

Single-Channel Monochrome Image Acquisition

NI 1407

- 1 video input for standard monochrome cameras (RS-170 or CCIR VGA)
- Synchronization for multiple camera acquisition
- Partial image acquisition
 - Onboard programmable ROI
 - Onboard pixel decimation
- Programmable gain and offset
- Pixel jitter less than 2 ns
- 256-byte LUT
- 1 external trigger/digital I/O line
- Scatter-gather DMA controller

Models

- NI PCI-1407
- NI PXI-1407

Operating Systems

- Windows 2000/NT/XP/Me/9x

Recommended Software

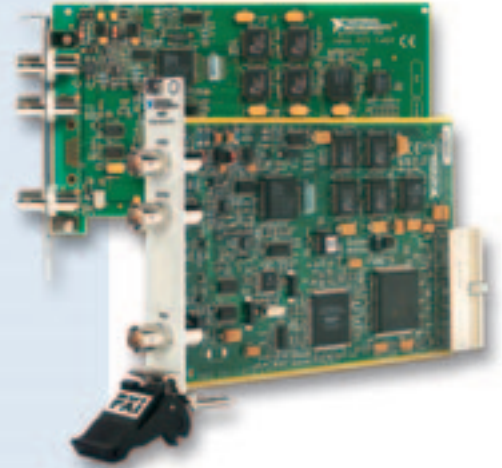
- LabVIEW
- Measurement Studio
- Vision Development Module
 - IMAQ Vision
 - NI Vision Builder

Other Compatible Software

- C/C++

Driver Software (included)

- NI-IMAQ



Overview

The NI 1407 Series is ideal for machine vision and scientific imaging end users and OEM developers who are looking to reduce costs. The NI 1407 Series consists of image acquisition plug-in devices with a single high-accuracy monochrome video input, external triggering capabilities, and easy-to-use image acquisition driver software. The NI 1407 Series advanced features include partial image scanning, programmable gain and offset, and onboard decimation and LUT processing.

For easy configuration of both RS-170 and CCIR monochrome cameras, the NI 1407 Series includes NI-IMAQ image acquisition driver software and the National Instruments Measurement & Automation Explorer configuration utility. With NI-IMAQ, you can quickly and easily start your application without having to program at the register level.

Quick and Easy Camera Configuration

Easily configure standard video capture with the Measurement & Automation Explorer delivered with NI-IMAQ. This utility is an interactive configuration tool for setting the camera type (RS-170 or CCIR VGA), programmable ROI, decimation, gain, and offset.

Applications

The low-cost, high-accuracy NI 1407 Series is ideal for both industrial and scientific environments. The NI 1407 Series is a high-performance, versatile solution for a wide range of vision applications, such as assembly-line product inspection and biological cell growth monitoring.

Hardware PCI Interface

The PCI bus is the electrical interface for both the NI PCI-1407 and the NI PXI-1407. The PCI interface, implemented with a National Instruments MITE ASIC, can transfer data at a maximum sustained rate of 132 Mbytes/s in master mode to maximize the use of the available PCI bandwidth. An NI 1407 Series device can generate 8, 16, and 32-bit memory read and write cycles (both single and multiple). The interface logic ensures that the NI 1407 meets the loading, driving, and timing requirements of the PCI specification.

Scatter-Gather DMA Controller

With the NI 1407 Series, there is no need to lock down large, continuous blocks of memory. NI 1407 devices have an onboard DMA controller capable of transferring data from the PCI bus to the onboard FIFO buffer to host memory. The controller performs scatter-gather DMA, which means the DMA controller can reconfigure on the fly and perform continuous image transfers to either contiguous or fragmented buffers.

INFO CODES

For more information, or to order products online visit ni.com/info and enter:

pci1407
pxi1407

BUY ONLINE!

Single-Channel Monochrome Image Acquisition

Genlock and Synchronization Circuitry

The genlock and synchronization circuitry receives the incoming video signal and generates PCLK, HSYNC, and VSYNC signals for use by the acquisition and control circuitry. Use the genlock feature to synchronize multiple cameras and multiple 1407 devices for simultaneous image acquisition.

8-Bit A/D and LUT

An 8-bit flash A/D converter performs the image digitization. The result of the digitized image passes to a 256 by 8 RAM LUT. You can configure the LUT to implement simple imaging operations, such as gamma correction, contrast enhancement, data inversion, or any nonlinear transfer function. An NI 1407 has programmable gain and offset circuitry for optimizing the input signal range.

I/O Connector

The three BNC connectors provide connections to the video source, the external digital I/O line/trigger, and CSYNC external lines.

Warranty and Support Services

As a complement to your image acquisition product, consider:

- Technical Support: FREE through Applications Engineers worldwide, Web resources, and Premier Support – ni.com/support

Ordering Information

NI PCI-1407	777852-01
NI PXI-1407	777948-01
Includes the NI1407 device, NI-IMAQ software and a 2 m IMAQ-BNC-1 cable	

Specifications

Typical for 25 °C unless otherwise noted.

Available Formats

RS-170/NTSC	30 frames/s interlaced
CCIR-601/PAL	25 frames/s interlaced
VGA.....	60 frames/s, noninterlaced

Video Input

Quantity	1 monochrome
Video 0.....	Single-ended (BNC)
Input impedance	75 Ω (PXI)
Bandwidth.....	Typical 20 MHz (-3dB)
Input full-scale range.....	2 Vpp maximum

A/D Conversion

Gray levels	256 (8 bits)
DNL.....	±1 LSB maximum
RMS noise	< 0.5 LSBrms
SNR.....	Typical 48 dB

External Synchronization and Trigger Signals

Trigger sense	TTL
Trigger polarity	Programmable (positive of negative)
CSYNCIN sense.....	Selectable (TTL)
CSYNCIN level.....	Programmable (positive of negative)
Minimum detectable pulse width.....	20 ns
VIH (TTL).....	2 V
VIL (TTL).....	0.8 V

Pixel Clock

RS-170	12.27 MHz ±5%
CCIR.....	14.75 MHz ±5%
VGA.....	24.54 MHz ±5%
Pixel jitter	< 2 ns
Lock time	<1 frame

PCI Interface

Bus interface.....	Master, slave
Bus-master performance.....	132 Mbytes/s (ideal)
Power Requirement	
+5 VDC (±5%)	1.25 A

Physical

Dimensions	
PCI	10.7 by 17.5 cm (4.2 by 6.9 in.)
PXI	10 by 16 cm (3.9 by 6.3 in.)

Environment

Operating temperature	0 to 55 °C
Storage temperature.....	-20 to 70 °C
Relative humidity	5 to 90%, noncondensing