OM02 HIRES
Special CCD Cameras
for PCB Inspection

Sinartis

Image Processing Technologies

OM02 HIRES CCD camera

In an anodized aluminum block which is vibration resistant and dust protected are mounted a CCD camera, a *telecentric* objective, a near infrared illuminator and an optical filter which has a transmission peak at the illuminator wavelength. The illuminator radiation passes through the filter but the camera receives only the backscattered light from the object of the same wavelength. So, the visible environmental light is cut-off.

The connections for power in and signal out are made with connectors fixed by screws.

The CCD cameras **OM02** are designed for the inspection and the alignment with high precision of PCBs (*Printed Circuit Boards*) during their manufacturing process (layers stacking, pressing, cutting, drilling, etc.).

The use of a *telecentric* optics is very important to reduce perspective errors and to obtain constant magnification in spite of the fact that the PCB changes its distance from the optics, due to the change of thickness of multi-layers.

The CCD cameras **OM02** are manufactured with three working areas: *Standard* 8 x 10.6 (4x 5.3 with zoom 2X active) mm *Laser* 3.6 x 4.8 (1.8 x 2.4) mm e *BGA* 2.3 x 3 (1.1 x 1.5) mm.

Being the working areas so small it is possible to detect images with high resolution and to process them for micrometric measurements.

TECHNICAL SPECIFICATIONS

CCD Camera
- Sensor: CCD 1/3"
- Standard video: *CCIR* B/W
- Number of *pixel*: 795 Hor. x 596 Ver.
- Scanning System: 625 lines 50 fields/sec
- Video *out*:   1 Volt p-p / 75 Ohm
- *Shutter*:   1/50—1/120.000 automatic
- *S/N:*   52 –60 dB (*AGC off*)
- *Iris*:   automatic esp.
- *AGC:*   ON /OFF

Optics
- Objective: fixed focus telecentric
- Working area :
  8 x 10.6 (4x5.3 Zoom) mm *Standard*
  3.6 x 4.8 (1.8x2.4 Zoom) mm *Laser*
  2.2 x 2.9 (1.1x1.4 Zoom) mm *BGA*
- Working distance: 41   mm (± 12) *Standard*
  31.5 mm (± 2.5) *Laser*
  43.5 mm (± 1.5) *BGA*

Material
- Black anodized aluminum

Illuminator *IR LED*
- Wavelength: 880 nm
- Number of *LED*s: 18 in a ring dia. 21 mm
- Illum. angle: 20°
- Lum. intensity: >20 mW/sr / *LED*

Dimensions (mm, included connectors)
  Standard :   128 x 54 x 48
  Laser :   140 x 54 x 48
  BGA :   140 x 54 x 48

Power in
- +12 Volt – 250 mA

Connectors
- DIN SKV 5p M
  for power in CCD and LED
  for zoom, AGC and mirror on/off signal input
- TNC for video out

Connectors

How to order:
8S0965/S : OM02 Hires *Standard*
8S0965/L : OM02 Hires *Laser*
8S0965/B : OM02 Hires *BGA*
8S0765   : Coax. Cable 5 m BNC-BNC
8S0966   : Power Cable 5 m DIN 5P F -DSUB 9

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APPLICATION NOTE

Special CCD cameras **OM02** for *PCBs* inspection can be used in a *kit* which includes electronic boards with image capture and processing software manufactured by *Sinartis*.
Depending on the application, it is possible to choose between a *stand-alone* solution or a PC-based one. In both cases, software is available to find the PCB reference *pad* and to calculate its geometrical center with very high (*sub-pixeling*) precision and repeatability of ($\approx\pm1$ μm).
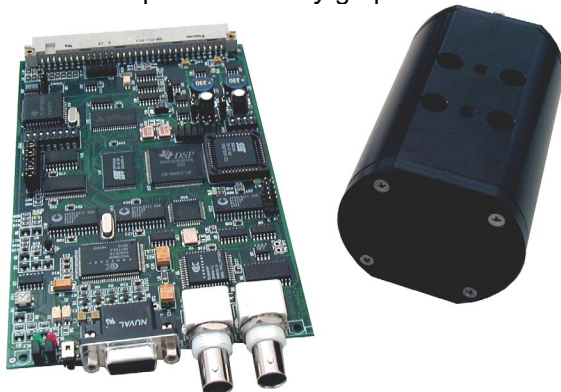
STAND ALONE processing
(no PC required)

In this configuration the **OM02** camera is delivered in a *kit* with the *DSP* (*Digital Signal Processor*) board **Sindsp-5409** or with the *Video Processor* apparatus **Sinpatt**.
A proprietary software to process the PCB pads is pre-loaded on a Flash EPROM memory and it executed by the *DSP* processor.
The data communication with a control unit (*CNC*, *PLC* etc.) is made by RS-232 or RS-485 standard serial interfaces following a specified protocol which is delivered to the customer.
It is possible to have as input up to four CCDs cameras in *multiplexing* mode. As outputs, in addition to the standard serial interfaces, there is a monitor output with *overlay* graphics.
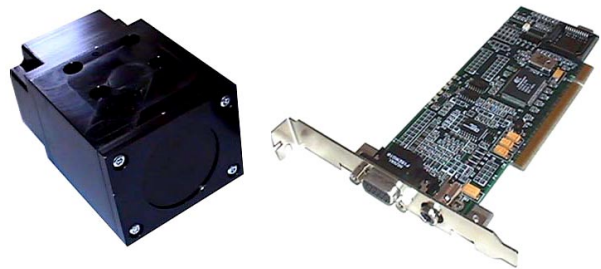

KIT OM02 with Sindsp-5409 DSP board

Sinpatt *Video Processor*

PC BASED processing

In this configuration the **OM02** camera is delivered in a *kit* with the frame grabber **Sincapt-II** for video capture and image transfer in real time to a host PC memory by standard PCI interface (*Peripheral Component Interface*).
Sincapt-II has driver compatibility for *Windows* 95/98, *Windows XP*, *Windows* 2000, *LINUX* and it is software supported for C/C++ languages and compilers.
On request, SW libraries *SinIMAGE.lib* are available for advanced image processing algorithms which are optimized for the measurement of PCB pads.

KIT OM02 with Sincapt-II frame grabber

PC based image acquisition

HOW TO ORDER
8S0918/S/L/B:Kit OM02H+Sindsp5409+FW
8S0919/S/L/B:Kit OM02H+ SincaptII+Drivers+OM02
+ SW *SinSample* (C++ source code)
8S0920/S/L/B:Kit OM02H + Sinpatt V.P.+ FW
8S0887: Cable 3 m DIN 5P F e TNC– DSUB15M Sincapt
8S0890: Cable 3 m DIN 5P F e TNC– DSUB15M Sindsp
8S0507: Cable coax. video 5 m BNC-TNC
8S0825: Cable coax. video 5 m BNC-BNC for monitor
8S0892: Cable coax. video 5 m TNC-RCA for Sincapt
8S0853: External power supply for Sinpatt
110711: SinImage.lib SW library for advanced image
processing (C/C++, Visual C/C++)