

## Smart Multiplexer

### SM 100 Smart Multiplexer

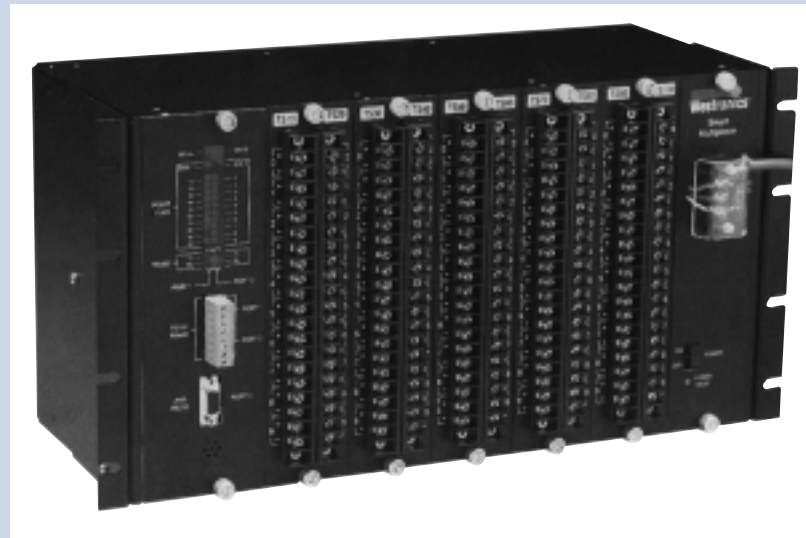
The Westronics Smart Multiplexer is designed to be an economical front end for PLC Networks, Data Acquisition Systems, and Distributed Control Systems. The multiplexer is available in a space-saving 19" rack-mount configuration, surface-mount configuration, or installed in a NEMA 4X fiberglass or NEMA 4X stainless steel enclosure.

The Smart Multiplexer can monitor up to 100 inputs of any type: voltage, current, thermocouple and dry contact closures, or RTDs. Each of the five card slots can accept one of three card types: 20-input active signal card, 10-input universal input card, or 10-contact output card. For increased accuracy, the SM 100 can accept 4-wire as well as 3-wire RTDs. With user-configurable programming, inputs may be mixed in any arrangement, eliminating the need to specify different types of input modules. The Smart Multiplexer can be configured to provide up to 50 contact outputs for alarming and on/off control.

A programmable priority scanning feature allows any point to be assigned to a three-tier priority scanning configuration with a maximum sample time of 60 mS per channel. All necessary hardware/software to condition any type of process signal is included in a single box. The power supply, analog-to-digital converter, central processor, and communications interface work together to provide a cost-effective signal conditioning tool.

Data from the Smart Multiplexer can be transferred via one of two available communication ports. Communication interface ports are available in two configurations: two RS485 ports or one RS485 port and one RS232 port. Both communication ports provide a MODBUS<sup>™</sup> RTU or ASCII compatible output.

Each Smart Multiplexer is provided with a PC-based configuration and maintenance software package.



### Features

Economical front-end (I/O) for:

- PLC Networks
- Distributed Controls Systems
- PC-based Data Acquisition Systems
- SCADA Systems

Each unit monitors up to 100 points

Each unit can provide up to 50 contact outputs

Dual communication interface ports: 2 RS485 or 1 RS485 plus 1 RS232

Selectable MODBUS<sup>™</sup> or ASCII protocol; custom protocols available

Programmable priority scanning

Field upgradable

Universal inputs

Configuration and maintenance software included

# Convenience, Flexibility, and Reliability

## Convenience

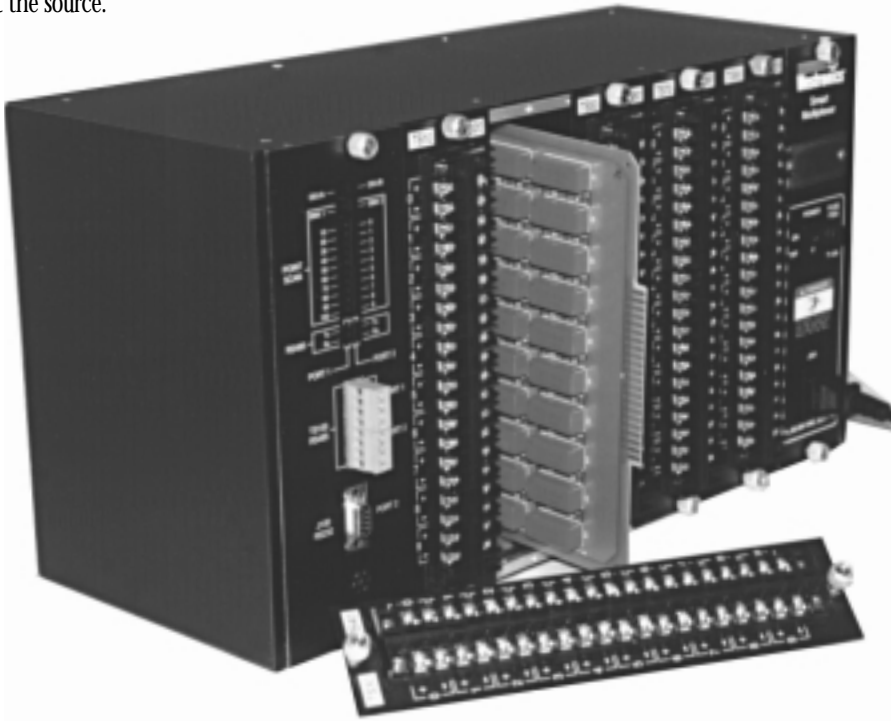
The self-contained construction of the Smart Multiplexer results in significant savings in wiring and installation costs. The 19" rack- or wall-mount design enables the Smart Multiplexer to be located close to the primary measurement device. Enclosures are available for applications in harsh environments. Digital conversion of analog signals near the source and digital communications with the host device minimize the introduction of noise into critical measurements. Maintenance and calibration are performed via the RS232 serial port, which also provides convenient access to process data at the source.

## Flexibility

The Smart Multiplexer is designed to accommodate up to 100 inputs or up to 50 contact outputs per box. With user-configurable programming, inputs may be mixed in any arrangement, eliminating the need to specify different types of input modules. Each card can be configured for use with inputs or outputs.

## Reliability

The Smart Multiplexer is designed for applications that require rugged, industrial-strength construction. With removable terminal strips and plug-in modules, expandability is simple with no need for additional power supplies, rails, or enclosures.



*With the ability to monitor up to 100 points per unit, programmable priority scanning, and selectable MODBUS or ASCII communications protocol, the SM 100 Smart Multiplexer is the most flexible and economical front end available for PLC Networks, Data Acquisition Systems, and Distributed Control Systems.*

# The SM 100 is the Intelligent Choice

## Intelligence

The Smart Multiplexer monitors and stores (in on-board RAM) the high peak, low peak, and user-definable moving average for each input. This allows the host device to rely on the Smart Multiplexer for data monitoring and collection tasks. With outstanding networking

capabilities built in, up to 31 Smart Multiplexers may communicate on a single twisted-pair RS485 loop. All input configuration information is stored in non-volatile EEPROM memory, ensuring that programmed parameters will not be lost during power failure.

## Priority Scanning

For applications that require some points to be monitored more closely than others, the Smart Multiplexer is equipped with a priority scanning system. Configured points may be assigned to one of three priority levels. Self-reporting of the true update rate for each point allows precise calculations. No more guessing when time-sensitive mathematical calculations are involved.

# Typical Applications

## Distributed Control Systems

The Smart Multiplexer provides a cost-effective means of measuring, processing and communicating data into the host DCS. This releases the DCS from the task of data collection and increases its effectiveness in process control.

## Programmable Logic Controllers

In the same way that the Smart Multiplexer aids the DCS, it will also increase the efficiency of a PLC network. Because a large number of the overall inputs to the PLC may not be critical control points, the PLC can perform its primary control function quicker and easier. The assistance of the Smart Multiplexer becomes an important factor in the effectiveness of any PLC device.

## PC-based SCADA

The Smart Multiplexer's networking capabilities will increase the input capacity of any PC-based SCADA system to which it is attached.

In addition, the Smart Multiplexer eliminates dependability and compatibility concerns common to other internal data acquisition cards. The multiple-host communications capabilities of the Smart Multiplexer reduce the cost of true system redundancy.

# How to Order

To order your SM 100, choose one selection from each group to build your model number.

<b>Base Model</b>	<b>Description</b>		
SM 100	19" rack- or wall-mount Smart Multiplexer		
<b>Table A</b>	<b>MUX Input Card # 1</b>		
1	Active signal input (20 inputs: T/C, mA, mV, V, contact)		
2	Universal input (10 inputs: RTD, T/C, mA, mV, V, contact)		
3	Contact outputs (10 outputs)		
<b>Table B</b>	<b>MUX Input Card # 2</b>		
0	None		
1	Active signal input (20 inputs: T/C, mA, mV, V, contact)		
2	Universal input (10 inputs: RTD, T/C, mA, mV, V, contact)		
3	Contact outputs (10 outputs)		
<b>Table C</b>	<b>MUX Input Card # 3</b>		
0	None		
1	Active signal input (20 inputs: T/C, mA, mV, V, contact)		
2	Universal input (10 inputs: RTD, T/C, mA, mV, V, contact)		
3	Contact outputs (10 outputs)		
<b>Table D</b>	<b>MUX Input Card # 4</b>		
0	None		
1	Active signal input (20 inputs: T/C, mA, mV, V, contact)		
2	Universal input (10 inputs: RTD, T/C, mA, mV, V, contact)		
3	Contact outputs (10 outputs)		
<b>Table E</b>	<b>MUX Input Card # 5</b>		
0	None		
1	Active signal input (20 inputs: T/C, mA, mV, V, contact)		
2	Universal input (10 inputs: RTD, T/C, mA, mV, V, contact)		
3	Contact outputs (10 outputs)		
<b>Table F</b>	<b>ADC</b>		
1	Standard		
2	Universal (with RTD support)		
<b>Table G</b>	<b>Communications</b>		
1	One RS485 and one RS232/RS485 with MODBUS		
<b>Table H</b>	<b>Power Input Selection</b>		
1	117-230 VAC, 50/60 Hz, with terminal blocks		
2	117-230 VAC, 50/60 Hz, with terminal blocks and 8' power cord		
3	117-230 VAC, 50/60 Hz, with IEC 320 connector plug and power connector adapter (socket straight cable entry)		
4	117-230 VAC, 50/60 Hz, with IEC 320 connector plug and power connector adapter (socket 90° cable entry)		
5	117-230 VAC, 50/60 Hz, with IEC 320 connector plug, and 8' power cord for IEC 320 connector (straight)		
6	24 VDC + 10%, -15% with terminal blocks		
<b>Table I</b>	<b>Option 1</b>	<b>Table J</b>	<b>Option 2</b>
0	None	0	No enclosure
1	50 Ω current shunt (required for 4-20 or 10-50 mA inputs)	1	NEMA 4X fiberglass
		2	NEMA 4X stainless steel
<b>Table K</b>	<b>Option 3</b>	<b>Table L</b>	<b>Option 4</b>
0	None	0	None
1	Stainless steel nametag	1	Seismic (IEEE 344) Certificate
		2	EMI/RFI (CE Mark)
<b>Table M</b>	<b>Option 5</b>	3	1 and 2
1	Customer database programming, 60 Hz	4	1 and 2 and Software V & V
2	Factory database programming, 60 Hz		
3	Customer database programming, 50 Hz	<b>Table N</b>	<b>Option 6</b>
4	Factory database programming, 50 Hz	0	None
		X	Special Item

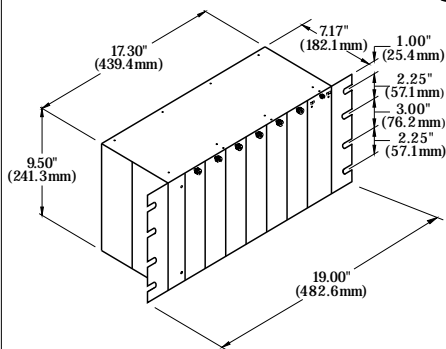
## Model Summary

SM 100 (A) (B) (C) (D) (E) (F) (G) (H) (I) (J) (K) (L) (M) (N)

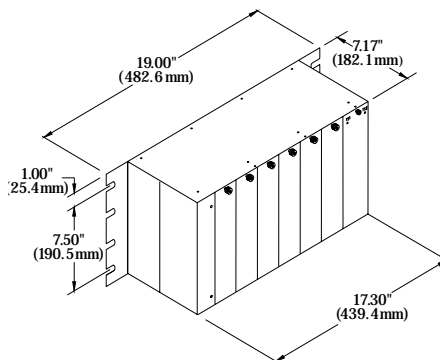
# Specifications

<b>Input Signals</b>	T/C: J, K, T, E, R, S, B, C, Ni-Ni Moly & Nicrosil RTD: 100 & 200 $\Omega$ Platinum 385 & 392; 385, 120 $\Omega$ Nickel; 10 $\Omega$ Cu (3-wire or 4-wire RTDs) Linear & industrial square root: $\pm 100$ mV, $\pm 1$ V, $\pm 10$ V, 4-20 mA, 10-50 mA Dry contact	<b>Sample Time</b>	60 mS/channel maximum
<b>16 Bit Resolution</b>	No missing codes	<b>Scan Rate</b>	3 programmable priority scan levels: PtpH: Number of points assigned to high priority PtpM: Number of points assigned to medium priority PtpL: Number of points assigned to low priority High Priority Rate: 60 mS • (PtpH + 1) Medium Priority Rate: HPR • (PtpM + 1) Low Priority Rate: MPR • (PtpL)
<b>Integral Nonlinearity</b>	$\pm 0.0015\%$ FSR typical	<b>Power</b>	AC Input: 90 to 264 VAC at 40 Watts Line Frequency: 47 to 63 Hz
<b>Input Accuracy</b>	Voltage: $\pm 0.05\%$ Current: $\pm 0.1\%$ including shunt resistance Thermocouple: $\pm 1^\circ$ C for J, K, T, E, Nicrosil-Nisil, and Nickel/Nickel Moly; $\pm 3^\circ$ C for R, S, and C; $\pm 4^\circ$ C for B RTD: $\pm .5^\circ$ C	<b>Operating Temperature</b>	$-25^\circ$ to $50^\circ$ C
<b>Input Impedance</b>	$> 10$ megaohms (100 mV & 1 V ranges) 30K $\Omega$ (10 V range)	<b>Operating Humidity</b>	0% to 95% noncondensing
<b>Common Mode Voltage</b>	300 VDC or peak VAC	<b>Storage Temperature</b>	$-50^\circ$ to $85^\circ$ C
<b>Common Mode Noise Rejection</b>	$>100$ dB at 50/60 Hz	<b>Storage Humidity</b>	0% to 100% noncondensing
<b>Normal Mode Noise Rejection</b>	$>50$ dB at 50/60 Hz	<b>Communications</b>	
<b>Input Cards</b>	Barrier strips 0.375" spacing up to 12 gauge wire 20 channels: Voltage, current, T/C and dry contact 10 Channels: RTD	Port 1	RS485 switch programmable Baud rates: 19200, 9600, 4800, 2400 Parity: Even, Odd, None Data Bits: 8, 7 Protocol: RTU MODBUS, ASCII MODBUS
<b>Capacity</b>	5 input cards maximum	Port 2	RS232/485 Baud rates: 9600 Parity: None Data bits: 8 bits Protocol: RTU MODBUS
		<b>PC-based Software</b>	MSDOS-based configurator and maintenance package
		<b>Dimensions</b>	13.32" H x 23.07" W x 11.8" D (33.8 x 58.6 x 29.97 cm)

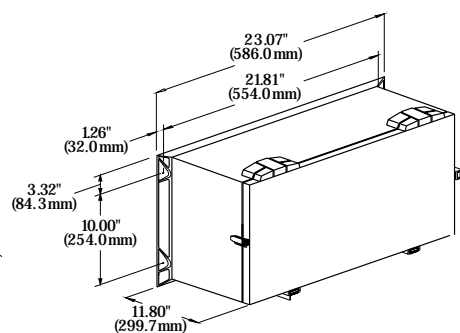
## Dimensional Drawings



19" Rack Mount



Surface Mount



NEMA 4X Enclosure



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