

Bert & Protocol Analyzers BTM10



PCM Analyzers

The BTM10 E1/T1 analyzer is a compact, sub-note sized E1/T1 PCM measuring instrument designed for field use in analysis and maintenance of E1 (2.048Mbps) or T1 (1.544Mbps) lines. The BTM10 performs framed, unframed, signaling analysis, drop and insert 8K voice, Nx64Kbps, or Nx56Kbps data into any time slot. The BTM10 analyzer also provides a variety of E1 or T1 line statuses, transmission performance testing (BERT) and monitoring. On the E1 or T1 line, the BTM10 may be used as a generator or receiver.

Features

- BERT Histogram Analysis
- LCD display 32 Characters x 8 Lines, Text / Graphic mode
- Portable for field use
- Print out via Parallel Printer port
- Rechargeable Battery with battery low indicator
- Results Report: Internal Memory storage of test result:
Direct display on LCD screen
Print out via Parallel Printer port
- Upgradeable for advanced features
- Loop Back Code Setting and Detection:
IN Band and Out Band
- Pulse Wave Analyzer (optional):
ITU G.703(E1), ANSI T1.403(T1) & ITU G.703(T1)
- DS0 Control Loop Codes (optional):
TIP, LSC, LBE, FEV
- VF Noise Measurement (optional):
C-Message Weighting, P-Weighting

Specifications

General Specifications

Power	AC	100 — 240VAC Adapter
	DC	12VDC
Environment	Temperature	0 — 50°C (Operating); -20 — 65°C (Storage)
	Humidity	0 — 95% non condensing
Power Consumption	10W	
Dimensions(WxDxH)	235mm x 173mm x 54mm	
Weight	1.6Kg	

Functions

E1 BERT Analysis	E1/T1frame, code, CRC and BPV performance analysis and generator
Alarm Setting	Manual or automatic alarm setting
VF Access	Drop and Insert 8K voice; frequency generator (transmit VF Frequency from 60 to 3950 Hz, transmit VF level from 0dBm to -55dBm) and measurement (A-law and u-law). Voice access by using telephone
VF Noise Measurement	C-Message Weighting, P-Weighting
Pulse Shape	E1/T1 pulse shape mask
Signal Result	E1/T1 PCM level meter and frequency analysis
Signaling Setting	ABCD bit setting
Signaling Display	Display all channel's of ABCD bits
BERT on Data Port	Data port BERT performance analysis
Remote Control	Remote controlled by PC terminal or modem
SS7 Analysis	Decode and performance analysis of levels 2, 3, 4
Examine Analysis	Off-line analysis of BERT performance
External Drop & Insert	Acts as a Fractional E1 or T1 converter
User Programmable	32 bit Programmable patterns which can be inserted onto the E1/T1 line and drop for analysis
Pattern Setting	Available, bypassed, or idle
Timeslot Setting	Timeslot, Drop and Insert Nx64k data onto E1/T1 line
Timeslot Mapping Data	Analyze any channel data of two frames
SLIP Measure	Uncontrolled, Controlled, Frame, and Timing SLIP measure
Sa Bits Setup and Monitor	Multiframe Sa bits setup and monitor.(E1 only)
File Management	Ten configuration and result memory locations can be stored and recall by user
ISDN Analysis	Digital Subscriber Signaling System No.1 (DSS 1)-Monitoring ISDN D-Channel Signaling information (ITU Q.921,Q.931)
V5.1/V5.2 Analysis	Monitoring V5 Signaling information

Specifications - E1

Receiver Interface of E1/ CEPT		
Line Code	HDB3/ AMI	
Pulse characteristics	meets ITU G.703	
Jitter Tolerance	meets ITU G.823	
Input Port Type	Coaxial pair Symmetrical pair DB15	
Input mode (with AGC)	Termination	Coaxial Pair Impedance: 75ohm resistive (unbalanced) Symmetrical Pair Impedance: 120ohm resistive(balanced) Return Loss: >18dB Receive Sensitivity:+3dB to -40dB
	Bridge Mode: Impedance	>1000ohm Receive Sensitivity: +3dB — -30dB
	DSX-MONitor Mode	Coaxial Pair Impedance: 75ohm resistive(unbalanced) Symmetrical Pair Impedance: 120 ohm resistive(balanced) Receive Sensitivity: +6dBdsx to -30dBdsx
	Receive Timing Range	2.048MHz — 1000Hz
	Transmitter Interface of E1/CEPT	
Bit Rate	2048K bit/s ± 3ppm	
Line Code	HDB3/ AMI	
Pulse characteristics	Meets ITU G.703	
Pulse Amplitude	Nominal 2.37V for CoaxialPair 75 ohm Nominal 3.00V for Symmetrical Pair 120 ohm	
Zero Amplitude	0.1 V max	
Jitter Tolerance	Meets ITU G.823	
Output Port Type	Coaxial pair: BNC (unbalanced) Symmetrical pair: Bantam or DB15 (balanced)	
TX Clock Source	Internal Timing: 2.048MHz ± 3ppm	
	Internal Timing + 50ppm offset (30ppm factory option)	
	Internal Timing - 50ppm offset (30ppm factory option)	
	Recovery from RX Timing (Loop Timing)	
	External Timing Data Port Timing	
E1/CEPT Frame Structure	Unframed	
	FAS (PCM31)/ FAS+CRC4 (PCM31 with CRC)	
	FAS+CAS (PCM30)/ FAS+CRC4+CAS (PCM30 with CRC)	
Line Build Out	0dB, -7.5dB, -15dB, -22.5dB (Accuracy: ±1dB)	

Specifications - T1

Receiver Interface of T1/DS1		
Line Code	B8ZS/ AMI	
Pulse characteristics	Meets ITU G.703	
Jitter Tolerance	Meets ITU G.824	
Input Port Type	Symmetrical pair: Bantam or DB15 (balanced)	
Input mode (with AGC)	Termination	Symmetrical Pair Impedance: 100ohm resistive ± 5% resistive (unbalanced) Return Loss >18dB Receive Sensitivity: +6dB to -36dB
	Bridge Mode	Impedance: >1000ohm, Receive Sensitivity: +6dB to -36dB
	DSX-Monitor Mode	Symmetrical Pair Impedance: 100ohm ± 5% resistive Receive Sensitivity: up to -30dBdsx
	Receive Timing Range	1.544MHz ± 4000Hz
Transmitter Interface of T1/DS1		
Bit Rate	1544K bit/s ± 3ppm	
Line Code	B8ZS/ AMI	
Pulse characteristics	Meets ITU G.703	
Pulse Amplitude	Nominal 3.00V for Symmetrical Pair 100 ohm	
Zero Amplitude	0.1 V max	
Jitter Tolerance	Meets ITU G.824	
Output Port Type	Symmetrical pair: Bantam or DB15 (balanced)	
TX Clock Source	Internal Timing: 1.544MHz ± 3ppm	
	Internal Timing +50ppm offset (30ppm factory option)	
	Internal Timing -50ppm offset (30ppm factory option)	
	Recovery from RX Timing (Loop Timing)	
	External Timing Data Port Timing	
T1/DS1 Frame Structure	ESF/ ESF+CRC6/ D4(SF)/ SLC-96/ T1DM/ Unframed	
Line Build Out	0dB, -7.5dB, -15dB, -22.5dB (Accuracy: ±1dB)	

Specifications - G.703 E1/T1 BERT

BERT Patterns

63, 127, 2⁹-1 (511), 2¹¹-1 (2047), 2¹⁵-1 ITU standard, 2¹⁵-1 non-standard(inverted), 2²⁰-1 ITU standard, 2²⁰-1 non-standard(inverted), QRSS, 2²³ -1 ITU standard, 2²³-1 non-standard(inverted), ALL ONES (Mark), ALL ZEROs (Space), ALT(0101..), 3 in 24, 1 in 16, 1 in 8, 1 in 4

BERT Display Format

Normal ITU-M.2100 (option)

ITU G.821

BERT Transmit Error Rate

Force Single Error: Logic (Bit), Frame, CRC, and BPV (Bipolar Violation)

Performance Analysis

Logic, Frame, CRC, BPV, E-bit Errors

Receive Counter

Error Seconds

Error Free Seconds

Error Rate

G.821 Available Seconds

G.821 Degraded Minutes

G.821 Severely Error Seconds

G.821 Error Seconds

G.821 Unavailable Seconds

G.826 Blocks

G.826 Available Seconds

G.826 errored block (EB)

G.826 background block error (BBE)

G.826 errored second (ES)

G.826 severely errored second (SES)

G.826 errored second ratio (ESR)

G.826 severely errored second ratio (SESR)

G.826 background block error ratio (BBER)

LOF (Loss of Frame) Events

COFA (Change of Frame Alignment) Events

Severely Errored Frame Count

Ordering Info

BTM10-E1	E1 PCM Multi-Tester with Full Features
BTM10A-E1	E1 PCM Multi-Tester without Pulse Shape Feature
BTM10B-E1	E1 PCM Multi-Tester without Datacom Feature
BTM10C-E1	E1 PCM Multi-Tester without Pulse Shape and Datacom Feature

Specifications - Datacom BERT

Mode A: DTE or DCE Synchronous BERT Interface

RS-232, V.35, X.21, RS-449, RS-530

Data rates for 56Kbps Multiples: Nx56Kbps (n = 1~32)

56k, 112k, 168k, 224k, 280k, 336k, 392k, 448k, 504k, 560k, 616k, 672k, 728k, 784k, 840k, 896k, 952k, 1008k, 1064k, 1120k, 1176k, 1232k, 1288k, 1344k, 1400k, 1456k, 1512k, 1568k, 1624k, 1680k, 1736k, and 1792k bps

Data rates for 64Kbps Multiples: Nx64Kbps (n = 1~32)

64k, 128k, 192k, 256k, 320k, 384k, 448k, 512k, 576k, 640k, 704k, 768k, 832k, 896k, 960k, 1024k, 1088k, 1152k, 1216k, 1280k, 1344k, 1408k, 1472k, 1536k, 1544k, 1600k, 1664k, 1728k, 1792k, 1856k, 1920k, 1984k, and 2048k bps

BERT Patterns

63, 127, 2⁹-1 (511), 2¹¹-1 (2047), 2¹⁵-1 ITU standard, 2¹⁵-1 non-standard(inverted), 2²⁰-1 ITU standard, 2²⁰-1 non-standard(inverted), QRSS, 2²³ -1 ITU standard, 2²³-1 non-standard(inverted), ALL ONES (Mark), ALL ZEROs (Space),

Tx Clock Source

The Tx Clock may be set to internal or external

The polarity may also be inverted

Rx Clock Source

The Rx Clock is set to external. The polarity of the external clock may also be inverted

BERT Transmit Error Rate

single, 10³, 10⁴, 10⁵, 10⁶, or 10⁷

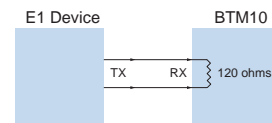
Flow Control

DCE permitted to transmit on RTS signal or not

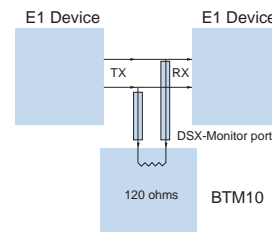
DTE permitted to transmit on CTS signal or not

Application

Receiver in Terminal Mode



Receiver in Monitor Mode



Receiver in Bridge Mode

