FCD-24

Integrating E1 Multiplexer

RAD

FEATURES

- Integrates high speed data with a PABX E1 link into E1 or Fractional E1 services

- Two or four data channels, optional E1 sub-link

- V.35, X.21, RS-530 or V.36/RS-449 interfaces

- Sync data rate: n x 64 kbps

- Selectable 2 or 16 frames per multiframe with CRC-4 support

- Multiple clock sources

- Setup and control via front panel or supervisory port

- Complies with ITU-T G.703, G.704 and G.732

- Dial-out on alarm events

- Can be used as a multi-channel short range modem

DESCRIPTION

- The FCD-24 is an Integrating Multiplexer for E1 and Fractional E1 services. Two or four synchronous data channels and one E1 sub-link can be connected over the public E1 network, while paying only for the bandwidth required. The E1 sub-link enables PABX connection to the E1 interface.

- Four FCD-24 models are available:(see *Ordering*) **FCD-24** with four synchronous data channels; **FCD-24/E1** with four synchronous data channels and one E1 sub-link; **FCD-24-2** with two synchronous data channels; **FCD-24-2/E1** with two synchronous data channels and one E1 sub-link.

- Data rates are selectable for any multiple of 64 kbps. Selectable timeslotting places data into timeslots (DSOs) either consecutively (bundled), or by user-definition (without restrictions). Selected timeslots on the E1 sub-link are bypassed to the same timeslots on the E1 main link.

- Data channel interfaces available are V.35, X.21, RS-530 or V.36/RS-449. (V.36/RS-449 is converted from RS-530 via cables supplied with V.36 interface option - see *Ordering*.)

- The FCD-24 is compatible with virtually all carrier-provided E1 services, meeting all

requirements of ITU-T G.703, G.704 and G.732. It supports 2 or 16 frames per multiframe, with or without CRC-4. Zero suppression over the line is HDB3. An optional integral LTU (Line Termination Unit) supports ranges up to 1.6 km (1 mile), enabling the FCD-24 to be used as a multi-channel short range modem for private applications.

- Multiple clock source selection allows the E1 main link to be clocked from the recovered clock (LBT), from the data channel source, from E1 sub-link, or from an internal oscillator.

- Data channels may be set to DCE (FCD-24 provides RX and TX clocks to user equipment), DTE1 (FCD-24 provides RX clock to user, while TX clock is received from user) or DTE2 (both clocks received from user) clocking modes.

- The E1 sub-link transmit clock is locked to the E1 main link clock. The receive clock can be used as an external clock source for the E1 main link transmit clock.

- Setup, control and monitoring of status and diagnostic information can be activated from 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 BERT for rapid identification of faults.

- For dial-out operation, the FCD-24 activates the modem to automatically dial a pre-programmed number whenever an alarm event occurs.

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SPECIFICATIONS

E1 MAIN AND SUB-LINKS

- **Bit Rate**
  2.048 Mbps
- **Framing**
  Selectable:
    16 or 2 frames per multiframe,
    with or without CRC-4
  Note: CRC-4 available for main
        link only
- **Line Code**
  HDB3
- **Impedance**
  Selectable:
    120Ω, balanced
    75Ω, unbalanced
- **Signal Levels**
  Receive:
    0 to -33 dB, with LTU
    0 to -10 dB, without LTU
  Transmit:
    Balanced: ±3 V, ±10%
    Unbalanced: ±2.37 V, ±10%
- **Signal Levels**
  Receive:
    0 to -10 dB
  Transmit:
    ±3 V, (±10%) soft-adjustable
    to be measured at 0-655 feet
- **Jitter Performance**
  As per ITU-T G.823
- **Transmit Timing**
  Soft-selectable:
  Internal: ±32 ppm
  Receive Timing: ±50 ppm
  External Timing: ±100 ppm, from
   data channel or E1 sub-link
  source
- **Connectors**
  15-pin D-type, female, balanced
  Two BNC coaxial, unbalanced

APPLICATION

DATA CHANNELS

- **Interface**
  V.35, X.21, RS-530 or
  V.36/RS-449 (converted from
  RS-530 via supplied cables)
- **Connectors**
  V.35: 34-pin, female
  X.21: 15-pin D-type, female
  RS-530: 25-pin D-type, female
  V.36/RS-449 (on conversion
  cables): 37-pin D-type, female
- **Bit Rate**
  n x 64 kbps (n = 1 to 31)
- **Clock Modes**
  DCE: FCD-24 provides RX and
  TX clocks to user DTE;
  DTE1: FCD-24 provides RX to
  user while receiving TX clock
  from user;
  DTE2: FCD-24 receives both RX
  and TX clocks from user DCE.
- **Control Signals**
  Support RTS, CTS, DCD, DSR
  Support C, I (X.21)

GENERAL

- **Timeslot Allocation**
  Selectable:
    Consecutive (bundled)
    User-defined (no restrictions)
- **Diagnostics**
  E1 main link loopback
  Data channel loopback
  E1 sub-link loopback
  BERT through remote FCD-24
- **Statistics and Alarms**
  OOS (Out-Of-Sync) counter
  CRC-4 error counter
  Alarm buffer size: 100 events
- **Supervisory Port**
  Interface: V.24/RS-232, async
  Connector: 9-pin D-type, female
  Speed: 0.3 to 9.6 kbps, autobaud
  Dial-out: Alarm event activated

- **Power**
  115 or 230 VAC (±10%)
  47 to 63 Hz, 25W
- **Indicators**
  Main and Sub-links:
    Local and remote sync loss;
  Per channel: TD, RD; TEST
- **Physical**
  Depth: 24.3 cm / 9.5 in
  Width: 43.2 cm / 17.0 in
  Height: 4.3 cm / 1.7 in (1U)
  Weight: 2.3 kg / 5.0 lb
- **Environment**
  Temperature: 0-45°C/32-113°F
  Humidity: Up to 90%,
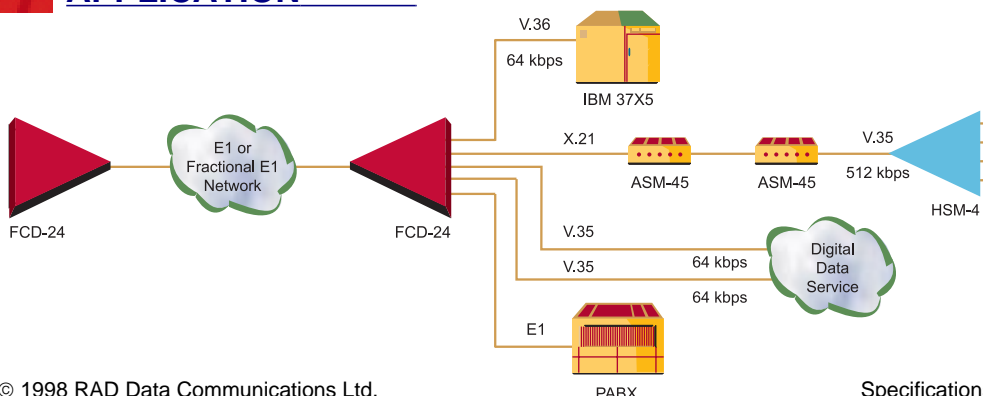   non-condensing

ORDERING

FCD-24/*/#/&
Integrating E1 Multiplexer with 4
channels

FCD-24-2/*/#/&
Integrating E1 Multiplexer with 2
channels

* Specify **E1** for E1 sub-link
  (default is without sub-link)

Specify data channels interface:
  V35 for V.35 interface (default)
  X21 for X.21 interface
  530 for RS-530 interface
  V36 for V.36/RS-449 interface
  (via supplied conversion cables)

& Specify **LTU** for integral LTU
  (default is without LTU)