



# PointScan™ Series Overview



## Ethernet-Based Temperature, Voltage, & Digital I/O Modules for Distributed Applications

### Features

- Nine I/O modules for measuring and controlling a wide variety of signals
- Cost-saving integrated terminal base for direct field wiring
- 4-, 8-, and 16-channel analog input modules with up to 16-bit resolution
- 4- or 8-channel analog output modules with up to 14-bit resolution
- NIST-traceability for all analog I/O modules
- 8- or 16-channel isolated industrial digital I/O modules
- Economical combination analog/digital I/O modules
- 1200 Vrms isolation (module-to-communication port)
- Direct Ethernet connection 10BaseT @ 10 Mbps or direct RS-485 connection
  - Multi-drop network expansion up to 32 modules
- Hot-swap function for module substitution under power
- On-board diagnostics and status LEDs
- -30° to +70°C extended operating range
- Class I, Div 2 (hazardous location) compliance
- Space and cost saving compact form factor
- DIN-rail or panel mountable
- Mechanically keyed bases prevent mis-configuration of I/O modules and bases
- Optional OPC server link to DASyLab®, LabVIEW®, Microsoft Excel®, Visual Basic®, and SCADA/HMI software



Select the PointScan when you need to monitor volts, current loop, thermocouples, or other inputs over a large distributed area

PointScan™ distributed I/O modules feature integrated field wiring terminals and resident network interfaces in a single, small form-factor module. These industrially robust modules can be either DIN-rail or panel mounted and are designed to be located near the sensor, process, or device under test/DUT. With I/O count options from 4 to 16 channels, modules can be economically matched to I/O count requirements, and modules can be easily added to meet future I/O expansion requirements.

### Distributed I/O Benefits

The ability to distribute I/O modules close to the sensor, process, or device under test/DUT provides the following significant benefits.

**Cost Savings.** The reduction of signal wiring, the elimination of stand-alone termination blocks, and the ability to better match modules to applications with either low I/O count nodes or nodes with a wide range of I/O types results in significant cost reductions.

**Higher Data Integrity.** All signal corruption sources associated with running cabling over long-distances in potentially harsh, high-noise environments is eliminated or minimized by employing digital networking.

**Improved Uptime.** On-board diagnostics, auto-calibration, and hot-swap support combine to reduce maintenance time and improve system uptime.

PointScan Modules Selection Chart									
Features	/102	/104	/108	/109	/121	/127	/129	/130	/142
4-20 mA inputs	16	—	—	—	—	—	—	8	—
Thermocouple	—	8*	—	—	—	—	—	—	—
mA	—	8*	—	—	—	—	—	—	—
Volts	—	8*	—	—	—	—	—	—	—
mV	—	8*	—	—	—	—	—	—	—
4-20 I/O	—	—	8 inputs 4 outputs	—	—	—	—	—	—
RTD	—	—	—	4	—	—	—	—	—
Digital Output	—	—	—	4	—	—	8	—	16
Digital Input	—	—	—	—	16	—	8	8	—
Counter	—	—	—	—	—	8	—	—	—

\* Module has 8 inputs that can be configured in any combination

#### Support Modules

PointScan/440 – field configuration module

PointScan/443 – power supply

PointScan/441 – RS-232 to RS-485 convertor

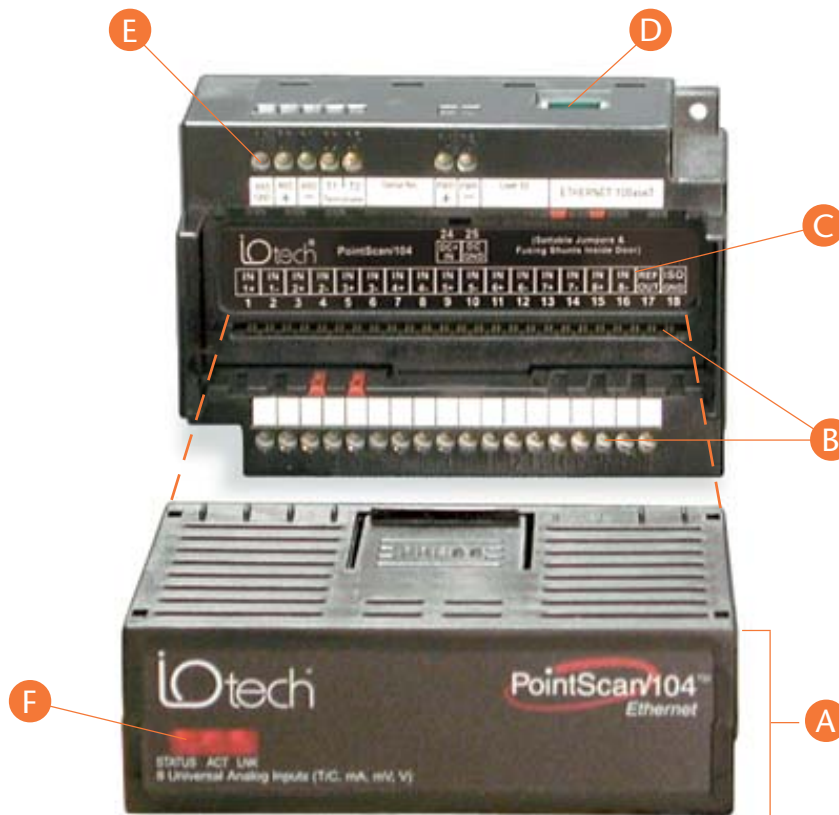
PointScan/446 – 5-port industrial switch



# PointScan™ Series Overview

## General Information

### PointScan/100 Series (Ethernet & RS-485)



### PointScan Series Features

- A Easy I/O Module Removal/Insertion** – Modules can be replaced without tools
  - Hot-Swap** – Replace modules under power and they automatically re-configure and run
  - Highly Scalable** – PointScan-based systems can expand to 512 I/O – on a single IP address
  - Combination I/O** – Space and cost saving modules with analog inputs and outputs, digital inputs and outputs, analog inputs and digital outputs, or digital inputs and analog outputs
  - Hazardous Location Certification** – Class I, Div 2 (Groups A, B, C, D)
  - N.I.S.T. Traceable Analog I/O** – All analog I/O modules are calibrated with N.I.S.T traceability
- B Direct Field Wiring** – Space and cost saving screw-termination for direct field wiring
  - Wiring Diagram** – Save installation time with immediate access to wiring information
  - Isolation** – 1200 Vrms isolation (between module and Ethernet/RS-485 ports) and 500V channel-to-channel isolation (digital I/O only)
  - Safety Keying** – Mechanical keying makes mis-configuration impossible
- C Easy-to-Read Labels** – Large labeling area for application-specific signals
- D Built-in Ethernet Network** – A standard RJ45 connector provides immediate access to the resident (10BaseT @ 10 Mbps) Ethernet network. Competitive offerings require an expensive and space-consuming add-on communications module to provide what is standard with PointScan.
  - Open Architecture** – Ethernet (TCP/IP) and MODBUS (ASCII & RTU) protocols for easy integration into legacy installations
  - Web Access** – Only an IP address is required to establish web-based communication using one or more industry standard protocols (TCP/IP, IPX/SPX, or NetBEUI)
- E RS-485 I/O Expansion Port** – Supports economical I/O expansion of up to 32 modules supporting up to 512 I/O
  - RS-485 Communication** – Two-wire (half duplex) and four-wire (full duplex) modes are supported on multi-drop networks communicating with up to 32 PointScan modules over distances up to 2 miles (1.2 km). RS-422 point-to-point communication is also supported.
- F LEDs Status Indicators** – Provide power, module OK, and I/O status
  - Rail or Panel Mount** – No add-on accessories required



# PointScan™ Series Overview

## General Information

### Networking Options

Networking and expansion are the heart of distributed monitoring and control systems. PointScan leverages industry standards for both. Ethernet, the de facto networking standard for industry, is built into PointScan/100 series modules, supporting high-speed communications and providing TCP/IP-based access to intranets and to the internet. Unlike other distributed I/O offerings, PointScan does not require the added cost, complexity, and space associated with external, add-on network/communication modules.

Additionally, the PointScan/100 series features built-in RS-485 communication, allowing expansion up to 32 modules (512 I/O), for up to 2 miles (1.2 km) using low-cost twisted pair cabling. Both the Ethernet and serial (RS-485) ports feature 1200 Vrms isolation which protects the controlling PC from potential damage and improves signal integrity by eliminating ground loops.

### Modular Architecture

Each PointScan is composed of a terminal base and a removable I/O module. Power for modules is supplied from an external 24V DC supply. This modular architecture enables PointScan systems to be configured to meet specific application requirements based on I/O count, type, and location.

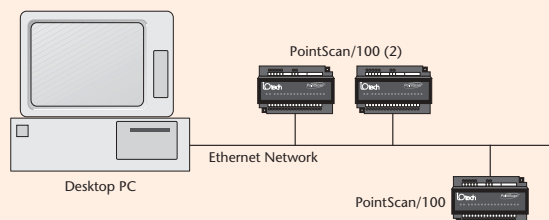
### I/O Modules

A wide variety of analog, digital, and combination modules are available. Analog input modules provide up to 16-bit resolution supporting instrument-like measurements, and are available with 8 and 16 input channels. Analog output modules provide up to 14-bit resolution for step-less outputs, and are available with either 4 or 8 output channels. All analog I/O modules are calibrated with N.I.S.T. (National Institute of Standards and Technology) traceability and are auto-calibrating. Digital input and output modules, including a high-speed counter with direct quadrature encoder input, are also available with 4-, 8-, and 16-channel counts. Low- and high-voltage (AC/DC) options, high-current outputs, watchdog functions, and programmable start-up/failure output states make PointScan well-suited for industrial monitoring and control applications.

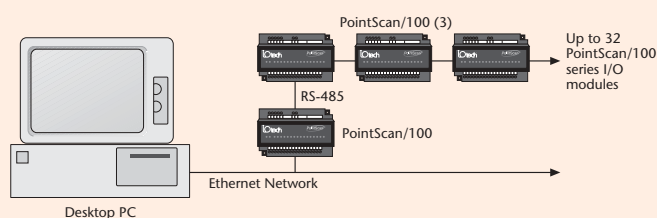
### Terminal Bases

PointScan features three terminal base types to meet specific application requirements. The high-density base is an economical solution for modules with 16 inputs and is used for high channel-count applications. The field-ready bases are pre-wired (e.g. bus power) in order to reduce field wiring and speed-up installation.

### Sample Configurations



*For high-speed distributed I/O each module can have its own IP address and be added at any point on a network*



*Only a single IP address is required to communicate with up to 32 PointScan modules on a multi-drop RS-485 network*

The universal base is used for applications where channels need to be individually isolated (500 VDC). All terminal bases feature integrated screw-terminals for direct field wiring, and can be either panel or DIN rail mounted. To prevent misconfiguration, terminal bases are mechanically keyed. Additional time and cost-saving PointScan features include hot-swapping, self-configuration, and on-board diagnostics.

### Industrially Rugged

With a wide operating range of -30° to +70°C, hazardous location compliance (Class I, Div. 2, Groups A, B, C, D), and ability to be mounted on (vibrating) machinery (IEC68-2-6 and IEC68-2-34), PointScan eliminates the hidden costs associated with add-on (gas purged) enclosures. Additionally, all PointScan modules meet domestic and international standards including CE and cUL.

### Real-time Performance

A non-optimized (10 Mbps) Ethernet-based PointScan system typically provides data updates in the 30 to 50 ms range. However, on a dedicated, lightly loaded network using a master-slave polling scheme, data updates in the 10 to 30 ms range are supported.

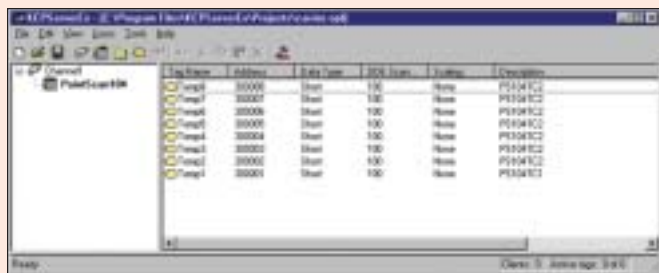


# Spectrum of Software Support for PointScan Products

The PointScan™ series open software architecture insures that you match the best available software with your application. Unlike other suppliers who attempt to solve all applications with a single software solution, IOtech offers a spectrum of software solutions. From free configuration software for quick

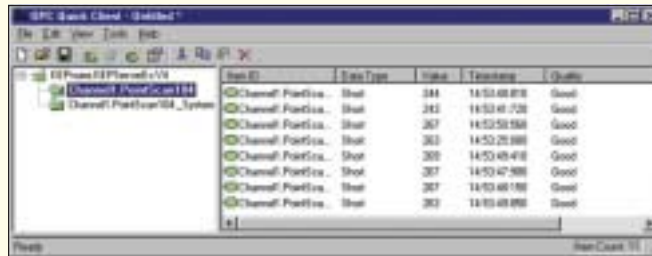
setup without programming to powerful SCADA/HMI software for demanding enterprise-wide systems, IOtech has a solution that meets your needs. Only IOtech can meet your software requirements from general-purpose data acquisition in the test lab to process monitoring and control solutions on the factory floor.

## IOToolkit™



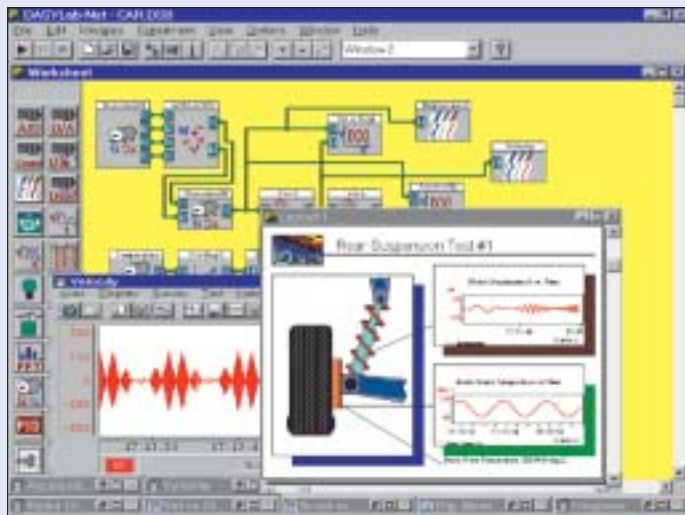
IOToolkit™ software is included with all PointScan series I/O and is used to quickly and easily configure and test the modules and their communication interfaces. With only 5 steps and a few minutes modules can be configured/re-configured and tested—without programming. Easy-to-use calibration options are also included, and powerful on-line help is always available for as-needed reference.

## KEPServerEX™



KEPServerEX™ software is an OPC server with drivers for the PointScan series. As an OPC v2.x compliant server it functions as the link to any commercially available OPC client software. This flexibility allows you to select a software solution that meets your specific application requirements.

## DASYLab®

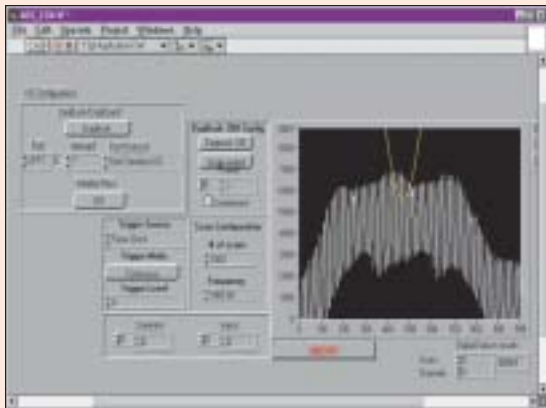


DASYLab® software offers a greater degree of flexibility and customization. You can learn DASYLab in a matter of days, without the weeks of training required for some other icon-based application-development software.



# Spectrum of Software Support for PointScan Products

## LabVIEW® Support



IOtech offers extensive LabVIEW® support for the PointScan™ through MODBUS® and KEPServerEX™, including examples. IOtech data acquisition VIs for LabVIEW are more than just simple hardware access VIs, they are full blown examples complete with engineering data conversion, and data display.

## OLE for Process Control/OPC



OLE for Process Control (OPC) server software (Kepware, Inc.— KEPServer) provides connectivity to any commercially available application software package with an OPC-client interface. OPC is an industry-standard device interface specification based on Microsoft® OLE, COM, and DCOM technologies. OPC technology enables the move from closed proprietary solutions to open architectures providing more cost-effective and matched solutions.

## MODBUS®-Based Programming

- 01 - Read multiple discrete outputs
- 02 - Read multiple discrete inputs
- 03 - Read multiple analog outputs
- 04 - Read multiple analog inputs
- 05 - Write a single discrete output
- 06 - Write a single analog output
- 15 - Write multiple discrete outputs
- 16 - Write multiple analog outputs

MODBUS® Protocol is a messaging structure, widely used to establish master-slave communication between intelligent devices. A MODBUS message sent from a “master” (PC, PLC or touchscreen device) to a “slave” (PointScan series distributed I/O) contains the address of the slave, the “command”, the data, and a check sum. MODBUS is only a messaging structure, and is independent of the underlying physical layer. So, either MODBUS RTU or MODBUS ASCII messages can be sent to PointScan series I/O modules via serial (RS-232, RS-422 or RS-485) or Ethernet (MODBUS/TCP) links using a variety of media (fiber, radio, or cellular).