

HCT-BERT Series

HCT-BERT/H

E1/T1/Datacom Bit Error Rate Tester

The **HCT-BERT/H** series analyzer is a compact, notebook sized E1/T1 PCM measuring instrument designed for field use in analysis and maintenance of E1 (2.048Mbps), T1 (1.544Mbps) or Datacom lines. The **HCT-BERT/H** performs Bit Error Rate Testing, framed, unframed and signaling analysis. The **HCT-BERT/H** series analyzer also provides a variety of E1 or T1 line statuses, transmission performance testing (BERT) on the E1/T1/Datacom and monitoring. On the E1, T1 or Datacom line, the **HCT-BERT/H** series product may be used as a generator or receiver.



Functions

- **E1/T1 BERT Analysis:** E1/T1 frame, code, CRC, and BPV performance analysis and generator.
- **Alarm Setting:** Manual or automatic alarm setting.
- **Signal Result:** E1/T1 frequency analysis.
- **Signaling Setting:** ABCD bit setting.
- **Signaling Display:** Display all channels of ABCD bits.
- **Remote Control:** Remote controlled by PC terminal or modem.
- **Examine Analysis:** Off-line analysis of BERT performance.
- **User Programmable Pattern Setting:** There are three 32 bit programmable patterns, which can be inserted onto the E1/T1 line and drop for analysis.
- **Timeslot Setting:** Available, bypassed, or idle timeslot, Drop and Insert N x 56K or N x 64K BERT data on to the E1/T1 line.
- **Timeslot Mapping Data:** Analyze any channel data of two frames.
- **File Management:** Ten configurations and result memory locations can be stored/recalled by user.
- **Datacom BERT** Both low speed BERT, up to 115.2Kbps and high speed BERT, (N x 56, N x 64) up to 2,048Kbps
- **Sa Bits Setting and Display**

Features

- 1. Loop Back Code Setting and Detection:**
In-Band, Out-Band and ITU-T V.54
- 2. DS0 Control Loop Codes (optional)**
TIP, LSC, LBE, FEV
- 3. Large LCD display**
32 Characters x 8 Lines
Text / Graphic mode
- 4. Results Report**
Internal Memory storage of test result.
Direct display on LCD screen
Print out via Parallel Printer port
Print out via RS-232 Series Port (option)
- 5. Portable for field use**
- 6. Rechargeable Battery with battery low indicator**
- 7. Temp. Range**
0° C to 50° C (operating)
-20° C to 60° C (storage)
- 8. Humidity: up to 95%**
- 9. Power Source**
AC100-240V/DC12V/1A Switching adapter
- 10. Dimensions**
173 mm (L) x 235 mm (W) x 54 mm (H)
- 11. Weight**
1.6 kg net

Interface Port Description

DB15(Male):	E1/T1 TX and RX Port
BNC x 2:	E1 /T1 TX and RX Ports
Bantam x 2:	E1 /T1 TX and RX Ports
HD26 (Female):	Datacom Port
Bantam x 1:	External Clock In
DB15 (Female):	Printer Port
DB9 (Male):	Remote Control Port/Serial RS-232 Print Port (optional)

Slide Switch	External (Reference) Clock
Setting:	TTL/PCM
Power Switch:	Power ON/OFF
Mini-Phone Jack:	DC9V~12VIN

E1 Specifications

1.Receiver Interface of E1/CEPT

Line Code:	HDB3/AMI
Pulse characteristics:	meets ITU-T G.703
Jitter Tolerance:	meets ITU-T G.823
Input Port Type:	Coaxial pair: Symmetrical pair:
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 to -30dB
DSX-MONitor Mode:	Coaxial Pair Impedance 75ohm resistive (unbalanced) Symmetrical Pair Impedance: 120 ohm resistive (balanced) Receive Sensitivity: +6dBsx to -30dBsx
Receive Timing Range:	2.048MHz \pm 4000Hz

2.Transmitter Interface of E1/CEPT:

Bit Rate:	2048K bit/s \pm 3ppm.
Line Code:	HDB3/AMI
Pulse characteristics:	meets ITU-T G.703
Pulse Amplitude:	Nominal 2.37V for Coaxial Pair 75 ohm Nominal 3.00V for Symmetrical Pair 120 ohm
Zero Amplitude:	+0.1 V max.
Jitter Tolerance:	meets ITU-T G.823
Output Port Type:	Coaxial pair: BNC (unbalance) Symmetrical pair: Bantam or DB15(balanced)
TX Clock Source:	1.Internal Timing: 2.048MHz \pm 3ppm. 2.Internal Timing plus 50ppm offset (30ppm factory option) 3.Internal Timing minus 50ppm offset (30ppm factory option) 4.Recovery from RX Timing (Loop Timing) 5.External Timing 6.Data Port Timing

3.E1/CEPT Frame Structure:

FAS	(PCM31)
FAS+CRC4	(PCM31 with CRC)
FAS+CAS	(PCM30)
FAS+CRC4+CAS	(PCM30 with CRC)
Unframed	

4.Line Build Out:	0dB -7.5dB -15dB -22.5dB (Accuracy \pm 1dB)
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E1 Analyzer Mode

1.Channel Map	6.Alarm/Warning: Signal Loss(Pulses) Frame Loss Pattern Loss
2.Sa Bits	Excess Zero Error AIS
3.Signaling	SLIP RAI MRAI
4.General Status: Signal Present HDB3 Pattern Sync Frame Sync	7.Print out of test results
5.Results: Bit Errors BPV Errors Frame Errors CRC Errors G.821 Analysis G.826 Analysis M.2100 Analysis Histogram	

T1 Specifications

1.Receiver Interface of T1/DS1

Line Code:	B8ZS/AMI
Pulse characteristics:	meets ITU-T G.703
Jitter Tolerance:	meets ITU-T G.824
Input Port Type:	Symmetrical pair: Bantam or DB15 (balanced), and BNC
Input mode (with AGC)	
Termination:	Symmetrical Pair Impedance: 100 ohm \pm 5% resistive (unbalanced) Return Loss: >18dB Receive Sensitivity: +6dB to -36dB
Bridge Mode:	Impedance: > 1000 ohm Receive Sensitivity: +6dB to -30dB
DSX-MONitor Mode:	Symmetrical Pair Impedance: 100 ohm \pm 5% resistive(balanced) Receive Sensitivity: up to -30dBsx
Receive Timing Range:	1.544MHz \pm 4000Hz

HCT-BERT

2. Transmitter Interface of T1/DS1:

- Bit Rate:** 1544K bit/s \pm 3ppm.
- Line Code:** B8ZS/AMI
- Pulse characteristics:** meets ITU-T G.703
- Pulse Amplitude:** Nominal 3.00V for Symmetrical Pair 100 ohm
- Zero Amplitude:** \pm 0.1V max.
- Jitter Tolerance:** meets ITU-T G.824
- Output Port Type:** Symmetrical pair: Bantam or DB15(balanced), or BNC
- TX Clock Source:**
 1. Internal Timing: 1.544MHz \pm 3ppm.
 2. Internal Timing plus 50ppm offset (30ppm factory option)
 3. Internal Timing minus 50ppm offset (30ppm factory option)
 4. Recovery from RX Timing (Loop Timing)
 5. External Timing
 6. Data Port Timing

3. T1/DS1 Frame Structure:

- ESF
- ESF+CRC6
- D4(SF)
- SLC-96
- T1DM
- Unframed

4. Line Build Out:

- 0dB
- 7.5dB
- 15dB
- 22.5dB
- (Accuracy: \pm 1dB)

T1 Analyzer Mode

- | | |
|---|--|
| 1. Channel Map | 5. Alarm/Warning:
Signal Loss(Pulses) |
| 2. Signaling: ABCD | Frame Loss |
| 3. General Status:
Signal Present
B8ZS
Pattern Sync
Frame Sync
Looping | Pattern Loss
Excess Zero Error
AIS
SLIP
Yellow Alarm
Loop Up
Loop Down |
| 4. Results:
Bit Errors
BPV Errors
Frame Errors
CRC Errors
G.821 Analysis
G.826 Analysis | 6. Print out of test results |

DATAKOM BERT Test

Mode A: DTE or DCE Synchronous BERT

1. Interface:

RS-232 (max. speed up to 128Kbps), V.35, X.21, RS-232, RS-449
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.

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.

4. 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, User Programmable

5. Tx Clock Source:

The Tx Clock may be set to internal or external. The polarity may also be inverted.

6. Rx Clock Source:

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

7. BERT Transmit Error Rate:

single, 10e-3, 10e-4, 10e-5, 10e-6, or 10e-7.

8. Flow Control:

DCE permitted to transmit on RTS signal or not, DTE permitted to transmit on CTS signal or not.

Mode B: DTE or DCE low speed BERT

1. Data Rate:

Asynchronous: from 50 to 115.2K bps.
Synchronous: from 150 to 72K bps.

2. BERT Patterns:

63, 511, 2047, FOX, SPACE, MARK, and ALT

3. Tx Clock Source:

DTE or DCE.

4. Flow Control:

Xon/Xoff, RTS/CTS, or disable.

Ordering Information

● HCT-BERT/H

E1/T1/Datacom BERT Analyzer

Application

