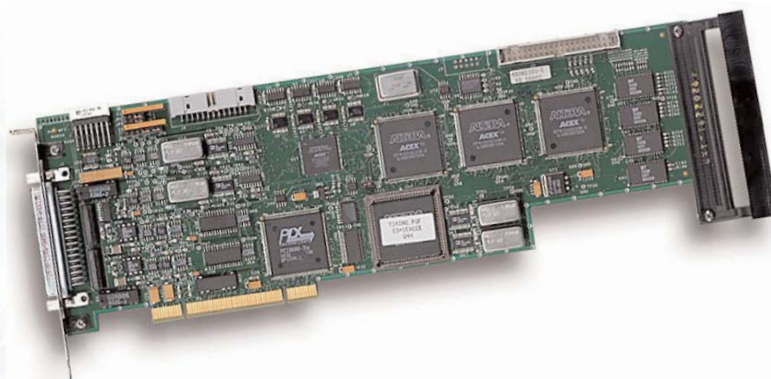


Ground Systems

Multifunction PCI Telemetry Module

MFT733-PCI



- Dual decomm design saves PCI slots
- Bus-mastering DMA channels can support both input and output channels
- Extract clock and data from noisy PCM data streams at rates to 10 Mbps
- Decode, translate, or generate IRIG-A, -B, or -G time
- Time tag PCM input frames with 1 microsecond resolution optionally synchronized to an external source
- Status tag PCM input frames, including sync state, bit slip, CRC error detection
- Extract two asynchronous embedded frames, or fully decommutate a primary and an embedded stream
- Simulate arbitrary telemetry data and formats to 20 Mbps
- Send real-time strip chart data directly to ADP716-PC Analog & Digital Ports with VTS, bypassing host processor
- Compatible with PCI Mezzanine Carrier (ZCM796)

L-3's best-selling Multifunction PCI Telemetry Module (MFT733-PCI) brings a new level of integration to the system designer. The functions of three previous PCI or ISA boards are now combined into a single PCI slot, accommodating more telemetry applications in a standard PC workstation or server. It provides a complete PCM telemetry system for 1 or 2 data streams, ideally suited for quick-look applications, flight-line checkout systems, and portable configurations. A rich, robust, and proven set of embedded functions typically offloads the host processor and can be applied to a wide variety of data communications solutions.

The Multifunction PCI Telemetry Module includes the functions of two decommutators, two simulators, two bit synchronizers, and a full-function IRIG time code decoder/generator/translator. Embedded software configuration options include:

- 2 bit syncs, 2 decomm/simulators, internal time clock
- 1 bit sync, 2 decomm/simulators, 1 IRIG time code input, internal time clock
- 2 decomm/simulators, 1 IRIG time code input and output, internal time clock
- 1 bit sync, 1 decomm/simulator, 1 IRIG time code input, internal time clock

Digital synthesizers provide high-resolution frequency programming and low jitter output for two independent PCM outputs at rates up to 20 Mbps for simulation and commanding applications.

Proprietary embedded digital processing optimally acquires and tracks PCM and IRIG time signals and rejects noise. IRIG time functions are closely coupled with decommutation, providing high accuracy time-tagging of input data with 1 microsecond resolution for both real-time or tape playback applications.



communications

Telemetry-West

Excellence You Can Measure

MFT733-PCI Specifications

Bit Synchronizers

Signal Range	.50 mV to 10 V peak-peak
Codes	NRZ-L, NRZ-M, NRZ-S, BiF-L, BiF-M, BiF-S, randomized NRZ-L (11, 15, 17, 20, V35, Intelsat) DM-M, DM-S, RZ
Method	Second order, phase-locked-loop
Bit rate	NRZ codes: 100 bps to 10 Mbps Other codes: 100 bps to 5 Mbps
Tuning resolution	0.1% (percent of bit rate)
Loop bandwidth	0.1%, 0.2%, 0.4%, 0.8%, 1.6% (percent of transition rate)
Outputs	Tape, clock/data, phase, polarity, TTL/RS-422, frame search toggle

Input Channels (Decommutators)

Inputs

Data rates	0 to 20 Mbps per stream; 0 to 20 Mbps max. aggregate at 8 bpw
Input code	NRZ-L or randomized NRZ-L
Data polarity	Normal/Inverted/Auto
Data alignment	MSB/LSB first per stream
Input levels	TTL (data/clock) or RS-422 (data/clock)
Clock input phase	0° or 180°
Clock duty cycle	.50 ± 5%

Data Buffer

PCI data pass qualifier	Frame and subframe not-search and per-word programmable in sorted or tag/data modes
Data buffers	Two independent 32- or 64-kword double buffers
Format	Telemetry, status, and time words sorted per application setup, tag-data, or pass-through
Buffer access method	Bus-mastering DMA controllers or slave reads and interrupts

Other Outputs

Data pass qualifier	Frame and subframe not-search and per word
Embedded data streams	2 max.
Status to host	Frame sync state, subframe sync state, frame search detector, subframe search detector, bit slip detector, CRC error detector, interrupt state, interrupt overrun, active buffer size, bit rate
I/O connector	Real-time, parallel address; data compatible with L-3's Analog & Digital Ports board

Frame and Subframe Characteristics (Sorted Mode or Tag-Data)

Sync pattern	64 bits max.
Subframe sync method	SFID, unique sync code, URC, FCC, or none
Search-to-lock	1 to 4 valid sync words
Lock-to-search	1 to 4 valid sync words
Error threshold	0 to 3 bits
Sync aperture	±0 or ±1 bit
Frame size	2 to 32,768 telemetry words with simulator; 65,536 without simulator
CRC error checking	Programmable polynomial and word location to 16th order

Time-Tagging (Sorted Mode)

Time source	Internal time clock optionally synchronized to external IRIG
Format	BCD — microseconds to hundreds of days
Trigger source	End of minor frames
Resolution	One microsecond

Status Tagging (Sorted Mode)

Trigger source	End of minor frames
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Output Channels (simulators)

Modes of Operation

Repetitive	On-board current value buffer for simulation data
Command	Send one command sequence at a time, including sync, data, and fill bits under host control
Streaming encoder	Alternate between double buffers using DMA or slave writes and interrupts; continuous or burst modes supported

Data Buffer

Current value buffer	1 to 65,532 telemetry words
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Outputs

Data rates	PCM NRZ codes: 0 to 20 Mbps aggregate max. in combination with decodes @ 8 bpw Other PCM codes: 0 to 10 Mbps
Data rate resolution	1 bps
Data rate accuracy	Stratum 3 (±4.6 ppm) with internal reference
PCM data codes	NRZ-L, NRZ-M, NRZ-S, BiF-L, BiF-M, BiF-S, randomized NRZ-L (11, 15, 17, 20, V35, Intelsat) DM-M, DM-S, RZ
Output levels	TTL (data/clock) or RS-422 (data/clock)
Output drive	TTL high-level: -32 mA max.; RS-422: -20 mA max. TTL low-level: 64 mA max.; RS-422: 20 mA max.
Clock output phase	0° or 180°
Clock source	Internal/external

Time Code Reader/Generator/Translator

Inputs (applies to Reader Mode only)

Format	Analog: IRIG-A, -B, or -G forward
Playback rates	1/16, 1/8, 1/4, 1/2, 1, 2, 4, 8, or 16 times real time
Carrier frequency range	±5% of nominal in a wide loop bandwidth mode
Mark amplitude	200 mV to 10V (auto-range)
Impedance	1 MΩ or 75 Ω programmable
Modulation ratio	2:1 to 6:1
Error detection	Error frame bypass option
Phase-locked-loop	Tracks IRIG input time and generates time on signal loss; wide or narrow loop bandwidth (prog)

Internal Time Clock

Modes of operation	Translate or generate forward
Resolution	One microsecond
Stability in Generate Mode	±4.6 ppm
Interface	Host can read or set time to 1 μsec

Outputs

Format	Analog: IRIG-A, -B, or -G encode of internal time clock
Carrier frequency range	100 kHz maximum
Modulation ratio	3:1 nominal

Connectors

Rear panel	DB-50 (female)
Parallel I/O	40-pin 0.1" center header
Auxiliary	26-pin 0.1" center header
TTL external cable assembly (order separately)	DB-50 to 12 coax cables
RS-422 differential external cable assembly (order separately)	DB-50 to 8 triax and 4 coax cables

Power

+5V supply	1.6 A typical ± 5%
+12V supply	400 mA typical ± 5%
-12V supply	100 mA typical ± 5%
VIO	140 mA max. (either 5V or 3.3V)

Ordering Information

MFT733-PCI	PCI Multifunction Telemetry Module, Dual Stream
MFT733-PCI-T	PCI Multifunction Telemetry Module, Dual Stream, Triax Connectors (Differential)
MFT733-PCI-OEM	PCI Multifunction Telemetry Module, Dual Stream, OEM (Board & Driver Only)
MFT733-PCI-H	PCI Multifunction Telemetry Module, Dual Stream, Hardened Version
MFT733-PCI-S	PCI Multifunction Telemetry Module, Single Stream
MFT733-PCI-S-OEM	PCI Multifunction Telemetry Module, Single Stream, OEM (Board & Driver Only)
MFT-CABLE-D	Cable for MFT733-PCI (All Versions), Differential, Spare Only
MFT-CABLE-T	Cable for MFT733-PCI (All Versions), TTL, Spare Only

U.S. Headquarters

9020 Balboa Avenue
San Diego, CA 92123-3507
858-694-7500 800-351-8483
Fax: 858-279-0693

www.L-3Com.com/tw



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