The SmartView family of paperless data acquisition platforms provides an innovative approach to streamlining the collection, distribution, and analysis of critical process data. These systems help optimize operations to achieve maximum efficiency and profitability in a variety of industries including Power, Water and Wastewater, Petrochemical, and Pharmaceutical.

# SmartView 180 (SV180)
# SmartView 180 Multibank (SV180MB)

## 180 mm Paperless Data Acquisition System



**Remote or direct retrieval of process data in electronic format**
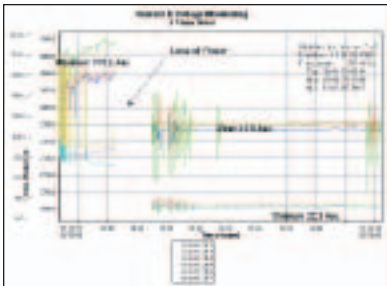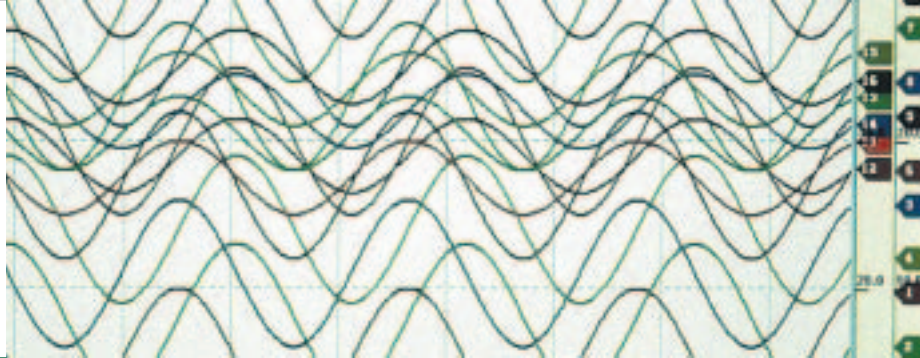


**Data analysis and report generation software for process efficiency improvements**

The SmartView 180 (SV180) centers on providing engineers, operators, and technicians with an intuitive, scalable, and easy to maintain data acquisition platform.

The strength of all Thermo "Smart" data acquisition platforms, which includes the SV180, SV100, and SM100, is the focus on implementing designs that offer flexible configurations for improved process monitoring, seamless integration with existing control systems, and enhanced data analysis and management. When combined with plant historians and Human Machine Interfaces (HMI), the SV180 provides the most comprehensive data acquisition and management solution for any application.

### Features and Benefits

- Versatile for existing or new installation
- Facilitates process optimization and reporting via seamless integration with existing control systems and other Thermo data acquisition products
- Touch-screen controls provide the simplest programming available and gives fast and easy access to process information
- Customizable display allows viewing of data in a preferred format
- Easy front panel access allows effortless expansion and upgrades as needed
- Remote access and viewing of real-time and historical data
- Networkable platform for seamless plant-wide data distribution and long term data storage
- 10 CFR50 Appendix B in-house nuclear program

Formerly Thermo Westronics

Analyze • Detect • Measure • Control™

**Thermo**
ELECTRON CORPORATION

**SmartView180 (SV180)**
**SmartView180 Multibank (SV180MB)**

Designed around Intel® Pentium® technology, the processing power of the SV180 coupled with its touch-screen interface, network awareness, large I/O handling capacity, and field upgradeable firmware allow you to efficiently monitor and manage new and existing application parameters while leaving room for future expansion.

As a stand-alone unit, the SV180 can accept up to 80 direct process signals with the added capacity of configuring and displaying calculated points (averages, peaks, flow totals, equations, etc.) bringing the complete total up to 999 points. The SV180 may also be used in conjunction with the Thermo SM100 "Smart Multiplexer" to accept up to 999 direct process signals (see Plant Networking diagram to the far right).



**Flexible Display Modes**

The bright, 12.1 inch TFT, free-format display of the SV180 makes monitoring the process that much easier. Additionally, the various screens can be customized to display selected point groups. A ninth screen is reserved as a four-quadrant display which can be set up to show a scaled down version of any four configured screens.

**Overview**



**Horizontal bargraphs**



**Vertical bargraphs**



**Horizontal trends**



**Vertical trends**



**Alarm/event**



**Digital values**



**Circular chart**



**Four-quadrant split screen**

**Straightforward networking set up menu**



**Media status display**



**Simple single page data point configuration menu**



**On-screen keyboard for live event messaging**



## User-Friendly Programming

The touch-screen technology in combination with the easy-to-use menu structure makes the SV180 simple to program allowing for quick set up. Programming and operational proficiency is achieved in minimal time even without the manual.

## Intuitive One-Touch Access

Good for over 2.2 million touches, the versatile touch screen interface offers the most convenient method for quickly configuring the system and accessing process information. The heart of the interface lies in the "operator task bar" at the bottom of each screen. Unlike hot keys, thumbwheels, and navigational keypads, the operator task bar is straightforward and allows secure access to all features with virtually one touch of the screen.
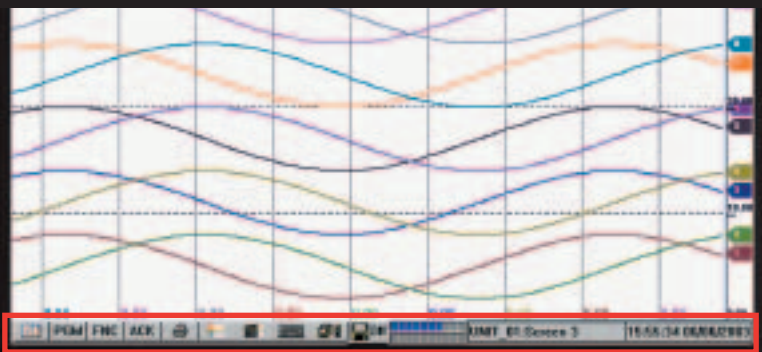




### 1. Screen
Press once to select any of nine programmable screens. Thumbnails and descriptions of all configured screens are displayed to eliminate the need to scroll through numerous selections.

### 2. Program
One-touch access to all configuration menu items. The added convenience of programmable password protection offers controlled access to critical configuration settings.

### 3. Function
Access all system functions with the touch of a button. As with the Program menu, access is controlled via user programmable security settings.

### 4. Acknowledge
Alarm acknowledge flashes when a new alarm occurs. Solid when acknowledged.

### 5. Printer icon
Press to capture and print existing screen to an attached parallel printer.

### 6. Trend icon
Turn digital values on/off. When digital indicators are turned on, operators can display valuable point information such as alarm settings and input type by simply touching the indicator box.

### 7. Historical review
Review/replay historical data from system memory and the local storage media(s) while simultaneously viewing real-time "live" data. Zoom in or out on any trend screen, scroll through historical data, or search by date, time and alarm/event. Get the exact digital value for the cursor location.

### 8. Keyboard icon
Press to display keyboard to document process conditions without interrupting the recording session. All messages are written to the storage media and displayed on the trends and alarm/event screens. When used in conjunction with pre-defined text messages, the SV180 provides impromptu and standardized electronic documentation.
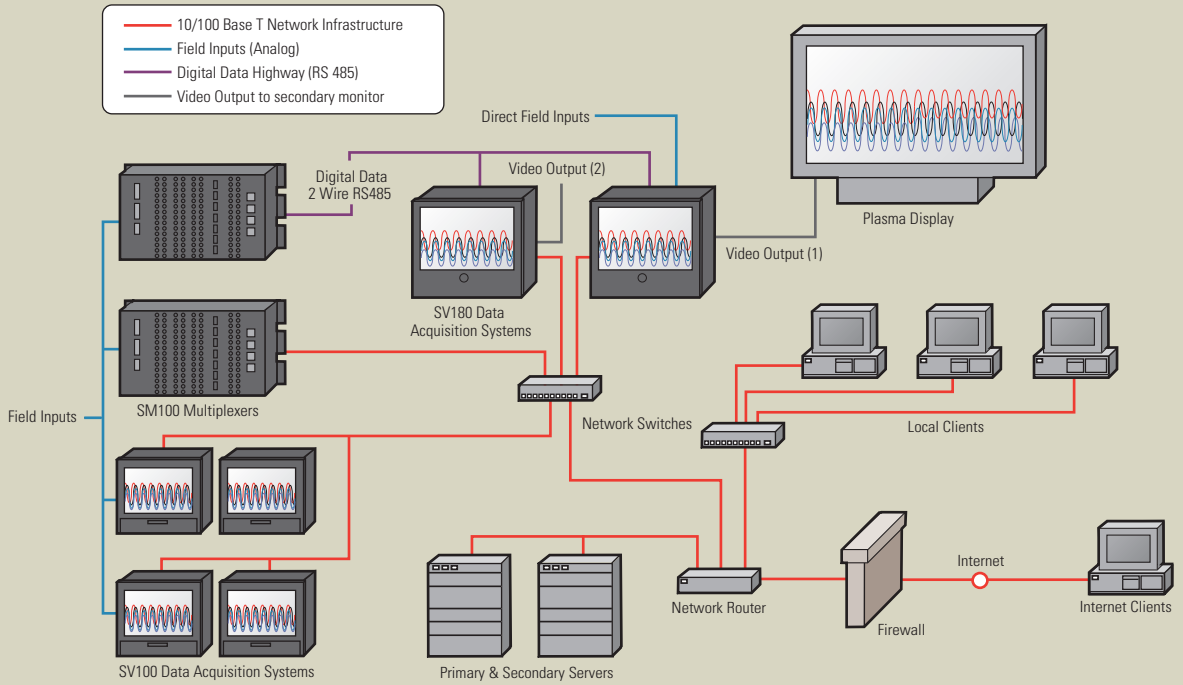
### 9. Media status indicator
Primary and secondary media status indication provides an easy method of identifying drive status and available space. Media status can be linked to an output alarm for audio/visual notification at a user-defined percentage of full.

### 10. Unit ID
Identifies unit and screen name including time and date.

**Plant Networking**



Legend:
- 10/100 Base T Network Infrastructure
- Field Inputs (Analog)
- Digital Data Highway (RS 485)
- Video Output to secondary monitor

Diagram labels:
- Direct Field Inputs
- Video Output (2)
- Plasma Display
- Digital Data 2 Wire RS485
- Video Output (1)
- SV180 Data Acquisition Systems
- SM100 Multiplexers
- Network Switches
- Local Clients
- Field Inputs
- Network Router
- Internet
- Firewall
- Internet Clients
- SV100 Data Acquisition Systems
- Primary & Secondary Servers

### Data Management

The SmartView data acquisition product line excels as a networkable system.

The SmartView networking capabilities will automate and significantly reduce the time required to collect, distribute and manage process data to make day-to-day business decisions, meet regulatory requirements, analyze process parameters and much more. The combination of one or several SmartView data acquisition units with supporting PC application software can be easily integrated into an existing plant-wide data collection system or built from the ground up.

The key to data management and networking as a whole is flexibility and scalability. Designing these two characteristics into the SmartView family provides unsurpassed cross-platform functionality. The SV180 along with its paperless counterparts is loaded with an array of communications capabilities to easily reduce the costs associated with managing and distributing process information throughout the enterprise.

Whether a stand-alone system or a more complex data acquisition network is presently required, the SmartView system of today is also designed to meet system needs and demands of tomorrow.

### File Transfer Protocol (FTP)

- Automatic (Client)
- Manual (Server)
- Configuration

The FTP functionality can be configured to automatically and securely transfer all data from the storage media to an assigned network location at a user specified interval. Stored files can also be accessed directly from any client PC location on demand. The SV180 supports FTP authentication and log-in requirements. The SV180 can also be configured through the network via FTP.

### Data Historians and
### Human Machine Interface (HMI)

- ProView Plus
- ProServer OPC

Thermo tools with OLE for Process Control (OPC) and Modbus support for existing plant historians and HMI packages capture and view process parameters on a plant-wide basis. Thermo Electron also offers a turnkey data acquisition solution to upgrade legacy systems or develop new systems.

### Real-Time Communications

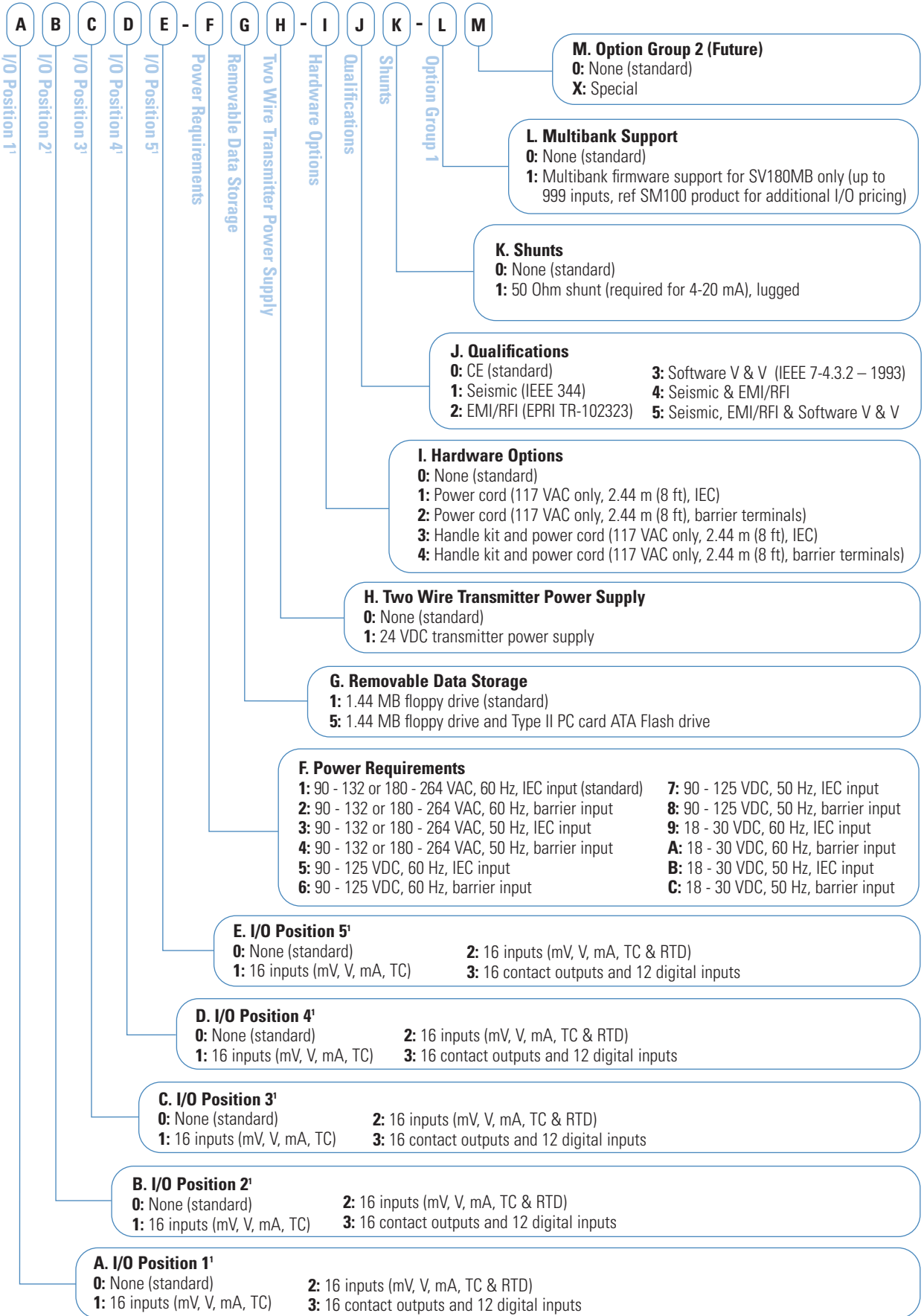- ProView Plus
- ProServer OPC
- Web Browser Access

Communications over a plant local area network, intranet or Internet can be accomplished utilizing the built-in web page or Thermo tools with OPC and Modbus/TCP support. Thermo Electron offers a scalable solution for remote or local communications for any plant network infrastructure.

**SV180 / SV180MB**

SV180 – 180 mm Paperless Data Acquisition System

SV180MB – 180 mm Paperless Data Acquisition System with Multibank Support (SM100 multiplexers ordered separately)

**SV180 / SV180MB –**

A B C D E - F G H - I J K - L M

I/O Position 1[1] | I/O Position 2[1] | I/O Position 3[1] | I/O Position 4[1] | I/O Position 5[1] | Power Requirements | Removable Data Storage | Two Wire Transmitter Power Supply | Hardware Options | Qualifications | Shunts | Option Group 1

**M. Option Group 2 (Future)**
**0:** None (standard)
**X:** Special

**L. Multibank Support**
**0:** None (standard)
**1:** Multibank firmware support for SV180MB only (up to 999 inputs, ref SM100 product for additional I/O pricing)

**K. Shunts**
**0:** None (standard)
**1:** 50 Ohm shunt (required for 4-20 mA), lugged

**J. Qualifications**
**0:** CE (standard)          **3:** Software V & V  (IEEE 7-4.3.2 – 1993)
**1:** Seismic (IEEE 344)     **4:** Seismic & EMI/RFI
**2:** EMI/RFI (EPRI TR-102323)  **5:** Seismic, EMI/RFI & Software V & V

**I. Hardware Options**
**0:** None (standard)
**1:** Power cord (117 VAC only, 2.44 m (8 ft), IEC)
**2:** Power cord (117 VAC only, 2.44 m (8 ft), barrier terminals)
**3:** Handle kit and power cord (117 VAC only, 2.44 m (8 ft), IEC)
**4:** Handle kit and power cord (117 VAC only, 2.44 m (8 ft), barrier terminals)

**H. Two Wire Transmitter Power Supply**
**0:** None (standard)
**1:** 24 VDC transmitter power supply

**G. Removable Data Storage**
**1:** 1.44 MB floppy drive (standard)
**5:** 1.44 MB floppy drive and Type II PC card ATA Flash drive

**F. Power Requirements**
**1:** 90 - 132 or 180 - 264 VAC, 60 Hz, IEC input (standard)     **7:** 90 - 125 VDC, 50 Hz, IEC input
**2:** 90 - 132 or 180 - 264 VAC, 60 Hz, barrier input           **8:** 90 - 125 VDC, 50 Hz, barrier input
**3:** 90 - 132 or 180 - 264 VAC, 50 Hz, IEC input               **9:** 18 - 30 VDC, 60 Hz, IEC input
**4:** 90 - 132 or 180 - 264 VAC, 50 Hz, barrier input           **A:** 18 - 30 VDC, 60 Hz, barrier input
**5:** 90 - 125 VDC, 60 Hz, IEC input                            **B:** 18 - 30 VDC, 50 Hz, IEC input
**6:** 90 - 125 VDC, 60 Hz, barrier input                        **C:** 18 - 30 VDC, 50 Hz, barrier input

**E. I/O Position 5[1]**
**0:** None (standard)              **2:** 16 inputs (mV, V, mA, TC & RTD)
**1:** 16 inputs (mV, V, mA, TC)    **3:** 16 contact outputs and 12 digital inputs

**D. I/O Position 4[1]**
**0:** None (standard)              **2:** 16 inputs (mV, V, mA, TC & RTD)
**1:** 16 inputs (mV, V, mA, TC)    **3:** 16 contact outputs and 12 digital inputs

**C. I/O Position 3[1]**
**0:** None (standard)              **2:** 16 inputs (mV, V, mA, TC & RTD)
**1:** 16 inputs (mV, V, mA, TC)    **3:** 16 contact outputs and 12 digital inputs

**B. I/O Position 2[1]**
**0:** None (standard)              **2:** 16 inputs (mV, V, mA, TC & RTD)
**1:** 16 inputs (mV, V, mA, TC)    **3:** 16 contact outputs and 12 digital inputs

**A. I/O Position 1[1]**
**0:** None (standard)              **2:** 16 inputs (mV, V, mA, TC & RTD)
**1:** 16 inputs (mV, V, mA, TC)    **3:** 16 contact outputs and 12 digital inputs

Notes: [1]Shunt resistor required for each current input. See model selection category K.

| | Specification |
|---|---|
| **Inputs** | |
| Number | 16, 32, 48, 64, or 80 isolated direct analog inputs (up to 999 total points including calculated and external inputs) |
| Type | DC Voltage: Linear and square root programmable to 10 VDC (50 mV, 100 mV, 200 mV, 1 V, 5 V and 10 V bipolar ranges) |
| | DC Current: Linear, square root and log programmable to 4-20 mA, 10-50 mA and dry contact |
| | T/C: J, K, T, E, R, S, B, C, Nicrosil Nisil and Nickel/Nickel Moly |
| | RTD: 10Ω Cu, 100Ω Pt 385, 100Ω Pt 392, 200Ω Pt 385, 200Ω Pt 392 and 120Ω Ni |
| | External: SM100, DCS, PLC, SCADA or computer generated |
| Accuracy | Voltage: ±0.05% of programmed range |
| | Current: ±0.1% using external shunt resistor |
| | T/C: ±1˚C for J, K, T, E, Nicrosil-Nisil and Nickel/Nickel Moly; ±3˚C for R, S, and C; ±4˚C for B |
| | RTD: ±0.5˚C |
| Resolution | 0.006% of full scale |
| Impedance | >10 MΩ |
| Common Mode Voltage | 300 VAC p-p |
| Common Mode Noise Rejection | 120 dB at 50/60 Hz |
| Normal Mode Noise Rejection | 60 dB at 50/60 Hz |
| Scan Rates | All points scanned once a second |
| **Recording** | |
| Rate | User programmable 1 sec to 24 hours |
| Format | ASCII or Binary |
| Internal Memory | 64 MB RAM, 500 KB non-volatile RAM, 8 MB Flash |
| Storage Media | 1.44 MB (3.5") floppy disk, Type II PC card ATA Flash and/or Compact Flash with adapter |
| Data Storage Methods | Data may be saved to storage media as instantaneous, average, max or min values |
| | Data may be saved based on user-defined interval, alarm or external trigger |
| File Type | Data file, alarm/event file, configuration file |
| **Display** | |
| Type | 12.1" Color active matrix TFT LCD (800x600) |
| Display Modes | Up to 9 user-defined screens (vertical trend, horizontal trend, vertical bargraph, horizontal bargraph, digital, overview, alarm/event, circular and four-quadrant split); up to 32 points per trend screen |
| | 1 user defined quadrant screen |
| Display Colors | Up to 40 colors |
| Virtual Chart Speed | User programmable in mm or inches per hour |
| Virtual Chart Scales | User programmable |
| Video Output | External VGA port (VGA 800x600) |
| **Math Package** | |
| Formulas | Algebraic equations, conditional, moving average, hi/lo peak, |
| | timer, rate of change, totalize, timed average, programmable linearization curve and logarithmic |
| **Alarm Functions** | |
| Number of Alarms | Up to 5 alarm setpoints per point |
| Alarm Types | High, low, rate of change and abnormal |
| Contact Output/Input | 16 isolated Form A or B contact outputs and 12 digital inputs per card (1 Amp @ 117 VAC or 26 VDC resistive, 0.5 Amp @ 230 VAC resistive, 0.4 Amp @ 250 VDC resistive); up to 5 input/output cards |
| | 1 common alarm (100 mA @ 250 VDC/VAC) |
| Deadband/Failsafe | User selectable |
| **Power** | |
| Requirements | 90-132/180-264 VAC (50 to 60 Hz), 90 to 125 VDC or 18 to 30 VDC |
| Consumption | 120 VA max (powering 80 transmitters); 40 VA (no transmitter powered) |
| Power Fail Protection | Programmed parameters stored in nonvolatile memory; clock battery |
| Transmitter Power Supply | 24 VDC at 2 Amps (60 VA or 120 VA maximum with option) |
| **Communications** | |
| Serial Ports | RS232 and/or RS485 communication w/ Modbus (RTU or ASCII) |
| Parallel Printer | Text data logs to external printers |
| Network Type | Ethernet (10/100 Base T), Modbus/TCP protocols, OPC/PI compliant, FTP client/server, web-enabled |
| Realtime Monitoring & Data Historian | ProView Plus, ProServer OPC and Modbus (RTU and ASCII) support |
| **Environmental** | |
| Operating Temperature | -10˚ to +50˚C (-14˚ to +122˚F) |
| Operating Humidity | 10% to 90% RH non-condensing |
| Enclosure | NEMA 4/IP65 Front Panel |
| Dimensions | Bezel: 288 mm x 288 mm (11.4 in x 11.4 in); Cutout: 282 mm x 282 mm (11.1 in x 11.1 in); Depth: 232 mm (9.1 in) |
| Weight | 9.8 kg max (21.6 lbs.) |
| **Qualifications** | |
| Commercial | CE Mark |
| Nuclear Qualifications | Seismic (IEEE 344-1987), EMI/RFI (EPRI TR-102323 Rev 2), Software V&V (IEEE std. 7-4.3.2-1993), 10 CFR21, 10 CFR50 Appendix B and IEEE 323-1983 (mild environment) |