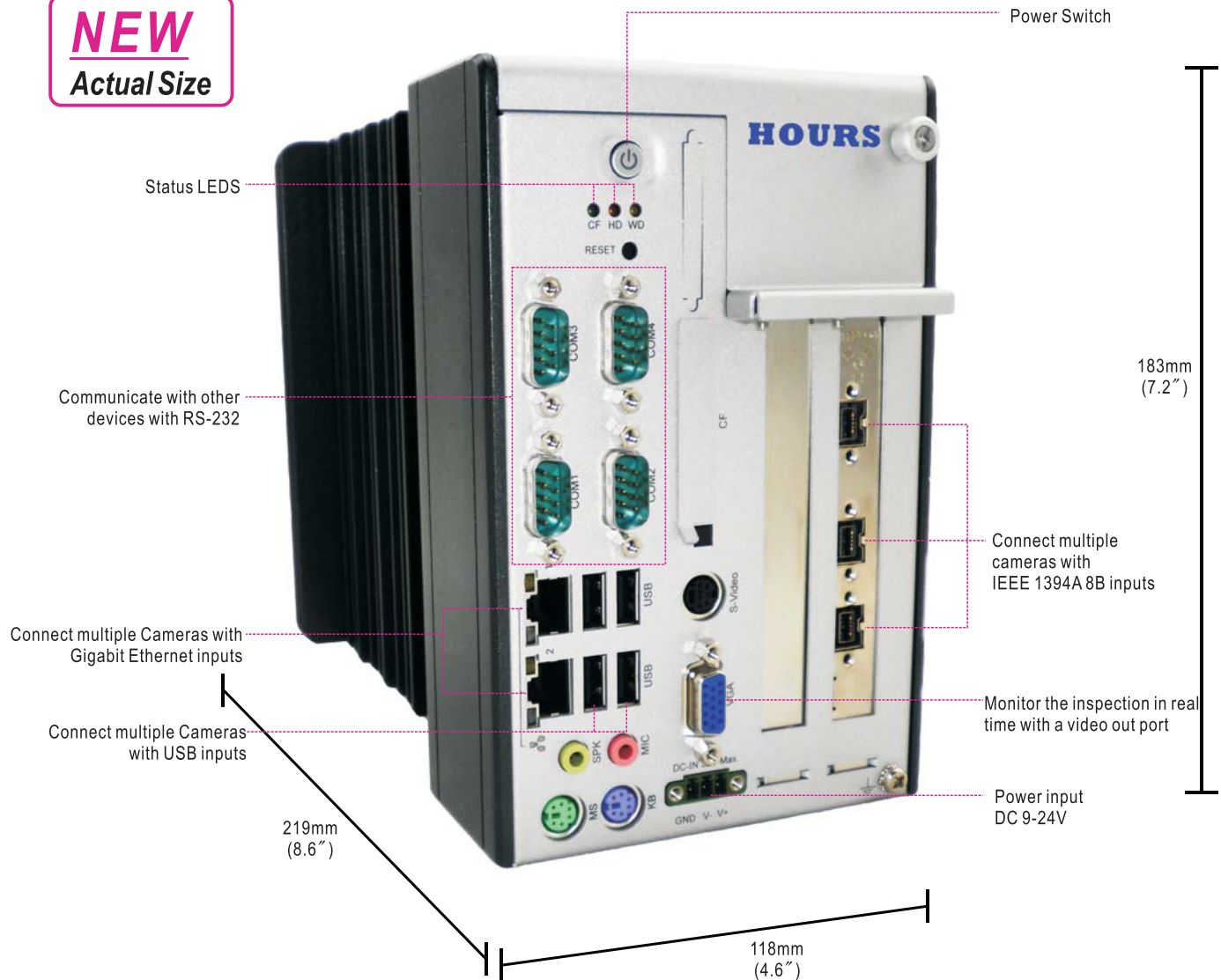


## Compact Vision System

## VDM Series

**NEW**  
Actual Size



**The Compact Vision System offers more processing power, more I/O, and more camera options for your inspection needs.**

with easy-to-use software and hardware, Compact Vision System gives you the power and functionality of multiple smart cameras. The high-performance processor can tackle tough inspection applications, and the IEEE 1394 ports deliver connectivity to multiple cameras. Communicate with a multitude of automation devices using Ethernet, RS-232, or a large number of digital I/O channels. Choose the Compact Vision System for rugged environments.

Model	VDM-49112301G	VDM-49112301F	VDM-49112309G	VDM-49112309F
Item				
Typical Processor	Core I5	Core I5	Core I5	Core I5
Performance				
Digital I/O	24 DIO	24 DIO	96 DIO	96 DIO
Cameras	UP to 16	UP to 16	UP to 16	UP to 16
Resolution	up to 2000x2000	up to 2000x2000	up to 2000x2000	up to 2000x2000
Frame Rate	up to 100fps	up to 100fps	up to 100fps	up to 100fps
Non-volatile Storage	500G	500G	500G	500G
Memory	4GB	4GB	4GB	4GB
Ethernet	3 GbE ports (Intel 82574L)	2 GbE ports (Intel 82574L)	3 GbE ports (Intel 82574L)	2 GbE ports (Intel 82574L)
IEEE 1394a	0	1-CH	0	1-CH
IEEE 1394b	0	2-CH	0	2-CH
Serial Port	2 RS-232/422/485 (COM1&2) 2 RS-232 (COM3&4)	2 RS-232/422/485 (COM1&2) 2 RS-232 (COM3&4)	2 RS-232/422/485 (COM1&2) 2 RS-232 (COM3&4)	2 RS-232/422/485 (COM1&2) 2 RS-232 (COM3&4)
USB	4 USB 2.0 ports	4 USB 2.0 ports	4 USB 2.0 ports	4 USB 2.0 ports
DC Input	Built-in 9-32 VDC wide-range DC input with over-voltage protection 3P pluggable connector with latch (GND, V-, V+)			
Operating Temperature	0°C to 55° C			

# Algorithms

VDM Vision software Provides More than 200 image processing and analysis functions, including:



## Pattern Matching

Use pattern matching to quickly locate known reference patterns, or fiducials, in an image, even with changes in position, rotation, lighting and occlusion. Create a model or template that represents the object for which you are searching. Then search for the model in each acquired image, calculating a score for each match.



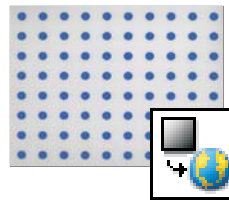
## Barcodes

Barcodes are important in the identification and tracking of products. A wide variety of formats are available to use with the Vision software.



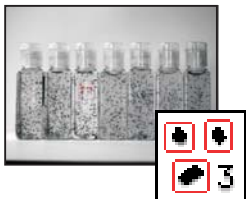
## Optical Character Recognition

OCR functions use a trainable optical character recognition algorithm specifically designed to identify all types of fonts, characters, and symbols despite poor and inconsistent image quality. Train different types of fonts and symbols including common industrial fonts such as OCR A, OCR B, and SEMI.



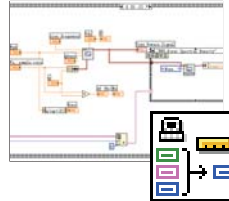
## Image Calibration

Account for distortion arising from optics or perspective. Spatial calibration is the process of computing pixel to real-world unit transformations while accounting for many errors inherent to the imaging setup.



## Particle Analysis

Use particle analysis to detect connected regions or groupings of pixels in an image and make selected measurements of those regions. Choose from more than 80 unique measurements that return data in both real-world and pixel values.



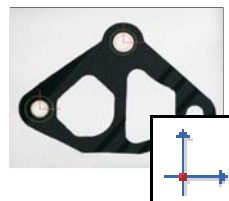
## Image Arithmetic and Logic Functions

Operators perform basic arithmetic and logical operations on images. Use operators to add, subtract, multiply, and divide an image with other images or constants. Perform logical operations, such as AND/NAND, OR/NOR, and XOR/XNOR, and make pixel comparisons between an image and other images or a constant.



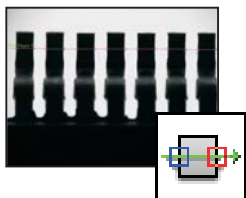
## Color Matching

color matching quantifies which colors and how much of each color exists in a region of an image and uses this information to check if another image contains the same colors in the same ratio.



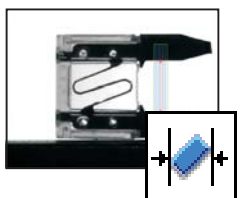
## Coordinate Systems

Set up coordinate systems to ensure that all your measurements move with the object within the field of view.



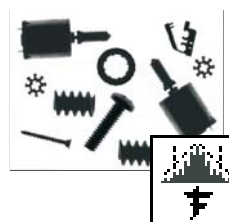
## Edge Detection

Use the edge detection tools to identify and locate discontinuities in the pixel intensities of an image. Find edges in order to align, measure, or detect features in the image.



## Gauging

You can use dimensional measurement or gauging tools to obtain quantifiable, critical distance measurements—such as distances, angles, areas, line fits, circular fits, and counts—to determine if a certain product was manufactured correctly.



## complex and Fourier

Image Analysis

Frequency filters alter pixel values with respect to the periodicity and spatial distribution of the variations in light intensity in the image. Get the frequency representation of an image through the Fast Fourier transform (FFT) function, which reveals information about the periodicity and dispersion of the patterns found in the source image.

# Machine Vision Hardware

## Overview

VDM series systems give you flexibility, integration, and ruggedness for all your inspection, alignment, gauging, and identification applications. A high-performance processor integrated with three FireWire, two GigE, four USB ports means that VDM systems are equipped to handle any inspection task. A diverse range of digital I/O options means that VDM systems can communicate with a wide range of automation devices including PLCs, relays, and robotics.

## Multicamera Inspection

The Compact Vision System provides a low-cost way to inspect from several angles. With three FireWire, two GigE ports you can connect up to 16 cameras to the Compact Vision System with ease. Each camera shares a portion of the 800 Mb/s, 1Gb/s bandwidth.

## Choice of sensor

By using FireWire GigE image acquisition, a Compact Vision System gives you the option of choosing the sensor that is right for your application. You can choose a low-cost, low-resolution sensor or a high-performance sensor. In addition, as new improved industrial FireWire cameras, GigE cameras enter the marketplace, VDM series systems are ready for them.

## External Device Control

The VDM series has 32 digital I/O lines (option) and 4 RS232 with built-in functionality for communicating with external devices, such as reading quadrature encoder inputs, generating strobe pulses, and writing to or reading from digital lines. Using these signals, you can dynamically control your lighting or cameras, synchronize with a conveyor belt, or communicate with relays that control solenoids and other actuators. Digital inputs and outputs are available for both 5V and TTL-signaling levels. In addition, VDM systems can send Commands and data to other devices, such as PLCs, via Ethernet and RS-232 Serial.

## Real-Time Display

Using the VGA output, you can see the product under inspection in real time, as well as pass/fail and inspection data. All of the overlays are user definable; you can change the overlays programmatically and create custom user displays. Connect the system to any network to monitor the inspection. Send images over the network for viewing or store them in a database for future reference. In addition, you can use VI Server technology to publish your data and results in real time to a Web browser.

# Compact Vision System

## Machine Vision Software

	VDM for Automated Inspection
	Stand-Alone Configuration Software
One-shot acquisition	✓
Continuous acquisition	✓
Triggered acquisition	✓
Camera configuration	✓
Trigger output	✓
Full frame rate display	✓
Save images to disk	✓
Image manipulation tools	✓
Pixel manipulation tools	✓
Image filters	✓
Image arithmetic	✓
Image logic functions	✓
Morphology	✓
Region of interest tools	✓
particle analysis	✓
Gauging	✓
Pattern matching	✓
Distortion calibration	✓
Real-world measurements	✓
barcode reader	✓
Coordinate systems	✓
Optical character recognition	✓
LabVIEW Real-Time compatible	✓
Performance benchmarking	✓
LabVIEW VI generation	✓

## Connect to Compact FieldPoint

VDM systems connect easily to Compact FieldPoint, the National Instruments real-time modular industrial control and measurement system. If you need analog signals, specialized digital inputs, or other types of distributed control to interface with your Compact Vision System, you can link them easily with the combination of the Compact Vision System and Compact FieldPoint.

## Rugged, Reliable Design

Run your application with confidence. The Compact Vision System uses the award-winning LabVIEW Real-Time engine, a reliable and embedded programming environment. Time-bounded algorithms ensure that you can meet the deterministic demands of your system. The temperature range of 0 to 55°C ensures that uptime is kept at a maximum. No fans, vents, or moving parts ensure reliable industrial inspection for robotics, packaging, or assembly applications.