



SCIENTIFIC DATA SYSTEMS
LLC

HDT-1

Handheld Diagnostic Tool

Key Features

- Hand-held Device
- Bright LED Displays

Monitor

- PCM Decom
 - Frame Sync or All Clocks Mode
 - CVSD digital audio decoder to headphone jack
 - Analog output of selected PCM words
- MIL-STD-1553
- Chapter 8
- Ethernet
- 16PP194

Generator

- PCM
- MIL-STD-1553
- IRIG B and G Time
- Video
- Ethernet

Other Capabilities

- 28V Discretes
- Powered from aircraft 28V
- IRIG 106 Chapter 10 Ethernet Streaming

One Handheld Tool Supports Multiple Aircraft Tests

The HDT is a hand-held diagnostic tool that provides both monitor and generator capabilities for multiple types of aircraft data.

Monitor

The HDT provides monitoring for IRIG 106 Chapter 4 PCM, MIL-STD-1553, Chapter 8 1553, Ethernet, and 16PP194 streams.

PCM Monitor

The HDT provides extensive IRIG 106 Chapter 4 PCM monitoring capabilities. It supports bit rates up to 20 Mbps. The HDT synchronizes to the aircraft's PCM stream using its embedded frame synchronizer. Alternatively, if the aircraft provides the word clock, minor frame clock, and major frame clock, the HDT can synchronize using these signals. The HDT provides both minor and major frame lock indicators and dropout counters.

The HDT allows the user to select any word in the PCM stream to be monitored. The selected word's current value or maximum value is displayed on the front panel in decimal or hexadecimal. The HDT also provides a visible indicator whenever the selected word changes. When monitoring for the maximum value and changed values, all occurrences of the word in the PCM stream are evaluated.

The HDT also allows a user to independently select a PCM word to be sent to both its IRIG 106 Chapter 5 CVSD audio decoder and its analog output. Super-commutated PCM words are supported by the CVSD decoder and the analog output. The audio output from the CVSD decoder is provided to the user via a headphone jack with volume control. The 0-2V analog output is provided via a SMA connector on the HDT.

MIL-STD-1553 Monitor

The HDT provides extensive MIL-STD-1553 bus monitoring capabilities. It performs

continuous protocol analysis on the attached bus. The user specifies the target command word (with an optional mask) and the word of interest within the message to be monitored. The user may select any data word, the command word, status word, or message response time to be analyzed. The selected word's current value or maximum value can be displayed in decimal or hexadecimal. The HDT also provides a visible indicator whenever the target word occurs on the bus, plus an additional indicator any time the word's value changes.

IRIG 106 Chapter 8 Monitor

The HDT can also be used to monitor a MIL-STD-1553 bus that is transmitted via an IRIG 106 Chapter 8 PCM stream. The HDT's Chapter 8 monitoring provides the same basic 1553 monitoring capability as standard MIL-STD-1553 bus monitoring. It also monitors and displays the minor frame time stamp and the message time stamp. Since IRIG 106 Chapter 8 supports multiple 1553 busses, the HDT allows the user to select the bus number containing the message to be monitored.

Ethernet Monitor

The HDT provides monitoring capabilities for 10BaseT and 100BaseT Ethernet streams. The HDT provides a continuous count of the number of valid and invalid Ethernet frames that have been received. Valid frames are identified by verifying the frame structure, frame size, and frame CRC value.

16PP194 Monitor

The HDT provides monitoring of 16PP194 words sent via an IRIG 106 Chapter 4 PCM stream. The HDT displays the data associated with a user specified 16PP194 address and sub-address. The data is displayed in decimal or hexadecimal. The HDT also provides a visible indicator whenever the target address/sub-address is found, plus an additional indicator any time the data value changes.

Generator

The HDT generates test data streams for Chapter 4 PCM, MIL-STD-1553, IRIG-200 B/G Time Code, Video, and Ethernet.

Note that generation of these data streams is independent of monitoring. All generators can be used simultaneously without affecting the ability to use the HDT as a data monitor.

PCM Generator

The HDT generates an IRIG 106 Chapter 4 compliant PCM stream. Selected bit rates up to 20 Mbps are supported and both clock and data (NRZ-L) are available as RS-422 signals.

MIL-STD-1553 Generator

The HDT also provides a MIL-STD-1553 bus simulator. When using this feature, the HDT will continuously send a user specified command word and associated RT response at a user specified bus load. The user can also designate that the selected command word be sent as a RT-to-RT transfer.

IRIG Time Code Generator

The HDT can be configured to generate an amplitude modulated (0-2Vpp) IRIG 200 time code signal on its analog output port. Either IRIG-B or IRIG-G codes can be selected. The time encoded in the generated stream is the time since power-on of the HDT unit. Generation of the time code output disables the analog output of PCM word values.

Video Generator

The HDT generates a video test pattern (color bars) with a video frame count overlay. Both composite and S-Video signals are provided.

Ethernet Generator

The HDT provides an Ethernet test frame generator. The METS multi-frame format is generated at a user specified bus load. Both 10BaseT and 100BaseT speeds are supported.

PCM Monitor Specifications

Number Channels: 1
 Input Signals: PCM data, bit clock, word clock, minor frame clock and major frame clock
 Frame Synchronization: External (all clocks)
 Internal (clock and data)
 Internal (data only - use internal bit sync)
 Input Signal Levels: RS-422 and TTL (clock and data only)
 PCM Codes: NRZ-L, RNRZ-L, Bi-Phase-L
 Maximum Bit Rates: 20 Mbps (NRZ), 10 Mbps (Bi-Phase)
 CVSD Audio: IRIG 106 Chapter 5 CVSD Audio Decoder
 Analog Output: 0 to 2 V Analog output of any PCM word

*** These inputs are used to monitor Chapter 4, Chapter 8, and 16PP194 PCM data streams.

MIL-STD-1553 Monitor/Generator Specifications

Number Channels: 1 (Bus A and Bus B)
 Coupling: Direct Coupled
 Monitor Mode : Message Monitor
 Monitor Features : Message Filtering
 Generator Formats : User defined message

*** The same channel is used to monitor and generate MIL-STD-1553 data.

Ethernet Monitor/Generator Specifications

Number Channels: 1
 Speeds: 10BaseT, 100BaseT
 Bus Loading: 1-100 percent
 Capture Buffer: 4096 Kbytes
 Error Detection: Invalid CRC, Illegal frame size, Illegal start-of-frame
 Generator Formats: METS Multi-Frame

*** The same channel is used to monitor and generate Ethernet data.

PCM Generator Specifications

Number Channels: 1 (clock and data)
 Output Signal Levels: RS-422
 PCM Formats:

Format	Bits/Minor	SyncPattern
1	512	FE6B2840
2	8,192	FE6B2840
3	4,096	FE6B2840
4	88	EB90
5	240	FAF320
6	User Defined	User Defined

PCM Codes: NRZ-L, RNRZ-L, Bi-Phase-L
 Supported Bit Rates: 200K, 500K, 1M, 2M, 5M, 10M, 20M

Video Generator Specifications

Number Channels: 2 output channels (Composite & S-Video)
 Formats: NTSC (Optional PAL)
 Video Output: Internally generated color bars
 Overlay: Frame Count

Time Code Generator Specifications

Number Channels: 1 Channel
 IRIG-200 Codes: B or G
 Output Signal Levels: Amplitude Modulated (2 Vpp)

28VDC Discrete Specifications

Number Channels: 2 (1-UP / 1-DOWN)
 Output Signal Levels: DISCRETE-UP (OFF = OPEN, ON = 28VDC)
 DISCRETE-DN (OFF = OPEN, ON = 28VDC_RTN)

Miscellaneous

Dimensions: 4.5 x 9 x 1.5 inches
 Power : 22-30 VDC

Specifications subject to change without notice.

