

FLIGHT TEST TELEMETRY



TMA 2000 product range

Integrated Turnkey Data Acquisition System for flight testing of Commercial & Military Aircraft

A new concept for your data
acquisition system

MODULAR, FLEXIBLE AND POWERFUL

Up to 16 acquisition units

Fault tolerant (local failure does not interfere with the rest of the system)

DECENTRALIZED, DISTRIBUTED ACQUISITION AND CPU THROUGH ADSL LINK

Up to 100 yd between units, linked via 2 x 20 Mb/s ADSL



Example of a set of TMA 2000 units

User dedicated CPU available on-board acquisition modules (40 Mips)

High coherency (simultaneous sampling across system with 150 ns accuracy)

EASY TO INSTALL, TO CONFIGURE - RE-USABLE

Little wiring needed : two twisted pair for each ADSL link

User friendly **Monitoring & Control Computer** with real time decommutation capability

EASY INTEGRATION WITHIN EXISTING SYSTEM THANKS TO PCM MERGING

VERSATILE TELEMETRY CODING

IRIG-106 programmable PCM encoding up to 12 Mb/s

Optional IRIG-107 or CCSDS PCM standards (data packets) on Ethernet 100Mbps output

4 selectable formats for real-time switching during test

Other formats on demand - **consult us**

4 HOUSINGS AVAILABLE

From 19" rack mounted chassis **TMA 2000 RM**

Large size rugged chassis - standard **TMA 2000-LC**

Large size rugged chassis - waterproof **TMA 2000-LC-W**

Small size rugged chassis **TMA 2000 SC**

MANY ACQUISITION MODULES AVAILABLE TO FIT ALL NEEDS

From 4 acquisition modules to 20 acquisition modules per chassis
according to the housing

Large size

ARINC 429

MIL-STD 1553

RS - 232/422/485

High accuracy Analog channels with signal conditioning

Discrete channels with programmable threshold

Frequencemeter, counter, period-meter

RMS and power measurement

Wide band analog channels with signal conditioning and
TEDS sensor management

Small size

ARINC 429 - MIL-STD 1553

RS - 422/485

Analog channels

Discrete channels

Other modules available - Custom development on demand - **Consult us**



TMA 2000 housing line

RACKABLE UNIT TMA 2000-RM

19"width, 4U height rack mounted unit
Up to 20 large size acquisition modules on universal slots
Halfwidth version available with up to 9 acquisition modules
200W or 400W power supply according to Unit load
All connectors on rear panel allowing module replacement without withdrawal of the cables
Optional protection against power cuts, optional alarm and monitoring modules

LARGE SIZE RUGGED CHASSIS TMA 2000-LC

160mmx 200mm cabinet
8/ 12 / 16 large size acquisition modules on universal slots
Halfwidth version available with up to 9 acquisition modules
200W power supply according to Unit load
All connectors on top
Optional protection against power cuts, optional alarm and monitoring modules

SMALL SIZE RUGGED CHASSIS TMA 2000-SC

Up to 14 small size acquisition modules
27 W or 55 W power supply according to Unit load
Compact unit
width : 104 mm
height : 63,5 mm
length : 57,3+8,4N (N number of modules)
(133 mm for 9 acquisition modules)



Large size acquisition module line

COMMON FEATURES

User dedicated CPU including 40 Mips DSP + 3MB SRAM, for down-loaded processing routines
6-byte date and time stamp : 1 μ s resolution

ARINC 429 acquisition module

16 individually programmable ARINC 429 channels, High or low data acquisition rate
8 and 10 bit labels, 32 bit word length, interword gap > 2 bits
Built-in self-test including ARINC 429 electrical interface, Individual status for each channel

MIL-STD 1553 acquisition module

8 buses acquisition channels with MIL-STD-1553 Bus monitoring
Message structure, inter-message gap, response time analysis,
Individual status for each bus

Serial link acquisition module

8 individually programmable RSxxx channels, following EIA 232/422/485 standards
Data rate between 150 Hz and 153 600 Hz,
Synchronous or asynchronous operation
7/8 bits per character, 1/1.5/2 stop bits, even/odd/no parity
Individual status report for each channel
Optional full duplex links (programming of external sensors)

Discrete acquisition module

36 discrete channels with 100 kHz bandwidth
Individually programmable thresholds (-10 to +10V, 100 mV steps)
Logical test output available for maintenance/test purpose,
Individual status for each channel

Analog acquisition module

16 analog channels, individually programmable, DC - 3000 Hz bandwidth
Integrated programmable signal conditioning
16 bit resolution, 12 bit accuracy analog to digital conversion
Multi-sensor : PT100, strain gauge, thermocouple, analog,
...

Large choice of selectable input range : +/-16 mV to +/-51.2 V
Low inter-channel distortion (0.1° @ 500Hz on same unit) for correlation
Continuous internal temperature compensation process (user transparent)
Individual status for each channel, including sensor fault detection

Frequency - Period Counter module

8 individually programmable channels
Frequency measurement (0 to 100 kHz) with 1Hz accuracy
Period measurement (0 to 655 350 µs) with 1 µs accuracy
Counter (12, 16, 24 or 32 bits) with external trigger
Large choice of selectable input range : +/-16 mV to +/-51.2 V
Programmable bandpass filter,
Programmable thresholds
Individual status for each channel

RMS - Power measurement module

8 Individually programmable channels,
DC - 3kHz bandwidth
Large choice of selectable input range : +/-16 mV to +/-51.2 V
1 channel ? RMS value or 2 channels ? Powervalue (V x I)
Integrated programmable signal conditioning
16 bit resolution, 12 bit accuracy
Sensor types : PT100, strain gauge, analog,...
Digital filtering
Continuous internal temperature compensation process
6-byte date and time stamp : 1 µs resolution
Individual status for each channel, including sensor fault detection



Small size acquisition module line

COMMON FEATURES

6-byte date and time stamp : 1 µs resolution

ARINC 429 acquisition module

16 Individually programmable ARINC 429 channels,
High or low data acquisition rate
8 and 10 bit labels, 32 bit word length, interword gap >2 bits
Built-in self-test including ARINC 429 electrical interface,
Individual status for each channel

MIL-STD 1553 acquisition module

2 buses acquisition channels with MIL-STD-1553 Bus monitoring
Message structure, inter-message gap, response time analysis,
Individual status for each bus

Serial link acquisition module

2 individually programmable RSxxx channels, following EIA 422/485 standards
Data rate between 150 Hz and 153 600 Hz, asynchronous operation
7/8 bits per character, 1/1.5/2 stop bits, even/odd/no parity
Individual status report for each channel

Discrete acquisition module

20 discrete channels with 100 kHz bandwidth
fixed thresholds (-10 to +10V, 100 mV steps)
Individual status for each channel

Analog acquisition module

16 or 8 analog channels, individually programmable, DC - 3000 Hz bandwidth
Integrated programmable signal conditioning (8 channels version)
16 bit resolution, 12 bit accuracy analog to digital conversion
Factory configured multi-sensor acquisition
User programmable digital filter
Individual status for each channel, including sensor fault detection
Custom design on demand. Consult us for more details



Large size & Small size core module line

Control module

Management and control of all the modules of the unit
1 per unit (rack-mounted or stand-alone chassis)
Recovery of all acquisition data from modules inside unit,
Acquisition of IRIG time
Generation of PCM message according to format
Generation of unit status message
Interconnection between units via ADSL link

DC-DC converter module

Input voltage : 24 - 32 VDC
Output voltage : + 15 VDC, -15 VDC, + 5 VDC
Protection against short-circuit and over-voltage,
Protection against excessive temperature rise
Power-on in-rush current limiting,
Protection against input power supply short cuts
Status reported to M&C link
100 W or 200 W ; 27 W or 55 W

Surveillance module (option)
