

ANALOG ACQUISITION SYSTEM



ELECTRONICS
DESIGN AND
MANUFACTURE

OVERHAULING

SERVICING

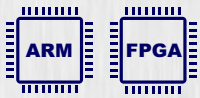
REBUILDING

EMS-21TS



The Analog Acquisition System is intended to provide communication between the analog and the digital systems of the aircraft airborne equipment. It manages the translation of analog signals from variety of sensors and actuators into avionics data formats, supporting cockpit flexibility needs in upgrade, control, and data recording applications.

The system is highly modular and can be set up for any numbers and types of analog data to process.



ARINC 429

CAN

The heart of the system is a Texas Instruments™ Hercules™ Safety ARM MCU, a dual-core processor running in a lock step mode, based on TI's 20+ years of safety critical system expertise. Unlike many microcontrollers that rely heavily on software for safety capabilities, Hercules™ microcontrollers implement safety in hardware to maximize performance and reduce software overhead. Dual-core lockstep CPU architecture, hardware BIST, MPU, ECC and on-chip clock and voltage monitoring are some of the key functional safety features available to meet the needs of automotive, railway and aerospace applications.

Power: 8-36 VDC, 18 Watts maximum
Dual power supply

CPU module

Size: 180 mm x 130 mm x 70 mm

Weight: 0.3 kg + 0.3 x modules kg

Interfaces: 4x ARINC 429 output channels
1x CAN bus
5x hi-rel discrete inputs
2x RPM conversion channels

Analog acquisition module A-1

Size: xxx x xxx x xxx

Weight: xxx

Interfaces: 2x RTD or thermocouple input channels

7x universal analog input channels with supply voltage generation

1x voltage measurement channel with extended range of 80 volts

Analog acquisition module A-2

Size: xxx x xxx x xxx

Weight: xxx

Interfaces: 6x thermocouple measurement inputs

3x analog/discrete input channels with supply voltage generation

14x analog/discrete input channels

Environmental:

Pressure range:

-1,400 ft. to 30,000 ft.

Operating temperature range:

-40°C to +80°C

Humidity:

95% non-condensing

Certification:

Designed to be compliant to DO-160, DO-178C, DO-254 standards for installation in experimental aircrafts. This product holds no TSO certification.



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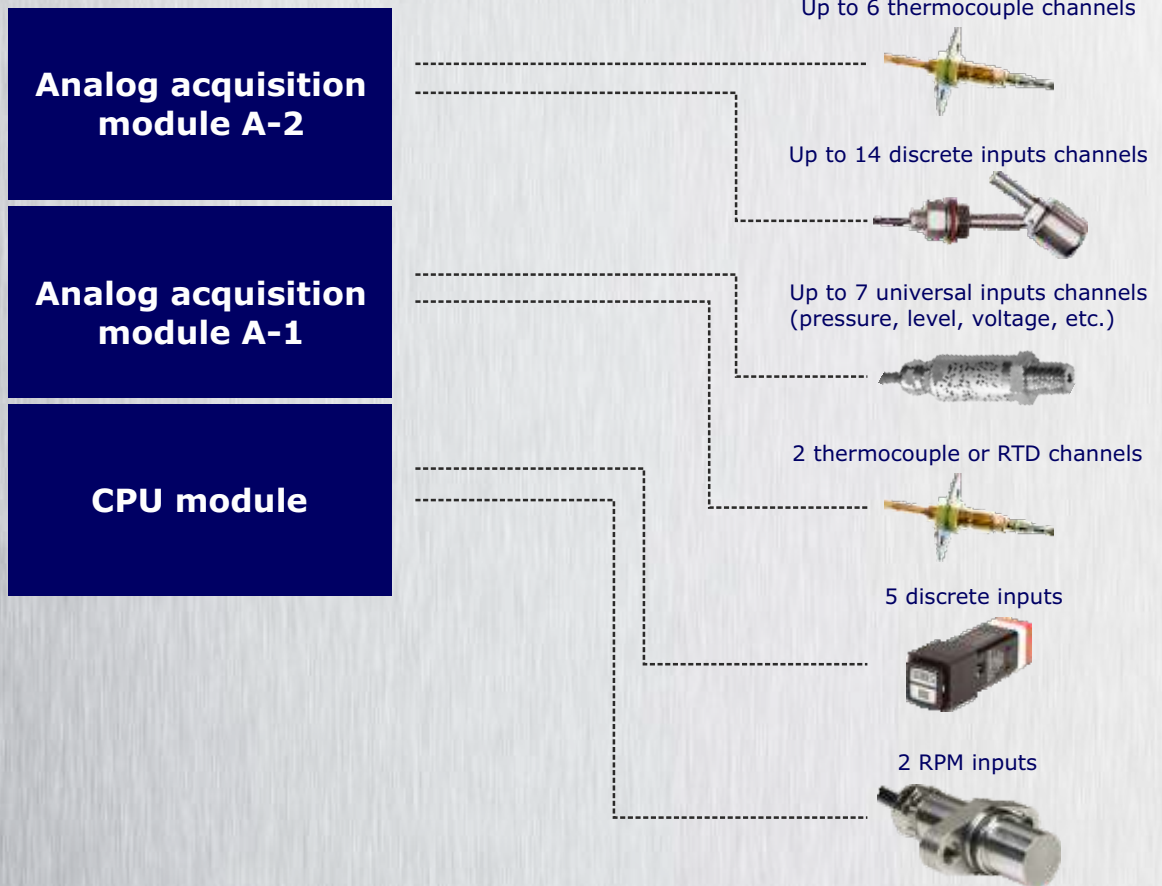
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EXAMPLE OF SYSTEM CONFIGURATION



Analog acquisition module A-1

- 2x RTD input channel, configurable to accept Pt100, Pt1000, NTC, PTC sensors or thermocouples
- 7x universal analog input channels for ratiometric, absolute, differential or single-ended measurements with adjustable gain of 1 to 64. Each channel can provide adjustable excitation or supply voltage for sensors in the range of 5 to 12 volts.
- 1x voltage measurement channel with extended range of 80 volts

Analog acquisition module A-2

- 6x thermocouple measurement inputs
- 3x universal analog input channels for absolute voltage measurements. Each channel can provide adjustable excitation or supply voltage for sensors in the range of 5 to 12 volts. Each channel can be set up to be a discrete input with adjustable low and high thresholds with specified filter delay times or as a frequency or period counter.
- 14x universal analog input channels for absolute voltage measurements. Each channel can be set up to be a discrete input with adjustable low and high thresholds with specified filter delay times or as a frequency or period counter.

CPU module

- 4x ARINC 429 output channels freely configurable for rate and payload of collected data. Conversion results can also be processed by digital filters prior to sending over ARINC 429 interface.
- 1x CAN bus that is used for configuration and setup from EICAS display or management tool.
- 5x Hi reliability optoisolated inputs for interfacing to engine starting unit or other equipment that require fast processing.
- 2x RPM tachometer sensor inputs with translation to a standard level signals with conversion to digital form. The output is provided as a differential signal of an input frequency.

The system consists of a base CPU module with up to 15 stackable acquisition modules. During power up all modules are queried and initialized to the pre-defined or custom settings. During the work of the system the state of the modules is monitored and sent over ARINC 429 and CAN interfaces. The system can be set up to output any set of measured parameters with any acceptable rate over any selected number of ARINC 429 channels.