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Matsushita Electric Works

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Matsushita LightPix AE10



LightPix – The Revolutionary Vision Sensor

For 100% Quality Assurance and Factory Automation

LightPix
AE10



- Exceptionally easy to use*
- Fast two-dimensional inspection, recognition and measurement*
- Flexible concept*
- Various inspection functions including colour processing*
- Integrated LED light*
- Cost-effective solution*

LightPix AE10

Machine Vision – as easy as a Photoelectric Sensor



Mount, connect, inspect

The LightPix AE10 is as easy to use as a photoelectric sensor. With its small LCD colour display, setting up your inspection application is like child's play. The Main Unit includes LED lights and all optical parts, simplifying installation. Furthermore, the Operation Unit offers a bright and easy-to-read colour LED display, which facilitates quick and intuitive teaching.



Learning at the push of a button

LightPix AE10 can be taught to detect potential product defects by using the automatic "Teach-In" mode. In only three steps, you teach AE10 a new inspection task, including the appropriate lighting settings. This requires no expert knowledge and takes less than 5 minutes.



Modularity

Twelve different Main Units offer you the optimum solution for your individual inspection task. These units differ in their field of view, installation distance and inspection program. Each unit can function independently or be used in combination with an Operation Unit and a Finder Unit.



The best of both worlds

Conventional photoelectric sensors are often too unreliable, even for easy inspection applications. This is caused by their punctiform working principle and restrictions with respect to changing or poorly reflective surfaces. On the other hand,

the alternative – a Machine Vision System – often proves oversized or uneconomical. In such cases, LightPix AE10 is just the right tool since it combines the best of both worlds: it is fast, reliable and cost-efficient.

More than 60 parts per second

A fast CMOS colour chip and an optimised RISC processor provide the AE10 with a response time of just 15ms. Therefore, it can also be used on high-speed production lines without slowing down the overall processing time.



0.1mm resolution

A sensing element that detects 100,000 pixels enables the AE10 to attain a resolution of up to 0.1mm. Hence the AE10 can detect and differentiate the minutest of quality gradations. Compared to conventional photoelectric sensors, detection is also much more stable.



Cost-effective

AE10 is also an attractive solution cost-wise, and not just because it is reasonably priced: you save time on installation and learning how to use it. As a modular and complete product, AE10 will produce no further costs for hardware or software.

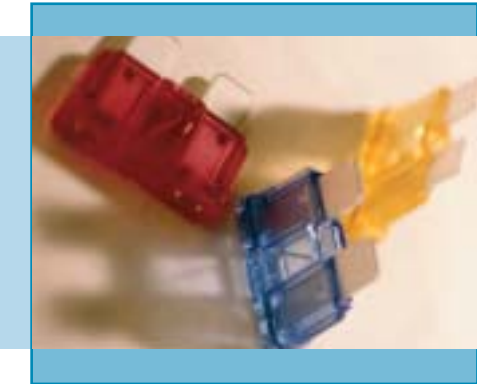


LightPix AE10

Functions and applications

Reality is not black and white colour

Most vision sensors process only binary or grey-level data. This is sufficient if the errors to be detected appear with enough contrast in the image. LightPix AE10, however, can also detect colour, thus broadening the application range significantly: e.g. sorting by colour, presence checking of certain colours, distinguishing product types by colour, object identification, etc.



Function 1: Colour extraction

Mode 1: Area Measurement

AE10 measures the area of a certain registered colour and judges the result based on predefined upper and lower area limits.



Applications:
sorting, presence checking, type differentiation.

Mode 2: Colour discrimination

Up to 7 colours can be registered in the AE10. It detects which colour is closest to the inspected one.

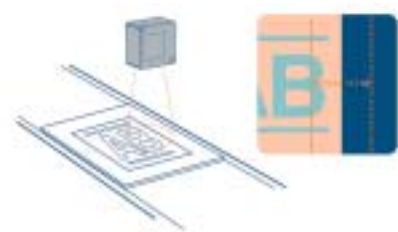


Applications:
colour checking, type differentiation, sorting, presence checking

Function 2: Edge/Position Detection

Mode 1: Edge detection

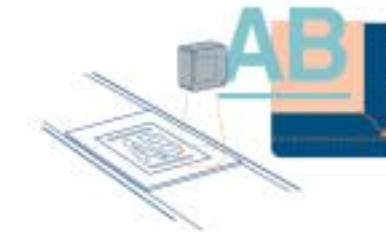
AE10 detects the position of a horizontal or vertical edge and outputs its co-ordinates via the RS-485 interface.



Applications:
Presence checking, size/level measurement, position detection

Mode 2: Corner detection

Based on the intersection point of two edges, the position of the corner is detected and its position output.

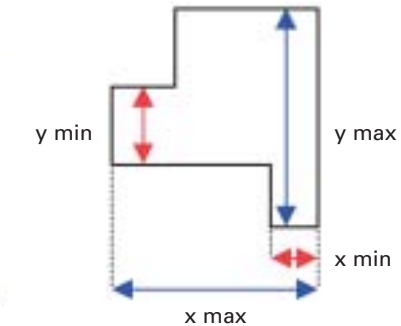
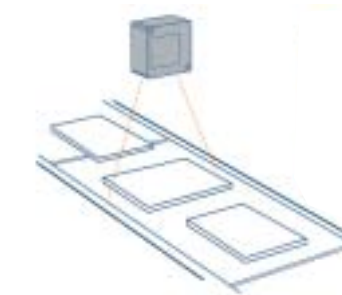


Applications:
Assembly check, position detection.

Function 3: Size Measurement

AE10 detects the min. and max. dimensions in horizontal and vertical directions and outputs the results via the serial interface.

Applications:
dimensional check, position inspection, type differentiation



For which applications is LightPix AE10 especially well suited?

The range of possible applications for AE10 starts where conventional photoelectric sensors start to work unreliably. The adjacent table provides an overview of typical inspection applications.

	Conventional Sensor	Vision-Sensor Light Pix AE10
Area (non-point) inspection	--	++
Changing position of an object	--	++
Object with poor reflectance (e.g. black rubber)	-	+
Changing size of an object	-	++
Changing object surface (e.g. shiny/matt)	--	+
Changing object colour	-	++
Objects with complex surface conditions (e.g. film, blister)	-	+

LightPix AE10

Flexible System

Cleverly modular



Main Unit

- Stand-alone usage possible
- Three available inspection programs
- CMOS Colour Chip
- Integrated LED light
- Serial interface and 11 digital switching outputs



Finder Unit

- 2" LCD Colour Display
- Allows easy alignment of the Main Unit
- Can be combined with an Operation Unit

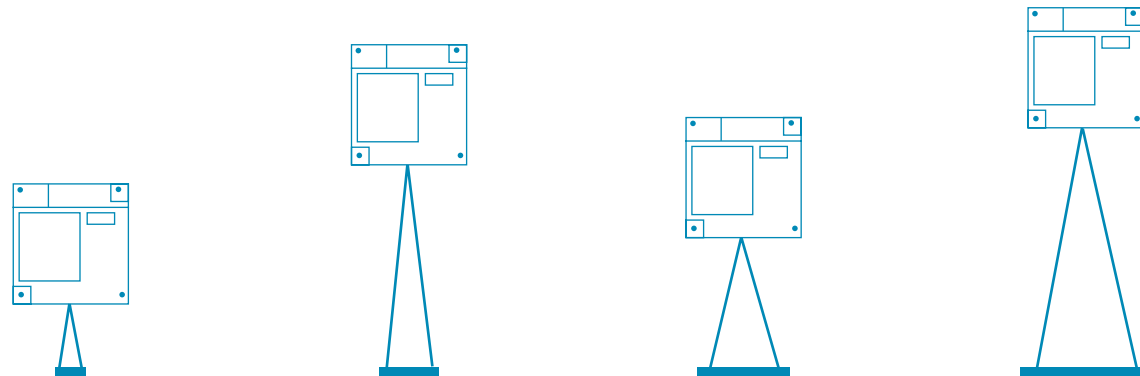


Operation Unit

- Clearly arranged, bright 7-segment colour display
- Few buttons
- Easy handling
- Fits nicely into control panels

Max. 10m LAN cable

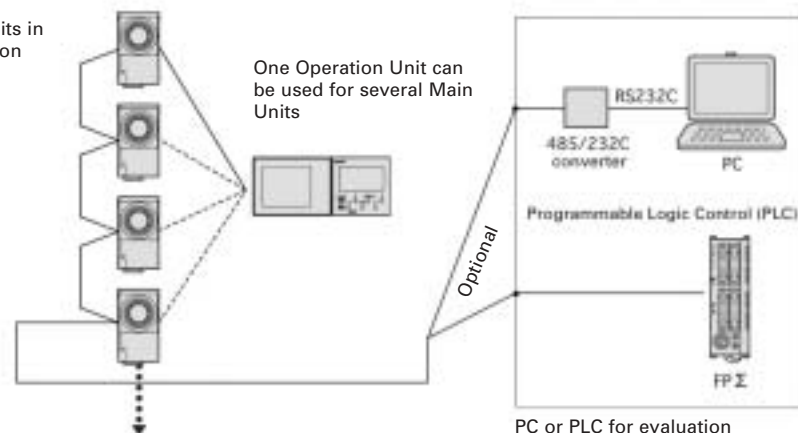
Main Unit – available with four different fields of view/installation distances



Field of view (mm)	10 x 8	25 x 20	50 x 40	100 x 80
Installation distance (mm)	45	110	55	130

Networking

Max. 31 Main Units in serial connection



LightPix AE10

Technical Specification

Main Units

	ANE101x	ANE102x	ANE103x	ANE104x
Inspection program	Alternatively Colour Extraction, Edge Detection or Size Measurement ¹⁾			
Response time	15ms (HIGH), 25ms (MIDDLE), 40ms (LOW)			
Installation distance (mm)	45 ± 2.5	110 ± 5.5	55 ± 5.5	130 ± 13
Field of view B x H (mm)	10 x 8	25 x 20	50 x 40	100 x 80
Resolution (mm)	0.1		0.2	0.5
Sensing element	CMOS (colour), 352 x 288 pixels			
Integrated light	LED, white			
Exposure time	Shutter timing and interlock			
Interfaces	RS-485			
	Serial (screw terminals)	9600 / 14400/19200/38400/57600 8 Bit ASCII, half duplex		
	Parallel (D-Sub, 15-pin)	6 input points (photocoupler, max. 30VDC) for trigger, mode change, type change, device setting 5 output points (PhotoMOS) for judgement output, ready and alarm		
	To the operation unit	Proprietary interface		
Operating voltage	24VDC ± 10%			
Current consumption	< 0.7A			
Housing material	Plastic			
Ambient temperature	0°C to 40°C (usage), -20°C to 60°C (storage)			
Weight	Approx. 300g			

Inspection programs

		ANExxx0
Inspection Program		Colour Extraction
Colour Resolution		12 colours
Functions	1. Area measurement: 2. Colour discrimination:	Measures the area of a certain colour Discerns which registered colour is closest to the inspected one

		ANExxx1
Inspection Program		Edge/Position Detection
Resolution		like Main Unit
Functions	1. Edge detection: 2. Corner detection:	Detects the position of an edge in horizontal and vertical position Detects the intersection point of two edges

		ANExxx2
Inspection Program		Size Measurement
Resolution		Resolution of the Main Unit multiplied by 2
Functions		Measurement of horizontal and vertical dimensions

¹⁾ Pro Sensorkopf ein Softwarepaket

LightPix AE10

Technical Specification

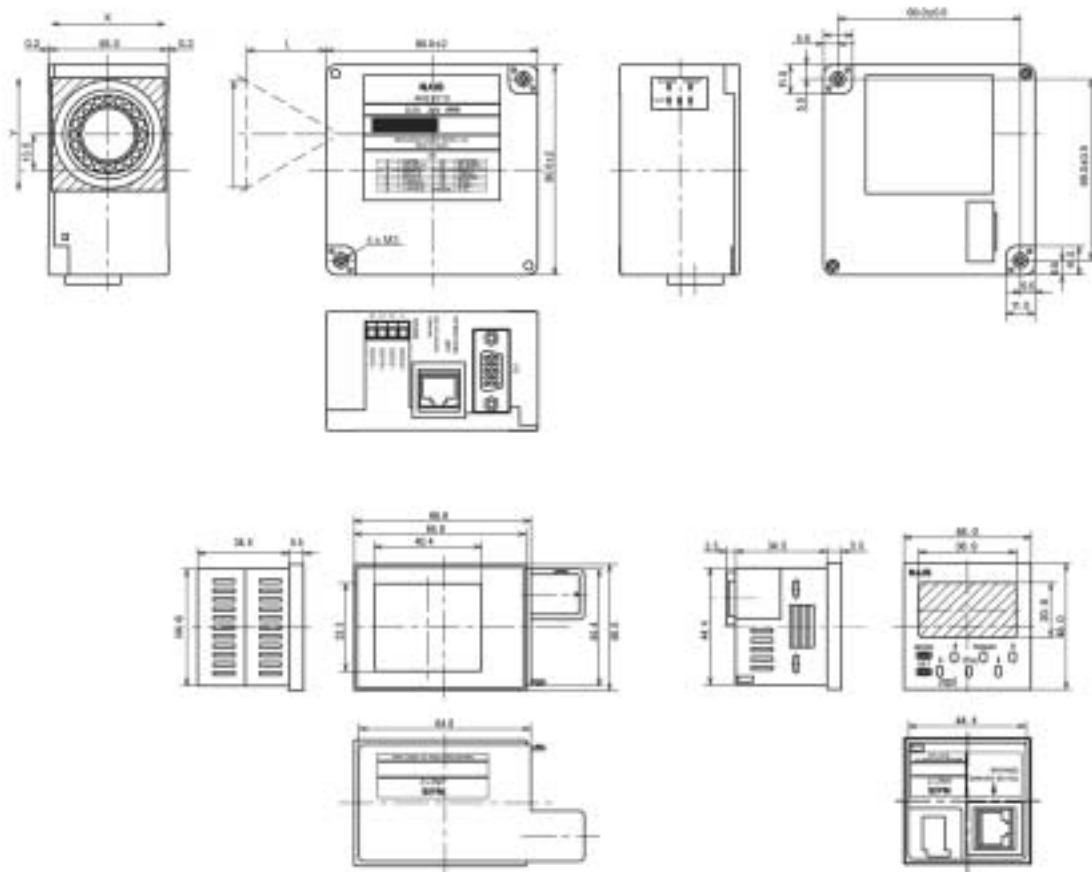
Operation Unit

	ANE11
Display	7-segment, 3 colours
Setting functions	Mode, SET, Parameter, Type, Trigger, UP/DOWN
Housing material	Plastic
Weight	Approx. 200g

Finder Unit

	ANE12
Display	2-inch colour LCD
Backlight life	40,000h (at 25°C)
Housing material	Plastic
Weight	Approx. 200g

Dimensions



LightPix AE10

Related Products



Compact Machine Vision Systems Imagechecker A100/200

For more sophisticated applications, the A-Series is the next step. With its dimensions of just 120 x 40 x 70mm, the A-Series Imagechecker is one of the smallest of its kind. It allows high-speed, dual-camera processing (A200) with a robust and mature stand-alone hardware.



Colour Image Processing Systems AX30/AX40

Once colour-related product failures require detection, AX30/AX40 is the perfect solution. It evaluates the images of up to two cameras with respect to minute colour differences, checks objects' features, measures dimensions, compares patterns and much more.



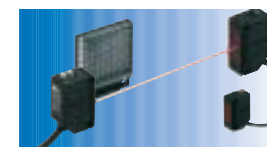
PC-based Machine Vision

P400 and P400S Imagecheckers represent the next generation of PC-based Machine Vision. The systems are user-friendly and offer multiple functions for a wide range of sophisticated industrial inspection applications. High-end solutions materialise with a simple mouse-click.



High-End Machine Vision: Imagechecker AG50

One of the most demanding Machine Vision applications is the surface inspection of discrete parts. The Imagechecker AG50 is an extremely powerful device that solves such complex tasks quickly, reliably and with precision.



Sensors

SUNX is the brand name for our sensor products. Whatever type of sensor is required, our wide product range offers you the right solution.



Programmable Logic Controllers

Programmable Logic Controllers from Matsushita represent "Control advantages" that pay for themselves right from the start.



Human Machine Interfaces

Our compact size, bright and easy to read Human Machine Interfaces can be used to visualise inspection results. Touch panels can even replace the standard keypad if you so desire.



Power Supplies

Our DIN-rail power supplies offer all features required for industrial use in an incredible compact design.