# SM1-16

## SM SERIES

**Direct Ethernet Access**

## Substation Multiplexor

*Multi-Point Telephone or Ethernet Serial Switch*

## Features

- 19 Inch Rack Mount
- Optically Isolated
- 16 Ports—2 RS485 & 14 RS232
- Built-In Isolated 33k or 56k Modem
- 10BaseT Ethernet Connectivity
- Multi-level Password Protection

- Universal Design for Any Serial IED
- Incorporates Modem Manager™ Technology
- High Speed Communicaton Lowers Telephone Bills
- Designed for Harsh Substation Environments
- Low Cost
- Improves Telephone Line Communication

## 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 (10BaseT 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* Dck Yf`A cb]hcf]b[`UbX`Ga`Ufh;`f]X`Gc`i`h]cbg

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 sup-ply designed for reliable long-term service.

### Improve Communication Reliability

Modem Manager™ Technology allows the internal or an external modem to communi-cate 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, rene-gotiate, 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 signifi-cantly 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 dif-ferent 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™ tech-niques.

### High Speed Communication– Lowers Telephone Costs

The Substation Multiplexor incorporates an optional internal modem with performance up to 33K.
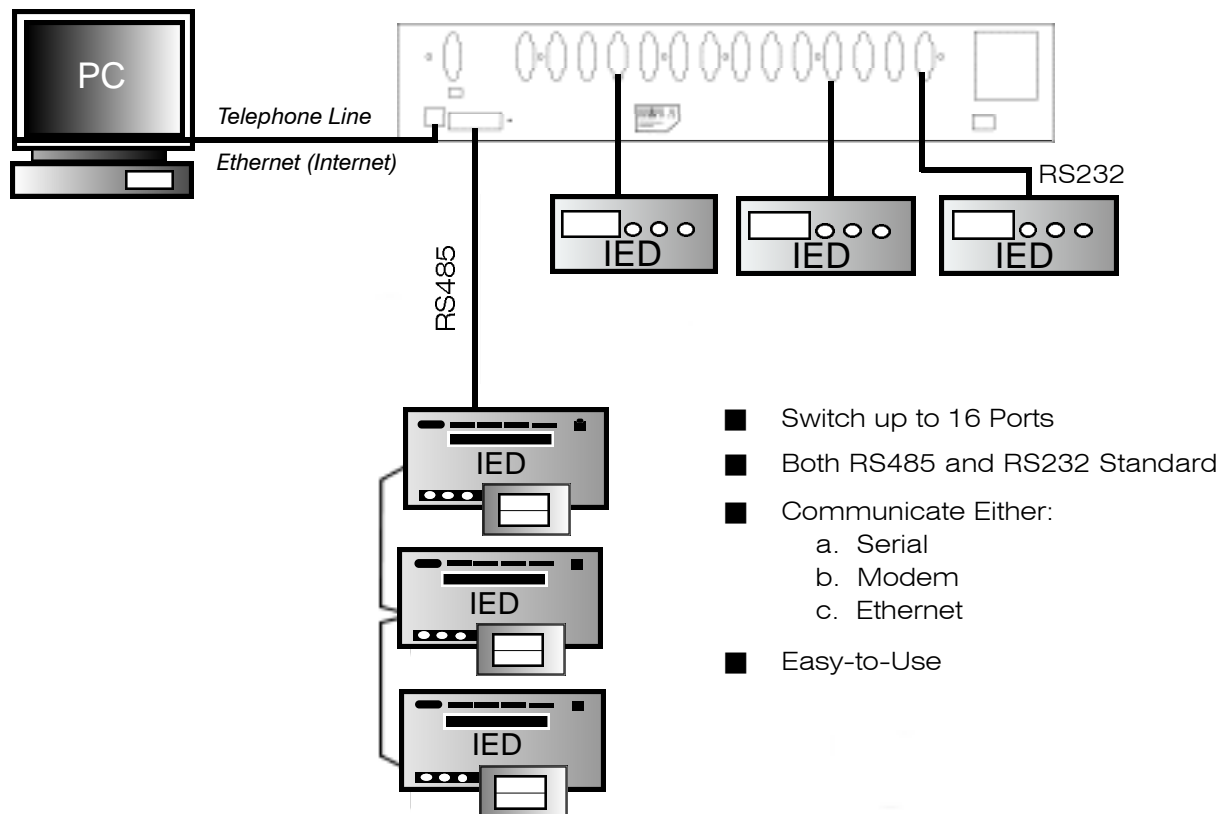
Using Modem Manager™ Technology, you can use faster device baud rates for quicker data access and faster downloads. Faster downloads mean less time on the phone line. This will mean significant savings on telephone bill costs!

### 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 multi-ple ports. Since the SM1-16 utilizes digital switching, the port switching function oper-ates 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 limit-ed communication features.
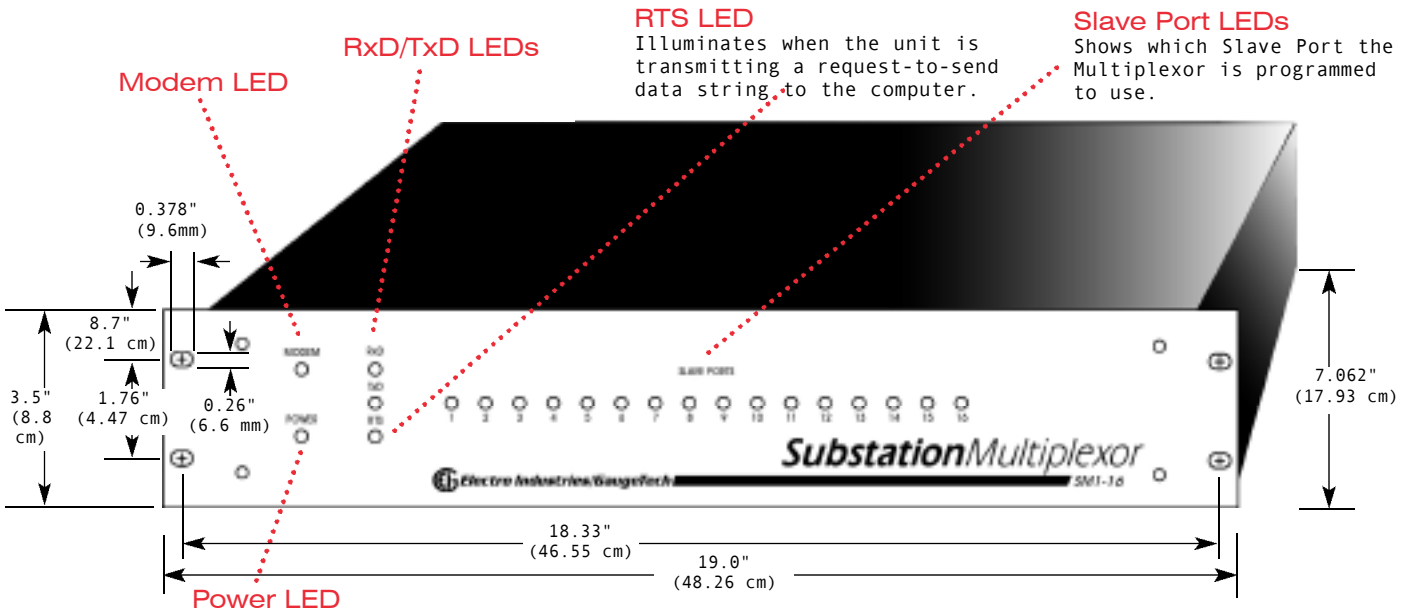
### Put Your IEDs on Your Ethernet LAN Now!

The Substation Multiplexor now comes with an Ethernet Option that allows integrated network connectivity through RJ45 (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.



- Switch up to 16 Ports
- Both RS485 and RS232 Standard
- Communicate Either:
    a. Serial
    b. Modem
    c. Ethernet
- Easy-to-Use

# Dimensions & Port Configurations

## Modem LED

## RxD/TxD LEDs

## RTS LED
Illuminates when the unit is transmitting a request-to-send data string to the computer.

## Slave Port LEDs
Shows which Slave Port the Multiplexor is programmed to use.

0.378"
(9.6mm)

8.7"
(22.1 cm)

3.5"
(8.8 cm)

1.76"
(4.47 cm)

0.26"
(6.6 mm)

7.062"
(17.93 cm)

18.33"
(46.55 cm)

19.0"
(48.26 cm)

MODEM

POWER

RXD TXD DCD RTS

SLAVE PORTS

1  2  3  4  5  6  7  8  9  10  11  12  13  14  15  16

*SubstationMultiplexor* SM1-16

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## Power LED

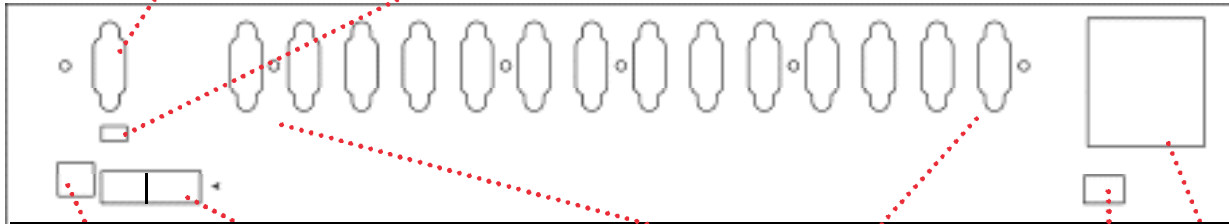## Master/Modem Port RS232
For direct connection to a computer or an external modem

## 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

## Fail Safe Relay

## Power Supply

## 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 |

*Pins 4 and 6 are shorted internally

## RS232 Female Port Close-up

1  2  3  4  5
6  7  8  9

# 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 | | |