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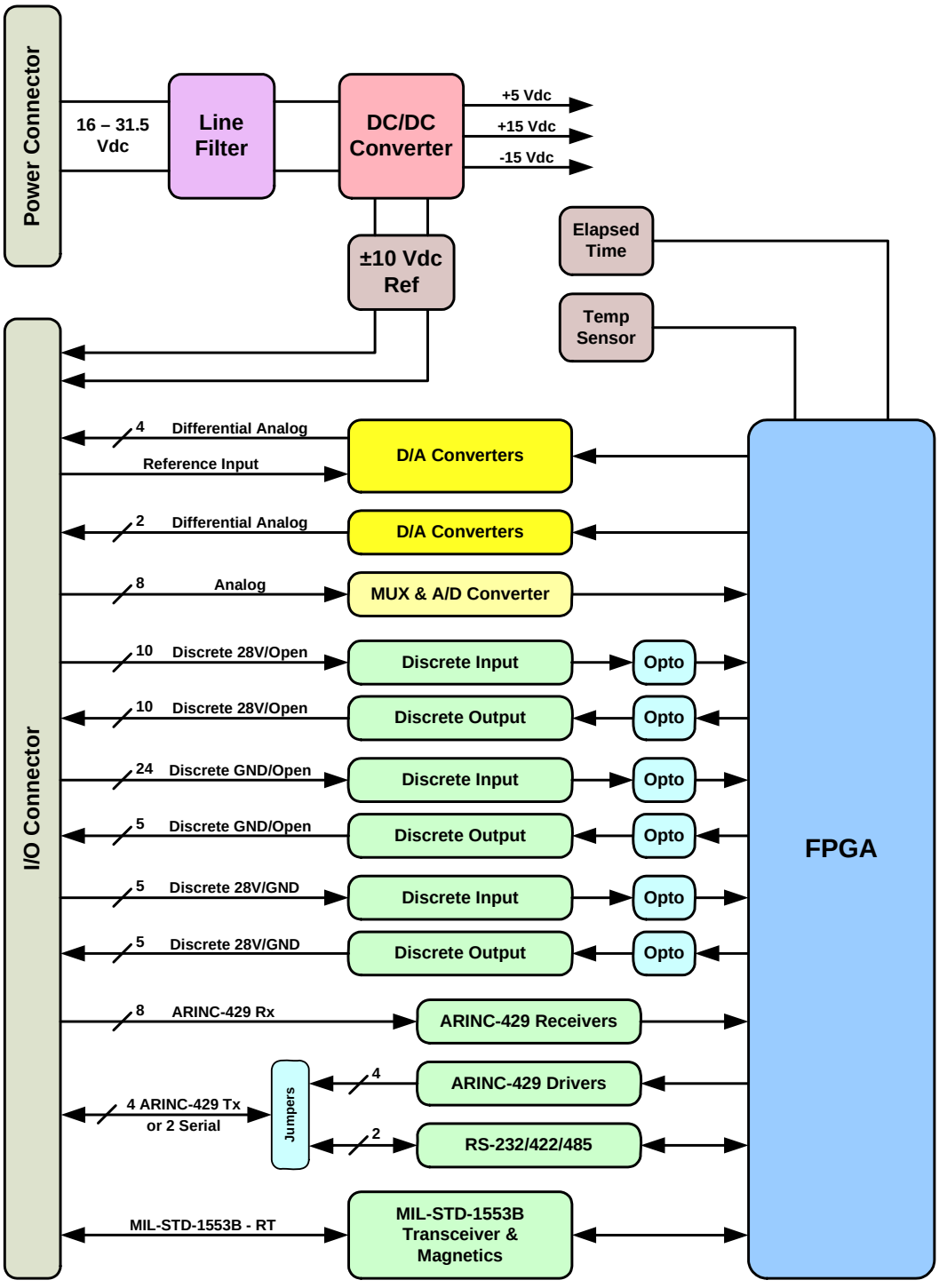
Find the *Aitech Defense Systems A175* at our website: ***Click HERE***

A175 I/O Expansion Subsystem



- **Expands Avionics Computer I/O Capabilities**
- **MIL-STD-1553B Interface to Avionics Computer**
- **Powered from a standard 28V input per MIL-STD-704D**
- **Faraday Cage Enclosure**
- **EMI/RFI filtering of I/O signals per MIL-STD-461/2**
- **Large Variety of I/O Interfaces**
  - **ARINC-429 In/Out**
  - **Analog In/Out**
  - **Discrete In/Out**
  - **Serial Ports**
  - **Reference Voltages**
- **Onboard Temperature Sensor**
- **Elapsed Time Meter**
- **Compact and Lightweight**
- **Single Board High Reliability Design**
- **Extremely Low Power Consumption**
- **Environmentally Sealed**
- **Natural Convection Cooled**

Aitech Defense Systems, Inc.
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A175 Functional Block Diagram (typical configuration)

Flexible I/O Expansion for Avionics Systems

Aitech's A175 I/O Expansion Subsystem is a small add-on unit for avionics systems specially designed to:

- Expand I/O capabilities of existing avionics systems
- Support Avionics I/O having sensitive signals

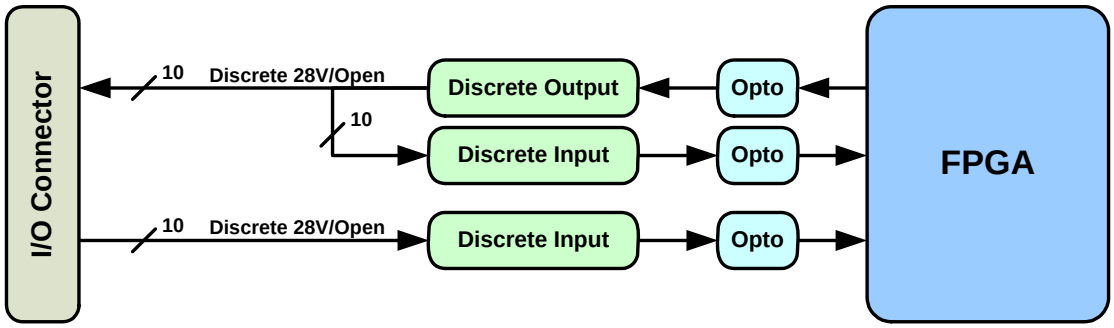
With its high variety of I/O interfaces, small form factor, low power dissipation, and standard MIL-STD-1553B avionics bus interface (RT), the A175 handily meets these requirements. It can be used to expand the I/O capabilities of any avionics computer with a standard MIL-STD-1553B interface.

For sensitive signals, the unit can be mounted in close proximity to sensors enabling short wiring to ensure maximum signal integrity and minimum signal loss.

The A175 is ideal for expanding the capabilities of existing avionics systems, with inherent scaling capability provided by additional units that can be added as slaves to the main avionics computer. The number that can be added is limited only by the capabilities of the main avionics computer.

All I/O interfaces are implemented in the unit's FPGA, with only the physical layers being dedicated devices. This minimizes power consumption, and enables convenient customization of the unit to meet specific applications.

To ensure highest reliability, the A175 includes extensive Built-in Test (BIT) capabilities. Each discrete output line is routed to a dedicated discrete input to enable loopback testing. (These dedicated discrete inputs are in addition to the discrete inputs available at the I/O connectors). The FPGA compares the input and output signals and writes a health status bit for each channel to registers in the FPGA that are accessible to the avionics computer CPU via the MIL-STD-1553B link.



The ARINC-429 inputs are tested using test patterns generated in the ARINC-429 receiver device. The pattern is analyzed in the FPGA and the result stored in a dedicated health status register.

The ARINC-429 outputs are tested in similar fashion, using extra dedicated ARINC-429 inputs as loopbacks.

The discrete inputs are tested at the component level. Each discrete input device has a dedicated input line for loopback testing, and a dedicated health status register in the FPGA.

All analog outputs, including the reference voltages, as well as the on-board temperature sensor and power supplies, are connected to the analog input MUX to allow monitoring and analysis by the FPGA.

The I/O Expansion Subsystem is housed in a rugged compact Faraday cage chassis that has been designed and tested for survivability and full functionality under the extreme conditions of temperature, shock, vibration, acceleration, altitude, and humidity that are to be expected in military airborne applications. The single board design, with no interconnects, ensures maximum reliability even when the unit is mounted near aircraft engines or other high vibration locations.

Superior EMI/RFI performance is assured by the Faraday cage design of the chassis and on-board filtering of I/O signals.

The unit is powered by any standard 28 Vdc MIL-STD-704D compliant supply.

Specifications

I/O Interfaces

- One dual redundant MIL-STD-1553B (RT) channel
- Two* asynchronous RS-232/422/485 UART serial ports
- Eight single ended 12-bit A/D input channels
- Two differential 16-bit D/A output channels
- Four differential 16-bit D/A output channels with external or internal reference voltage
- Voltage reference source set of +10 and -10 Vdc
- Discrete Input Channels
  - Twenty-four GND/OPEN discrete input channels
  - Ten 28V/OPEN discrete input channels
  - Five 28V/GND discrete input channels
- Discrete Output Channels
  - Five GND/OPEN discrete output channels
  - Ten 28V/OPEN discrete output channels
  - Five 28V/GND discrete output channels
- ARINC-429
  - Eight ARINC-429 receivers
  - Four* ARINC-429 line drivers
  - Supports bit and character-oriented data transfers
  - Complies with AEEC adoptions of ARINC-429 specification
  - All receivers can detect time-out between two consecutive ARINC-429 words
  - High speed or low speed configuration
  - Receivers can accept data at any standard rate
  - Parity support

Additional Features

- Temperature Sensor
- Elapsed Time Meter
  - Records cumulative operating time
  - Records on-off cycles

* The unit can be configured with two serial ports or four ARINC-429 drivers

Power Supply

- 16 – 31.5 Vdc input voltage range
- 10 W Typical Power Consumption (<15 W maximum)
- Integral input power line filter

Environmental

- Operating Temp. -40 to +71 °C
- Storage Temp. -54 to +105 °C
- Altitude -1,500 to +60,000 ft
- Humidity 100%
- Vibration
  - MIL-STD-810F, Method 514.5, Procedure I
- Gunfire Vibration
  - MIL-STD-810F, Method 514.5, Procedure IV
- Shock
  - MIL-STD-810F, Method 516.5, Procedure I
- Linear Acceleration
  - MIL-STD-810F, Method 513.5, Procedure II
- Dust
  - MIL-STD-810F, Method 510.4, Procedure I
- Fungus Resistant
- Drip Proof
  - MIL-STD-810F, Method 506.4, Procedure III
- Salt Fog
  - MIL-STD-810F, Method 509.4, Procedure I
- EMI/RFI
  - MIL-STD-461/462: RS02, RS03, CS01, CS02, CS06, RE02, CE01, CE03, CE07
- Lightening Protection
  - RTCA DO-160D, Section 22

General Specifications

- Dimensions (not including connectors)
  180 x 180 x 33 mm (L x W x D)
- Weight < 1.1 kg

MTBF

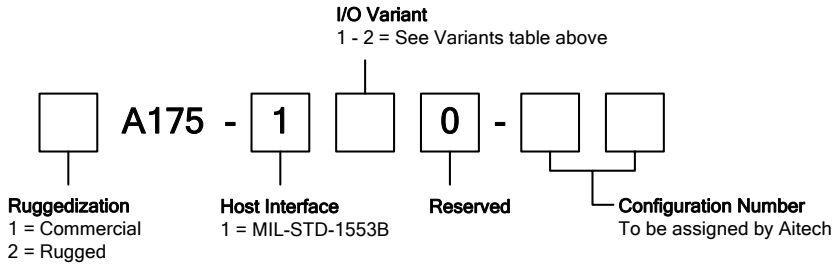
- >9000 hours - A_{RW} @ 50 °C (MIL-STD-217F)

I/O Configuration Variants

	Variant	
	1	2
Analog Inputs, 12-bit, Single Ended	8	
Analog Outputs, 16-bit, Differential	6 *	
Discrete Inputs, GND/Open	24	
Discrete Inputs, 28V/Open	10	
Discrete Inputs, 28V/GND	5	
Discrete Outputs, GND/Open	5	
Discrete Outputs, 28V/Open	10	
Discrete Outputs, 28V/GND	5	
ARINC-429 Rx	8	
ARINC-429 Tx	4	0
Serial Ports	0	2

* 4 outputs with external or internal reference voltage

Ordering Information



Example: 2A175-120-00

For more information about the A175 I/O Expansion Subsystem or any Aitech product, please contact Aitech Defense Systems sales department at (888) Aitech-8 (248-3248).

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