

DIGITAL TRANSMISSION SYSTEM
828AF DIGITAL MULTIPLEXER
SPECIFICATIONS

1. GENERAL

- 1.01 This section is a cover sheet for the Telco Systems Fiber Optics Corporation Digital Transmission System 828AF Digital Multiplexer Specifications. This section is reproduced with permission of Telco Systems Fiber Optics Corporation and is the equivalent of Telco practice 830-102-004, Issue 2.
- 1.02 Whenever this section is reissued the reason(s) for reissue will be listed in this paragraph.
- 1.03 This section contains specifications for the 828AF Digital Multiplexer and the card and module specifications.
- 1.04 If corrections are required in the attached document, use Form-3973 as described in Section 000-010-015.
- 1.05 If equipment design and/or manufacturing problems should occur, refer to Section SW 010-522-906 for procedures on filing an Engineering complaint.

2. ORDERING PROCEDURE

- 2.01 For information concerning equipment and parts availability contact Telco Systems, Order Administration Department, in Norwood, Massachusetts, at:

1-800-44-SALES
1-617-551-0300

- 2.02 To order additional copies of this practice, use TELC 365-407-852SW as the section number.

PROPRIETARY

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3. REPAIR/RETURN

3.01 For defective modules and assemblies contact the Repair and Return Department at the following number:

8:00 a.m. - 5:00 p.m. (617) 551-0300 - Ext. 2778

Attachment: Telco Systems Fiber Optics Corporation
Digital Transmission System
828AF Digital Multiplexer
Specifications

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 SPECIFICATIONS

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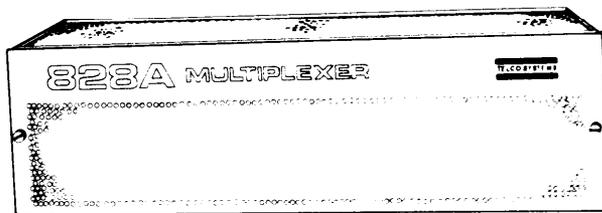


Figure 4-1. 828AF Multiplexer

1. SCOPE

1.01 This section contains specifications for the 828AF Digital Multiplexer (see Figure 4-1), and the card and module specifications.

1.02 This section is reissued to update the specifications, and for general revisions.

2. MULTIPLEXER SPECIFICATIONS

2.01 TABLE A contains the 828AF specifications, including interface and power requirements, physical characteristics, and environmental operating conditions.

3. CARD AND MODULE SPECIFICATIONS

3.01 This subsection contains the specifications for the cards and modules of the 828AF Multiplexer. Included are specifications on the following:

- LS INTER T1 (T1 Low-Speed Interface) card (TABLE B)
- LS INTER T1C (T1C Low-Speed Interface) card (TABLE C)
- LS INTER T2 (MAIN and STBY Low-Speed Interface) card (TABLE D)
- HS COM (High-Speed Common) card (TABLE E)
- XCVR (Transceiver) card (TABLE F)
- Power Supply Module Input/Output Voltages (TABLE G)
- DS-2 Optical Interface, Single-Mode and Multimode LTU Cards, optional (TABLE H)
- Remote Alarm Card (RAC II), optional (TABLE I)

TABLE A. 828AF Digital Multiplexer System Specifications

DS-1 INTERFACE Line Rate: Line Code: Line Impedance: Pulse Amplitude: Jitter: Cable: Maximum Span:	1.544 Mb/s \pm 130 ppm Half-width Bipolar (AMI)* 100 ohms, nominal balanced 3.0 V \pm 0.6 V 0.3 time-slots rms ABAM or equivalent 655 feet to cross-connect facility
DS-1C INTERFACE Line Rate: Line Code: Line Impedance: Pulse Amplitude: Cable: Maximum Span:	3.152 Mb/s \pm 30 ppm Half-width Bipolar, (AMI)* 100 ohms, nominal balanced 3.0 V nominal (zero-to-peak) ABAM or equivalent 655 feet to cross-connect facility
DS-2 INTERFACE Line Rate: Line Code: Line Impedance: Pulse Amplitude: Cable: Maximum Span:	6.312 Mb/s \pm 33 ppm B6ZS (Bipolar with 6-Zero substitution) 110 ohms, nominal balanced 4.2 V \pm 10% ABAM or equivalent 1000 feet to DSX-2 cross-connect facility; line buildout networks supplied for shorter spans.
HIGH-SPEED INTERFACE Line Rate: Line Code: Wavelength (Minimum Center): Wavelength (Maximum Center):	44.736 Mb/s \pm 20 ppm (optical) Randomized NRZ data 1280 nm 1330 nm

* AMI (Alternate Mark Inversion)

TABLE A. 828AF Digital Multiplexer System Specifications (Cont.)

MULTIPLEXER MAIN FRAME			
Channel Capacity:	Up to 28 lines of 1.544 Mb/s data		
Multiplexed Data Rate:	44.736 Mb/s \pm 20 ppm		
Transmit Multiplex Timing:	Internally or externally supplied		
Line Impedance:	75 ohms, \pm 5% unbalanced		
Reframe Time - Automatic:	T1C 17 ms		
	T2 7 ms		
	T3 2 ms		
Operating Mode:	Full Duplex		
Signal Interface:			
Line Rate:	44.736 Mb/s \pm 20 ppm (optical)		
Line Code:	Randomized NRZ data		
PRIMARY POWER			
Voltage:	-21 Vdc to -28 Vdc; -42 Vdc to -56 Vdc		
Power Consumption:	40 Watts		
PHYSICAL			
Height:	6.0 inches		
Width:	23.0 inches		
Depth:	11.5 inches		
Weight:	22.0 lb. (fully loaded)		
DS-1, DS-1C, DS-2 Connectors:	Wire-wrap		
ENVIRONMENTAL CONDITIONS (OPERATING)			
<u>Condition</u>	<u>Min. to Max. Temperature (°F)</u>	<u>Min. to Max. Temperature (°C)</u>	<u>Relative Humidity (30°C) % Non-Condensing</u>
Operational:	+32 to +104	0 to +40	Up to 80%
Short Term:	+32 to +122	0 to +50	Up to 90%
Storage:	-40 to +140	-40 to +60	10 to 95%

Note: Ambient temperature refers to conditions 5 feet above the bottom of, and 15 inches in front of the 828AF.

TABLE B. LS INTER T1 Card Specifications

Line Rate:	1.544 Mb/s \pm 130 ppm
Line Code:	Half-width bipolar (AMI)*
Impedance:	100 ohms nominal, balanced
Amplitude:	3.0 V \pm 0.6 V
Cable Type:	ABAM or equivalent
Cable Span:	0 to 655 feet to DSX-1 cross-connect facility

TABLE D. LS INTER T2 Card Specifications

Line Rate:	6.312 Mb/s \pm 33 ppm
Line Code:	B6ZS (Bipolar with 6-Zero Substitution)
Impedance:	110 ohms nominal, balanced
Amplitude:	\pm 4.2 V \pm 10%
Cable Type:	ABAM or equivalent
Cable Span:	1000 feet to DSX-2 cross-connect facility with line buildouts for shorter cable spans

TABLE C. LS INTER T1C Card Specifications

Line Rate:	3.152 Mb/s \pm 30 ppm
Line Code:	Half-width bipolar (AMI)*
Impedance:	100 ohms nominal, balanced
Amplitude:	3.0 V nominal (zero-to-peak)
Cable Type:	ABAM or equivalent
Cable Span:	0 to 655 feet to DSX-1C cross-connect facility

TABLE E. HS COM Card Specifications

Line Rate:	44.736 Mb/s \pm 20 ppm
Line Code:	ECL (Emitter-Coupled Logic) level
Format:	Bell System DS-3 Mastergroup structure

* AMI (Alternate Mark Inversion)

TABLE F. XCVR Card Specifications

Output:	$-9.0 \text{ dBm} \pm 1.5 \text{ dB}$
Receiver* Sensitivity:	$\leq -37.0 \text{ dBm}$
Receive Saturation:	$\geq -23.0 \text{ dBm}$

* This includes the loss at the XCVR card receive optical connector.

TABLE G. Power Supply Module Specifications

Input Voltages:	$-42 \text{ to } -56 \text{ Vdc}$ (PSX016-1)
Input Voltages:	$-21 \text{ to } -28 \text{ Vdc}$ (PSX016-2)
Output Voltages:	$-5.6 \text{ Vdc} \pm 0.025 \text{ Vdc}$ (Full Load)
	$+5.4 \text{ Vdc} \pm 0.025 \text{ Vdc}$
	$+15.3 \text{ Vdc} \pm 0.050 \text{ Vdc}$

TABLE H. DS-2 Optical Interface

Single Mode LTU Card Specifications

Number of lines:	2 fibers per LTU card (TX/RX)
Line Rate:	12.624 Mb/s (2 x 6.312 Mb/s) \pm 33 ppm
Line Code:	3B6B (Vendor proprietary)
Wavelength:	1250 nm to 1320 nm center frequency
Spectral Width:	80 nm line width
Transmit Device:	LED with Single-Mode fiber
Receiver Device:	PIN detector
Transmitter Output:	\geq -31.5 dBm
Receiver Sensitivity:	-43 dBm at 10^{-9} BER
Available Power:	System Gain 11.5 dBm
Required Margin:	Equipment operating margin is 5.5 dB, includes time and temperature variations
Optical Connector:	FC-type optical connector

Multimode LTU Card Specifications

Number of lines:	2 fibers per LTU card (TX/RX)
Line Rate:	12.624 Mb/s (2 x 6.312 Mb/s) \pm 33 ppm
Line Code:	3B6B (Vendor proprietary)
Wavelength:	1250 nm to 1320 nm center frequency
Spectral Width:	Not Available
Transmit Device:	ELED with Multimode fiber
Receiver Device:	PIN detector
Transmitter Output:	\geq -20.0 dBm
Receiver Sensitivity:	-42.0 dBm at 10^{-9} BER
Available Power :	System Gain 22.0 dBm minimum
Required Margin:	Equipment operating margin is 6.0 dB, includes time and temperature variations
Optical Connector:	FC-type optical connector

Table I. Remote Alarm Card (RAC II) Specifications

Alarm Input Capacity:	Eight Opto-Coupled Alarm Points
Alarm Active Range	
Lack of a Voltage Input:	0 Vdc \pm 500 mV
Input Voltage Sense:	5 to 53.75 Vdc
Input Impedance:	2.7 kohms (Design per PUB 49001)
Relay Contact Closure Outputs:	Eight
Relay Contact Closure Rating:	500 mA
Contact Closure Fusing:	1 A

Note: Contact closures may be configured to be normal energized or de-energized.