

# SM1-16

## Substation Multiplexor

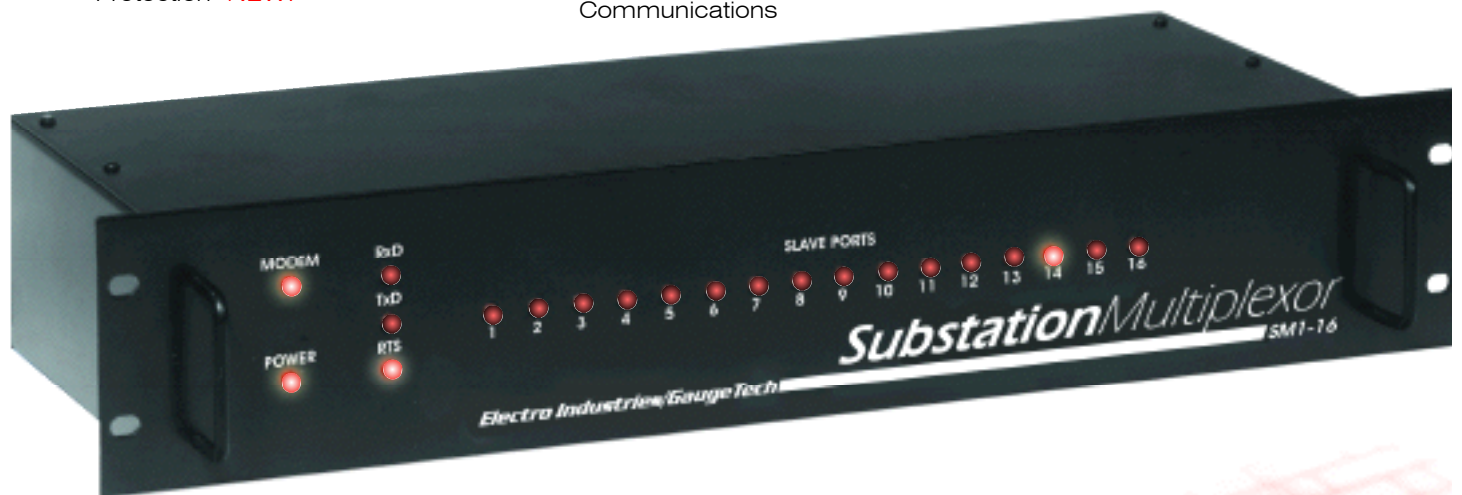
Multi-Point Telephone or Ethernet  
Serial Switch

SM  
SERIES

Direct  
Ethernet  
Access

### Features

- 19 Inch Rack Mount
- Optically Isolated
- 16 Ports—2 RS232 & 14 RS232 Ports
- Built-In Isolated 33k or 56k Modem
- 10BaseT Ethernet Connectivity **NEW!**
- Multi-level Password Protection **NEW!**
- Universal Design for Any Serial IED
- Incorporates Modem Manager® Technology
- High Speed Communication Lowers Telephone Bill
- Designed for Harsh Substation Environments
- Low Cost
- Improves Telephone Line Communications



### Description

The Substation Multiplexor provides a low-cost, dependable way to switch 16 or more serial devices in a substation to a single telephone line or to an Ethernet LAN connection. Using this device, you will be able to access any meter, relay or other IED in your station from a remote location. The unit provides either an

Ethernet (10 BaseT RJ45) or Modem connection to the substation devices with a switch command to choose the specific device at the desired port. Using the SM1-16, you can collect your data, quickly, easily and reliably.

 **Electro Industries/GaugeTech**  
The Leader in Web Accessed Power Monitoring



Designed and  
Manufactured

### Isolated and Protected, Providing Superior Reliability

The unit uses 1500 Volt optical isolation between the master port or modem and the other devices. This insures that spikes or surges at the modem end will not damage critical devices. Moreover, the unit also uses an isolated and MOV- protected power supply designed for reliable long-term service.

### Improve Communication Reliability

Modem Manager® Technology allows the internal or an external modem to communicate without any need to specifically program the modem for a particular device. This departure from existing technology allows the local and remote modem to negotiate, renegotiate, use flow control, error correction and compress data transmissions to maintain the telephone line communication and optimize speed. Other switch technology requires most modem communication capability to be disabled. As a result, the communication becomes less reliable. The Substation Multiplexor makes communication significantly faster and more dependable.

### Devices with Different Baud Rates Share the Same Modem

SM1-16's all-digital switching design allows the unit to multiplex any substation IED at different baud rates with one modem. The baud rate of the IED does not have an effect on the modem communication speed. The modem is free to communicate using the highest speed possible. This is accomplished by using a 32K byte RAM communication buffer with EIG's Modem Manager® techniques.

### High Speed Communications Lowers Telephone Costs

The Substation Multiplexor incorporates an optional internal modem with performance up to 33K.

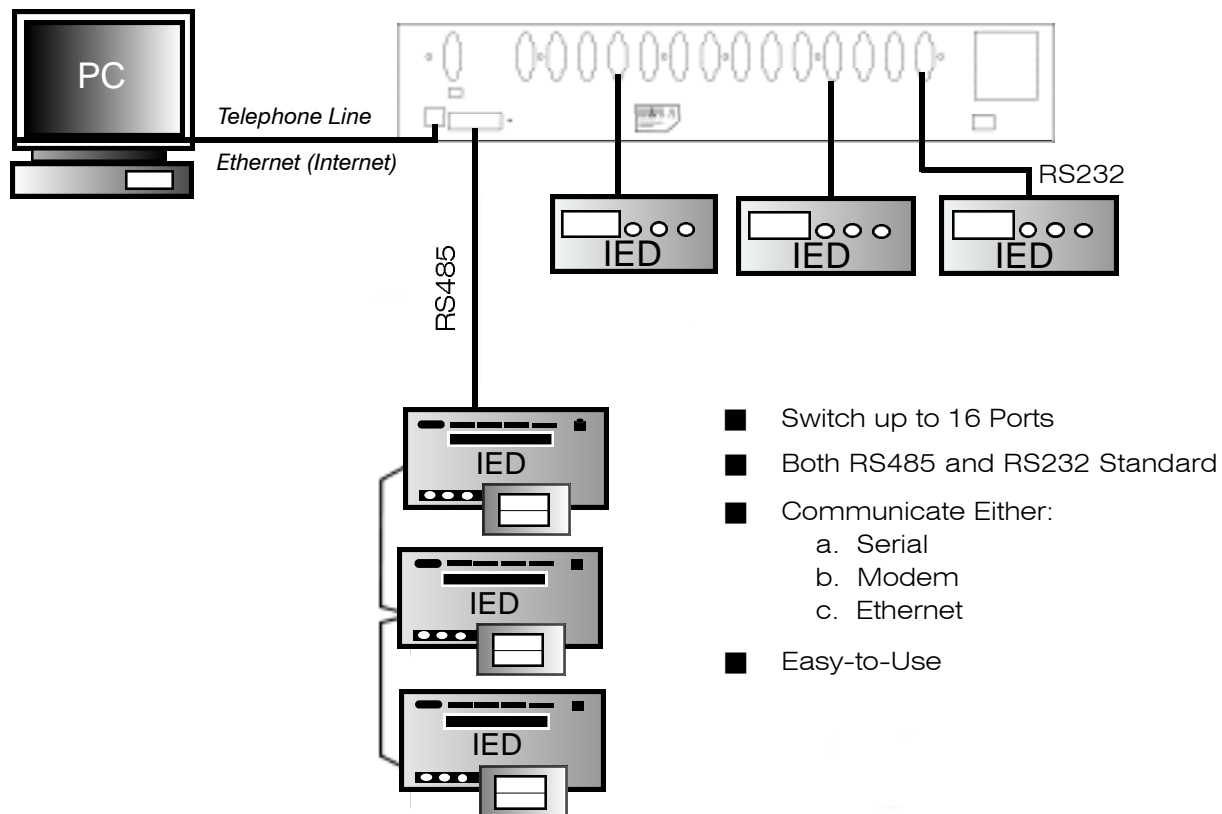
Using Modem Manager® Technology, you can use faster device baud rates for quicker data access and faster downloads. Faster downloads mean less time on the phone line. This will save significantly on telephone bill costs!

### Data Concentrating and Multiplexing

In addition to telephone line switching, the unit can be used as a data concentrator allowing an RTU or PLC to communicate to many RS232 devices without needing multiple ports. Since the SM1-16 utilizes digital switching, the port switching function operates with minimal delay. By adding a port switch command as a virtual address, the unit can switch to each device in a loop to bring back data quickly. This is essential when using more primitive devices with limited communication features.

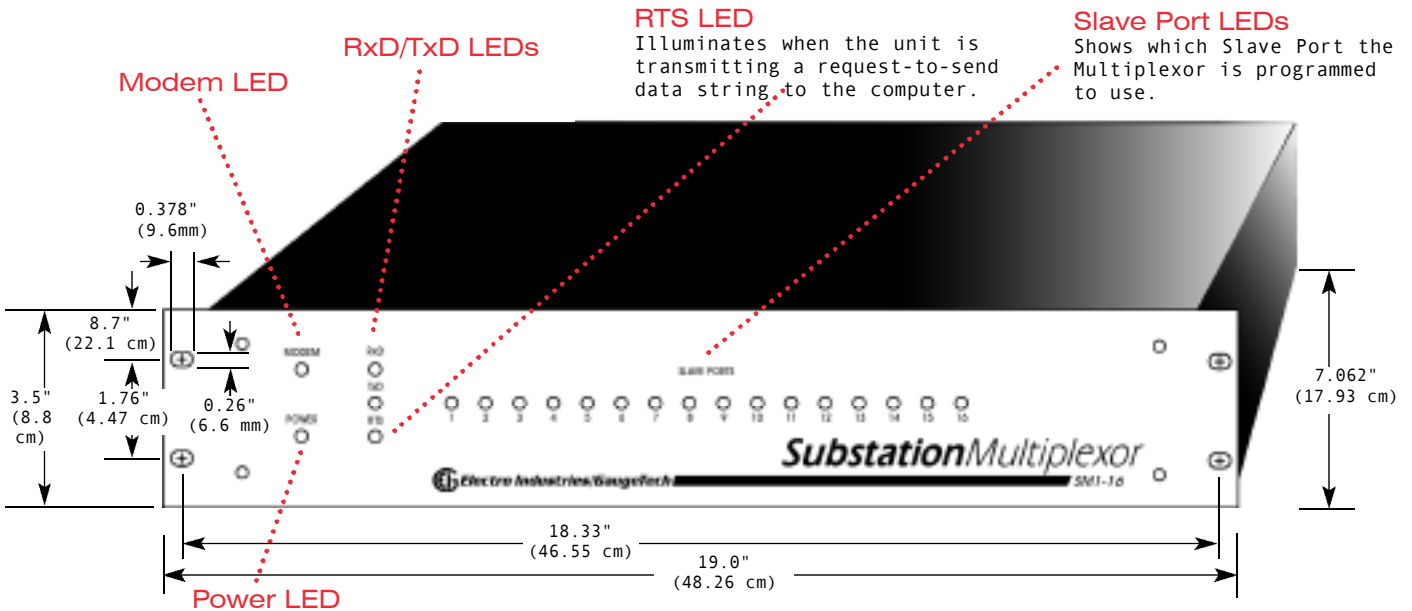
### Put Your IEDs on Your Ethernet LAN Now!

The Substation Multiplexor now comes with an Ethernet Option that allows integrated network connectivity through RJ-45 (10BASET) connection. Now you can take legacy meters, relays, reclosers and recorders and bring them directly through substation Ethernet highways. This upgrades your system automatically and eliminates the need for telephone lines.



# Dimensions & Port Configurations

## Front Panel



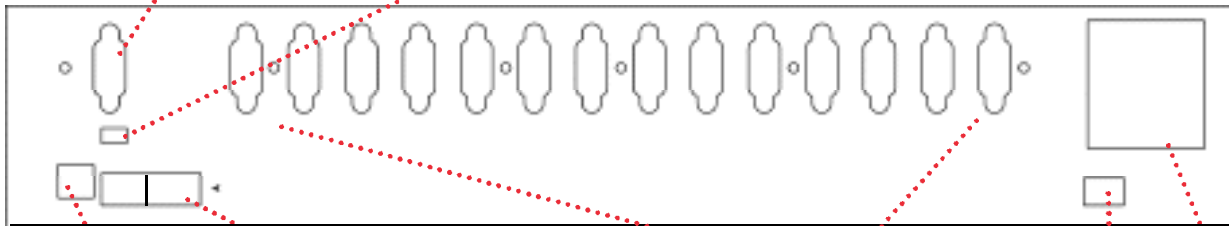
## Back Panel

### Master/Modem Port RS232

For direct connection to a computer or an external modem

### DCE/DTE Switch for Master/Modem Port

When using a modem (internal or external), set to DTE.  
When connecting directly to the computer from the RS232 Master Port, set to DCE.



### Ethernet/Modem Port Phone Jack

Standard RJ11 - Modem  
Standard RJ48 - Ethernet

### Slave Ports 1 & 2

2-wire RS485

### Slave Ports 3-16

9-pin female RS232 ports.  
Use a standard DB-9F 232 cable

### Power Supply

Fail Safe Relay

## RS232 Pin Assignments

Master Port		
PIN	DTE	DCE
1	DCD	DCD
2	Rx	Tx
3	Tx	Rx
4	DTR	DSR
5	Gnd	Gnd
6	DSR	DTR
7	RTS	CTS
8	CTS	RTS
9	Ring	Ring

Slave Port	
PIN	DTE
1	N/A
2	Rx
3	Tx
4	N/A*
5	Gnd
6	N/A*
7	RTS
8	CTS
9	N/A

### RS232 Female Port Close-up



\*Pins 4 and 6 are shorted internally

## Specifications

### TEMPERATURE RATING

- (-20 to +70)° C

### CONSTRUCTION

- Housed in a metal case. All hardware is stainless steel.

### I/O ISOLATION

- 1500V DC from Modem or Network to any Slave Port

### CONTROL POWER REQUIREMENTS

- 115V AC, ±20%, (**OPTION 115A**)
- 24-48 DC, ±20% DC (**OPTION D**)
- 125V AC or DC, ±20% (**OPTION D2**) universal
- 220V AC, ±20% (**OPTION 230A**)

### PORT CAPABILITY

- Slaves—14 RS232 Ports, 2RS485
- Master—One RS232 Port or Internal Modem

### COMMUNICATIONS

- 56k Baud Hayes Compatible (**OPTION IM**)
- Ethernet 10Base-T (**OPTION INP10**)

### COMPLIANCE

- IEEE C37.90.1 (SWC)
- IEEE C62.41 (Surge)

## Ordering Information

**Model**

**Control Power**

**Communication Protocol**

**Option Numbers:**

Specify a unit by writing its option numbers below. Specify the model number, desired power supply and communication option below.

-

-

**Example:**

SM1-16

-

**115A**

-

**IM**

**SM1-16**

**115A**

115 Volts AC ±20%

**IM**

Internal 56k Modem

**230A**

220 V AC/DC ±20%

**INP10**

Ethernet

**D**

24-48 Volts DC ±20%

**D2**

125 Volts AC/DC  
±20% universal



**Electro Industries/GaugeTech**

1800 Shames Drive • Westbury, NY 11590

**1-877-EIMETER** (1-877-346-3837) • **E-mail:** sales@electroind.com

**Tel:** 516-334-0870 • **Web Site:** www.electroind.com • **Fax:** 516-338-4741

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