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Find the *Aitech Defense Systems C437* at our website: ***Click HERE***

C437

ARINC-429, A/D, D/A, and Digital I/O VME Board



- Rugged 6U VME Single Slot Board
- VME Slave Interface
- Four Opto-isolated Differential 16-bit A/D Input Channels
- Four Opto-isolated Differential 16-bit D/A Output Channels
- Two +10 Vdc and Two –10 Vdc Voltage Reference Source Sets
- Opto-isolated Discrete I/O Channels
  - 45 GND/OPEN Inputs
  - Ten 28V/OPEN Inputs
  - Five 28V/GND Inputs
  - Two 5V Differential RS-422 Inputs
  - 41 GND/OPEN Discrete Outputs
- ARINC-429 I/O
  - 16 ARINC-429 Inputs
  - Eight ARINC-429 Outputs
  - High or Low Speed Configuration
- Audio Announcement System
- All I/O Signals Routed to the VME P2 & P0 Connectors
- Low Power Consumption
- On-board BIT Support (ref voltages and loopbacks)
- VME64x Compliant
- Conduction and Air Cooled Versions
- Vibration and Shock Resistant

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Overview

Aitech's C437 provides multiple I/O including ARINC-429, Analog to Digital, Digital to Analog, and discretes, as well as an MP3 player with stereo audio output, on a single slot rugged VME board.

The card integrates a sophisticated design totally separating it into independent analog, digital, and discrete domains, thereby minimizing crosstalk and interference, allowing it to achieve high quality analog to digital and digital to analog conversions.

With its extensive I/O capabilities, the C437 provides an attractive solution for system integrators requiring I/O for large numbers of sensors and actuators as in avionics and other versatile control systems. Analog inputs and outputs can be factory configured for compatibility with a wide range of devices.

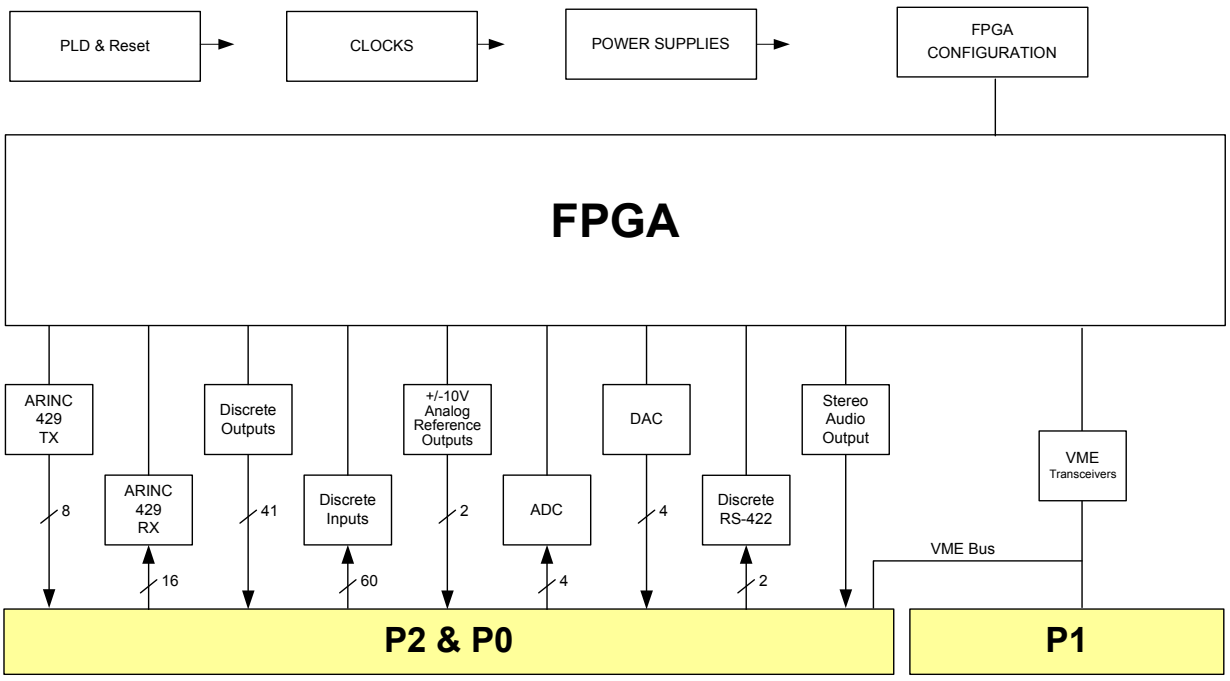
Also provided is an Audio Announcement System with stereo audio output for systems that provide audio messages playback. Dedicated Flash and SRAM resources enable the C437 to play pre-recorded audio messages in various formats (mp3, wav, etc.) as well as run time messages.

With its exceptionally low power consumption per functionality, the C437 can easily be integrated into systems having moderately sized power supplies. System thermal design is also simplified by the low power consumption.

The VMEbus interface implemented in the C437 is incorporated in an FPGA logic device providing simple and reliable interface. The VME interface provides slave functionality only and supports A32/D08/D16/D32 access modes.

The FPGA also provides full autonomous control over all onboard functions, leaving the VME host board free to perform other tasks.

The C437 is delivered with a complete set of drivers and Built-In Tests (BIT) for all on board resources. The drivers integrated into the VME host card environment provide full control/status and access to all of the C437 modules.



C437 Block Diagram

Functional Description

Power/Ground Domains

The analog, digital, and discrete I/O sections of the C437 are fully isolated from one another in order to maintain signal integrity and to ensure that no signal domain is in any way affected by the others. Each has its own independent power and ground domains.

ARINC-429

The C437 VME I/O board provides 24 ARINC-429 channels, compliant with the AEEC adoptions of ARINC-429 specification:

ARINC-429 Receivers

- Sixteen ARINC-429 receivers
- Accept serial data and construct legal word
- 2 kB FIFO per channel
- Support high and low speed – 12.5 kbps & 100 kbps
- Identify timeout between consecutive words, according to desired gap
- Filtering incoming data by label/SAL and SDI
- Flip label order
- Identify damaged word (ODD/EVEN parity, partial word, sync loss)
- Store data in FPGA built in memory
- Programmable interrupt with mask options
- Configure FIFO almost full flag
- Start/stop channel operation
- Reset channel
- Return channel's status
- Return Receiver queue status and

ARINC-429 Transmitters

- Eight ARINC-429 line drivers
- Construct ARINC-429 words accepted from host CPU
- 2 kB FIFO per channel
- Support high and low speed – 12.5 kbps & 100 kbps
- Flip label order
- Calculate and transmit ODD/EVEN parity
- Transmit data from FPGA built in memory
- Activate programmable interrupts
- Configure FIFO almost full flag
- Start/stop channel operation
- Reset channel
- Return channel status
- Return Transmitter queue status
- Parity generation configured through software

Analog I/O Interface

The C437 Rugged I/O VME board includes opto-isolated Analog to Digital (A/D) and Digital to Analog (D/A) channels, and two voltage references as described below:

Isolated A/D Input Channels

- Four differential analog input channels
- Full isolation between the analog and the digital domains (opto-isolated)
- 16-bit ADC device resolution (12-bit actual input voltage resolution)
- Input voltage range: - 10 to + 10 Vdc (other input voltage ranges available upon request)
- Up to +/- 70 Vdc overvoltage/fault protection
- Two modes of operation:
  - **Convert on Command** – convert on command one selected channel.
  - **Continuous Scan** – Channels are scanned and sampled in cyclic mode. The software can select specific channels to sample in the cycle.
- Support for VME interrupt or polling mode operation
- Offset and Gain Calibration support using built-in voltage and ground references
- Software programmable gain control
- BIT support for the A/D path using internal loopback connections from D/A outputs to A/D inputs

Isolated D/A Output Channels

- Four analog output channels
- 16-bit D/A device resolution (12-bit actual input voltage resolution)
- –10V to +10V analog output voltage range
- Buffer amplifier outputs delivers up to 5 mA at full-scale voltage on all outputs simultaneously

Voltage References

- +10 Vdc and -10 Vdc voltage references

Digital I/O Interface

The C437 board provides isolated digital input and output channels.

Input Channels

- Optically isolated
- 45 GND/OPEN discrete input channels
- Ten 28V/OPEN discrete input channels
- Five 28V/GND discrete input channels
- Two 5V Differential RS-422 input channels
- Support for VME interrupt or polling mode operation
- All inputs include anti-bouncing mechanism

Output channels

- 41 optically isolated output channels
- OPEN/GND circuit operation state modes
- Max output voltage range: 0 to +50 VDC
- Max output current: 250 mA per output channel
- Each output channel includes an on board feedback status circuit used for testing during real-time operation.
- Internal matching mechanism compares between each output channel state and its feedback state and assert interrupt with the channel number information
- Each channel has common-cathode clamp diode for switching inductive loads
- Support for VME interrupt or polling mode operation
- During power-up and initialization, all outputs are set to logic “0” (lines open).
- Output channels can be paralleled for increased current capability

Audio Announcement System

- Two separate audio outputs (left and right)
- Decodes MPEG 1 & 2 audio layer 3 (ISO 11172-3), MP3+V, WAV and PCM files
- SRAM and Flash memory for file playback and storage
- High-quality stereo DAC with no phase error between channels
- Support for VME interrupt or polling mode operation

VMEbus Interface

The C437 VME Bridge is implemented in an FPGA logic device. The VME Bridge provides slave VME capabilities and supports A32/D08/D16/D32 data transfers from/to any standard VME host board

The C437 supports VMEbus interrupts generation on any of the seven VME interrupt levels.

Geographical Addressing

The C437 VME Base address can be set in one of three methods:

- Using the on board jumpers
- Using VME64x geographical address signals
- Factory programmed upon request

Software Support

The C437 slave VME board is supplied with VxWorks or Integrity RTOS drivers for the VME host board (master). These drivers allow operation and control of the C437 from the host board via the VMEbus.

The C437 drivers also include a set of BIT functions for testing all on board functions.

Drivers for other popular real-time operating systems can be supplied upon request

Mechanical Features

The C437 is available in two mechanical formats:

- Air-cooled per ANSI/VITA 1-1994
- Conduction cooled per IEEE 1101.2

Both mechanical formats are single slot 6U modules.

Custom metal frame provides excellent rigidity and shock resistance. In addition custom metal frame provides an array of stiffeners to support rugged PMC boards.

Dimensions

- Air-cooled: per ANSI/VITA 1-1994
- Conduction cooled: per IEEE 1101.2

Thermal Management

A careful mechanical design including custom Heatsink modules combined with a metal frame allow for optimal heat dissipation.

Power Requirements

In its default configuration, the C437 receives all its power from the VME backplane +5.0 V, +12 V, and -12 V supplies. It can also be configured at the factory to utilize the +3.3 V power supply from the backplane supply as defined in the VME64x specification.

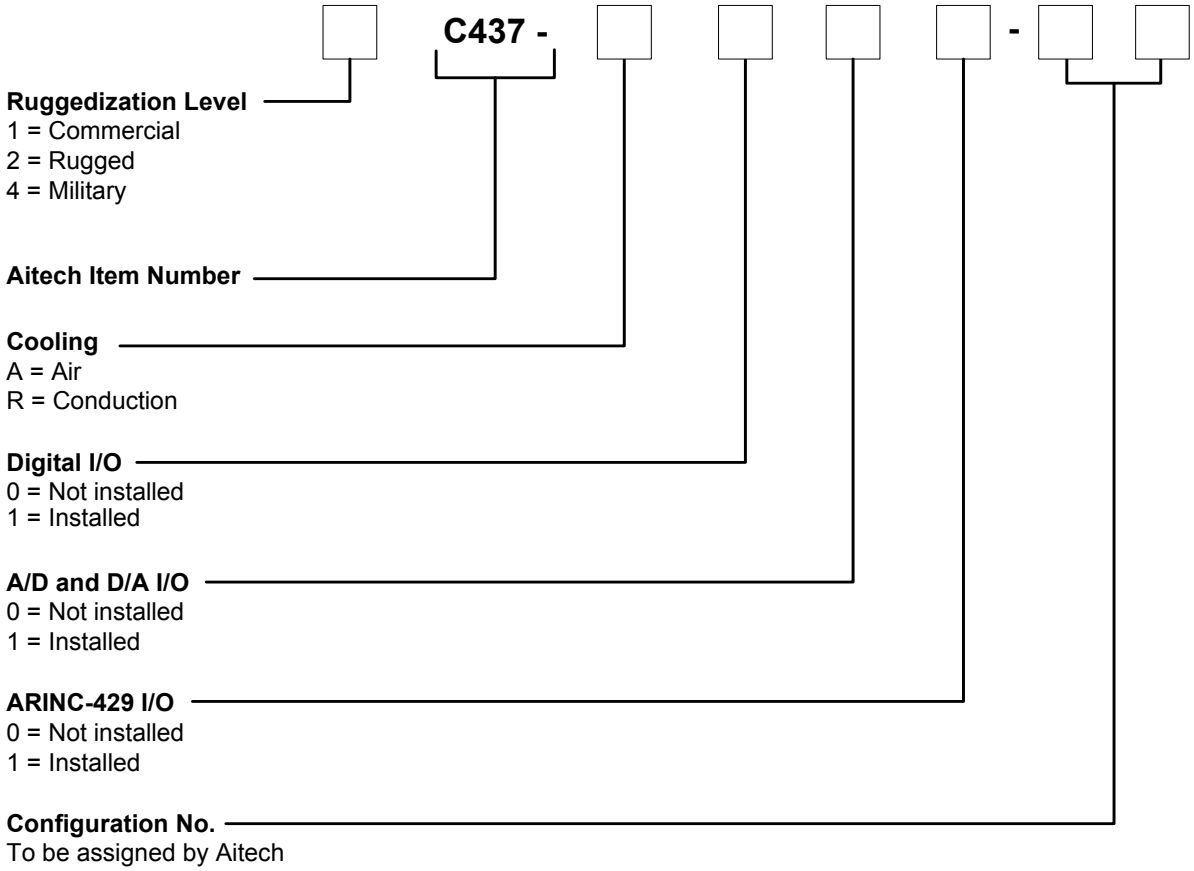
Typical power consumption of the fully featured C437 is 14 W, as follows:

+5.0 V	0.4 A
+3.3 V	0 A
+12 V	0.5 A
–12 V	0.5 A

Environmental Features

Refer to the Aitech Ruggedization datasheet.

Ordering Information for the C437



Example: 2C437-R111-00

For other configurations, please contact your Aitech sales representative.

For more information about the C437 or any Aitech product, please contact Aitech Defense Systems sales department at (888) Aitech-8 (248-3248).

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