Vision Sensors

Application-specific machine vision - simple and intelligent

Brochure · December 2008

SIMATIC MV230

SIMATIC MV220

SIMATIC VS120

SIMATIC Sensors

SIEMENS

Vision Sensors

Simple and intelligent

The intelligent vision sensors SIMATIC VS120, the SIMATIC MV220 color area sensor and the SIMATIC MV230 height profile sensor are specially designed for application-specific machine vision.

Their task is the inspection of objects in relation to their form, type, position, color or elevation profile. The product line impresses customers by a simple operating concept and easy teaching of the inspection tasks.

Functionality overview

SIMATIC MV220

■ Inspection task	Color inspection tasks in manufacturing and assembly systems
■ Applications	Manufacturing, packaging industry and food and beverages industry
■ Type of parts to be inspected	e.g. completeness of colored parts, blister packs, cups, bottles, labels and covers.

SIMATIC MV230

■ Inspection task	Inspection of surface contours and profiles in manufacturing and assembly
■ Applications	Manufacturing, the packaging industry and mechanical engineering
■ Type of parts to be inspected	Inspection, parts recognition and position checking of parts based on their geometric surface contour or profile

SIMATIC VS120

■ Inspection task	Correctness, lack of damage and position of a part or pattern; position of the part with x/y coordinates and angle of rotation in degrees, presence inspection
■ Applications	Conveyor belts, workpiece holder carousels, gripper units, production machines
■ Type of parts to be inspected	e.g. screws, bolts, molded parts, pharmaceutical products, confectionery, logos, patterns, etc.

SIMATIC MV220: Quick inspection of colored objects

- Optimized for use under harsh industrial conditions thanks to degree of protection IP65

- High-speed procedures can be controlled thanks to the short inspection time of the sensor (approx. 30 inspections per second)

- Fast changeover thanks to easy model switchover
  - 16 inspection models/objects can be taught
  - The inspection models are switched over by means of digital inputs

- Flexible adaptation to the application is possible
  - Flexible adjustment of image window and reading distance
  - Flexible adjustment of parameters

- Fast commissioning
  - No image processing knowledge necessary
  - No programming necessary

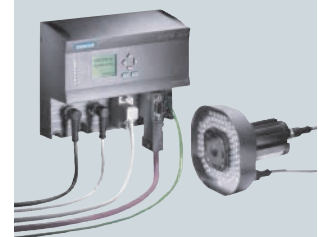- Integration into the plant automation using digital inputs and outputs

SIMATIC MV230: Quick inspection of height contours and profiles

- Optimized for use under harsh industrial conditions – degree of protection IP65 and immune to influences of ambient light

- Inspection of objects with a width of up to 7 cm

- Noticeable difference height of up to 100 mm

- Fast changeover thanks to easy model switchover
  - 16 inspection models/objects can be taught
  - The inspection models are switched over by means of digital inputs

- Flexible adaptation to the application is possible
  - Flexible adjustment of image window and reading distance
  - Flexible adjustment of parameters

- Fast commissioning
  - No image processing knowledge required
  - No programming required

- Integration into the plant automation using digital inputs and outputs

SIMATIC VS120: Inspection of small components for shape, type or position

- Object recognition

- Sort function for up to 15 trained objects

- Fast commissioning
  - No image processing knowledge required
  - The system is commissioned by teaching it, not programming it (64 models can be taught)

- High flexibility: a quick changeover of the plant to other types is possible in the case of previously trained objects

- Complete packages consisting of lighting, processing unit, sensor and cables

- Realization of a stand-alone solution for simple conveyor units without an additional PLC

- Simple connection with PROFIBUS DP/PROFINET or serial interface

- WinCC integration

- Remote diagnostics

- Web server for operation and start setup support

The technology at a glance

Vision Sensors			
	MV220	**MV230**	**VS120**
Sensor type	CMOS sensor (color), 640 x 480 pixels	CMOS sensor (color), 750 x 480 pixels	CCD chip, 640 x 480 quadratic pixels
Image capture	Digital, max. 33 frames/second	Digital, 20 frames/second	Triggered frame transfer
Sensor head type	Variable display field size	Fixed display field size	2 x fixed focus with fixed display field size, 1 x C/CS mount with variable display field size
▪ Available versions	Complete system		
▪ Enclosure	see below	see below	Extruded aluminum enclosure
▪ Degree of protection	IP65	IP65	IP65

Parts size (W x H)	Display field size (infinitely) adjustable
	- For object distance of 50 mm:
	  Display field size 40 x 30 mm
	- For object distance of 250 mm:
	  Display field size 200 x 150 mm
		- For object distance of 310 mm:
		  Display field size 75 x 100 mm
			- Objects up to 60 mm x 40 mm,
			  inspection window: 70 mm x 50 mm
			- Objects up to 34 mm x 24 mm,
			  inspection window: 40 mm x 30 mm
			- Variable size of object with C/CS mount

Ambient temperature	0 ... 45 °C, no condensation		0 °C ... 50 °C, without fan
Lighting			
▪ Illuminant	Integrated white LEDs	Laser diode, red light	Red LEDs
▪ Enclosure	see below	see below	Plastic ring light with plastic diffusing panel
▪ Degree of protection	IP65	IP65	IP65
Processing unit			
▪ Operator controls	4-character text display with 4 operator buttons		LCD display panel (4 lines/10 characters) and 6 operator buttons for menu operation
▪ Number of types to be saved	up to 16	up to 16	up to 64
▪ Inspection triggering	External	External or internal freewheeling trigger	External
▪ Permissible parts rate	33 inspections/s	20 inspections/s	20 items/s (object-dependent)
▪ Infeed direction	Any for external triggering		
- For automatic triggering	–	Any	–
Enclosure (degree of protection	Plastic, aluminum (IP65)		Plastic, suitable for cabinet-free installation (IP40)
Interfaces on processing unit			
▪ Digital inputs for 24 V DC	6 (of which 1 trigger input)		8 (of which 1 trigger input)
▪ Digital outputs for 24 V DC	5	4	6 (including 3 x 0.5 A)
▪ Integrated interface	–	–	PROFIBUS DP / Ethernet / PROFINET IO
▪ Sensor head	–	–	Digital interface
▪ Supply voltage	24 V DC	24 V DC	24 V DC
Power consumption max.	2 A	2 A	4 A