

**University Visvesvaraya College of Engineering,  
Department of Mechanical Engineering**

**Detailed specification of Machine Vision and Image  
Processing System**

TEQIP-II/2015/KA2G01/Shopping/44 Package No. 119

Sl. No.	Particulars
<p><b>1</b> <b>1.1</b> <b>1.2</b> <b>1.3</b> <b>1.4</b> <b>1.5</b> <b>1.6</b> <b>1.7</b>  <b>1.8</b> <b>1.9</b> <b>1.10</b></p>	<p><b>Camera:</b> Progressive Scan Color CCD Camera with 1024 x 1024 Pixel, 12-16 Bit ADC, High fps(120-200), 1/2" CCD size, Adjustable gain, low Offset, Binning Mode, Synchronization - Frame rate adjustable, External trigger with internal exposure control, External trigger with pulse width exposure control, Power Supply, necessary Camera Link Cable Stand and Standard Megapixel Lens.</p> <p><i>Note: Camera should be capable of capturing images of stationary/ moving /rotating parts with image quality same as that of stationary object.</i></p>
<p><b>2</b> <b>2.1</b>  <b>2.2</b> <b>2.3</b> <b>2.4</b> <b>2.5</b>  <b>2.6</b>  <b>2.7</b>  <b>2.8</b>  <b>2.9</b></p>	<p><b>Frame Grabber:</b> 20MHz to 100MHz Camera Link clock, PCI x 4 host bus interface, 512MB – 1.7GB of DDR SDRAM, Frame and line scan sources Support, On-board processing: image reconstruction, image sub-sampling, color space conversion, Bayer Conversion, Input formats: mono &amp; color 8/16 bit, Output Formats: mono 8/16bit, RGB 8/16 bit planar, BGR 32bit packed, Connectivity: Two- Four Camera Link ( HDR) connectors, General purpose I/O : TTL configurable , aux LVDS, ex Opto-isolated, hsync &amp; vsync , separate LVDS pixel clock , necessary power supply and cables, Compatible with image processing software library and Windows XP/ Vista/ 7 / 8.</p>
<p><b>3</b> <b>3.1</b> <b>3.2</b>  <b>3.3</b>  <b>3.4</b></p>	<p><b>Image processing software:</b> Interactive Windows based Imaging software - easy- to-use, Interface with point-and-click access for image capture, processing, analysis, annotation, display and archiving with tools like Pattern Recognition (Pattern Matching and Geometric Model Finder), Feature Extraction and Analysis (Blob Analysis and Edge Finder), 1D &amp; 2D measurements (Measurement, Bead Inspection and Metrology), Color Analysis (Color Distance, Color Matching), Character Recognition (OCR and String Reader),</p>

3.5	1D and 2D code reading and verification, Registration, 2D calibration, 3D calibration and reconstruction,
3.6	High Level Programming Library for Image Capture, Image Processing,
3.7	Analysis, display & archiving.
3.8	Processing should be performed to sub-pixel accuracy, Option of multi-processing and multi-threading support, Compatible with hardware technologies: SIMD, multi-core CPU, multi-CPU, GPU1 and FPGA.
3.9	Programming environments for windows application development : C, C++, C# and Visual Basic languages, with applications compatible to new hardware platforms,
3.10	Capable of handling of interfaces addresses means, such as digital I/O, data logging, visualization of live images and generation of results
3.11	Image Compression/decompression and should supports 32-bit/64-bit Windows XP/Vista/7/8.
4	<b>Lens:</b>
4.1	Lens kit suitable for camera specification with working distance 100-200mm,
4.2	Field of View 10-70mm,
4.3	Rear converters 1.5x – 3x ,
4.4	Extension tubes and zoom lens of 10-120mm with manual zoom.
5	<b>Lighting:</b>
5.1	should provide even illumination preventing glaring from metal surfaces.
5.2	<b>Diffused illumination:</b> Ring type with outer diameter 100-150mm, inner diameter 70-100 mm, inclination of emitting surface 45 <sup>0</sup> - 60 <sup>0</sup> , color: suitable for our application.
5.3	<b>Direct illumination:</b> LED arrays arranged as ring with outer diameter 100-150mm, inner diameter 30-50 mm, inclination of emitting surface 30 <sup>0</sup> - 45 <sup>0</sup> , color: suitable for our application.
5.4	<b>Coaxial illumination:</b> outer dimension: 80 x 60mm, inner dimension: 50x 50mm, color: suitable for our application. All the above lighting system should be accompanied with necessary power supply, accessories and cables 5-10m long.
6	<b>Camera stand:</b>
6.1	Non-reflective column of 1000mm height with printed fine grid cm/inch scale.
6.2	The column mounted on baseboard (W x H x D): approx. 500 x 25 x 600 mm.
6.3	Hand-cranked height adjustment along column
6.4	With horizontally adjustable camera arm to change the distance to the column,
6.5	approx. 100mm back and forth.
6.6	Maximum load to be mounted : 2-3 kgs.

## Accessories & Spares

The manufacturer should furnish details of all essential/optional accessories, spares and consumables for the machine.

## **Documentation:**

One Set of following documents in English to be supplied along with the machine.

- Machine Description Manual
- Operational Instruction Manual
- Maintenance & Spare Parts manual
- Programming and control system manual
- Electrical manual for machine and system
- Machine test Charts

## **Installation & Commissioning**

The scope of supply should include installation and commissioning of machine at our institute. Mention details for site preparation for Installation and commissioning.

## **Training**

Complete training for our personnel towards programming, maintenance and detailed operation of machine.

## **Warranty**

The Machine shall be warranted for defective materials, manufacturing defects and functional performance for a period of minimum 36 months from the date of commissioning.

## **Others**

The manufacturer should have sufficient experience in supply of similar machines. Details of supply to educational institutes and industries are to be provided. Mention the model name if any of the Machine.