MARS LABS
Partners in Precision Performance

CMS16VR-53

Titan CMS Mini-Recorder

Key Features:

- Very High Speed 16 Channel Data Acquisition Recorder with multi-sensor support
- Stand-alone recording to SD memory card with onboard controls for recording and calibration
- High performance analog front-end with full Balance and Calibration loopback features
- ICP sensor support
- GPS recording supported
- Records directly to a PC via USB
- Interfaces with other Titan products to provide up to 320 analog channels, plus digital channels

Applications:

- Durability & Fatigue
- Noise & Vibration Analysis
- Vehicle Dynamics
- Ride Quality Assessment
- Acoustics
- Shock

Specifications:

Number of Channels	16 fault-tolerant channels on DB9F connectors
Sample Rate	Very High Speed Operation: **up to 60,000 samples per second per channel** Low Speed Operation: up to 1200 samples per second per channel
Resolution	Utilizes 24-bit A/D converters; 16-bit exported
Input Impedance	>10 Meg (Input Dividers OFF) / 16K (Input Dividers ON)
Programmable Gain	From ±1/16 to ±512; ±32V Full scale input voltage maximum
Programmable Filter	10 pole Linear Phase tracking filter (High Speed operation) 8 pole Butterworth filter (Low Speed operation)
Calibration Modes	Resistive (RCal): ±100K Ohms per channel (shunt calibration) Voltage (VCal): Precision positive and negative calibration voltages provided
Excitation Value / Current	Precision per-channel programmable, 2 to 11.5V @25mA with overload protection
Analog Sensor Support	Strain Gauge: Full/Half/Quarter Bridge 350Ω resistive type, with on-board bridge completion Voltage: Up to ±32 Volts Thermocouples: Types J, K, & T Tachometer/Totalizer: Frequencies up to 7KHz ICP Sensors: 2.5mA
Digital Sensor Support (via optional Digital Pod)	CAN/CAN FD, SAE J1939, ISO 15765 (ECU CAN), GPS, IMU (3DM-GX3/3DM-GX5), and multiple WFT protocols including Kistler and Michigan Scientific
GPS	Optional dedicated on-board GPS support for the Garmin 18X-5Hz w/PPS or U-Blox GNSS sensor
PC Operation	Remote recording and control via USB
Stand-alone Operation	Via on-board switches or Titan Remote Control (Mars Labs CBL-RMT)
Recording Media	Secure Digital (SD) memory card, 32GB (furnished)
Expansion Slot (1)	Supports optional Mini-Digital Pod (digital input) or Mini-DAC (analog output) expansion cards
Power Requirements	10 VDC (min), 11-32 VDC recommended; 3 Watts (base unit, sensors not driven)
Dimensions / Weight	17.6 cm x 10.6 cm x 3.7 cm (L x W x H) / Weight 540g

29 C Street / Laurel, Maryland 20707 / 301.470.3278 / www.marslabs.com

MARS LABS

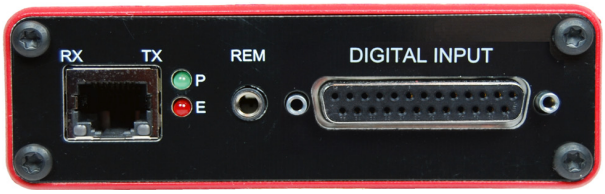
Expand the capabilities of the Titan Mini-Recorder with the optional Mini-Digital Pod Expansion Card and Accessories:

Mini-Digital Pod

Digital Input Expansion Card

Features/Specifications:

- Adds digital input capability to Titan Mini-Recorders
- Provides three CANbus inputs, plus GPS and Serial data inputs
- Each CANbus input supports CAN/CAN FD, SAE J1939, ISO 15765 (ECU CAN), and multiple WFT protocols, including Kistler and Michigan Scientific
- CANbus rates up to 2Mb
- Support for the 3DM-GX3/3DM-GX5 Inertial Measurement Unit [6 DOF channels and 3 Euler channels]
- GPS support for the Garmin LX18-5Hz sensor [12 channels + PPS] or U-Blox GNSS sensor



The Mini-Digital Pod expansion card adds a DB25 connector* to the rear of the Mini-Recorder.

*An optional DB25 Breakout Cable is available (ICA-TIDP5) that provides individual DB9 input connections for 3 CAN, GPS, and IMU inputs.

Titan Sensors

Sensor technology optimized for use with Titan Input Modules

Lord MicroStrain 3DM-GX5 IMU

Connects directly to Titan Digital Pod or Mini-Digital Pod with adapter

GPS Sensors

Support for Garmin LX18-5Hz GPS (MLACC10005) or U-Blox GNSS (MLACC10019 shown) Sensors

About IMUs

The Inertial Measurement Unit (IMU) is a self-contained system that measures linear and angular motion, usually with a triad of gyroscopes and triad of accelerometers. An IMU can either be gimballed or strapdown, outputting quantities of angular velocity and acceleration in the sensor/body frame. By the integrating and processing these values, the rotation (Yaw, Pitch, and Roll, also known as Euler Angles) can be determined.