

Compact High-speed Gray-scale Machine Vision System *MICRO-IMAGECHECKER*[®] A 220 OCV Checker

All of our character verification know-how is now packed into the world's best-selling machine vision system. The A220 is a snap to setup, and will handle even difficult character verification problems with ease.





High-speed inspection of characters produced by laser marking. The A220 will reliably inspect even fine and low-contrast characters. Uses two cameras to perform simultaneous and highly accurate sub-pixel inspection of lead pins.

Inspection of stamped printing on boxes for cosmetics and pharmaceuticals.



High-speed inspection of embossed markings such as usage restrictions and lot numbers. Presence of included instructional documents can be accomplished by using the two cameras together.





High-speed inspection of characters produced by UV marking. The A220 will reliably inspect stamped characters that have variable thickness.





High-speed inspection of text such as "use by" dates produced by thermal transfer printing. In addition to character inspection, the A200 is equipped with an extensive range of inspection functions for other applications as well.

A compact machine vision system from the market leader* designed especially for character verification.

We lead the world in sales of machine vision systems and have continually worked to develop and evolve our MICRO-IMAGECHECKER to meet the needs of the market.

The A220 OCV Checker provides a simple and flexible solution to the character inspection requirements for electronic components, food products,

Simple, Reliable and Flexible

A state-of-the-art algorithm simplifies character inspection. Based on extensive study of the needs of manufacturers and the knowledge that we have acquired from right on the factory floor, we have developed a reliable character inspection algorithm that does not require complicated setup. This product will greatly expand your inspection possibilities.

Three-step screen-based setup and adjustment

STEP1	Easy setting Range specification	Just perform area setup for the characters to be inspected. There is no need to create an inspection character dictionary as with conventional character verification checkers. If the condition of the background is poor, the A220 automatically segments the gray-scale template on a character-by-character basis, so all you need to do is specify the range.
STEP2	Easy setting Character segmentation	Automatic segmentation using the gray-scale method (for character separation) When the character contrast and background condition are poor, the background processing noise cut function uses the gray-scale method to automatically segment the characters. This also works well with low-contrast text such as that drawn by laser markers. You can perform adjustment while viewing the text in the segmented state on the screen.
STEP3	Easy setting Dispersion	Handles character thickness variations intelligently The Smart Setting function can take into account variations between acceptable characters and prevent them from being judged as unacceptable. Characters that are only slightly off are judged as acceptable, and only characters with critical defects are judged as unacceptable. This allows you to make inspection settings that grasp the essence of the characters, and to perform adjustments easily while viewing the screen.

Inspection Principle



Teaching function.





The A220 OCV Checker is not designed to inspect dot-based characters.

Use the gray-scale template registered as the standard to automatically generate a range from thin characters to thick characters. You can set the processing range while viewing the generated characters on the screen. The character verification checker performs gray-scale differential processing using the character, after smart setting processing has been applied, and the inspected character.

Unlike the conventional differential method, that cannot distinguish between critical defects such as incorrectly joined lines in a character and non-critical differences such as slight variations in thickness, and that judges both as unacceptable, this new method can make a more intelligent decision, and perform more reliable inspection.

Teaching allows changes to be made to the template for matching even from an external signal. Registering the change can be done simply by showing the object for detection. Teaching also supports positional corrections so that even when work is displaced, teaching can occur.

The Teaching function is compatible with the Position Adjustment function, and will reliably change if the work position shifts.

Extensive Gray-Scale Inspection Functions

Connector, QFP, SOP and lead inspection



Just specify the area, and the A220 will accurately measure the lead pitch and lead width in sub-pixel units and count the number of pins.

The Gray-scale Data Pixel Interpolation function allows highly accurate rotation adjustment.



Gray-scale window



Since the average value for brightness within the area is quickly calculated, directional distinction can still occur even when binary distinction is difficult due to the small differences in the grayscale levels. You can set mask processing with free shapes (rectangular, oval, polygonal) set to match the inspected object.



Smart matching (Fastest in its class).



With the smart matching with a high-speed CPU, vast memory, and original algorithm, even with a 64 x 64-pixel template,

64 x 64-pixel template, 256 x 256-pixel search area, and sub-pixel precision detection, you still get a processing time of about 10 ms. As you can see, this is the

ultimate in speed and precision for position detection. With smart template, just by showing multiple examples of the correct products, correct product images can be automatically composed. This allows simple inspection without setting complex parameters.



Rotation Adjustment

This uses the High-Speed Gray-Scale function to detect work rotation or shift and perform accurate correction to ensure reliable inspection even when there are variations in light.



Performance

Reduced size (Smallest in its class)

Equipped with a 200MHz 32-bit RISC CPU (320MIPS, 1.4GFLOPS) that runs our independently developed algorithm, and plenty of memory to allow fast and accurate inspection.

With a small 120 40mm footprint, installation is simple. Tight installation with checkers next to each other is also possible. With considerations for wiring, connectors, and removable terminal blocks, installation with all units facing one direction is possible for no wasted space.



Uses a high-speed random camera that captures images at four times the speed of our previous products (approximately 8.3ms). This combined with the high-speed imageprocessing algorithm provides a large reduction in total inspection time.



Simultaneous Image Capture Using Two Cameras

In addition to the high-speed image capture and processing functions, the A220 can perform simultaneous image capture using two cameras, so it can easily be introduced onto high-speed production lines for total inspection. The monitor display can also be freely switched using external input. Also, using the Image Composition function, you can display two camera images on one monitor at the same time. It has been designed with compact built-in cameras in mind, and is also compatible with many commercially available cameras.



Camera composition

External camera



Image storage function

Storing up to 8 pictures of fault occurrences in its memory, it is useful for analyzing error causes and making adjustments. Saving does not take up time, and does not disturb the inspection tact time. Also, using special software, image data and inspection conditions can be stored, and then faults can be analyzed and adjustments made from any location using e-mail.

Also, using special software, image data and inspection conditions can be stored, and then faults can be analyzed and adjustments made from any location using e-mail. Saved image data can be converted to Windows format and pasted into documents such as instruction manuals.





MICRO-IMAGECHECKER® A220 OCV Checker

Table of Product Numbers

Controller

Specifications	Part No.
Micro-Imagechecker A220 OCV Checker with CE (NPN output)	ANMA222
Micro-Imagechecker A220 OCV Checker with CE (Photo MOS output)	ANMA228

Camera

Specifications	Part No.
C mount camera, Progressive High speed Random: CE	ANM831
CS mount camera support electric-shutter with 3 m cable	ANM832
CS mount camera, support electric-shutter with 3 m cable: CE	ANM832CE

High-speed random trigger camera cable

Specifications	Part No.
3m	ANM84303
3m: CE	ANM84303CE

Camera extension cable

Specifications	Part No.
2 m extension: total 5 m	ANM84002
7 m extension : total 10 m	ANM84007
12 m extension: total 15 m	ANM84012
17 m extension: total 20 m	ANM84017
2 m extension : total 5 m: CE	ANM84002CE
7 m extension: total 10 m: CE	ANM84007CE
12 m extension: total 15 m: CE	ANM84012CE
17 m extension: total 20 m: CE	ANM84017CE

Keypad

Specifications	Part No.
with 2 m cable	ANM85202
with 3 m cable	ANM85203
with 2 m cable: CE	ANM85202CE
with 3 m cable: CE	ANM85203CE

Data backup software

Specifications	Part No.
Vision Backup-Tool Ver.2 English version	ANM70131V2

Microsoft windows NT4.0/95/98 compatible. An operating system is not included with this software.

Accessories

Specifications	Part No.
I/O terminal block For input:	4 10 4 4 9001
1 piece, for output, 1 piece	
BNC connector Monitor BNC	ANM8606
jack to PIN jack adapter	

In addition, a full lineup of accessories including lenses and illumination equipment is available.

Unless otherwise specified, estimate and delivery prices do oncess ourdivises specified, estimate and delivery prices do not include technician dispatching and other related services. Therefore, for the situations given below, additional charges may be added.

Installation and trial operation guidance
Inspections, adjustments, and repairs
Technical support and instruction

Please contact

A220 OCV checker specifications

Item		Specifications
Frame memory		512 X 480 (pixels) X 256 gradations
Operator interface		Menu selection using special-purpose keypad
Monitor display		Can be switched between Gray Scale Memory, Gray Scale Thru and Gray Scale NG
Cameras		2 maximum (horizontal/vertical screen splitting possible)
		High-speed random camera (progressive type)/Electric shutter camera/Other
		commercially available cameras
Menus		Japanese/English (switchable)
Number of	product types	32
Inspection	Position/rotation adjustment	8 per type/Two-point adjustment function using gray edge/matching
functions	Smart matching	4 per type/Includes a differential processing function that operates after
	(sub-pixel	detection matching
	processing)	Sub-pixel accuracy multiple detection matching by gray scale correlation
		processing Rotation by raster detection and raster detection position
		(±30 degrees) Output: number of detected items, correlation values,
		position and angleTeaching registration changes possible from external source
		Smart matching: Judgment learning function via smart template
	Gray edge	32 per type/Detection at gray sub-pixel units
		Area specification: Line or rectangle
		Scan method: Single/projection, gray filter/width
		Detection position: Edge, front edge and rear edge, maximum differential,
		and multiple edge (256 max.)
		Output: Detected edge coordinates (X 10), number of detections
		Judgment: Number of detections
	Lead inspection	32 per type/Detection at gray sub-pixel units
		Area specification: Line or rectangle
		Scan method: Single, gray filter/width
		Detection position: Dual edge detection
		Output: Number of leads
		Judgment: Number of leads, pitch, width, and overall judgment
	Character	16 per type/Character quality inspection using matching, subtraction and labeling.
	verification	Possible to select between individual character inspection and pattern inspection.
		Individual:
		Possible to inspect up to a maximum of 30 characters.
		Auto pattern registration function that uses an original character
		It is possible to set so that only character edges are masked during nattern registration
		Pattern:
		Patterns can be registered without character segmentation.
		Output:
		No. of detections, Detection position, Maximum differential, No. of
		differentials, and Correlation value for each character.
		Judgment:
	Crownin-I	UN/NG for all characters and individual characters.
	Gray window	Mask area: None, rectangle, polygon (3 to 16 points), circle or ellipse
		Niask area, None, rectangle, polygonar (s to ro points), circle or empse
Numoriaal	adaulation	22 per tupo/Arithmetia areten equere reat distance between two points encoifie
amenual	oaloulation	substitution referencing of previous data and output control
ludament	output	External output (D) registers: 32 per type Internal judgment (B) registers: 32 per type
Sorial	output	BS-232C: 2ch
ocna		Start input product type switch numerical/judgment inspection result output
		changing the maximum and minimum numerical limits camera switch
Parallel		Innuts: 11 Outnuts: 14
		Inputs: Start input, product type switch, screen switch, template registration
		character registration
		Outputs: READY signal, numerical calculation results, judgment results.
		overflow, error signal, flush period signal
Display functions		Image suppress function when setting checkers
		Image rotation function when setting checkers
		Bright display of reject locations Numerical calculations results display
Image save function		8 screens
		Save/load function for inspection image (all screens/problem screens)
		Store images for re-inspection/resetting
		Windows-PC image save/load function using the Vision Backup- Tool Ver.2
Debug function		Trap function, Simple Spreadsheet
Setup data	backup	Image data and settings can be saved to a Windows PC using the Vision
		Backup- Tool Ver. 2

E

The standard A220 Micro-ImageChecker and High-speed random camera are compliant with the EC directive (CE marking). EMF performance has been improved, so you can safely include the equipment in systems destined for Europe: The A220 Micro-ImageChecker and High-speed random camera comply with the following EMC directives: EMC directive (89/336/EEC) EN50081-2: 1993 EN50082-2

These materials are printed on ECF pulp. These materials are printed with earth-friendly vegetable-based (soybean oil) ink.



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