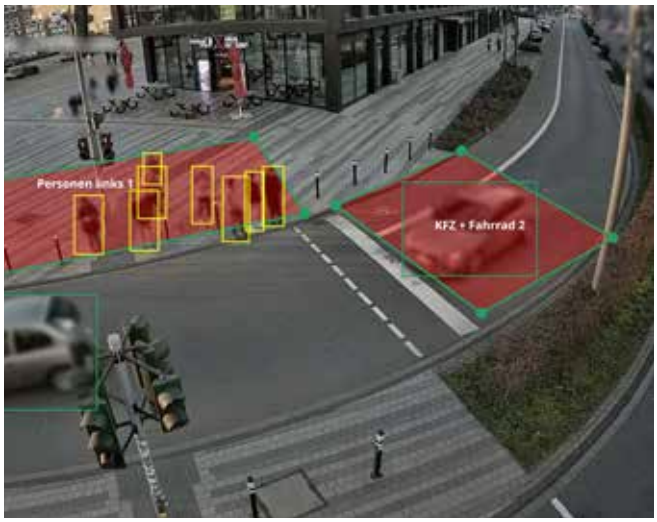
- BMA
- Mobile BMA
- BCA

Services

- Traffic surveys carried out by our team of measurement technology experts throughout Germany and Austria.
- Project-related customised solutions

Traffic Control





Adaptive traffic light systems reduce congestion and enable targeted prioritisation in real time. The BMA TLC detects traffic, while the BMC transmits switching pulses to the control unit via potential free contacts. This reduces waiting times, prevents tailbacks, and allows specific traffic classes such as cyclists, pedestrians, or public transport to be prioritised efficiently, all without civil engineering work and as a replacement for multiple induction loops. The solution scales from single intersections to entire networks and can be configured and monitored centrally for maximum flexibility.

Products

- BMA TLC
- BMC

Services

- Support in all design phases
- Traffic engineering and transport planning

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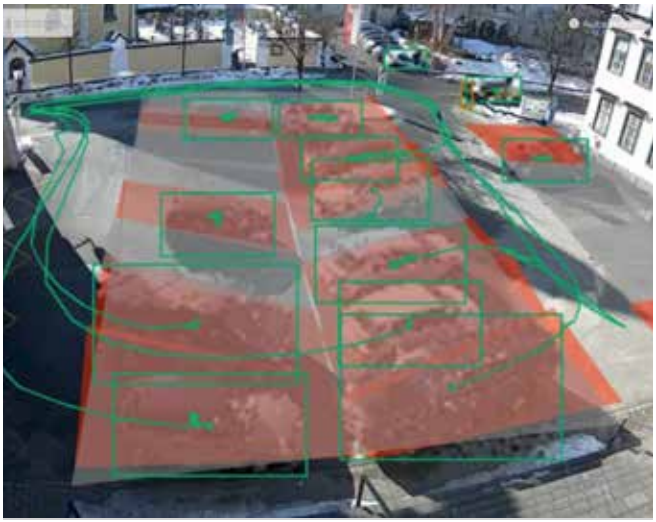
Parking Space Analysis



For parking garages, barrier systems or open areas, two approaches are available: tracking via vehicle entries and exits or individual parking space detection, both with an detection accuracy rate of > 99 % under optimal conditions. Entry and exit tracking records arrivals and departures to provide real time occupancy data with minimal hardware and high scalability. Individual space detection displays the status of each parking spot, free or occupied, and enables monitoring of special zones such as loading bays without the need for reconciled entry and exit calibration. ANPR can be integrated to support access control, authorisation checks and parking duration workflows, either as plain text data or with privacy focused pseudonymisation, depending on requirements.

- Detection accuracy > 99 %
- Offers two techniques: entries / exits tracking or individual parking space detection
- Provides real-time data for operation, parking guidance systems and reporting

Products

- BMA
- BCA
- B101/B401

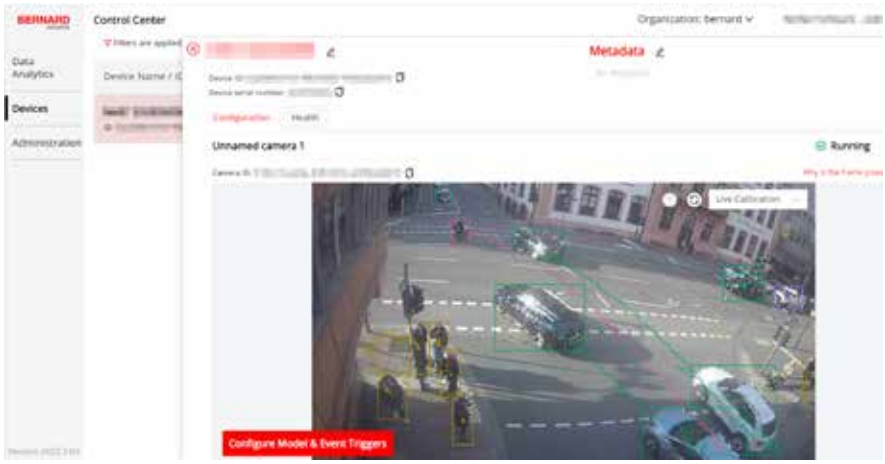
Services

- Design, tendering and implementation of parking guidance systems
- BCA
- B101/B401

Data Connection and Visualization

Control Center

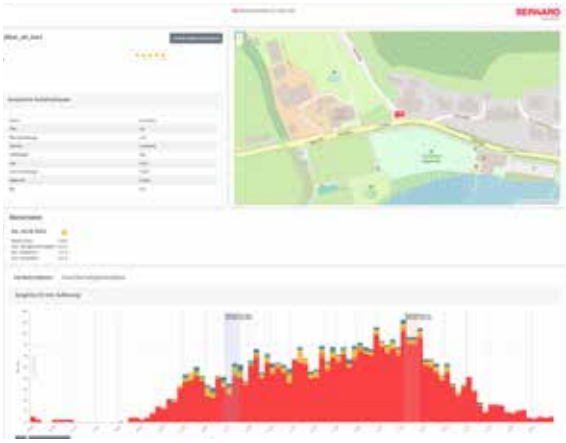
The hardware is configured in a easy to handle web-based control center.
Settings can be quickly and flexibly adapted to the respective situation.



- Device management
- Configuration interface
- Live function check
- Real time alerts

Dashboard

The data as well as individual evaluations are displayed in a dashboard.



- Live data display
- Historical data as bar chart (modal split, daily traffic profile, weather data, intersection flow diagram, etc.)
- Client-specific configuration
- Download Survey Data

Data Interface

Data can be connected to individual client systems via a defined interface.
In addition, data can be transmitted to traffic computers and control centers.

BERNARD Mobility Analyser - BMA

The BERNARD Mobility Analyser (BMA) continuously records moving and stationary traffic and delivers reliable, anonymised real-time data for safer, more efficient, and sustainable mobility. Its robust sensor system automatically detects and classifies amongst other pedestrians, cyclists, micromobility users, and light and heavy motorised traffic. Applications range from traffic counts and turning-movement analyses to parking monitoring, providing a solid basis for transport planning and parking management. With day / night operation, IP65 protection, LTE connectivity, and privacy-by-design, the BMA is built for permanent use in street and parking environments.

- 12+1 traffic classes and high counting accuracy
- Day/night-capable (IR) and robust for outdoor use (IP65)
- LTE data connection for centralised fleet management via the Control Center
- Data evaluation in the Data Center; integration via the Data Center API or MQTT/JSON

BMA - TLC

The BERNARD Mobility Analyser Traffic Light Controller (BMA TLC) enables adaptive traffic signal control by detecting traffic in real time and transmitting switching pulses via the BMC directly to the controller. Instead of fixed programs, intersections respond dynamically to actual traffic conditions. The system detects and classifies road users and triggers event-based signals, reducing congestion and waiting times while improving prioritisation, for example for cyclists and pedestrians. In combination with the BMC it provides a practical alternative to loops and additional detector technology.

- Real-time detection/classification of 12+1 classes with flexible control system day/night-capable (IR) and robust for outdoor use (IP65)
- Connection to the control unit via BMC (potential-free contacts)
- Robust continuous operation (day / night, IP65)
- Freely selectable fault contacts for signalling malfunctions
- Data connection via LTE enables convenient central fleet management via the Control Center
- Autonomous operation even in the event of LTE interference

BERNARD Mobility Controller - BMC

The BERNARD Mobility Controller (BMC) is the safe interface between the BERNARD Mobility Analyser Traffic Light Controller (BMA TLC) and the control unit of the traffic light system including power supply and galvanically isolated signal outputs. The BMC connects up to 4 BMA TLCs with the control unit of a traffic light system and converts vehicle actuated requirements, measurements or prioritisations as potential free signals. Thanks to galvanic isolation and DIN rail mounting, the controller can be easily integrated into existing systems for reliable, maintenance friendly

- Up to 4 BMA TLCs can be connected; supply of the connected devices directly via the BMC
- 12 potential free contacts
- Fault contact freely selectable
- Ideal for adaptive traffic light control systems without complex detector infrastructure

Mobile System

The mobile BERNARD Mobility Analyser (BMA) enables temporary traffic surveys with counting periods over several days - mobile, autonomous and safe. The proven detection quality of the BMA is combined with a self sufficient setup (telescopic mast, tensioning straps, rechargeable battery). It is suitable for day and night, communicates via LTE and provides counting and classification data for traffic volume counts and intersection turning movement counts.

- Mobile and flexible in use, easy to install
- Cost efficient 24/7 data collection and analyses via data center
- Counting periods of up to one week – rechargeable battery with high capacity and standby mode for maximum runtime
- 12+1 traffic classes and high countingaccuracy
- Day / night-capable (IR) and robust for outdoor use (IP65)

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B101/B401

B101 and B401 turn existing RTSP cameras into smart sensors: Edge processing for parking, ANPR and adaptive applications. If camera infrastructure is already available, B101/B401 provide the intelligence. The embedded devices process RTSP/H.264 streams and deliver structured events via MQTT/JSON optionally integrated into the Data Center and its API. Depending on the system level, the number of parallel processed streams scales from compact setups to multi camera solutions for large scale parking space analyses.

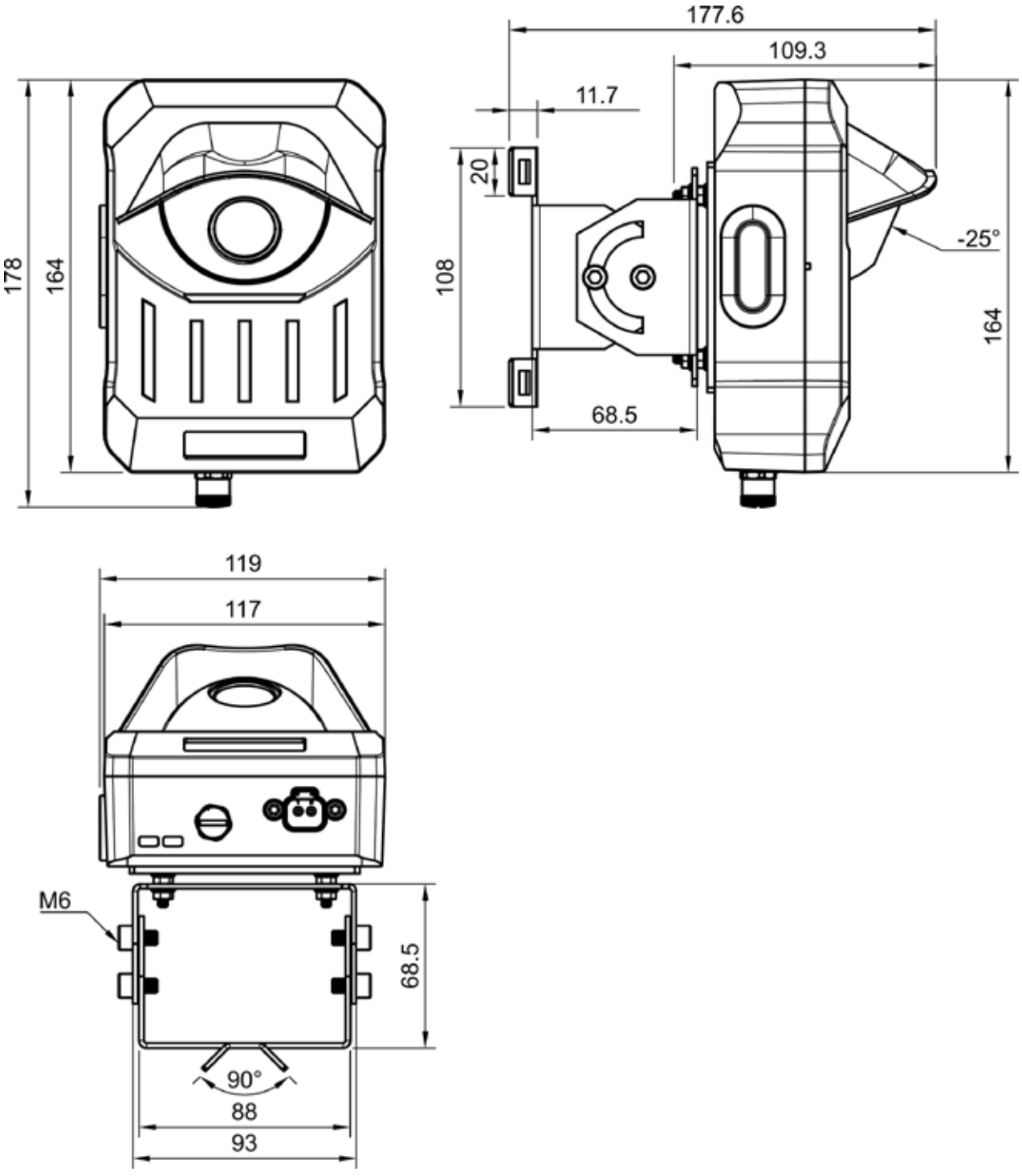
- Processing of RTSP/H.264 video streams (up to 1080 p @ 30 FPS) and output as MQTT/JSONI
- Parallel processing of camera streams (B101: 1 stream or up to 4 for individual parking spaces; B401: 4 streams or up to 12 for individual parking spaces)
- Network integration via Gigabit Ethernet; flexible power setup (12-48 V DC)
- Ideal for integration into existing systems

BERNARD Character Analyser - BCA

The BERNARD Character Analyser (BCA) enables automatic license plate recognition, data-protection oriented traffic flow surveys or parking space analysis. With the BCA, you can reliably record EU license plates day and night for traffic flow analyses with hashing procedures (maximum data protection) or for parking space monitoring with clear license plates, e.g. for verification/enforcement or access control at barrier systems.

- Automatic license plate recognition (EU formats), day / night with IR
- Function modes for parking (ANPR-based) and data-protection-oriented analyses (GDPR/hashing)
- LTE connection and standardised data formats (MQTT/JSON)
- Robust design for outdoor use (IP65)

Dimensions



Dimensions in mm

Specification

Data transfer		
Data streaming protocol	MQTT	
Data encoding	JSON	
Data transfer	LTE	
General		
Operating conditions	-20° C to +50° C	
Item number	BMA-V3-27	BMA-V3-60
Power supply	12–48 V DC	
Frequency range	LTE Cat-4	
Power consumption	max. 20 W	
Material	Housing: Polycarbonate rain cover: Polycarbonate 3D printing	
Protection class	IP65	
Dimensions	178 x 119 x 109 mm (L x W x H)	
Weight	850 g	
Mounting method	Pole mounting, clamping range 60 - 150 mm	
Certification		
GDPR compliant	Yes	

Privacy and Security

The BMA processes personal data only vaguely, without storing it and only for the purpose of anonymization. This is done on the basis of Art. 6 para. 1 f) GDPR, namely in the legitimate interest of the operator. Only the anonymous data is then used for traffic control measures.

The BMA complies with the Low Voltage Directive 2014/35/EU and the Electromagnetic Compatibility Directive 2014/30/EU. The compliance has resulted in the CE certification attached to the bottom of the device.

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