

Specifications

General specifications

Item	Specifications
Rated operating voltage	24V DC
Operating voltage range	21.6 to 26.4 V DC (including ripples)
Rated current consumption	1.5 A max. (2-camera type) / 2.0 A max. (4-camera type)
Ambient temperature during use	2-camera type: 0 to +45°C (no freezing or condensation) 4-camera type: 0 to +40°C (no freezing or condensation)
Storage ambient temperature	-20 to +60°C (no freezing or condensation)
Ambient humidity during use	35 to 85%RH (at 25°C (no freezing or condensation))
Storage ambient humidity	35 to 85%RH (at 25°C (no freezing or condensation))
Noise immunity	1,000 V, Pulse width: 50 ns, 1 μs (using the noise simulator method)
Vibration resistance	10 to 55 Hz, 1 sweep/min, double amplitude of 0.75 mm, 30 minutes each in the X, Y, and Z directions
Shock resistance	196 m/s ² , 5 times each in the X, Y and Z directions
Insulation resistance (initial value)	100 Ω or higher (measured by a 500 V DC megger) *1 Input and output terminals -- Power and ground terminals Input and output terminals -- Non-energized metal part Power terminal -- Non-energized metal part
Breakdown voltage (initial value)	500 V AC for 1 min (600 V AC for 1 sec), Cutoff current: 10 mA *1 Input and output terminals -- Power and ground terminals Input and output terminals -- Non-energized metal part Power terminal -- Non-energized metal part
Battery life	5 years or longer
Weight	Approx. 1,500 g

*1: The evaluation was carried out with the primary side power supply varistor and capacitor removed from the internal circuit of the unit.

Functional specifications

Item	Specifications
Input/ Output	Cameras From the quad-speed camera (640x480), 2-megapixel camera (1600x1200) and ultra-compact double-speed camera (640x480), up to two and four cameras can be attached to the 2-camera type and 4-camera type units respectively.
	Monitor output XGA (1024x768) output
	Memory card SD memory card
	Serial RS-232C x 2, RS485 x 1, USB x 1, Ethernet x 1
	Parallel Phoenix terminals: 14 inputs / 15 outputs MIL terminals: 32 inputs / 32 outputs
	Keypad input 1 connector for dedicated keypad (ANPVP**)

Image processing functional specifications

Item	Specifications
Menu display	Japanese/English selectable
Monitor display (XGA)	Split-screen display of up to four camera images Zoom function (2 to 400%) Image display: Through/Memory/NG object images Display effects: Gray Scale/Binarization Group/Pre-processing Group Display area (1024 x 768), 16,770,000 colors
Processing methods	Gray scale processing, binary processing
Number of connected cameras	2-camera type: Up to two cameras 4-camera type: Up to four cameras (Select from: Quad-speed camera, 2-megapixel camera, and ultra-compact camera)
Camera connection	Mini camera link connector for connection by camera link (PoCL)
Trigger input	Select from: All cameras, individual cameras, detection trigger (all)
Capture method	Frame mode only. Partial capture of up to two portions In partial capture mode, the minimum capture area to be set for the quad-speed and ultra-compact cameras is one line, and that for the 2-megapixel camera is 100 lines.
Shutter speed	11 patterns: 30 μs/100 μs/250 μs/500 μs/ 1 ms/5 ms/10 ms/50 ms/100 ms/500 ms/1000 ms
Gain setting range	0.25 to 1.0
No. of product types	25,600 types max. (depends on setting data)
Inspection functions (Checkers)	1,000 checkers/product type max. (depends on setting data) • Position correction, rotation correction, area adjustment • Binary window, gray scale window, binary edge, gray scale edge • Feature extraction, smart matching, line, flaw detection • Connector binary window, connector gray scale window • Connector gray scale edge
Inspection operation mode	Sequential processing: Mode compatible with the conventional model. After completing the result output, the next image capture for inspection can be started. Parallel processing: After completing the first image capture, the image capture for the next inspection can be started immediately. Image capture and inspection can be processed concurrently.
Binarization level group	8 levels/product type, 256-gray scale (0 to 255)
Pre-processing filters	13 filters For each product type, 5 groups/camera, 5 stages max. Filter size: 3 x 3 / 5 x 5 / 7 x 7 / 9 x 9 (exc. median) 13 pre-processing filters (Dilation/Erosion/Median/Smoothing/Sobel/Prewitt/Background cutting/Edge detection in the X direction/Edge detection in the Y direction/Laplacian/Edge enhancement/Dilation → Erosion/Erosion → Dilation)
Processing resolution	2-megapixel camera: 1600 horizontal x 1200 vertical pixels Quad-speed/Ultra-compact camera: 640 horizontal x 480 vertical pixels

Item	Specifications
Numerical computation	1,000 formulae/product type max., including those for evaluation result output (depends on setting data) Calculations involving output values of inspection functions
Operators	Four fundamental operations (+, -, x, ÷), bracket operations, trigonometric functions (14 types), comparison functions (6 types), math functions (15 types), geometric functions (18 types)
Statistic data operation items	Scan count/Pass count/Fail count/Average/Distribution/Max./Min./Range/Pass average/Pass distribution/Pass max./Pass min./Pass range/Fail average/Fail distribution/Fail max./Fail min./Fail range User limit: 1000 items /product type max.
Other operation items	Previous data of numerical computation and evaluation result outputs, general-purpose registers
Number of substitution items	16 items/formula
Evaluation result output	1,000 formulae/product type max., including those for numerical computation (depends on setting data) Substitution for and logical calculation of evaluation results from checkers and numerical computations
Operators	NOT/AND/OR/XOR/Brackets
Number of substitution items	16 items/formula
Others	Overall evaluation condition setting, image storing condition setting Image output condition setting, parallel output setting (8 outputs from OUT0 to OUT7 and 16 outputs from OUT0 to OUT15, or all setting output)
Data R/W mode	Four-window display of up to 80 (5x16) cells/product type on screen in table form in RUN mode Substitution of title input, checker conditions/results, numerical computation results, numerical computation evaluation results, evaluation output results, statistical results possible. Change of upper/lower limits of numerical computation in the table in RUN mode possible.
Conversion data	Coordinates, coordinate origin, horizontal and vertical coefficients can be set for each camera to obtain actual dimensions.
Others	Comment input
Marker	8 markers/product type max. for each camera Graphic display on the operation screen Selectable from eight colors Shapes Rectangle/Circle/Ellipse/Polygon/Straight line
Collective movement	Collective movement of set checkers in units of position/rotation correction groups Set the movement to Yes/No. Position and rotation correction checkers cannot be moved.
Template	Re-registration position Setting position/Correction position
Re-registration setting	Display Yes/No
Execution mode	Execution all Execution of all checkers Branch execution Branch blocks (0 to 9) can be set. Designated execution Blocks to be executed (0 to 9) can be set.