# EMBEDDED VISION SOLUTIONS FOR SMART RETAIL

- Vision Excellence
- Solution Consultancy and Design
- Broadest Product Portfolio
- Comprehensive Software Solutions
- Development and Production Competencies

**BASLER**

the power of sight

# GO EMBEDDED, GO VISION WITH BASLER AND PROFIT FROM OUR EXPERIENCE, HIGH-QUALITY PRODUCTS, AND SERVICES.

### VISION EXCELLENCE

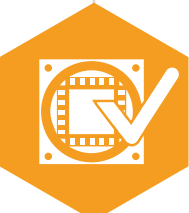Technology leadership with over 30 years of vision experience

- Most trusted brand in industrial digital cameras
- Best-in-class image processing, well-matched components and driver of innovation.

### SOLUTION CONSULTANCY AND DESIGN

Expert guidance to your optimal solution

- Expert knowledge in all the relevant elements for an embedded vision system
- Everything from plausibility checks, requirement and feasibility analyses, proof of concept, to final production from one source

### BROADEST PRODUCT PORTFOLIO

Get the right product for your embedded vision system

- High-quality products with long-term availability
- Products in different performance classes and technologies to offer best price/performance solutions and full flexibility

### COMPREHENSIVE SOFTWARE SOLUTIONS

Everything you need to get your system running

- Everything from drivers to application software optimized for vision applications
- Complete system software packages for highest ease of use
- Application specific building blocks and individual software components

### DEVELOPMENT AND PRODUCTION COMPETENCIES

From first idea to mass production

- Full development and customized mass production of your product
- Established high quality standards and extensive in-house product testing
- Service on demand by Basler's technical support

## ATM/VTM

To prevent fraud (skimming) at automated teller machines (ATM) and to assist customers via video teller machines (VTM), embedded vision solutions support monitoring

- of the user
- of money withdrawal
- of PIN entry

and communication with the user for support purposes.

## CHECK-OUT SYSTEMS

AI-based automated check-out systems that work with sophisticated neural network algorithms are ideally suitable for

- recording and detection of barcodes on products
- recognition of product features (e.g. color or type), for price determination according to weight (scaling), and of goods on conveyor belts
- bottom of basket inspection

## REVERSE VENDING MACHINES

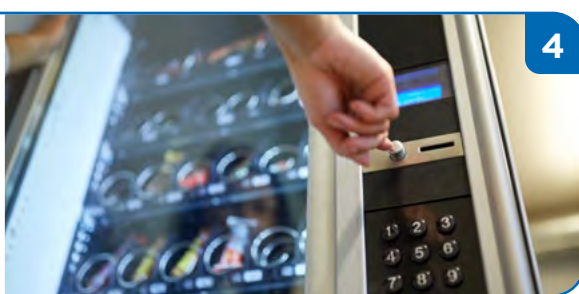Embedded vision solutions provide reliable and fast

- recognition of the bottle form and of labels on products to be returned
- handling of empty bottles and other products

## VENDING MACHINES AND KIOSK SYSTEMS

Ticket machines, digital signage systems and kiosk systems benefit from embedded vision solutions when

- monitoring the user and the issuing of goods
- communicating with the user

## RECOGNITION

Embedded vision systems with high-resolution Basler cameras as integral component support identification based on biometric face points for
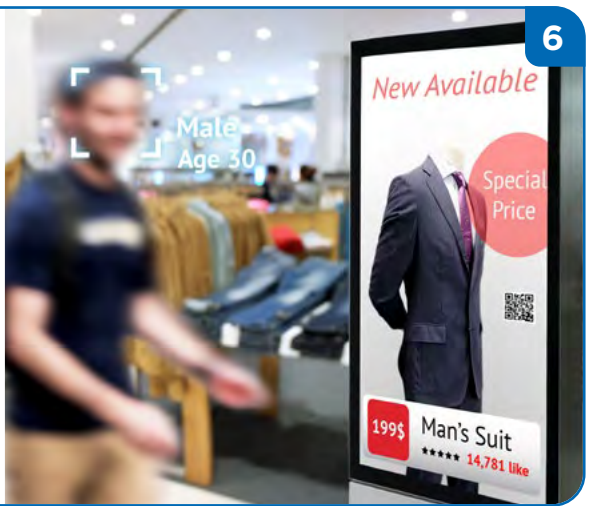
- customer recognition and assignment/profiling
- border and access control
- security applications

## DIGITAL SIGNAGE & PEOPLE TRACKING

Fast, compact, and high-performing embedded vision systems support insights by collecting and delivering reliable data on customer behavior and preferences. Digital signage applications help to catch the customers' attention and to influence their purchase decision at the point of sale. Systems are easily integrated in

- audience measurement solutions
- digital signage and vending machines
- shelves and store windows

## SHELF INSPECTION

Embedded vision systems can be integrated into autonomous movable systems or as static devices from fixed locations to

- monitor the fill levels of supermarket shelves
- support inventory checks

both to help store managers provide their customers with the broadest and most suitable product portfolio possible.

*For further information on recommended Basler cameras for Retail please visit www.baslerweb.com/retail*

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Retail applications affect all of us in so many different aspects of everyday life and embedded vision solutions are becoming increasingly important in this field. Vision technology will facilitate and even revolutionize our daily lives. We care deeply about giving retail technology the power of sight.

*Arndt Bake*
*Chief Marketing Officer (CMO)*
*Basler AG Germany*

# MATCHING VISION SOLUTIONS

## Evolving Opportunities for Retailers

Combining embedded design with vision technology is a rising trend. Embedded vision will enable a number of new applications in which small size, low power consumption and low costs are important. Our goal is to significantly reduce the still high integration effort for our customers. In the retail business new embedded IoT and AI solutions are evolving. There are many new ways in which retailers are able to improve the shopping experience of their customers. At the same time, smart retail applications enable the collection of big amounts of data that can be aggregated on cloud platforms and be analyzed instantaneously. This, in turn, provides you with valuable customer information giving you the edge for your business.

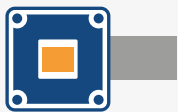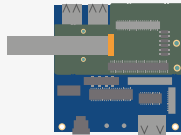## Components for Embedded Vision Solutions

### Image Acquisition
- Camera module
- Lens
- Cabling
- Lighting

### Embedded Processing
- System on chip (SoC)
- System on module (SoM)
- Edge computing

### Software & Connectivity
- System software (e.g. drivers, Board Support Package)
- Application-specific software
- AI and machine learning
- Cloud connectivity
- Internet of Things

## Basler Develops Your Smart Retail Embedded Vision Solution

### BASLER DART

The dart camera module, available with housing or as a bareboard model, is Basler's smallest camera and ideally suited to flexible system integration.

### EMBEDDED VISION KITS

Our Embedded Vision Kits are the starting point: As an assembly kit with all the important components they allow for the evaluation of our camera modules, the processing platform and their various interface technologies. Later on, the optimized hardware setup is designed into your embedded vision system.

### SOFTWARE

Be it the necessary system software such as our Basler pylon camera Software Development Kit and Board Support Packages or application-specific software modules such as people counting, face analysis or object detection: Basler will deliver a seamlessly working system.

## Innovative Vision Solutions with Strong Partners

New embedded vision solutions should be as hazzle-free as possible. By collaborating closely with major partners we ensure excellent vision solutions and concepts in the field of embedded processing, IoT and Cloud Services.

## How Does Basler Measure and Define Image Quality?

**1288** EMVA Standard Compliant

Basler is leading the effort to standardize image quality and sensitivity measurement for cameras and sensors. We are giving the EMVA 1288 standard our strongest support because it describes a unified method to measure, compute, and present the specification parameters for cameras and image sensors. Our cameras are characterized and measured in 100% compliance with the EMVA 1288 standard. Measurement reports can be downloaded from our website.

## How Does Basler Ensure Superior Quality and Reliable High Performance?

Our approach to quality assurance is rigorous: we continually audit all facets of our business to ensure powerful performance, increase efficiency and reduce costs for our customers. We are compliant with all major quality standards including ISO 9001, CE, RoHS, and more. To ensure consistently high product quality, we employ several quality inspection procedures during manufacturing.

Every Basler camera is subjected to exhaustive optical and mechanical tests before leaving the factory. We have developed a unique combination of optics, hardware, and software tools that can quickly and efficiently calibrate a camera and measure its performance against a set of standard performance criteria. Regardless of what technology or camera model you choose you can be assured of consistent performance.

## About Basler

Basler is a leading manufacturer of high-quality cameras and camera accessories for industry, medicine, traffic and a variety of other markets. The company uses its many years of experience in the field of embedded vision to create optimal embedded vision solutions for its customers. Basler offers a well-rounded portfolio including services such as consulting, development and production in addition to its camera modules, embedded vision kits and software solutions. The Basler Group is home to approximately 800 employees at its headquarters in Ahrensburg, Germany, and at other locations in Europe, Asia, and North America.



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