



# FCD-1L

## T1 or Fractional T1 CSU/DSU

### FEATURES

- T1 or Fractional T1 CSU/DSU
- Supports one DTE port
- Selectable sync data rates of n x 56 or n x 64 kbps, up to 1536 kbps
- DTE interface: V.35, RS-530, RS-449/422 or X.21
- Framing format: D4, ESF, Unframed
- Zero suppression: B7ZS, B8ZS, Transparent
- T1 interface: complies with AT&T TR62411, TR62421, ANSI T1.403
- Performance monitoring according to ANSI T1.403 (ESF mode only)
- Unframed over T1

### DESCRIPTION

- The FCD-1L is a low-cost, single port CSU/DSU for T1 or Fractional T1 services. The DTE port is selectable for any data rate multiple of 56 or 64 kbps up to 1536 kbps. User data is placed into a T1 frame, using only the selected number of timeslots.
- Timeslot assignment is according to the data port speed and is consecutive starting from any timeslot.



- The FCD-1L T1 interface is compatible with carrier provided T1 services, including ASDS from AT&T, meeting all requirements of TR-62421. It supports both D4 and ESF framed formats. Zero suppression over the line is selectable for either Transparent, B7ZS or B8ZS. The integral CSU ensures a range of up to 1 mile.
- The main T1 link may be clocked from the T1 network recovered clock, from the DTE or from an internal oscillator. The DTE port interface is internally selectable for V.35, RS-530/422. The physical connector is 25 pin D-type female. Special adapter cables can be ordered separately for X.21 and RS-449/422 (see Ordering).
- Setup and control of the FCD-1L is by internal jumpers. Front panel switches control all diagnostics options. Maintenance capabilities include user activated local loopbacks at the main T1 link and DTE port.
- The FCD-1L responds to network activated loops (RLB, LLB). The DTE port can respond to an in-band ANSI FT1 loop code that can be generated from the remote FCD-1L DTE port. A pseudo-random data pattern (BERT) can be transmitted for diagnosing the T1 link.
- The FCD-1L displays two alarm types on front panel: major alarm and minor alarm. The alarms are displayed by front panel LEDs which can be reset by front panel switch. The FCD-1L has a Severely Errored Second indicator (SES). This indicator is ON when the Bit Error Rate (BER) on the T1 line is above  $1 \times 10^{-3}$ .
- When operating in the ESF format, T1 network statistics are stored in memory in compliance with the ANSI version. This information may be retrieved by the service supplier.
- The FCD-1L is available as a stand-alone unit or as a card for the 19" rack that can accommodate up to 14 cards (ASM-MN-214). A rack mount adapter kit (RM-9) enables installation of one or two stand alone units in a 19" rack.

# SPECIFICATIONS

## T1 LINK (NETWORK)

- **Framing**  
D4, ESF
  - **Bit Rate**  
1.544 Mbps
  - **Line code**  
AMI
  - **Zero Suppression**  
Transparent, B7ZS, B8ZS
  - **Impedance**  
100  $\Omega$ , balanced
  - **Signal level**  
Receive  
0 to -36 dB  
Transmit  
0, -7.5, -15, -22.5 dB  
3V,  $\pm 10\%$
  - **Jitter performance**  
As per AT&T TR-62411
  - **Connector**  
RJ-48C 8-pin
  - **Transmit timing**  
Internal  $\pm 30$  ppm
  - **Loopback Timing**  
 $\pm 130$  ppm
  - **Compliance**  
AT&T TR-62411, ANSI T1.403
- ### DTE PORT
- **Number of ports**  
One
  - **Interfaces**  
V.35, RS-530 or  
RS-449/422 and X.21 by adapter  
cables
  - **Connector**  
25-pin D-type, female

Specifications are subject to change without prior notification

- **Bit Rates**  
 $n \times 56$  kbps or  $n \times 64$  kbps,  
( $n = 1, 2$  to 24)
- **Clock Mode**  
DCE: RX and TX clock are  
transmitted to the DTE port  
DTE1: RX clock is transmitted  
to the DTE port and TX  
clock is received from the  
DTE port
- **Control signals**
  - 1) CTS follows RTS or constantly  
ON, strap-selectable
  - 2) DSR constantly ON, unless in  
test mode
  - 3) DCD constantly ON, unless in  
RED ALARM

## GENERAL

- **Timeslot Allocation**  
Consecutive (bundled) starting  
from any timeslot
- **Diagnostics**  
Main T1 Link local (Analog)  
loopback (towards local DTE);  
Local (Digital) data port loopback;  
Remote (V.54) data port loopback;  
BERT generation and detection;  
T1 network loopback, code  
activated (CSU option only)
- **Performance Monitoring  
(On Main T1 Link)**  
Full statistical diagnostics  
according to ANSI T1.403 -1989
- **Front panel control switches for  
diagnostics activation**  
CLR - Clears alarm indications  
DIG - Local data port loop  
ANA - Main T1 local loop  
REM - Remote data port loop  
PATT - BERT test
- **Indicators**  
PWR, RTS, TEST, ERR, RED  
ALARM, YELLOW ALARM, SES,  
MIN ALARM, MAJ ALARM, TD, RD

- **Physical (S/A unit)**

Height	4.4 cm/ 1.7 in (1U)
Width	19.3 cm/ 8 in
Depth	24 cm/ 9.5 in
Weight	1.3 kg / 2.9 lb
- **ASM-MN-214 Rack**

Height	18 cm/ 7 in
Width	48 cm/ 19 in
Depth	26.7 cm/ 10.4 in
Weight	4.0 kg / 8.8 lb
- **Power**  
115 or 230V ( $\pm 10\%$ ), 47-63 Hz;  
24, 48 VDC Nominal (18-36V,  
36-72V)
- **Environment**  
Temperature: 0-50°C / 32-122°F  
Humidity: up to 90%,  
non-condensing

# ORDERING

### FCD-1L/\*

T1 or Fractional T1 CSU/DSU,  
stand-alone version

### FCD-1L/R

T1 or Fractional T1 CSU/DSU,  
card version for ASM-MN-214

- \* Specify power supply
- |     |             |
|-----|-------------|
| 230 | for 230 VAC |
| 115 | for 115 VAC |
| 48  | for -48 VDC |
| 24  | for 24 VDC  |

### CBL-530/449

Adapter cable for RS-449/V.36 36-pin  
connector

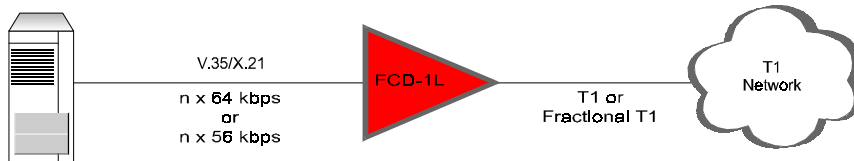
### CBL-HS2X1

Adapter cable for X.21 15-pin  
connector

### CBL-HS2V1

Adapter cable for V.35 34-pin  
connector

# APPLICATION



Order from: Cutter Networks

Ph: 727-398-5252 / Fax: 727-397-9610

**RAD**

data communications

**U.S. EAST:**  
900 Corporate Drive  
Mahwah, NJ 07430  
Tel: (201) 529-1100  
Fax: (201) 529-5777

**U.S. WEST:**  
7711 Center Avenue #350  
Huntington Beach, CA 92647  
Tel: (714) 897-2448  
Fax: (714) 891-1764

### INTERNATIONAL HEADQUARTERS:

12 Hanechoshet Street  
Tel-Aviv 69710, Israel  
Tel: (972) 3-6458181  
Telex: 371283 RADRSO R  
Fax: (972) 3-6498250, 6474436