

## *Fractional E1 (CEPT) Rate and Interface Converter*

### FEATURES

- Fractional E1 (CEPT) Rate and Interface Converter
- Available with or without LTU
- V.35, X.21 or V.36/RS-530 interface
- Selectable data rates: n x 56 or n x 64 kbps, synchronous
- Selectable 2 or 16 frames per multiframe with CRC-4 support
- Multiple clock source selection for both E1 and user ports
- Setup, control and monitoring via front panel or supervisory port
- Complies with CCITT G.703, G.704 and G.732
- Can be used also as a short range modem

### DESCRIPTION

■ The FCD-2 is a Rate and Interface Converter for Fractional E1 services, accepting data at rates from 56 kbps to 1.984 Mbps. User data is placed into an E1 (CEPT) frame, using only the required number of timeslots. Synchronous data channel connection is provided over the public E1 (CEPT) network without the need for a multiplexer. Where a



Fractional E1 service is available, the FCD-2 reduces payment to only the bandwidth used.

■ The FCD-2 is compatible with virtually all carrier provided E1 services, meeting all requirements of CCITT recommendations for G.703, G.704 and G.732. It supports both 2 or 16 frames per multiframe, with or without CRC-4. Zero suppression over the line is HDB3.

■ Selectable timeslotting allows data to be placed into timeslots, either consecutively or as defined by the user. The data rate can be programmed for any multiple of 56 kbps or 64 kbps.

■ The unit can be ordered with or without an LTU (Line Terminating Unit), allowing for operation either with the integral LTU or with an external unit. Three user interfaces are available: V.35, X.21 and V.36/RS-530, with selectable clock sourcing (see Ordering). The integral LTU ensures an operating range of up to one mile, allowing the FCD-2 to be used also as a short range modem.

■ Multiple clock source selection ensures maximum flexibility on both the E1 and the user interfaces. The E1 line may be clocked from the recovered receive clock, or from an internal oscillator. The user interface may be set to DTE or DCE with external transmit clock, or DCE where both receive and transmit clocks are inputs.

■ Setup, control and monitoring of status and diagnostic information can be activated via the front panel or via a terminal or PC connected to the supervisory port.

■ Remote line diagnostics, alarm information, unit configuration and other control/monitoring information can be accessed remotely via dial-up modems.

■ Maintenance capabilities include local and remote loopbacks at various points, as well as built-in BER test for rapid identification of faults.

# SPECIFICATIONS

## E1 (CEPT) DATA LINK

### Bit Rate

2.048 Mbps

### Framing

2 frames per multiframe, no CRC-4  
16 frames per multiframe, no CRC-4  
16 frames per multiframe, CRC-4, selectable

### Line Code

HDB3

### Impedance

120 ohms, balanced or  
75 ohms, unbalanced, selectable

### Signal Levels

Receive:

0 to -33 dB/with LTU  
0 to -10 dB/without LTU

Transmit:

Balanced:  $\pm 3V$ ,  $\pm 10\%$   
Unbalanced:  $\pm 2.37 V$ ,  $\pm 10\%$

### Jitter Performance

According to CCITT G.823

### Connector

15-pin D-type, female, for balanced  
Two BNC coaxial, for unbalanced

### Transmit Timing, Soft-selectable

Internal (accuracy  $\pm 32$  ppm)  
Receive Timing ( $\pm 50$  ppm)  
External Timing ( $\pm 100$  ppm) from data channel source

## DATA CHANNELS

### Interface

V.35, V.36/RS-530 and X.21  
V.36/RS-422, via adapter cable

### Connectors

V.35: 34-pin, female  
V.36/RS-530: 25-pin D-type, female  
X.21: 15-pin D-type, female  
V.36/RS-422: 37-pin D-type, female

### Bit Rate

$n \times 56/64$  kbps ( $n = 1, 2, 3 \dots 31$ )

### Clock Modes

- Rx and Tx clock to sync DTE
- Rx clock to sync device and Tx clock from sync device (V.35/RS-530 only)
- Rx and Tx clock from sync DCE

### Control Signals

Supports RTS, CTS, DCD, DSR  
Supports C, I (X.21 only)

## GENERAL

### Timeslot Allocation

Consecutive (Bundled) or  
User-defined (no restrictions), selectable

### Diagnostics

E1 local analog loopback to DTE  
Channel loopback to remote DTE  
BERT through remote FCD-2

### Statistics and Alarms

CRC-4 error counter  
OOS (Out-of-sync) counter  
BPV (Bi-polar Violation) counter  
Alarm Buffer Size: 100 events

### Supervisory Port

Interface: V.24/RS-232, async  
Connector: 9-pin D-type, female  
Speed: 300-9,600 bps, autobaud supported  
Dial-in: Supported

### Front Panel Controls

Display: 2 rows of 16 characters  
Push buttons: Cursor, Scroll, Enter

### Indicators

Local sync-loss  
Remote sync-loss  
TD, RD, TEST  
DCD (V.35/RS-530)/I (X.21)  
RTS (V.35/RS-530)/C (X.21)

### Power

230 VAC,  $\pm 10\%$ , 15 VA  
47 to 63 Hz

### Physical

Depth: 305 mm / 12 in  
Width: 267 mm / 10.5 in  
Height: 43 mm / 1.7 in (1U)  
Weight: 1.3 kg / 2.9 lb

### Environment

Temperature: 0-50°C/23-122°F  
Humidity: Up to 90%, non-condensing

# ORDERING

### FCD-2\*/#

Fractional E1 Rate and Interface Converter

- \* Specify data channels interface:  
**V35** for V.35 interface  
**530** for RS-530/422 interface  
**X21** for X.21 interface  
**V36** for V.36/RS-530 interface  
(Default is V.35 interface)

### # Specify:

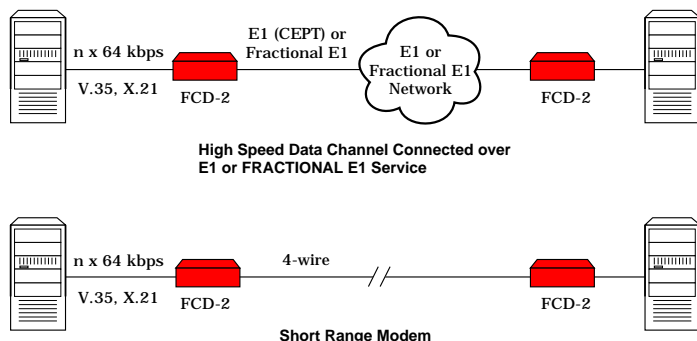
**LTU** for integral Line Termination Unit  
(Default is unit without LTU)

### RM-3

Hardware for mounting a stand-alone unit onto a 19" rack

Specifications are subject to change without prior notification

# APPLICATION



		data communications	
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		206-10-01/93	
www.bestdatasource.com			

\* Specify **LTU** for integral LTU  
default is without LTU