SLICE6 LEO

**Small 6-Channel Radiation-Tolerant Data Acquisition Unit,
Universal Analog Sensor Support,
Real-Time Streaming and/or Onboard Recording**

Overview

SLICE6 LEO is a compact, radiation-tolerant data acquisition unit designed to capture analog signals in low Earth orbit environments. Optimized for size, weight, and power (SWaP) efficiency, SLICE6 LEO is ideal for test applications with strict size and mass constraints.

The SLICE6 LEO supports standalone operation, networked high-channel-count configurations, and integration with existing Ethernet-based test instrumentation. Real-time streaming in IRIG formats and dual store-in-place recording provide simultaneous real-time monitoring and redundant onboard data capture.

Applications: In-Orbit Testing, Launch Vehicle Characterization, Satellite Monitoring, Onboard Distributed DAS

Features

- Radiation-tolerant to 18 krad
- 6-channel module, ultra-small (42 x 52 x 13 mm), low mass (50 grams)
- Designed to be positioned near the sensors, significantly reducing installation time and cost
- Universal analog sensor signal conditioning: Bridge, IEPE, Thermocouple, RTD, Voltage, etc.
- UART for RS232/422/485 serial data capture
- Configurable to function as a UDP Ethernet recorder
- Real-Time Streaming (CH10, IENA or TmNS) Onboard Recording (16 GB non-volatile memory)
- Programmable sampling rates & anti-alias filters
  Streaming: Max 20k sps on all channels
  Onboard Recording: Max 400k sps
- Time synchronization via IEEE 1588 PTPv2, IRIG-B, GPS/PPS with internal Real Time Clock; 1PPS input/output

Interface

51-pin sensor input connector

25-pin system control connector

Configurations

Standalone

Networked

2-port 10/100Mbit Ethernet switch supports up to 10x modules (60ch) in daisy-chain configuration

Centralized

SLICE6 LEO DS-4 Rack

Specifications

PHYSICAL	
Size:	Size: 42 x 52 x 13 mm (1.65 x 2.05 x 0.51 in)
Mass:	50 g (1.8 oz)
Connectors (Micro-D):	51-pin with 6 universal sensor inputs 25-pin for power, Ethernet (2-ports), and Control

ENVIRONMENTAL	
Operating Temp:	-40° to 80°C (-40° to 176°F)
Humidity:	95% RH non-condensing
Shock:	500 g, 4 msec half sine
Vibration	12 g rms, 3 to 2k Hz
EMI/EMC:	Standard protection for EMI, RFI, and ESD (8kV)
Military Standard:	MIL-STD-810G, MIL-STD-461G, MIL-STD-3053, and MIL-STD-833
TID-Total Ionizing Dose:	18 krad

DATA RECORDING	
Modes:	Recorder, Circular Buffer, Multiple Event
Memory:	16 GB non-volatile flash
Sampling Rate:	Programmable up to 400k sps on all channels
Recording Time:	>50 minutes at max sample rate
Pre-Trigger Data	Any part of memory can be used for pre- or post-trigger data

DATA STREAMING	
Sampling Rate:	Programmable up to 20k sps
Format:	IRIG 106 Chapter 10, IENA or TmNS

BRIDGE AND IEPE SIGNAL CONDITIONING	
Bridge Input Range:	0 to 5 volts (2.5 V center)
IEPE Signal Range:	0.5 to 23.5V
Bandwidth:	DC to 50 kHz
Gain Range:	1 to 1,280, software programmable
Auto Offset Range:	100% of effective input range at gain >2
Shunt Check:	Yes
Sensor ID:	Maxim Integrated (Dallas) silicon serial number
Linearity (typical):	0.1% (gain 1 to 320), ≤0.5% (gain ≥640)
Accuracy:	0.2% typical

POWER	
Supply Voltage:	9-30 VDC
Current (Maximum):	< 3W with full sensor load
Protection:	Reverse current, ESD

EXCITATION	
Type:	Independent regulator for each channel
Bridge Voltage:	5.0 V regulated, up to 20 mA per channel
IEPE Current:	5 mA per chanel (24-volt source)
Recovery:	Short circuit safe, recovers in <1 msec

FILTERS	
Pre-ADC	
Fixed Low Pass:	4-pole Butterworth, standard knee at 50 kHz
Adjustable Low Pass:	5-pole Butterworth set by software from 1 Hz to 35 kHz (bypass-able for maximum bandwidth)
Factory Options:	Bessel configuration, custom bandwidths
Post-ADC	
Adjustable Low Pass:	Either 65-tap FIR or 6-pole IIR Butterworth with adjustable parameters. Other options available on request.

ANALOG-TO-DIGITAL CONVERSION	
Type:	16-bit SAR (Successive Approximation Register) ADC, one per channel, simultaneous sampling of all channels in each module.
Synchronization:	< 10 µsec, via IEEE 1588 PTPv2 or PPS (channel-to-channel entire system)

TRIGGERING	
Hardware Trigger:	Contact closure & TTL logic-level (active low)
Level Trigger:	Positive and/or negative level on any active sensor channel

SOFTWARE	
Control:	DataPRO, API, LabVIEW
Operating Systems:	Windows®, Linux
Communication:	100M bps Ethernet with built-in IEEE-1588 compliant switch

CALIBRATION	
Calibration Supplied:	ISO/IEC 17025 (Accredited), Measurements traceable to SI
Service Options:	OEM, On-site, and Service Contracts available

SYNCHRONIZATION METHODS	
Via Ethernet:	IEEE 1588 PTPv2
Via External Clock:	IRIG-B122, GPS RS232/422/485, and 1PPS input/output

ACCESSORIES
See website for full line of accessories

Software

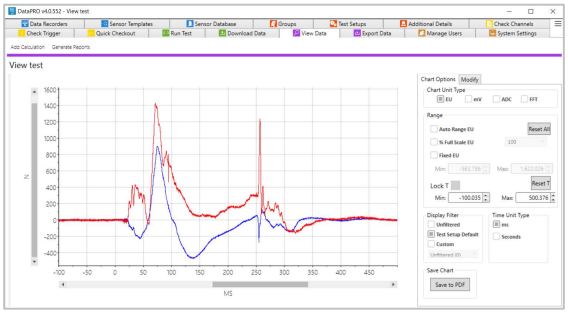
SLICE6 LEO configuration software options:

DTS DataPRO Software: Complete Windows application with sensor database, diagnostics, configuring streaming mode, arming, downloading, and data viewing

API: Application Programming Interface (API) for user-developed application support

LabVIEW (Display Only): NI LabVIEW driver for real-time data visualization

IRIG Chapter 10/IENA/TmNS Streaming: Requires 3rd party IRIG 106 compliant software for real-time data visualization



DataPRO Software

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