

# NAiS IMAGECHECKER

## MICRO-IMAGECHECKER A218 - A118 MultiChecker V2 Series

### ■ Specifications

		A218 Multi-checker V2	A118 Multi-checker V2
CPU		32-bit RISC CPU (high-speed processing version)	32-bit RISC CPU
Frame memory		512 x 480 (pixels) x 256 gradations	512 x 480 (pixels) x 256 gradations
Operator interface		Menu selection by specialized keypad	
Monitor display		Change between gray-scale memory/gray-scale through/binary memory (A/B/C/D/E/F)/binary through (A/B/C/D/E/F)/gray-scale NG/binary NG (A/B/C/D/E/F)	
Processing	Gray-scale	8 bit 256 gradations	
	Binarization	6 groups of binary processing from the gray-scale memory (upper and lower threshold settings)	
Number of product types		64	32
Execution modes		Execute All mode: Execute all set checkers Automatic Switch mode: Change the checker to be executed in accordance with the judgment output result User-Defined mode: Specify the checker for execution when the start signal is input	
Inspection	Position/rotation position adjustment function	Max. 96 per product type Rotation position adjustment function	Max. 48 per product type X-Y position adjustment function
		Priority adjustment multi-stage adjustment sequence setting by matching/gray-scale edge/binary edge or feature detection.	
	Exposure adjustment	Max. 96 per product type	Max. 48 per product type
		Shape: rectangular Binarization adjusts according to changes in the gray-scale data Gray-scale mean value detection/judgement	
	Smart matching/matching (sub-pixel processing)	Smart matching = Max. 96 pcs.; Equipped with post-detection differential processing function	Matching = 48 per product type
		Sub-pixel accurate multiple detection matching by gray-scale correlation processing Rotation by raster detection and raster detection position ( $\pm 30$ degrees) Output = number of detected items/correlation numbers/position/angle teaching registered changes can be imported from external source smart teaching (A210) = judgement learning function by the smart template	
	Gray-scale edge detection (sub-pixel processing)	Max. 96 per product type	Max. 48 per product type
		Scanning method = individual/projection gray-scale filter/width function detection by sub-pixel unit Detection position = forepoint/forepoint and afterpoint/largest differential/multiple edge	
	Gray-scale window	Max. 96 per product type	Max. 48 per product type
	Feature extraction	Shape: rectangular/polygonal or oval mask Shape: rectangular/polygonal or oval Gray-scale mean value detection/judgement	
		Max. 96 per product type	Max. 48 per product type
	Binary window	Shape = rectangular/polygonal or oval mask Shape = rectangular/polygonal or oval Image filtering Labeling Output values: counter/center of gravity (to one decimal place)/area/shading/width/principle axis angle	
		Max. 96 per product type	Max. 48 per product type
	Binary edge detection	Max. 96 per product type	Max. 48 per product type
		Shape = line/plane filter/width functions forepoint edge detection	
Line	Max. 96 per product type	Max. 48 per product type	
	Shape = straight line/polygonal line/circle or arc Image filters White/black pixel number count/judgement		
Conversion data	4 registers, Can quote to numerical conversion, Can convert numerical conversion result to actual distance, Standard distance, No. of pixels, Coefficient		
Numerical calculations	Max. 96 per product type	Max. 48 per product type	
	Absolute value of difference between sine and cosine Four data calculations, arctangent, root, the distance-between-points special substitutions reference to previous data output control		
Judgement output	External output (D) register = Max. 96 per product type Internal judgement (R) register = Max. 96 per product type	External output (D) register = Max. 48 per product type Internal judgement (R) register = Max. 48 per product type	
External interface	Serial	RS232C = 2ch (max.115200bps) Compatible with Matsushita Electric Works PLC FP series Compatible with Mitsubishi MELSEC A Series/FX Series and Omron C Series PLCs	
	Parallel	Input = 11points Output = 14 points Removable screw-down terminal block Image trigger (timing sensor unnecessary) external sensor timing repeat start	
Inspection start	Image trigger (timing sensor unnecessary) external sensor timing repeat start		
Other specifications	Display functions	Display item suppressing function (menu display hide function) Image suppress function when setting checkers, Image rotation function when setting checkers (A218) Clearly display reject location, Rotational adjustment angle display (A218), Data Monitor function Display of image processed with image filter, simple spreadsheet, checker list display	
	Marker function	Maximum of 8 graphics/type (line, rectangle or circle), and registered images are displayed on the main screen	
Setup tools	Image storage function	30 screens	8 screens
		Save/load function for inspection image (all screens/problem screens) Store images for reinspection/resetting Windows-PC image save/load function	
	Debugging	Trap function Image storage function	
Setup help	Focus setup, aperture setup, lighting adjustment, image profile monitor, recommended threshold level, I/O monitor, enforce output		
Moving object inspection	High-speed random trigger camera (progressive)/flash/electronic shutter used		
Camera support	High-speed random trigger camera (progressive) = ANM831 Standard camera = ANM830A, Composite video (NTSC) input used (however the connection requires one port)		
Number of support cameras	2	1	
Operating voltage	24 V DC less than 0.9 A	24 V DC less than 0.7 A	
Setup data backup	Image data and setup data can be saved to a Windows PC using vision Backup Tool Ver.		

\* Type data saved in the previous controller of the Micro Image Checker A Series (Ver. 1) cannot be directly restored to V2 using the Vision Backup-Tool. In this case, you will need the dedicated data conversion software (freeware) to convert the Ver. 1 type data for V2 use. If you require the data conversion software or information about how to use it, contact your Aromat Corporation representative. You can also download the data converter software from the following Web page. <http://www.aromat.com/acsd>

■ 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 functions	Position/rotation adjustment	8 per type/Two-point adjustment function using gray edge/matching
	Smart matching (sub-pixel processing)	4 per type/Includes a differential processing function that operates after detection matching Sub-pixel accuracy multiple detection matching by gray scale correlation processing Rotation by raster detection and raster detection position ( $\pm 30$ degrees) Output: number of detected items, correlation values, position and angle Teaching 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 verification	16 per type/Character quality inspection using matching, subtraction and labeling. 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 segmentation function. It is possible to set so that only character edges are masked during pattern 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: OK/NG for all characters and individual characters.
	Gray window	32 per type/Area: Rectangle, polygon (3 to 16 points), circle or ellipse Mask area: None, rectangle, polygonal (3 to 16 points), circle or ellipse Output value: Gray scale mean value
Numerical calculation	32 per type/Arithmetic, arctan, square root, distance between two points, specific substitution, referencing of previous data, and output control	
Judgment output	External output (D) registers: 32 per type Internal judgment (R) registers: 32 per type	
Serial	RS-232C: 2ch Start input, product type switch, numerical/judgment inspection result output, changing the maximum and minimum numerical limits, camera switch	
Parallel	Inputs: 11, Outputs: 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	

# NAIS IMAGECHECKER A230 (OCR)

## MICRO-IMAGECHECKER A230 Character Recognition Type

### ■ Specifications

Item	Specifications	
Frame memory	512 × 480 (pixels) × 256 gradations	
Operator interface	Menu selection using special-purpose keypad (English/Japanese switchable)	
Monitor display	Can be switched between Gray Scale Memory, Gray Scale Thru and Gray Scale NG	
Processing	Gray scale 8-bit 256 gradations	
Number of product types	32	
Inspection functions	Position and Rotation position adjustment function	8 per type Sequence setting by matching/gray scale edge Priority adjustment function, Multi-stage adjustment function
	Character recognition	Max. 8 per type Area: Rectangle Inspection method: Outputs character label with highest match with specified dictionary. Processing: Character reading using Neural Network Inspection object: Black/white specification possible Inspection direction: Right to left, left to right, up to down, and down to up Character segment: Gray scale, automatic binarization, fixed binarization, with dilation/erosion function Adjustment: Position and rotation adjustment group Output value: Read character string (16 characters max.) Other: Read function for joined characters and ability to specify character strings for judgment
	Dictionary for character recognition	5 max. (equipped with OCR-A and OCR-B fonts) 40 characters max. (36 alphanumeric characters and 4 symbols) per dictionary 3 patterns max. per character
	Character verification	16 per type Character quality inspection using matching, subtraction, and labeling. (Supports up to ±30 degrees rotation for each character.) Character: Possible to inspect up to a maximum of 30 characters. Auto pattern registration function that uses an original character segmentation function. It is possible to set so that only character edges are masked during pattern registration. Pattern: Patterns can be registered without character segmentation. Output: Number of detections, Detection position, Maximum subtraction, Number of subtraction, and Correlation value for each character. Judgment: OK/NG for whole characters and individual characters.
Smart matching (sub-pixel processing)	4 per type Includes a subtraction processing function that operates after detection matching 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, detection position and angle, teaching registration changes possible from external source Judgment learning function via smart template	
Lead inspection (sub-pixel processing)	32 per type Detection at gray sub-pixel unit 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	

Item	Specifications	
Inspection functions	Gray edge (sub-pixel processing)	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 value, or multiple edge (256 max.) Output: Detected edge coordinates, number of detections Judgment: Number of detections
	Gray window	32 per type Area: Rectangle, polygon (3 to 16 points), circle, or oval Mask area: None, rectangle, polygon (3 to 16 points), circle or oval Output value: Gray scale mean value
Conversion data	4 registers, Can quote to numerical calculation. Can convert numerical calculation result to actual distance. Standard distance, Number of pixels, Coefficient	
Numerical calculation	32 per type Arithmetic, arctan, square root, distance between two points, specific substitution, referencing of previous data, and output control	
Judgment output	External output (D) registers: 32 per type Internal judgment (R) registers: 32 per type	
External I/O	Serial	RS232C: 2 channels (max. 115200bps) Compatible with Matsushita Electric Works "FP Series" PLCs, Mitsubishi "MELSEC A Series/FX Series" PLCs, and Omron "C Series" PLCs.
	Parallel	Input: 11 points, Output: 14 points, Removable screw-down terminal block
Display functions	Display image brightness modification Image suppress function when setting checkers Image rotation function when setting checkers Bright display of reject locations, Data monitor, Checker list	
Setup support tools	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, Spreadsheet
	Setup help	Focus setup, Aperture setup, Lighting adjustment, Gray scale profile monitor, Input monitor function, Forced output function
Moving work compatibility	Double-speed random camera (progressive), Flash, Electronic shutter	
Camera	Double-speed random camera (progressive): ANM831, Standard camera: ANM832 Composite video (NTSC) input compatible (however the connection requires one port)	
Number of cameras	2	
Operating voltage	24V DC, 0.9A max.	
Setup data backup	Image data and settings can be saved to a Windows PC using the Vision Backup- Tool Ver. 2	
Dimensions (mm)	40 (W) × 120 (H) × 84 (D)	