BECOM
it's possible.

PRODUCTS

WE MAKE IT POSSIBLE

BECOM has been a reliable electronics engineering, manufacturing and service partner for its clients in industry since 1984. From the first creative concept through the development and validation stages, right up to series production, its clients can obtain everything from a single source. Thanks to international business locations and partners, today's clients around the world benefit from the high-quality solutions, services and know-how provided by our experts.

In recent years we have increasingly invested in embedded and sensor technology solutions in order to be able to react flexibly according to the ‚time-to-market' principle. In-house R&D enables technological progress on the market for our partners. Our customers benefit from a modular product range in the area of embedded systems. BECOM's scope of services and stability complement the innovative strength and guarantee customers long-term availability and highly efficient production processes.

BECOM remains a family-run business to this day. With roots in the Burgenland state of Austria, over the years the corporation has developed world-class solutions and quality. Healthy but consistent growth and an instinct for innovative developments make BECOM the go-to choice for clients working in every sector.

Turnover
> €100 million

R&D quota
5 %

Employees
~600

FROM IDEA TO SOLUTION
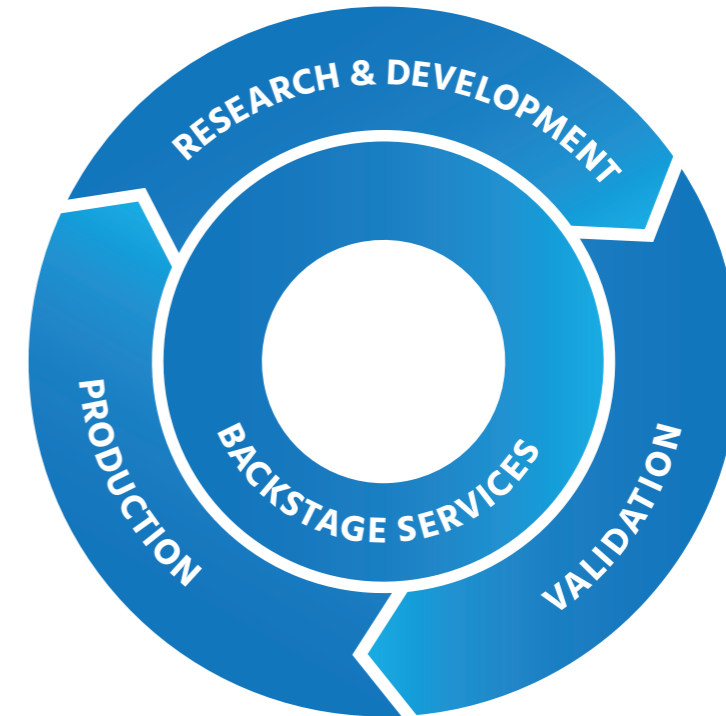
RESEARCH & DEVELOPMENT

- System development
- Hardware development
- Software development
- Mechanical development
- PCB design
- Process development
- Development of test methods
- Embedded systems
- Sensor technology

VALIDATION

- Accredited EMC acc. ISO/IEC 17025
- Environmental testing
- Electrical testing
- Test load levels
- Thermography measurements
- Authorized calibration body for ISO/IEC 17025

PRODUCTION

- SMT production
- THT production
- Robotics
- Coating
- Potting
- LED centering
- Assembling/Box build
- Traceability
- In-house automation solutions

BACKSTAGE SERVICES

- Project management
- Product lifecycle
- New product introduction/NPI
- Obsolescence management
- Product changes
- Risk management
- Logistics
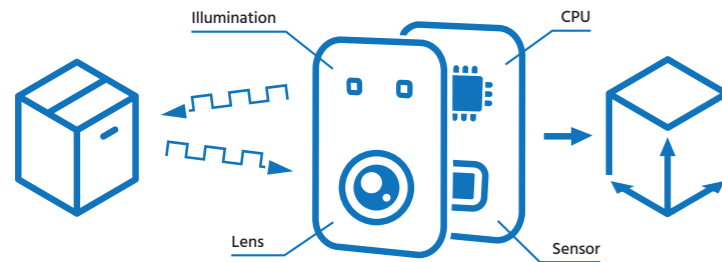- After sales services
- Feasibility evaluation

TIME-OF-FLIGHT TECHNOLOGY

BECOM's 3D cameras based on Time-of-Flight technology provide depth information and intensity data for each pixel (grey value).

The active illumination module emits modulated infrared light (IR) in the near-infrared. The object that is located in the field of view reflects light which is projected via the lens onto the 3D camera IC.

The distance data from the ToF IC to the object is calculated individually for each pixel while taking into account the angular phase shift. The result of one measuring cycle is a 3D point cloud which includes intensity data for each pixel.

Time-of-Flight Solutions from BECOM let machines perceive their environment like never before.

BECOM 3D Time-of-Flight Cameras

- Efficient – Direct distance data allows direct analysis of position, distance and significance
- Independent – Active infrared illumination makes Time-of-Flight independent from ambient light, color and patterns
- No moving parts in contrast to mirrors of laser scanners
- Each pixel is captured simultanously and individually
- Compact – Lens and illumination are closer together than in stereo- and triangular systems
- The compact setup without moving parts give BECOM Time-of-Flight sensors longlevity and makes them ideal for use in challenging environments.

CAMERAS

Under the Argos^{3D} TOREO^{2D+3D} and Sentis^{3D} brands BECOM offers a range of 3D cameras with maximum flexibility in mind unlocking a broad range of applications.

MODULAR TOF

With its own set of different Time-of-Flight building blocks BECOM accelerates the development of customer specific camera solutions.

BECOM's extensive experience in embedded systems and the unique modular approach allow Time-of-Flight technology to be integrated seamlessly into new and existing products. This facilitates robust and efficient sensor solutions with the shortest possible time to market.

CLIENT SPECIFIC SOLUTIONS

As a system solution provider BECOM's portfolio is completed by fully optimized 2D + 3D camera solutions based on client requirements, complete with integrated application software and customer assistance services.
Innovative ideas and highest quality have made us a trusted partner for all businesses. As such we deliver customer specific solutions and products that can perform even in challenging environments. With specialists for industries such as the automotive and medical sectors, BECOM meets even demanding standards and regulations.

USE CASES
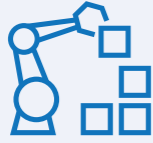
Logistics – handling and sorting
- Detection of volume and shape in sorting plants
- Fill-level control for shelves
- Pick&place applications

Medical patient position and fall detection
- Tracking & monitoring of patients for medical robotics
- Fall detection in hospitals and retirement homes
- Gesture control

Autonomous robots
- Navigation for automated transport systems
- Material handling for forklifts or heavy machineries
- Obstacle detection
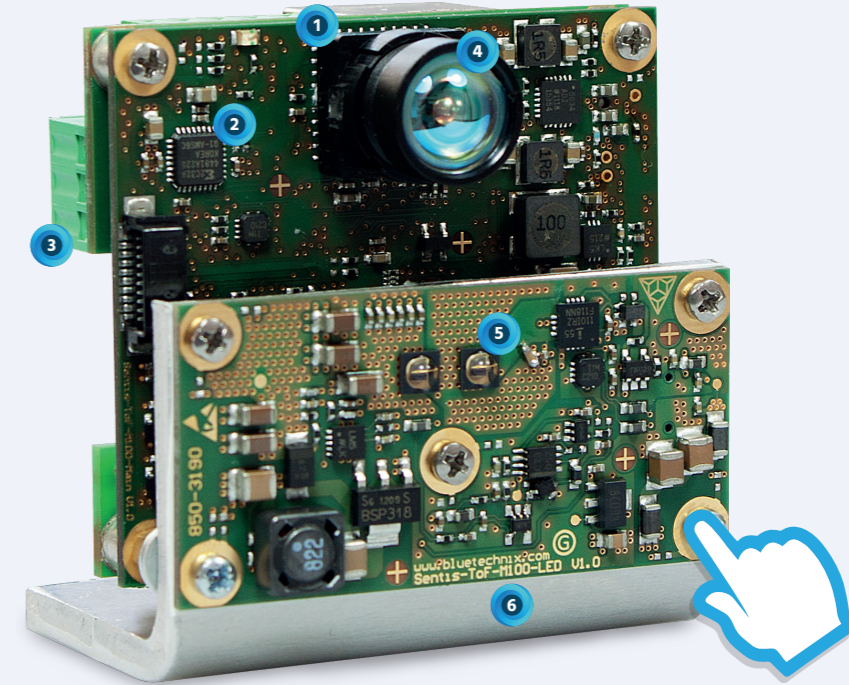
Anonymous counting and tracking of people
- Public transport and buildings
- Security gates

Automotive - next generation mobility
- Driver monitoring
- Gesture control and context awareness
- Near field obstacle detection

GETTING TIME-OF-FLIGHT RIGHT

1	**Sensor Integration** Multiple Vendors	4	**Optics** Lens Concepts, Field-of-View
2	**Embedded Processing** FPGA, ARM, DSP, Host SDK/API	5	**Illumination** LED/Laser, Eye Safety
3	**Connectivity** ETH, USB, MIPI Synchronisation	6	**Mechanical Integration** Miniaturization, Housings, Cooling

ARGOS³ᴰ CAMERAS

BECOM offers a range of different off-the-shelf cameras dedicated for a variety of applications. The Argos³ᴰ cameras are fully certified, built into a housing, and ready for immediate use.

TOREO²ᴰ⁺³ᴰ CAMERAS

The TOREO-P650 is a depth sensor for use in applications where either Stereo or ToF is not enough and where you can get the best of both worlds.

SENTIS³ᴰ CAMERAS

The Sentis³ᴰ cameras are OEM cameras without housing and are designed for integration in customer products. They contain all the necessary individual components for a depth sensor.

MULTI-TOF-PLATFORM

The multi-ToF-platform is an ecosystem for multiple sensors ToF and 2D working in parallel. It consists of two parts. The ToF Hub incorporates the processing platform and enables the connection of several different camera Front Ends.

MODULAR TOF

The modular ToF is a building block system that guarantees maximum flexibility as well as cost efficiency and serves as a basis for customer based ToF solutions. BECOM's many years of experience in the modules sector means that ToF based depth sensors can be divided into individual components. Its main components are the TIM (ToF sensor) and the LIM (illumination light) modules.

SPECIFICATIONS

Dimensions	173 x 65 x 46 mm
Temperature	-20 to 45 °C
Application Range	up to 5 m
FoV	60° or 80°
Resolution	640 x 480 px ToF
FPS	up to 40 fps
Illumination	850 nm / 940nm

OPERATING SYSTEMS
Linux, ROS, Windows

ENVIRONMENTS
LabVIEW, MATLAB®, MetriCam, Halcon

INTERFACES
Gbit/s-Ethernet
Trigger In
GPIO
Power

ARGOS³ᴰ – PULSE

The Argos³ᴰ - Pulse is a depth sensor, operating on the Time-of-Flight (ToF) principle and a VGA resolution for better accuracy.

The sensor delivers best-in-class noise performance.
The small form factor and flush mount option in combination with 3D ToF technology makes Argos 3D - Pulse a perfect choice for various 3D applications, where high accuracy is required.

Target Applications
Bin Picking / Conveyor Belt
Palletizing
Agriculture & Livestock
Freight Measurement
Patient Positioning
Industrial Automation

SCOPE OF SUPPLY

CAMERA
PON: 150-3088-1
Argos³ᴰ – Pulse-60

ACCESSORIES
Argos3D - Pulse Mounting Kit
ETH Cable
Power Supply
Power + IO Cable
SW / Support Online Link

More sensor accessories on request.

ARGOS³ᴰ – P230

The Argos³ᴰ - P230 is a new ToF camera operating on the Time-of-Flight (ToF) principle.

Using active IR illumination, the camera is able to capture 3D information. With a range of 5 m indoors, a field-of-view of 80° and a size of only 173 x 65 x 46 mm, this fast Ethernet connected camera can be used for next generation camera systems in various application.

The small form factor and flush mount option in combination with the new ToF technology makes this camera a perfect choice for people counting and security applications as well as kiosk systems.

SPECIFICATIONS

Dimensions	173 x 65 x 46 mm (without cover panel)
Temperature	-20 to 65 °C
Application Range	5 m indoors
	3 m outdoors
FoV	80°
Resolution	352 x 287 px
FPS	up to 40 fps
Illumination	850 nm LASER
Protection Class	IP 65

OPERATING SYSTEMS
Linux, ROS, Windows XP/7/8/10 32-64 bit

FRAMEWORKS
LabVIEW, MATLAB®, MetriCam, Halcon

INTERFACES
1 x 10/100 Mbit/s-Ethernet, 1 x Trigger In, 1 x GPIO (galvanic isolated)
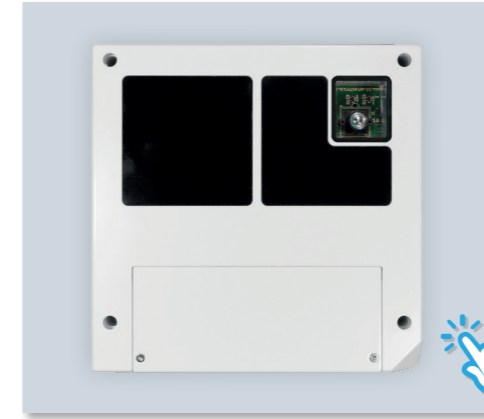
SCOPE OF SUPPLY

CAMERA
PON: 150-3053-1
Argos3D – P230

CAMERA KIT
PON: 150-3054-1
Argos3D – P230
ETH Cable
SW / Support CD
Power Supply
Documentation

More sensor accessories on request.

ARGOS³ᴰ – P330

The Argos³ᴰ – P330 is a high resolution camera combined with a 2D CMOS sensor. The smart camera IC delivers depth information and gray value image data for over 100,000 pixels simultaneously.

An additional integrated 2D CMOS imager captures scenes with a resolution of up to 720p. Therefore, it is possible to analyze scenes based on 3D depth data only or in combination with 2D data. The actual coverage is more than 10 m indoors and up to 3 m outdoors with a field of view of 80°.

A 2D and 3D data stream is provided by a Gigabit Ethernet interface which also has a PoE functionality.

SPECIFICATIONS

Dimensions	200 x 200 x 62 mm
Temperature	0 to 50 °C
Application Range	0.1 to 10 m indoors
FoV	80°
Resolution 3D	352 x 287 px
Resolution 2D	up to 720p
FPS	up to 40 fps
Illumination	850 nm LASER
PoE++	up to 90 W
Protection Class	IP 42

OPERATING SYSTEMS
Linux, ROS, Windows XP/7/8/10 32-64 bit

FRAMEWORKS
LabVIEW, MATLAB®, MetriCam, Halcon

INTERFACES
1 x Gbit/s-Ethernet, 1 x GPIO (galvanic isolated), 1 x Trigger In, 1 x Trigger Out

SCOPE OF SUPPLY

CAMERA
PON: 150-2037-1
Argos³ᴰ – P330

CAMERA KIT
PON: 150-2036-1
Argos³ᴰ – P330
ETH Cable, Power Supply
SW / Support Online Link
Documentation

ARGOS³ᴰ – P330		PON	2D	POE++
Standard	Argos³ᴰ-P330	150-2037-1	+	+
	Argos³ᴰ-P331	150-2042-1	N/A	+
	Argos³ᴰ-P332	150-2052-1	+	N/A

More sensor accessories on request.

TOREO – P650

The TOREO – P650 is a depth sensor for the use in applications where either Stereo or ToF is not enough. The housing with its protective class IP 67 covers the hardware from dust and water and facilitates the installation outdoor and in tough environments.

The smart depth sensor IC delivers depth information and grey value image data for each pixel. Two RGB sensor modules deliver a color data stream.The data is collected by a NVIDIA Tegra TX2 processing module, which calculates stereoscopic 3D data from the RGB modules. The actual coverage is up to 5 m indoor and up to 3 m outdoor with a field view of 60 °. A 3D data stream is provided by a 1 GBit Ethernet interface.

SPECIFICATIONS

Dimensions	230 x 148 x 106 mm
Temperature	-40 to 60 °C
Application Range	up to 5m
FoV	60°
Resolution 3D	640 x 480 px ToF
Resolution 2D	2 x 13 Mpx RGB Sensors
FPS	up to 30 fps
Illumination	850 nm
Protection Class	IP 67

OPERATING SYSTEMS
Linux, Windows

FRAMEWORKS
Halcon, Data Spree Deep Learning DS, Inference DS

INTERFACES
1 x Gbit/s-Ethernet (eight pole X-coded M12)
1 x Trigger In, Reset
2 Outputs, Power (twelve pole M12)
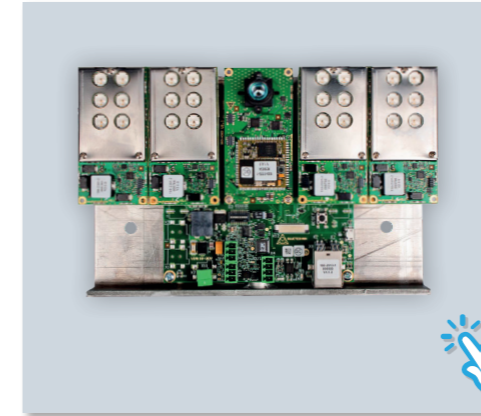
SCOPE OF SUPPLY

CAMERA
PON: 150-3086-1
TOREO – P650

ACCESSORIES
TOREO - P650 Mounting Kit
ETH Cable
Power Supply
Power + IO Cable
SW / Support Online Link

More sensor accessories on request.

SENTIS³ᴰ – M421

The Sentis³ᴰ – M421 is a new camera, operating on the Time-of-Flight (ToF) principle. The M421 is equipped with a PMD PhotonICs® 19k-S3 Time-of-Flight 3D IC sensor.

The camera module has a powerful illumination system enabling it to achieve ranges up to 7 m with a 90° field-of-view. The point cloud data is streamed over Ethernet. The camera can be accessed through our Windows and Linux API.

Using active IR illumination, the camera is able to capture 3D information. With a range of 7 m indoors, a field of view of 90° and a size of only 205 x 125 x 85 mm, this Ethernet connected camera can be used for next generation camera systems in various application fields like robotics, automation and people counting supply.

SPECIFICATIONS

Dimensions	205 x 125 x 85 mm
Temperature	-20 to 60 °C
Application Range	up to 7 m
Resolution	160 x 120 px
FoV	90°
FPS	up to 40 fps
Illumination	850 nm LED

OPERATING SYSTEMS
Linux, ROS, Windows XP/7/8/10 32-64 bit

FRAMEWORKS
LabVIEW, MATLAB®, MetriCam, Halcon

INTERFACES
1 x 10/100 Mbit/s-Ethernet (M421), 1 x Trigger In, 1 x Trigger Out, 1 x GPIO, 1 x RS232, 1 x RS485
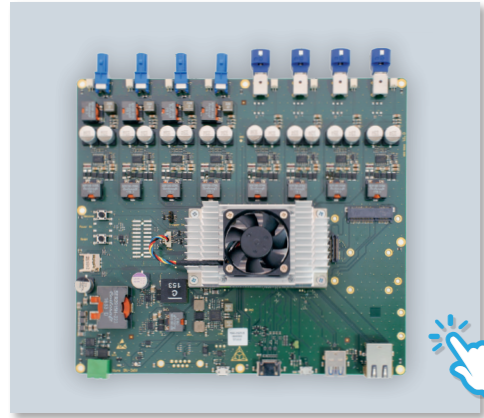
SCOPE OF SUPPLY

CAMERA
PON: 150-2225-1
Sentis³ᴰ – M421

CAMERA KIT
PON: 150-2217-1
Sentis³ᴰ – M421
ETH Cable
JTAG Adapter
Power Supply
Tripod
Documentation

More sensor accessories on request.

MULTI-TOF PLATFORM

The BECOM Systems multi-ToF platform is an ecosystem for multiple sensors working in parallel. The platform allows us to integrate different sensors in an easy way.
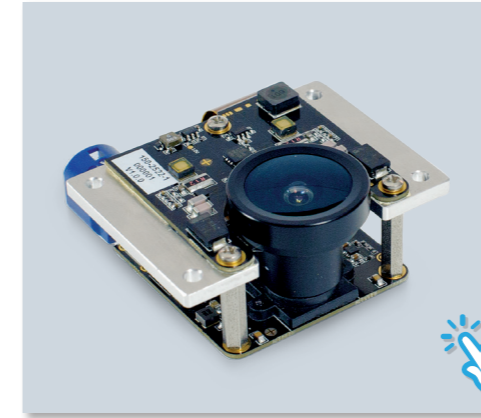
It gives software developers an environment close to their final target platform for developing, testing and deploying their application.

The multi-ToF platform consists of two parts, the ToF Hub and the ToF Front End. The ToF Hub incorporates an NVIDIA Tegra Processor and hosts connectors for 4 ToF sensor Front Ends.

SPECIFICATIONS HUB
Dimensions   205 x 210 x 69 mm
                    Including heat sink and fan

OPERATING SYSTEMS
Linux, ROS, Windows 7/8/10 32-64 bit

FRAMEWORKS
Matlab, MetriCam, Halcon

INTERFACE HUB
1 x Gbit/s Ethernet, 1 x Power Supply Input,
4 x FPD-III Link over STP, 4 x FPD-III Link over COAX
(FAKRA), 1 x PCIe, 1 x OBD-II (Can), 1 x USB OTG,
1 x HDMI, 1 x µSD-Card, 1 x Debug USB to UART,

PROCESSOR PLATFORM
NVIDIA Jetson TX2 module

SCOPE OF MULTI-TOF-PLATFORM

PON: 150-3050-1
multi-ToF platform HUB
multi-ToF platform FRONT END (1x)
ETH Cable
SW/Support and Documentation Online Link

MULTI-TOF ADDITIONAL FRONT END

The ToF Front End hosts the illumination and the sensor chip. The two parts are connected via a two wire serial connection which provides the power supply as well.

Target Applications
Driver monitoring
Gesture control
Obstacle detection
Sensor fusion

Target Customers
OEMs
Tier 1
Chip manufacturers
Software application developers
Predevelopment groups
Automotive start-ups

SPECIFICATIONS FRONT END
TOF chip   MLX75023
Dimensions   56 x 57 x 30 mm
                    Including cooling plate
Temperature   -20 to 85 °C*
Application Range   0.1 to 2,5 m**
Resolution   304 x 240 px
FoV   110°
FPS   up to 40 fps
Illumination   850 nm LASER

* depends on cooling mechanism
** depends on camera setup and FoV

Technical specifications are subject to change without prior notice.

INTERFACE TOF FRONT END
1 x Phantom powered FPD-III Link over STP,
1 x Auxiliary Power Supply Input

MULTI-TOF ADDITIONAL FRONT END

multi-ToF platform FRONT END
PON: 150-3051-1

More sensor accessories on request.

More sensor accessories on request.
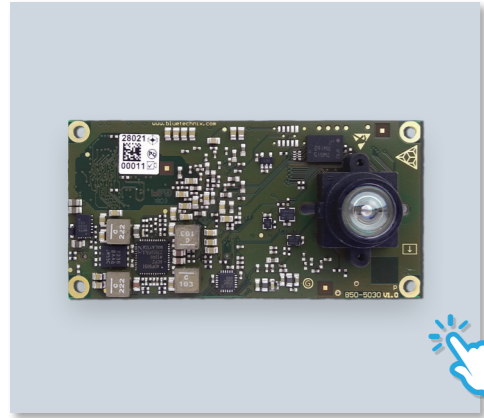
TIM-UP-IRS1125-P*

The TIM-UP-IRS1125-P* features 3D point cloud streaming via Ethernet, USB or Parallel Video Interface. It has a standard field of view of 80° and provides a 3D point cloud data via UDP stream.

A variety of lenses is available for this product – for details see Sensor Accessories on page 29.

SPECIFICATIONS

Dimensions	40 x 80 mm
Temperature	-40 to 85 °C
FoV	80° (default)
Resolution	352 x 287 px
FPS	up to 40+ fps

INTERFACES

1 x ETH 10/100 Mbit/s, 2 x I²C, 1 x UART
1 x Parallel Video Interface (8 bit), 1 x USB

SCOPE OF SUPPLY

Scope of supply
PON: 150-3055-1
TIM-UP-IRS1125-P*

* 90° rotated sensor orientation on request
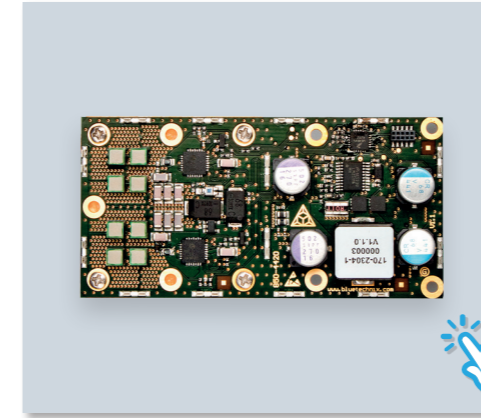
LIM-U-LASER-850-8

The LIM-U-LASER 850-8 light module offers 8 high power IR laser diodes on a surface of 40 x 80 mm. The default FoV is 110°. Other FoVs are available on request.

This product can be ordered starting with 100 pieces, also equipped with only 4 diodes.

SPECIFICATIONS

Dimensions	80 x 40 mm
Temperature	-40 to 85 °C*
FoV	110° (default)
VIN	12 to 30 VDC
Illumination	850 nm LASER
Total optical peak output power	24 W

*depends on cooling mechanism

Onboard overcurrent and over temperature protection

INTERFACES

1 x External Sync Interface,
1 x OWIRE,
1 x I2C,
Adress selection

SCOPE OF SUPPLY

PON: 170-2304-1
LIM-U-LASER-850-8 110

More sensor accessories on request.

More sensor accessories on request.

LOCATIONS

Production

Development/Validation

Sales

EUROPE

BECOM Electronics GmbH
Hochstraß, Austria

BECOM Systems GmbH
Wien, Austria

BLUETECHNIX Lab GmbH
Wien, Austria

BECOM Electronics Hungary Kft.
Környe, Hungary

IVP Group Germany GmbH
Buchenbach, Germany

Distribution office
Hamburg, Germany

ASIA

BECOM Electronics (Heyuan) Co. Ltd.
Heyuan, China

NORTH AMERICA

IVP, Inc. USA
Los Angeles, USA

CONTACT

Headquarters of the BECOM Group
A-7442 Hochstraß, Technikerstraße 1
T +43 2616 2930
office@becom-group.com
www.becom-group.com

Production, Development and Validation
Sales Austria: T +43 2616 2930 - 2000
Sales Germany: T +49 40 822 16 338 - 2001
sales@becom-group.com

Products and Embedded Solutions
Sales Austria: T +43 1 914 2091-2002
Sales Germany: T +49 40 822 16 338 - 2010
sales.systems@becom-group.com

IVP Group Germany GmbH
D-79256 Buchenbach, Gewerbestraße 3
T +49 7661 90 16 - 0
ivp@becom-group.com
www.ivp-gmbh.de

www.becom-group.com