PULNiX PRELIMINARY DATA SHEET

Rev. 03/31/00

ZiCAM™ PROGRAMMING-FREE SMART CAMERA

NEW PRODUCT SUMMARY

- Neural network technology
- 648 x 484 8-bit monochrome digital camera
- Multimedia Recognition Engine (MUREN™), including ZISC®, FPGA
- Short learning time (BGA inspection requires only a few minutes)
- Flexible interface with PLC
  - Source (PNP) / Sink (NPN) Output
  - Source (PNP) / Sink (NPN) Input
- RS-232 communication interface
- PCMCIA hard disk for image storage
- Composite analog video output (60 Hz)•
- Keyboard interface

FUTURE SUPPORT CAPABILITY

- 10 Base-T Ethernet, for fast image data transmission applications
  Color Digital Camera, for color appplications
  PCMCIA hard Disk, for larger data storage applications
  VGA Display Output, for local display and inspection result output
  Keyboard interface

GENERAL DESCRIPTION

The Pulnix ZiCAM is a programming-free, system-in-a-body smart camera for machine vision. A compact and cost-effective intelligent camera, the PULNiX ZiCAM eliminates the need for the expensive and cumbersome PCs and frame grabbers required by typical image processing systems.

Based on state-of-art neural network technology, the heart of the ZiCAM is the ZISC® (Zero Instruction Set Computer) chip. True parallel processing architecture realizes quick learning and computing, performing multi-dimensional non-linear classifications unacheivable via conventional algorithms. While other smart cameras require dedicated software/hardware program development for a fixed application, the PULNiX ZiCAM stores on-site object images inside the camera, learning the core factor to provide an answer based on interactive training.

INTERFACE

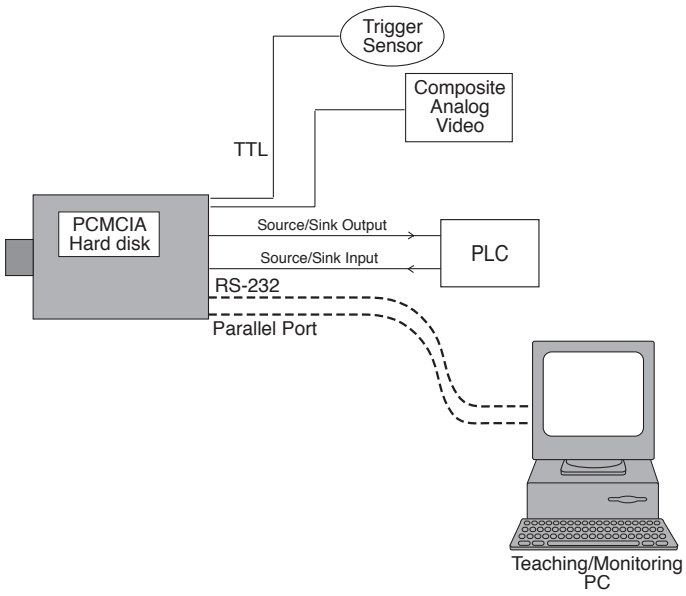
The PULNiX ZiCAM has a flexible interface with PLC and PC. Eight open collector outputs and five inputs enable the camera to directly interface with PLC. The I/O type is adjustable either as a PNP source or NPN sink level. TTL I/O is also available. Two RS-232 communication ports are supported.

APPLICATIONS

The capability to adapt itself to a new inspection object by reorganizing the RBF neural network chip results in a camera with the flexibility required by the most demanding machine vision applications. Suggested applications include:

- BGA (Ball Grid Array)inspection
- Pharmaceutical tablet inspection
- Web inspection
- Texture analysis
- Date code recognition
- Food sorting

FUNCTIONAL BLOCK DIAGRAM



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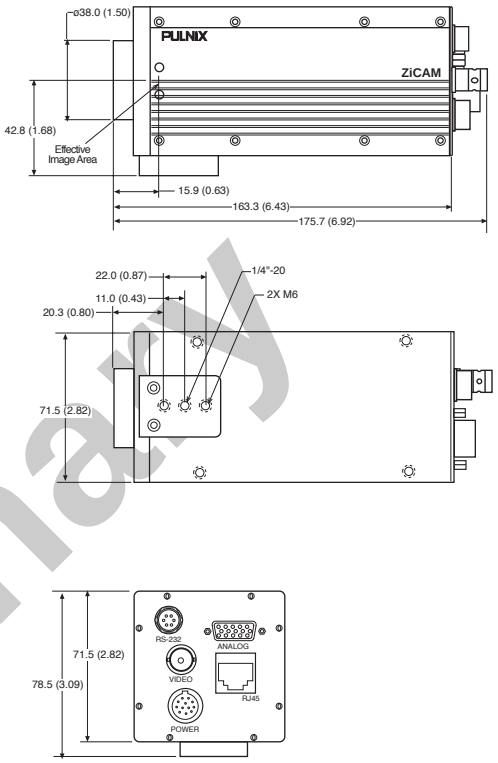
Rev. 04/01/99

PRELIMINARY PRODUCT SPECIFICATIONS

Imager	1/2" progressive scanning interline transfer CCD
Pixels	648 (H) x 484 (V)
Cell Size	9.0μm x 9.0μm square pixels
Scanning	60 Hz (double speed) non-interlace
Sync	HD = 31.469 KHz ±5%, VD = 59.9 Hz
Asynchronous reset	Ext. VINIT Ext. shutter speed control pulse (pulse width control)
Pixel Clock	25.49 MHz
S/N ratio	50 dB min. (AGC = OFF)
Video output	1.0 Vp-p composite video, 75Ω non-interlace
Interface	Source (PNP) / Sink (NPN) I/O for PLC TTL I/O (optional) RS-232 PCMCIA slot for Hard Disk Drive/VGA display
Electronic shutter	Asynchronous electronic shutter Mode A : 1/32,000 max. (controlled by 1H, 2H, 4H...) Mode B : External speed control pulse input
Lens mount	Full frame resolution per shutter
Vibration & shock	C-mount
Size (W x H x L)	Random Vibration 7 Grms 10-2000Hz, Shock 70 G
Weight	71.5mm x 71.5mm x 163.3mm
Power cable	812 g

PHYSICAL DIMENSIONS

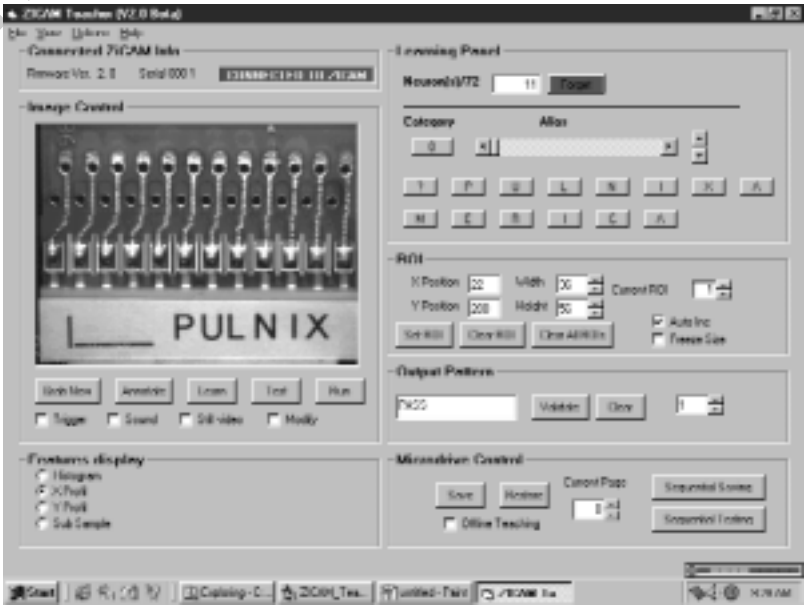


TEACHING TOOL

Each inspection object is classified as a category in the neural network, and is memorized inside ZiCAM. ZiCAM's teaching is done prior to starting the actual inspection. The user relates the object with a predefined category via "ZiCAM Teacher", the teaching software. "ZiCAM Teacher" is an interactive GUI software program that allows the user to teach ZiCAM efficiently and easily.

Specifications

- Quick, easy object classification with GUI support.
- 320 x 240, 160 x 120, and 80 x 60 image resolution display.
- Load/Save learning results from/to the PC hard disk or camera EEPROM.
- Multiple ROI (Region of Interest). Load/Save ROI's as a mask.
- Microsoft Windows 95/98



For product availability information or technical assistance contact the Imaging Products Sales Department.

PULNiX

Industrial Products Division

PULNiX America Inc.
1330 Orleans Drive
Sunnyvale, CA 94089

Tel: 408-747-0300
Tel: 800-445-5444
Fax: 408-747-0660

E-mail:pulnix@pulnix.com
www.pulnix.com