

PRELIMINARY

DATA SYSTEMS



ACQUIRE RECORD TELEMETRY & STREAM VISUALIZE & PROCESS

# LMA

## New Gen of COTS Data Acquisition Unit for Space Launch Vehicles



SPACE LAUNCH VEHICLE TELEMETRY

Heim

With its highly ruggedized design, LMA is an **ideal solution for data acquisitions in harsh space environments** with space radiation, vacuum, and high level of vibration and shocks.

Its ruggedized chassis has been designed for space radiative environment and insures a permanent supervision and management of potential SEL and SEE. **High modularity** and **versatility** is provided by the chassis thanks easy mounting/unmounting of acquisition modules by the user.

**Easy to integrate and to configure**, LMA can be tailored to your measurement plans.

The LMA allows for 2 configurations to achieve **the most cost-effective solution** according to radiation requirements of each stage of the launcher and is fully interoperable with the CMA product family.



Launch Vehicle



Space Orbital Module



Space Exploration

### DESIGNED FOR SPACE ENVIRONMENT

Radiation tolerant, shocks, vibration

### DISTRIBUTED ARCHITECTURE

Integrated system distributed among all stages of the launcher

### TAILORED TO APPLICATION

Users relatable acquisition modules

### INTEROPERABLE WITH THE CMA PRODUCT FAMILY

### COTS PRODUCT

Fully interoperable with the CMA product family

> TECHNICAL SPECIFICATIONS

The LMA Core is the basic structure which receives the user modules for your acquisition, reconstruction and topology requirements. It is composed of 1 Central Processing Unit including 28V Power Supply and 32 discrete inputs.

LMA is available in two versions:  
 LMA-Small: 5 modules  
 LMA-Large: 10 modules

**Chassis base functions**

PCM Output .....	IRIG 106 Chapter 4 & Chapter 7
Other Links .....	Ethernet, RS-422, IEEE1553
Time Sync. Input .....	IRIG-B, PTP IEEE-1588
Time Sync. Output .....	PTP IEEE-1588
Discrete Acquisition .....	32 channels
LMA-CMA Link .....	Ethernet, RS-422

**Radiation tolerant feature**

SEL full protection  
 SEE detection and recovery in less than 1s. Max probability of 1 event per mission GTO+ (24 000s duration and 20 000km) per channel  
 Full characterized (P+ and Hion)

**Mechanical characteristics**

**LMA-Small 5 modules**

Dimensions .....	356 x 116 x 118mm
Weight .....	2.1 kg typ. (with 5 modules)
Max. Power .....	50 W

**LMA-Large 10 modules**

Dimensions .....	356 x 116 x 118mm
Weight .....	4 kg typ. (with 10 modules)
Max. Power .....	85 W

**Interface**

Power Supply .....	8 pin circular connector (AMPHENOL)
CPU and Application modules .....	2 circular connectors
.....	APMHENOL 37 pins and 20 pins
.....	SOURIAU P/N 8MC.N.H51.POL3
.....	55 pin circular connector for discrete inputs

**Environmental conditions**

Temperature Operating .....	-20°C to +75°C
Vibration, random .....	25 gRMS (20 –2000 Hz)
Pyroshock .....	100g / 100Hz to 12500g / 25kHz
ESD .....	8kV (contact) /15kV
Lightning .....	Level 2 (DO160)
Power Supply .....	24 to 32 VDC 100 μs power loss protection
EMI/EMC (Transient, conducted, or DO-160 inducted perturbation and protection)	
Compliant .....	MIL-STD461ED
Vacuum and Thermal Vacuum .....	10-5mbar
Quick depressurization .....	50mbar/s during 20 seconds

> OPTIONAL MODULES

**LMA ANA - Analog acquisition module**

8 generic channels differential or single ended analog signal with or without excitation (current or voltage)  
 High bandwidth up to 20kHz metrological  
 High accuracy up to 0.05% FSR (±8mV - ±10.24V)  
 Thermocouples K, J, T, E, N with cold junction compensation  
 RTD linearisation (PT50, PT100, PT1000)  
 Full bridge strain gauges  
 ICP accelerometers

**LMA HDA - High Density Analog acquisition module**

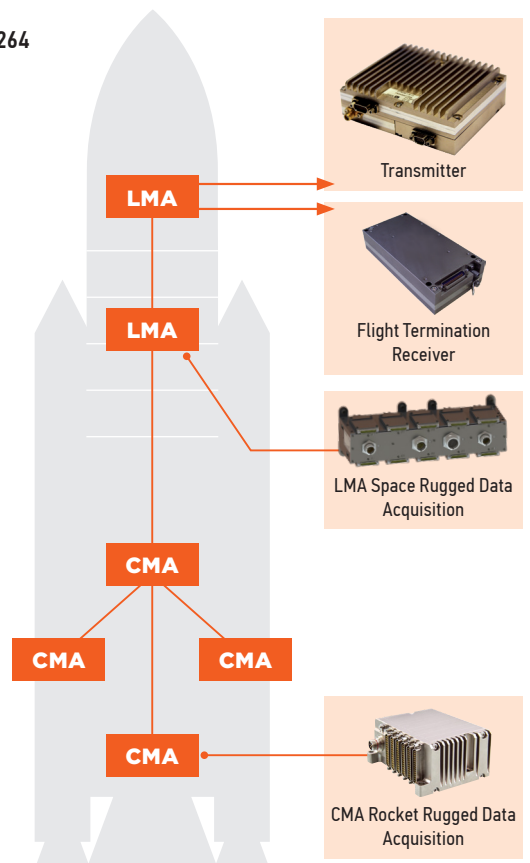
16 channels differential or single ended analog signal  
 High bandwidth up to 20kHz metrological  
 High accuracy up to 0.05% FSR (±8mV - ±10.24V)  
 Thermocouples K, J, T, E, N with cold junction compensation

**LMA HDD- High Density Discrete module**

40 discrete inputs

**LMA VDA - Video Acquisition**

2 video channels (Y/C, composite)  
 2 audio channels  
 PAL, NTSC  
 Encoding: H264



GLOBAL SALES

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