

Modems

Bell-202/202T and V.23 Modems



Rack Mount

Box / Stand Alone

Applied Systems Engineering, Inc. SM series products are Bell-202/202T and V.23 modems designed for operation over leased line communication circuits as commonly used in the electric power and pipeline SCADA industries.

These modems have been designed with commonly requested features including 900Hz soft-carrier turnoff, LED indicators, digital control over timing parameters (in millisecond increments), transmit levels from 0 to -31db, and input power from 5 to 160 VDC. The primary modem circuitry is based on commercially available ICs with many years of field proven operation.

Modems are available in a 19" rack configuration with a 16-slot custom backplane and AC power supply, or packaged in a stand-alone metal box. For IED manufacturers or applications where the modem can mount in an existing cabinet, a "board only" version can be used. The Board only version is a standard 3U card for VME applications, and can be mounted in a standard 3U VME slot.

To determine which product is best suited to a particular application, some key points should be considered:

- Preferred modem location (Remote or Master site)
- Total number of sites
- Total number of communication channels at each site
- Environmental issues and power inputs

FIELD PROVEN SOLUTIONS

ASE has been manufacturing the Bell 202/202T and V.23 modems for over 15 years. We have shipped over 5000 modems over the years, all across the planet. Installations vary from electrical substations to water processing plants.

 **Applied Systems Engineering, Inc.**

Product Codes

When ordering the product codes are of the form SM-**MMM-P-K** where:

| MMM Modem Type | | P Power Option | | K Packaging | |
|-------------------|---------------|-------------------|---------------|----------------|------------------------------|
| 202 | Bell-202/202T | I | 12 to 160 VDC | B | PC board only |
| V.23 | V.23 CCITT | X | 5 VDC | V | VME chassis mounting bracket |
| | | | | M | Metal box enclosure |

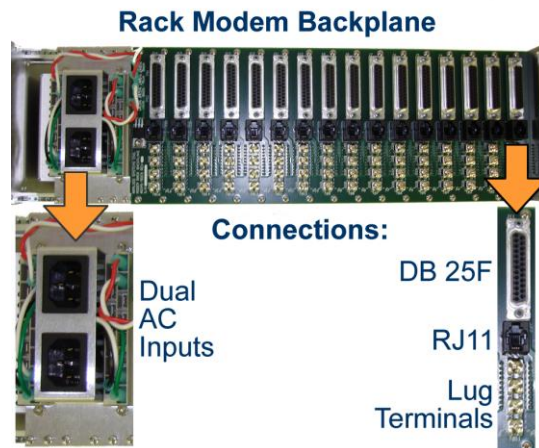
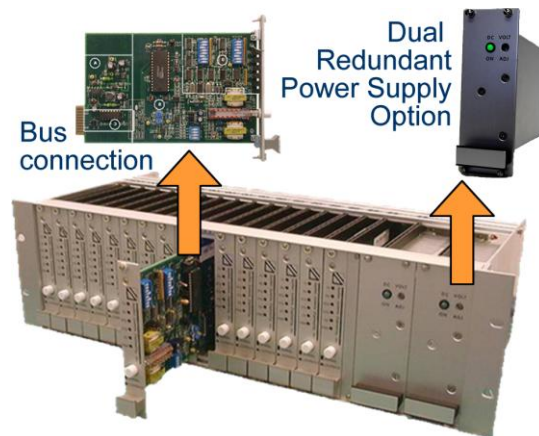
For example, SM-202-X-V specifies a Bell-202 modem with the 5 V power option and VME mounting bracket.

Rack Mount Modem Features

The rack mount chassis measures 19 inches wide by 5.25 (3U) inches high, and fits into standard EIA cabinets. The chassis holds 16 single-channel modems, as well as two power supplies. The modems slide into the chassis and connect to a 16-channel back plane. The multiple power supply configuration allows for a redundant power configuration.

Power

The 16 Channel Modem Chassis contains slots for two standard 3U x 9HP VME power supplies. The power supply is a 40-watt universal input (90 to 254VAC) with over voltage protection and continuous short circuit protection. The power supply has a single output +5VDC at 8.0 Amps and does not require a minimum load to obtain regulation. The power supply module contains a +5VDC adjustment pot that is accessible from the front panel and can be adjusted +/- 0.3 volts. The 16 Channel modem chassis does not require both power supplies to operate, and can run on a single supply. The second power supply can be added to provide the user with a higher mean time between failure. The power supplies are also hot swappable.



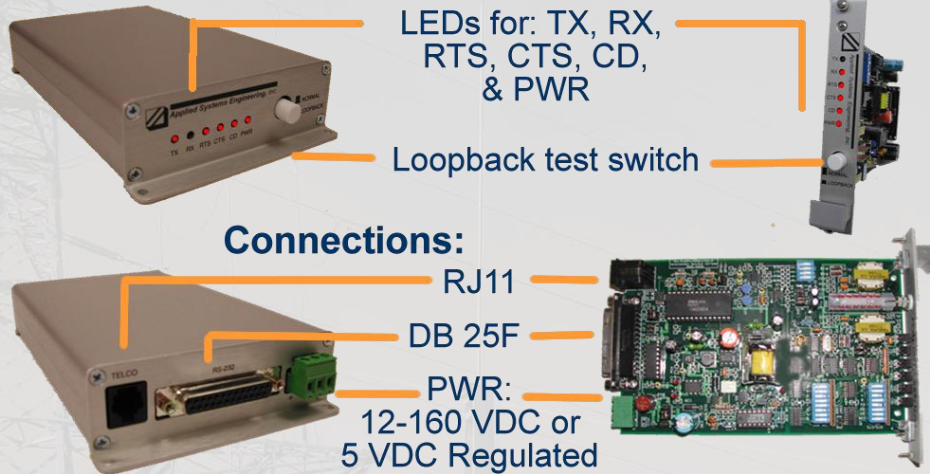
COST EFFECTIVE SOLUTIONS

Stand-Alone Bell 202/202T and V.23 Modems

The Stand-alone modem can be purchased in two formats, in a metal enclosure (Box) or ready to install in a VME rack with a form factor of 3U. The metal enclosure is 187 x 105 x 36 mm or 7.35 x 4.14 x 1.42". Flanges are provided at both ends for mounting the equipment. The 3U VME mounting bracket has screw downs for standard VME chassis'.

Metal Enclosure

3U VME Mount



Specifications for Rack-mount and Stand-alone Modems

| Item | Characteristic |
|--------------------------|--|
| Data Rates | 0-1200 bps |
| Operating Mode | Half or full duplex; 2 or 4 wire private line |
| Operating Format | Asynchronous, binary, serial |
| Line Requirements | Voice Grade, private lines |
| Line Impedance | 600 ohms, balanced |
| Bell 202 Modulation | Bell Frequency Shift Keying (FSK) Mark-1200 Hz; Space-2200 Hz; Soft Carrier-900 Hz |
| V.23 Modulation | V.23 Frequency Shift Keying (FSK) Mark-1300 Hz; Space-2100 Hz; Soft Carrier-900 Hz |
| Bell Carrier Frequency | 1200 Hz and 2200 Hz +/- 1% |
| V.23 Carrier Frequency | 1300 Hz and 2100 Hz +/- 1% |
| Transmitter | Output Level: 0 dBm, switch selectable to -31 dBm in 1 dBm increments RTS/CTS Delay: 0 to 254 mS, switch selectable (8 mS) 900 Hz Soft Carrier On Time: 0 – 15 mS (2 mS) |
| Receiver | Receiver Operating Range: 0 to -35 or -45 dBm Receiver Squelch: 0, or 156 mS for 2 wire Carrier Detect On Delay: 2 to 30 mS (8mS) Hysteresis: 2 dBm minimum |
| Electrical Isolation | Power Supply: 1800 Vac Telco Connection: 1500 Vrms (Primary to Secondary) |
| Environmental | Operating Temperature: 0 - 70° C Storage Temperature -40 to 80° C Humidity: 0 to 95% Relative Humidity (non-condensing) |
| Physical Characteristics | Stand Alone (Box): 187x105x36mm or 7.35x4.14x1.42 inches Rack mount / 3U VME: 19" Rack Mount is 5 1/4 " high with slots for 16 modems plus redundant power supply |
| Power | Stand Alone (Box/3U VME): 12-160 VDC @ 100mA Rack mount: 5VDC @ 100mA per card |
| User Equipment Interface | 25 Pin EIA Connector (RS232 C Compatible) |
| Telco Interface | RJ11 Jack (Box and Rack-mount), Terminal Blocks on Rack-mount only |
| Diagnostic | Analog Loop Back Switch |
| Front Panel LED Display | TXD, RXD, RTS, CTS, CD and PWR |

Pricing

Bell 202 Modems – Stand-alone

| Model | Mounting Option | Input Power | Unit Price | | |
|------------|---|--|------------|----------|----------|
| | | | 1 - 24 | 25-50 | 50+ |
| SM-202-I-B | No enclosure, board only. For mounting in an existing cabinet. | Regulated 5VDC or unregulated 12-160 VDC | \$360.00 | \$342.00 | \$324.00 |
| SM-202-I-V | VME Mounting bracket for mounting in a 3U logic chassis without backplane. Requires access to rear of board for external power, RS-232 and Telco connections. | | \$392.00 | \$372.40 | \$352.80 |
| SM-202-I-M | Metal box enclosure | | \$410.00 | \$389.50 | \$369.00 |

Bell 202 Modems – Rack-mount

| Model | Description | Input Power | Unit Price | | |
|------------|---|-----------------------------------|------------|----------|----------|
| | | | 1 - 24 | 25-50 | 50+ |
| SM-202-X-V | Single channel modem for use with SM-RACK-16 chassis and backplane | From SM-RACK-16 chassis backplane | \$360.00 | \$342.00 | \$324.00 |
| SM-RACK-16 | 19" VME Rack mount chassis with 5V logic power supply- holds 16 SM-202-X-V modems | 120 VAC | \$825.00 | N/A | N/A |
| SM-RACK-PS | Redundant 5V logic power supply | 120 VAC | \$248.00 | N/A | N/A |

Please contact ASE for any further information.



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