**Efficient Network Access for Substrate Applications**

**SC SRM-6 Subrate Mux Highlights**

- Efficient, cost-effective network access by reducing additional communication lines and equipment.
- Combines synchronous and asynchronous data from up to six subrate users into one TDM payload.
- Allows users’ mixed data rates in one TDM payload.
- Built-in diagnostic aggregate loopback (toward DTE)
- Operating status LEDs
- Alarm monitor and SNMP trap generation
- Supports channel alarms (one for each channel) for No RTS and No Remote CTS
- Supports aggregate alarms for No DCD and No Frame Sync
- Telnet, LAN, and ASCII/VT100 craft connections via SCM
- Multi-level password protection for console or Telnet management access; inactivity timers.
- Front Panel LEDs indicate operating status
- TFTP download for firmware upgrades
- Power requirements are less than 6 Watts per card.
- Multiple deployment options: SC5000 shelf, Dual SC2000 shelf or Single SC2000 shelf.

**Overview**

The SpectraComm SRM-6 is a six-channel Time-Division Subrate Multiplexer. It multiplexes up to six DTEs at the channel interface (RS-232), and connects a SpectraComm V.F28.8/33.6 modem, a SpectraComm 521A/S DDS CSU/DSU, or any RS-232 or RS-530 DCE device at the aggregate interface in point-to-point applications.

A SpectraComm Manager (SCM) card provides the Telnet and VT100 servers/agents, the Telnet/Ethernet connection, and the craft port. Field personnel can connect a VT100/ASCII terminal to the SCM craft port to provision the SRM-6, monitor alarms and status, and perform diagnostics and maintenance. The SCM also acts as an SNMP proxy agent for the SRM-6 and the modem/DSU by sending alarm traps to a trap manager.

**Intended Use**

The SRM-6 card and its two SpectraComm companion cards are intended for rack-mount installation in two linked (dual) SC2000 shelves (Figure 1). The SpectraComm devices may also be installed in the 16-slot SC5000 shelf. When a customer-supplied DCE is used, the SRM-6 and the SCM can be deployed in a single SC2000 shelf.

The mass termination connector at the SRM-6 front panel is cabled to an access panel which provides six EIA-232-E interfaces through DB-25 Female connectors wired as DCE. The access panel mounts onto the rear of the SC 2000 shelf or can be installed at the front of the telco rack (Figure 2).

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**Figure 1: Typical "Dual Shelf" Installation**

![Typical Dual Shelf Installation Diagram]

Shown is 4W private line modem application in a Dual SC2000 shelf. For DDS or LDM applications, replace modem with SC 521A/S DSU.
In Dual SC2000 shelf installations, the SCM and the SpectraComm modem must be installed in the same shelf; the SRM-6 is installed in either slot of the second linked shelf.

In a SC5000 shelf, install cards in any slot.

In DDS and T1 applications, the SC21A/S or SC553 DSU replaces the modem. Refer to the corresponding manual to make rear panel connections to those devices.

In Single SC2000 installations, the SRM-6 in slot 2 is connected to a customer-supplied DCE. See Figure 2-3 for Access Panel installation and connection details.
4-Wire Private Line Modem Application

The SRM-6 multiplexer with the SC V.F28.8 modem and the SCM in a typical 4-wire private line modem application (Figure 3). Management is conducted via a craft or LAN/Telnet connection to the SCM.

- On the DTE side, the SRM-6 acts as a DCE, multiplexing up six DTEs into one aggregate.
- On the DCE side of the SRM-6, communication with the co-located modem is configured to one of three aggregate data rates: 19.2, 28.8, or 33.6 Kbps.
- Local and remote sites are connected via the 4-wire, leased private line.

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DSS Network Application or LDM Application

The SRM-6 multiplexer with the SC 521A/S DSU and the SCM can be deployed for DDS applications (Figure 3). Management is conducted via a craft or LAN/Telnet connection to the SCM.

- On the DTE side, the SRM-6 acts as a DCE, multiplexing up six DTEs into one aggregate.
- On the DCE side of the SRM-6, communication with the co-located DSU is configured to one of two aggregate data rates: 56 or 64 Kbps.
- Local and remote sites are connected over the 4-wire, DDS line.

Figure 3: SRM-6 APPLICATIONS

4-Wire Modem Application

LOCAL SITE

DTE 1
DTE 2
DTE 3
DTE 4
DTE 5
DTE 6

SRM-6 MUX

RS-232 or RS-530

SC V.F28.8 MODEM

SCM

Telnet

OR

SNMP

TELNET

REMOTE SITE

DTE 1
DTE 2
DTE 3
DTE 4
DTE 5
DTE 6

SRM-6 MUX

SC V.F28.8 MODEM

SCM

Telnet

OR

SNMP

TELNET

DDS or T1 Applications

LOCAL SITE

DTE 1
DTE 2
DTE 3
DTE 4
DTE 5
DTE 6

SRM-6 MUX

RS-232 or RS-530

SC 553 or SC 521A/S DSU

SCM

Telnet

OR

SNMP

TELNET

REMOTE SITE

DTE 1
DTE 2
DTE 3
DTE 4
DTE 5
DTE 6

SRM-6 MUX

SC 553 or SC 521A/S DSU

SCM

Telnet

OR

SNMP

TELNET

Shown with SpectraComm DCE devices: SC V.F28.8 modem, SC553 T1 DSU or SC521A/S DDS DSU. In applications with a customer-supplied DCE, the SCM does not manage the DCE.
Management Interfaces

The SpectraComm Manager card provides craft, Telnet, and LAN connections for SRM-6 communication, monitoring, and management functions. These functions are accessed via the SCM front panel EIA-232 craft (CTRL) port, the rear panel DB25F LAN port, and the rear panel RJ45 WAN/DBU WAN ports.

Discovery

The SCM performs network discovery of the SRM-6. The discovery function identifies compatible network elements located in the SpectraComm shelf and stores element information in its local database. Information includes the element type, configuration checksum, serial number, alarm status, and equipment status. The user can access this information by means of the SCM Management Information Base (MIB).

Alarms and Traps

After the initial Discovery, the SCM card polls the active slot addresses for alarms and statistical data on network elements and also polls one inactive slot. By reducing the frequency at which it polls inactive slots, the SCM card can continuously monitor as rapidly as possible and still discover newly installed SCM-compatible equipment. The SCM communicates continually with the SRM-6 and forwards its alarm traps to a designated controller.

Secure Connectivity

Management access at the SCM craft and terminal interfaces is protected by several security features:

- User- and Supervisor-level password protection authorizes every access attempt.
- Inactivity logoff prevents hacks through ‘left on’ equipment
- RADIUS authentication and/or encryption security are also available as options to the SCM or modem.

Efficient Maintainability

SRM-6 firmware can be maintained and upgraded by authorized users via TFTP downloads whenever new feature sets become available from GDC.

Cost-Effective SpectraCommonality

Figure 4 illustrates SRM-6 system devices and their capability for centralized management in the Carrier’s network. From a central site or a local craft connection, the SRM-6, and the SpectraComm modem or DSU can be accessed via craft, Telnet via the SCM. The number of concurrent management sessions is determined by your workstation resources.

NOTE: In a DDS network, the SC521A is used instead of the SC V.F28.8/33.6 modem.
### Physical Specifications

<table>
<thead>
<tr>
<th>SC SRM-6 Subrate Multiplexer (P/N 076P054-001)</th>
<th>SpectraComm Manager Card (P/N 058P150-001)</th>
<th>SC VF28.8/33.6 Modem (060M012-001)</th>
<th>SC 521A/S DSU (P/N 076P028-001)</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Width: 178 mm (7.0 in.)</td>
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<td>- Height: 21 mm (0.81 in.)</td>
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<td>- Depth: 241 mm (9.5 in.)</td>
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<td>- Weight: 0.28 kg (10 oz.)</td>
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<td>- Shipping weight: 0.74 kg (1 lb 10 oz.)</td>
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### Operational Specifications

- **TDM Framing Format:** Proprietary
- **Operating Mode:** Point-to-Point
- **Channel Data Rates (Async or Synch):**
  - 1200, 2400, 4800, 9600, 19200 Kbps
- **Aggregate Data Rates (Synchronous):**
  - 19.2, 28.2, 33.6, 56, or 64 Kbps
- **Aggregate Interfaces:**
  - EIA/TIA-232-E, RS-530 (wired as DTE)
- **Channel Interfaces:**
  - EIA/TIA-232-E (Channels 1 through 6 wired as DCE)
- **Channel Async Character Format:** 8 - 11 bits
- **Channel Async Overspeed:** 1%

### Environmental Specifications

**Non-Operating**
- Temperature: -40 to 70 degrees C (-40 to 158 degrees F)
- Relative Humidity: 5% to 95%
- Altitude: up to 12,191 m (40,000 ft)

**Operating**
- Temperature: 0 to 50 degrees C (32 to 122 degrees F)
- Relative Humidity: 5% - 95% non-condensing
- Altitude: -60 to 3,660 m (-197 to 12,000 ft)

### Electrical Specifications

**Power Requirements**
- Power (AC or DC), voltage, frequency, and fusing determined by your SpectraComm shelf or enclosure.

**Power Dissipation**
- SRM-6 Card: Less than 6 Watts
- SCM Card: 6 Watts
- SC VF28.8/33.6 Modem: 6 Watts
- SC521A/S: 4 Watts

### Compliance & Compatibility

- **Safety:** UL Approved
- **EMI:** FCC Part 15 (Pending)
- **Quality Assurance:** ISO 9001:2000 Certified

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