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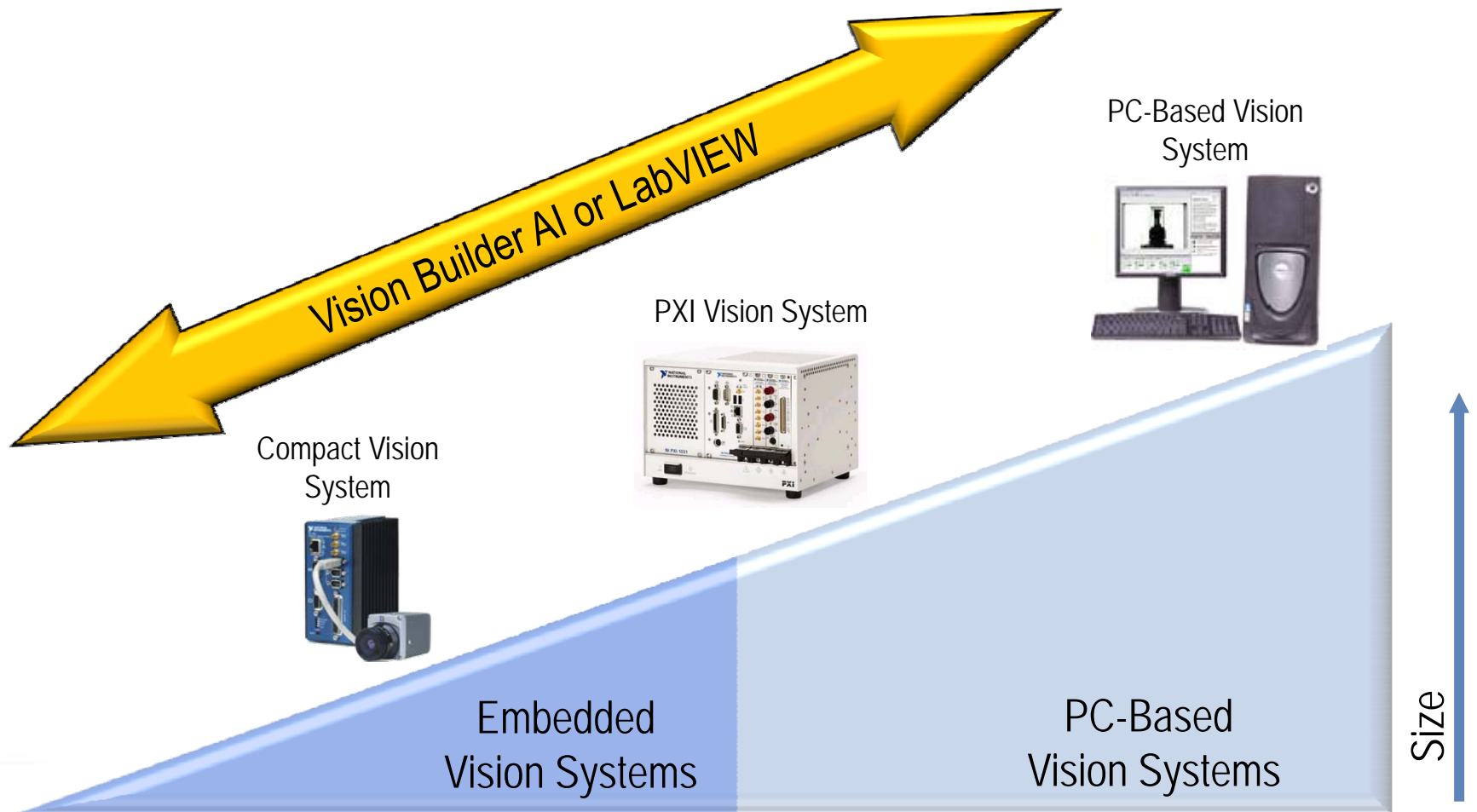
[ni.com/nidays](http://ni.com/nidays)



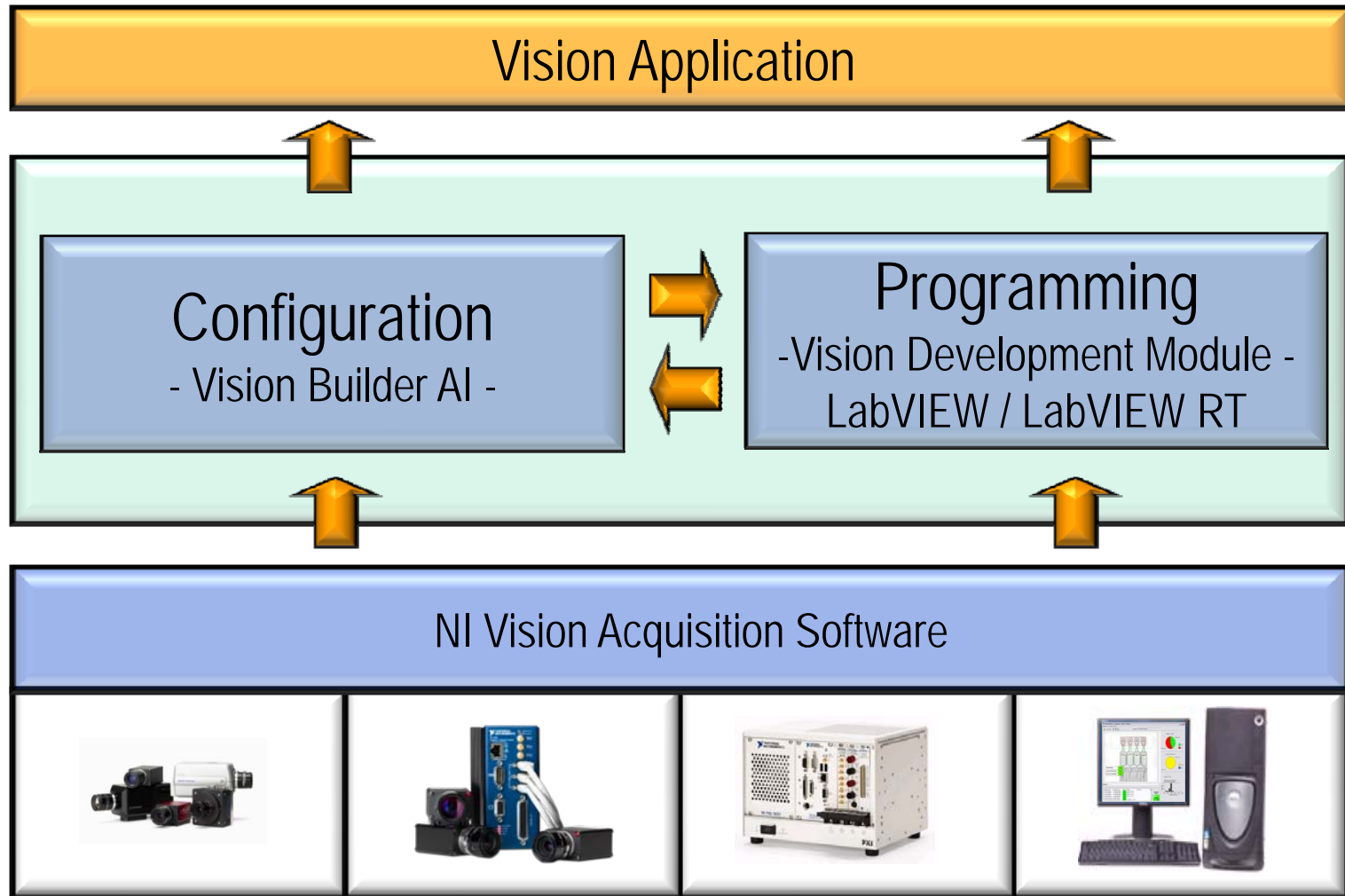
# The NI Smart Camera Family



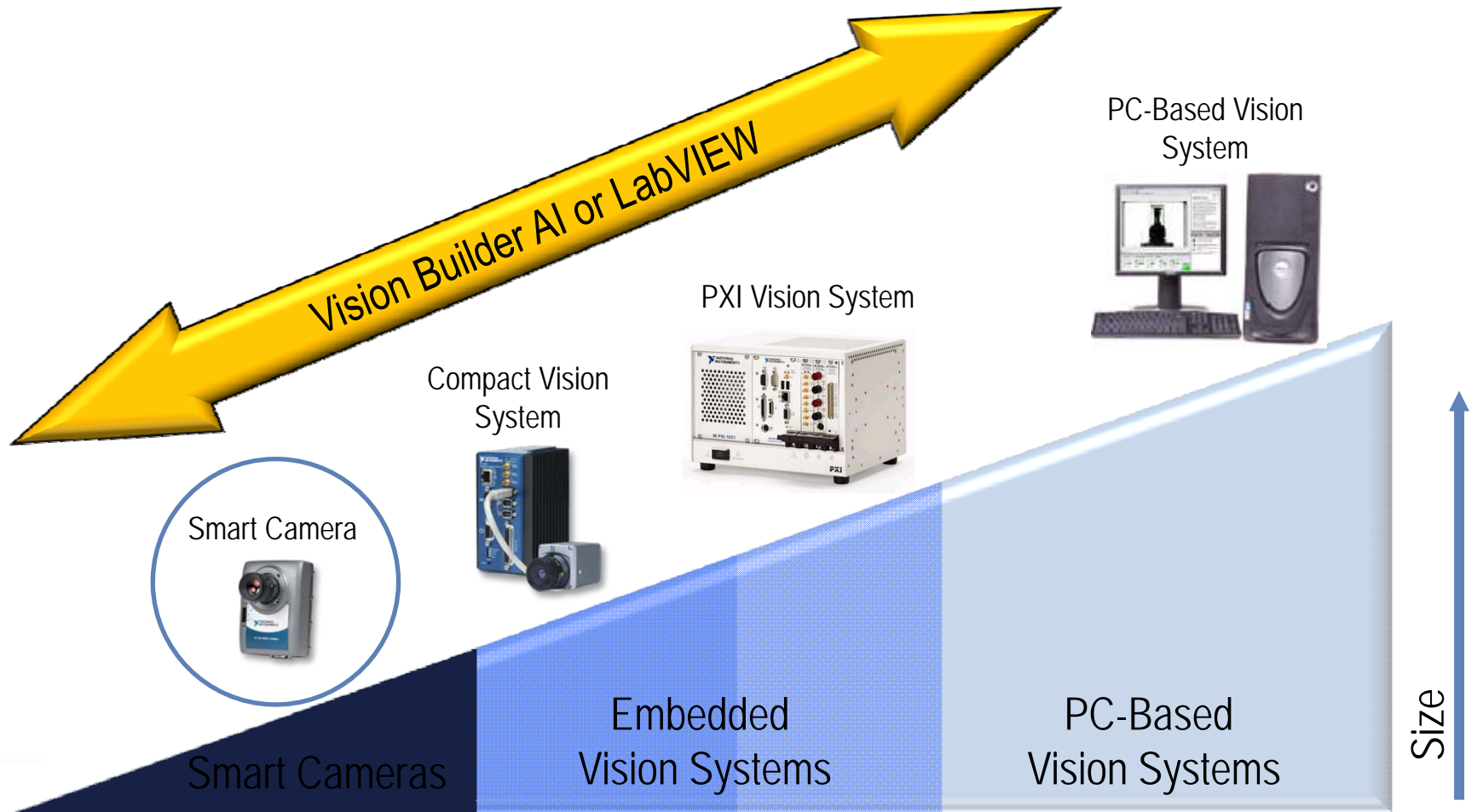
# NI Vision Platform



# NI Vision Platform



# NI Vision Platform



# A Smart Camera Is...



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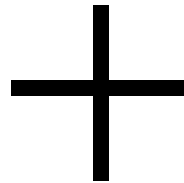


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# A Smart Camera Is...

1. An all-in-one device used to locate, identify, and inspect objects
2. A vision sensor that outputs inspection results, not images
3. The fusion of an automation controller with a camera sensor



- High-performance processor
    - PowerPC, DSP, or X86
  - Built-in I/O
  - Real-time operating system
  - Programmed or configured remotely
- Industrial camera
    - CCD or CMOS
    - Many sensor speeds
    - Many sensor resolutions
  - Standard lens mount

# NI 1722 and 1742 Smart Cameras

- **Sensor**
  - 1/3 in. Sony ICX424AL monochrome
  - VGA 640 × 480, 60 fps
  - Partial scan ( $\frac{1}{2}$ ,  $\frac{1}{4}$ ) and binning
- **Processor**
  - Freescale PowerPC 400/533 MHz
  - 128 MB RAM, 128 MB DOC
- **Industrial I/O**
  - Opto-isolated, 2-inputs & 2-outputs
  - RS-232
  - Quadrature encoder support \*
- **Direct Drive lighting control**
  - Current source lighting controller: Max 1 A strobe or 500 mA continuous\*
  - External Strobe generation (5V TTL, 24 V)
- **2 Gigabit Ethernet ports**
- **Dimensions: 117 x 85 x 30 mm**



\* NI 1742 only



# NI Smart Cameras

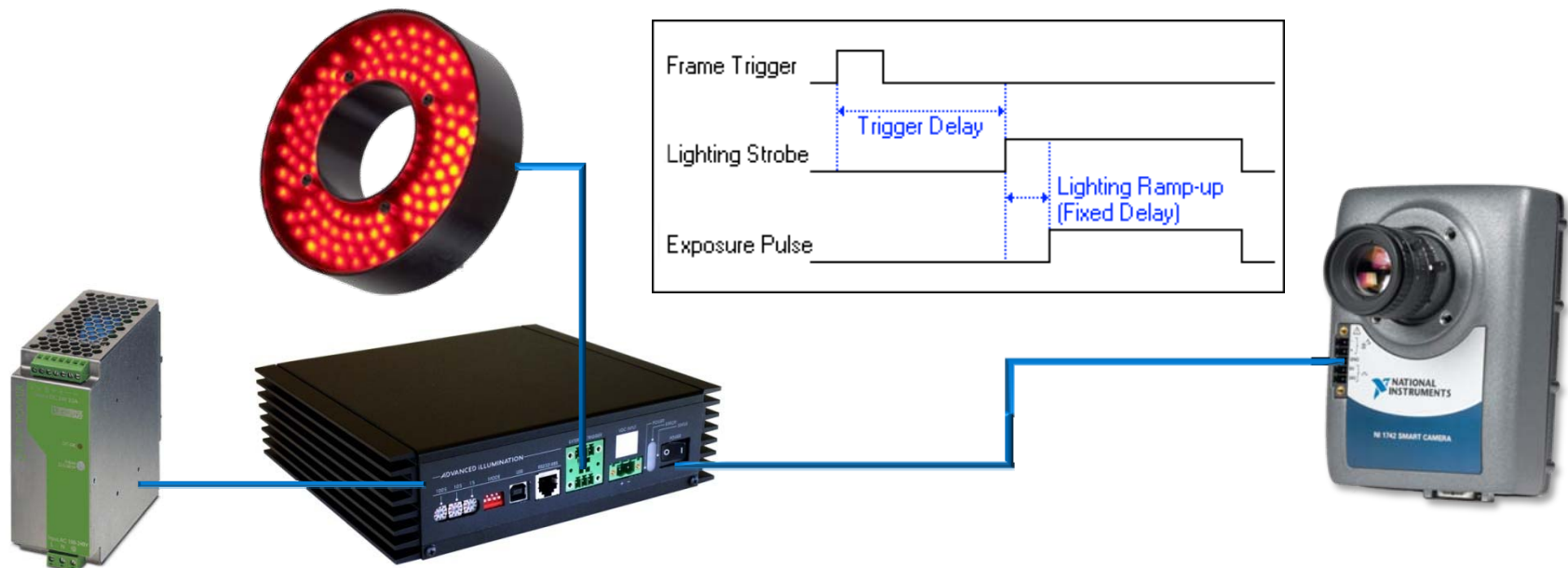
	Processor [MHz]	Sensor	Integrated Lighting Control	Encoder Support
NI 1722	PPC 400	VGA, 60 fps	✗	✗
NI 1742	PPC 533	VGA, 60 fps	✓	✓

# Lighting



5 V TTL and 24 V strobe signals

Camera generates strobe signals synchronized with image acquisitions



# Lighting (cont.)



## Integrated lighting controller (1742 only)

- Directly drive current-controlled light heads
- Up to 1 A in strobe mode
- Up to 500 mA continuous



# Inputs/Outputs



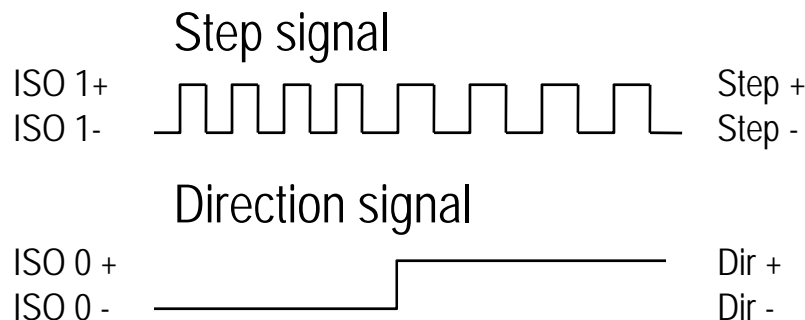
- 2 opto-isolated input lines
  - Sinking/sourcing, 24 V
  - Camera trigger input
  - Product selection, learn input signal
- 2 opto-isolated output lines
  - Sinking/sourcing, 24 V, 100 mA
  - Connect to PLCs, drive solenoids, valves, relays...



# Input/Outputs (cont.)



- Isolated outputs pulse generation
  - Single-shot pulse—Drive ejection mechanism
  - Pulse train—Basic stepper motor control, PWM output
- Quadrature encoder input (NI 1742 only)
  - Delay trigger or output pulse by given number of encoder counts
  - Read the absolute position of a motion axis



# Ethernet Expansion IO



- Compact FieldPoint, CompactRIO, 3<sup>rd</sup> party hardware
- Extension using Serial or Ethernet
- Protocols include raw TCP/IP, Modbus, Shared Variables



# Configurable Software



## Vision Builder

for Automated Inspection



- Machine Vision Configurable Software
- Included with NI 17xx Smart Cameras
- Vision Builder AI 3.5 new features
  - Shared Variable support
  - Customizable operator interface
  - Web server
  - New edge detector, reading QR codes, and more

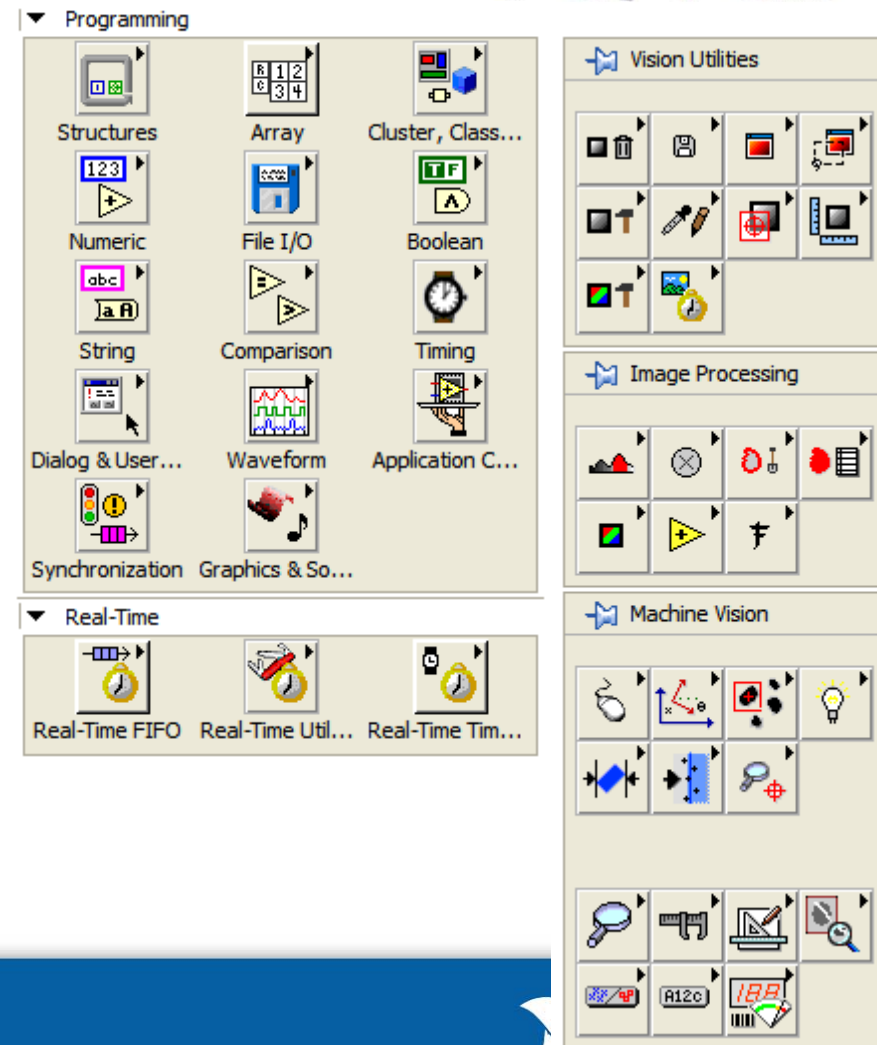
# Development Software



NATIONAL INSTRUMENTS

# LabVIEW™

- LabVIEW Real-Time Module
- NI-IMAQ Driver
- NI Vision Development Module
- Other LabVIEW Modules and Toolkits: Control Design and Simulation Module, and more





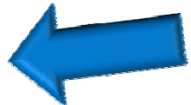
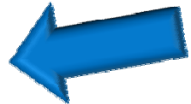
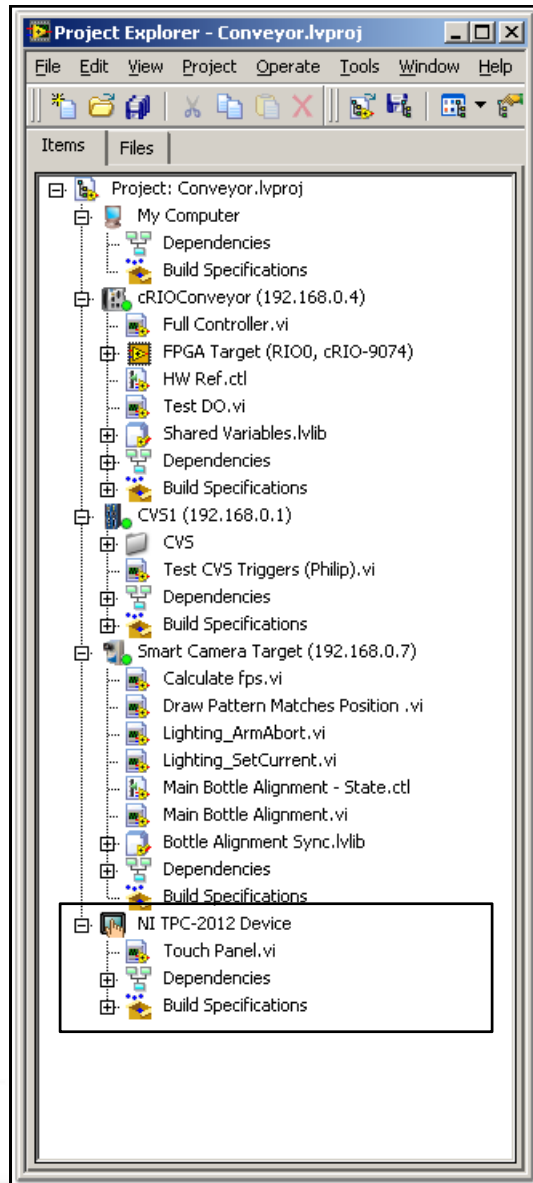
# Operator Interface

## Multiple Technical Choices for HMI

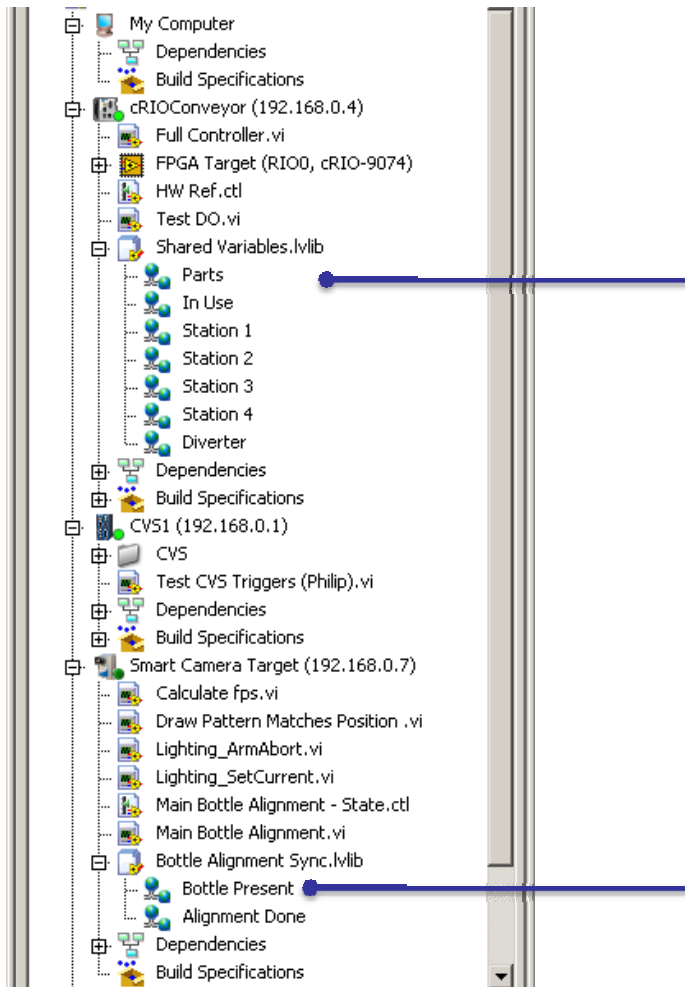
- **Hardware**
  - Touch-panel computers such as NI TPC-2006
  - PC
- **Software**
  - Modbus Serial or TCP
  - Shared Variables
  - Remote Front Panels and Web server
  - Vision Builder AI ActiveX control



# LabVIEW Project



# Shared Variables



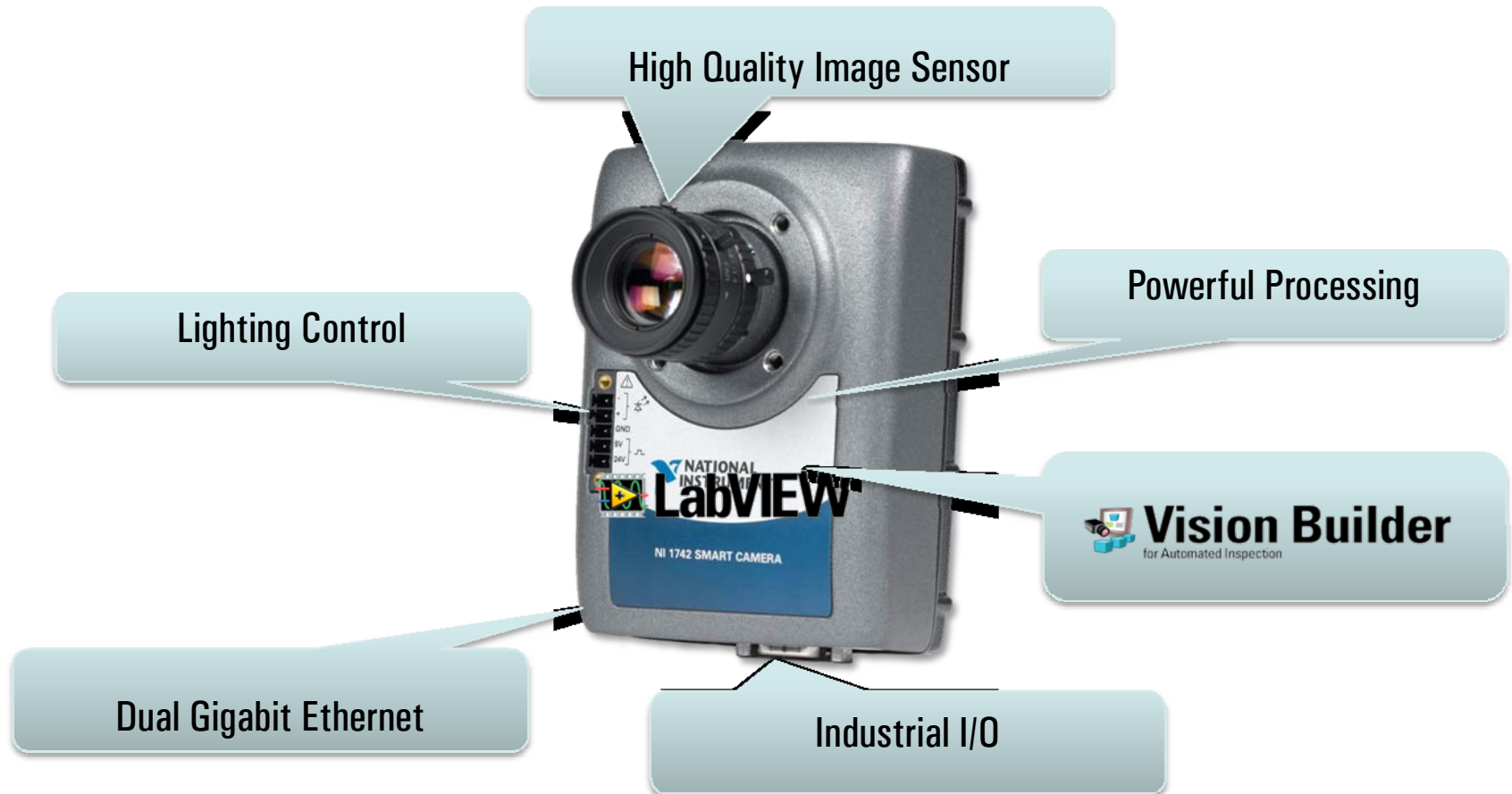
Shared Variables





- Program multiple distributed processors in a single environment using the same language
- Complete system view using the LabVIEW project
- Simplified communication using Shared Variables

# NI Family of Smart Cameras



For more information visit: <http://www.ni.com/vision/>