



Sync/Async Fiber Optic Modem Card



DESCRIPTION

- CMN-CF8 is a Fiber Optic Sync/Async Modem Card suitable for mounting in the CMN-16 rack. CMN-CF8 is used for local data distribution, connecting full or half duplex terminals to computers, over fiber optic cable.
- CMN-CF8 operates at data rates up to 19.2 kbps, supporting transmission over single mode or multimode fiber.
- CMN-CF8 performs diagnostic loops in compliance with the ITU V.54 standard, which includes local and remote tests. Two V.54 loops are available: analog loop (V.54 loop 3) and remote digital loop (V.54 loop 2). These loops are activated by either a 3-position switch on the front panel, or by the DTE interface Circuit 141 (pin 18) and Circuit 140 (pin 21). The TEST LED lights when any of the diagnostic loops is ON.
- Asynchronous transmission is provided by internal conversion from async to sync in compliance with the ITU V.22 bis standard. Different async formats are switch-selectable. Selectable stop bit shortening on the receiver end is used to handle frequency differences between an async terminal and CMN-CF8. The shortening is selectable to 12.5% or 25% of the stop bit, per ITU V.22 bis.
- In synchronous mode, transmit timing is provided by three alternate sources: internal oscillator, external clock or loopback clock derived from the receive signal.
- The modem's carrier can be strapped for either continuous operation (point-to-point application) or switched operation, controlled by the RTS signal (multipoint application).
- CMN-CF8 features a switch-selectable DTE/DCE option, letting it operate as a DTE for connection to another DCE such as multiplexer port, without requiring a crossover cable.
- CMN-CF8 incorporates all the advantages of fiber optic systems:
 - EMI/RFI immunity, saving the costs of expensive heavy shielding and complex error checking routines;
 - Almost absolute security since fiber radiates only negligible power, thus reducing the cost of data encryption and virtually eliminating all forms of eavesdropping;
 - Safety and electrical isolation, no spark hazards or ground loop noise problems.

FEATURES

- Synchronous or asynchronous operation
- Suitable for mounting in the CMN-16 rack
- Compatible with FOM-8
- Data rates up to 19.2 kbps
- V.54 diagnostics, local and remote loops
- Secure data transmission over fiber optic cable
- Full or half duplex
- Internal, external or receive clock
- DCE/DTE switch
- Supports single mode or multimode fiber
- LED display for status of interface signals

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SPECIFICATIONS

- Data Rates**
 Selectable by a rotary switch:
 1.2, 2.4, 3.6, 4.8, 7.2, 9.6, 14.4, 19.2 kbps
- Number of Data Bits (Async Mode)**
 8, 9, 10 or 11 including 1 start and 1 stop bit, with or without parity
- Frequency Allowance (Async Mode)**
 Selectable stop bit shortening for frequency difference:
 12.5%: for -2.5 to +1.0%
 25.0%: for -2.5 to +2.3%
- Transmission Line**
 Dual optical cable
- Transmission Mode**
 Sync or Async, full or half duplex
- Transmission Controls**
DCD (circuit 109) turns ON after recognizing the receive signal from the line;
CTS (circuit 106) turns ON 0, 8 or 68 msec (selectable) after the terminal raises RTS (Circuit 105);
DSR (Circuit 107) is ON when the modem is powered and is in the normal mode or in analog loop state. DSR turns OFF when the modem is in digital loop state;
TEST Mode (Circuit 142) turns ON when the modem is in one of its diagnostic loops.
- Optical Output Levels**
 -30 dBm into 100/140 fiber
 -32 dBm into 62.5/125 fiber
 -36 dBm into 50.0/125 fiber
 -31 dBm into 9/125 fiber
- Receiver Sensitivity**
 -45 dBm for 850 nm
 -47 dBm for 1300 nm
- Operating Wavelength**
 Multimode: 820 nm
 Single mode: 1300 nm

- Front Panel LED Indicators**

- PWR Power
- XMT Transmit Data
- RCV Receive Data
- DCD Data Carrier Detect
- TST Test

- Controls**

The front panel loop switch controls the CMN-CF8 test modes, giving access to normal operation (NOR), local analog loop (ANA) and remote digital loop (REM), from the front panel.

- Terminal Interface**

RS-232/ITU V.24
 25-pin female connector

- Optical Interface**

SMA, ST or FC connector (see *Ordering*)

- Power**

0.1 VA per modem card, derived from the CMN-16 power supply

- Physical**

Length: 196 mm / 7.7 in
 Width: 69 mm / 2.7 in
 Height: 25 mm / 1.0 in
 Weight: 106g / 3.7 oz

- Environment**

Temperature: 0-50°C (32-122°F)
 Humidity: Up to 95% non-condensing

INSTALLATION

- CMN-CF8 is factory set to DCE. For DTE operation, set the switch to DTE position (see *Table 3*).
- Set the Loop Switch to center position for normal operation and make sure that the Test LED is off (see *Table 1*).
- Set SW5 and SW6 to DIS (OFF position) if the attached DTE does not use Pins 18 and 21 for test purposes, or if the cable between DTE and CMN-CF8 does not contain these pins.

Set the rest of the switches according to mode (see below for Sync, Async or Controlled Carrier).

FOR SYNC MODE:

- Set the modem card according to *Table 1* and *Figure 1* as follows:
 - Set the baud rate.
 - Set CTS delay (DELAY).
 - Set Clock mode: (RCV, INT, EXT).
 - Set the Carrier (CAR, S4 of the dip switch).

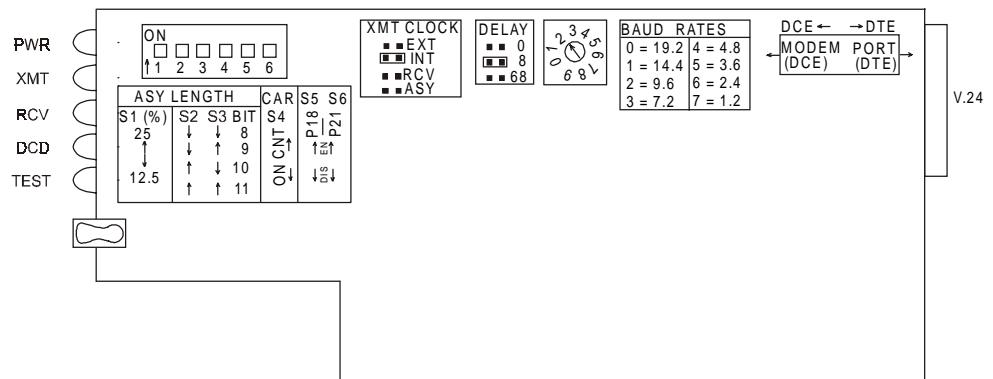


Figure 1. Strapping Diagram

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Table 1. Strap Selection

Strap Identity	Function	Possible Settings	Factory Setting
Data Rates	Selects data transmit rate	0-19.2 kbps 1-14.4 2-9.6 3-7.2 4-4.8 5-3.6 6-2.4 7-1.2	9.6 kbps
DELAY	Selects RTS-CTS delay	0 msec 8 msec 68 msec	8 msec
XMT CLOCK	Selects timing clock and async mode	INTERNAL EXTERNAL RECEIVE ASYNC	INTERNAL
ASY Length	Selects the character length in async mode (see Table 2)	S2 S3 Bits OFF OFF 8 OFF ON 9 ON OFF 10 ON ON 11	10 bits
	Selects the amount of stop bit shortening to be used in async mode	S1 ON-25% OFF-12.5%	12.5%
CAR	Selects carrier constantly ON or controlled by RTS	S4 ON-CONTROLLED OFF-CONSTANTLY ON	CONSTANTLY ON
S5	S5 Enables DTE control of analog loop either by Pin 18 or front panel switch	S5 ENABLE-PIN 18 DISABLE-SWITCH	SWITCH
S6	S6 Enables DTE control of remote digital loop either by Pin 21 or front panel switch	S6 ENABLE-PIN 21 DISABLE-SWITCH	SWITCH

FOR ASYNC MODE:

- 4b. Set the modem card according to Table, Table 2 and Figure 1 as follows:
- Set the baud rate.
 - Set CTS delay (DELAY).
 - Set ASY LENGTH (S1, S2, S3 of the dip switch).
 - Set Carrier (CAR, S4 of the dip switch).
 - Strap the clock mode (XMT CLK) to ASYNC.

FOR CONTROLLED CARRIER:

- 4c. Set the modem card according to Table 1 and Figure 1 as follows:
- Set the carrier (CAR, S4 of the dip switch) to ON (controlled carrier).
 - Strap the RTS-CTS delay (DELAY) as follows:
 - For data rates of 9.6 kbps and more: 8 msec or 68 msec;
 - For data rates of 4.8 kbps and less: 68 msec only.

Table 2. Async Character Length Setting

Start Bit	Data Bits	Parity	Stop Bit	No. of Bits
1	5	N	2	8
1	6	N	1, 1.5, 2	8
1	6	O	1, 1.5, 2	9
1	7	N	1, 1.5, 2	9
1	7	O	1, 1.5, 2	10
1	8	N	1, 1.5, 2	10
1	8	O	1, 1.5, 2	11

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Table 3. DTE/DCE Switch Configuration

Pin No.	Signal Name	DCE Position	DTE Position
2	TD	To Modem	From Modem
3	RD	From Modem	To Modem
4	RTS	To Modem	From Modem
5	CTS	To Modem	N.C.
6	DSR	From Modem	To Modem
7	GND	GND	GND
8	CD	From Modem	To Modem
15	TX CK	From Modem	
17	RX CK	From Modem	To Modem
18	ANA LOOP	To Modem	To Modem
20	DTR	To Modem	To Modem
21	REM LOOP	To Modem	To Modem
24	EXT CK	To Modem	From Modem
25	TEST	From Modem	From Modem

5. Insert the card through the rear of CMN-16.
6. Install the front panel which is supplied with the card.
7. Connect the line cable to the XMT pair on CMN-CF8 and to the RCV pair on the remote FOM-8, and vice versa.
8. Connect the RS-232/V.24 cable to the 25-pin socket.

OPERATION

TEST MODE

CMN-CF8 performs two of the V.54 test loops: analog loop (ANA, V.54 Loop 3) and remote digital loop (REM, V.54 Loop 2). The red TEST LED lights and Pin 25 (Circuit 142) is operant when the modem is in one of the diagnostic loops. The unit is factory-strapped for test loops control via the front panel switch. Alternatively, you can activate the loops from the DTE interface (Pins 18 & 21) controlled by the S5 and S6 jumpers (see *Table 1*).

ANALOG LOOP (V.54 Loop 3)

This loop tests the local modem only. The XMT signal to the line is looped back to the receiver.

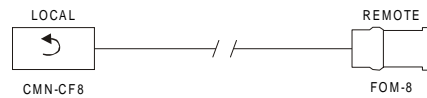


Figure 2. Local Loop Test

REMOTE DIGITAL LOOP (V.54 Loop 2)

This loop tests the local modem, the line and the remote modem.

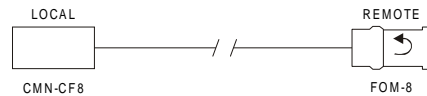


Figure 3. Remote Loop Test

To perform a loopback test via the front panel:

1. Perform the loopback test by setting the front panel switch to either ANA or REM position.
2. To return to normal operation, set the front panel switch to the NOR position. The TEST LED will then go off.

To perform loopback test via DTE interface:

1. Set the S5 (for Analog Loop) or S6 Jumper (for Digital Loop) to Enable.
2. Perform the Local Loop Test by connecting a 5V external power supply to the DTE Pin 18 (for Analog Loop) or Pin 21 (for Digital Loop).
3. To return to normal operation, remove the external 5V power supply from the DTE. The TEST LED will then go off.

ORDERING

CMN-CF8/+/#

Sync/Async Fiber Optic Modem Card for CMN-16 Rack

- + Specify connector type:
 - SMA** for SMA connector
 - ST** for ST connector
 - ST13** for ST connector with 1300 nm wavelength
 - FC** for FC connector (Default is SMA connector)
- # Specify wavelength:
 - 13** for 1300 nm (Default is 850 nm)



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