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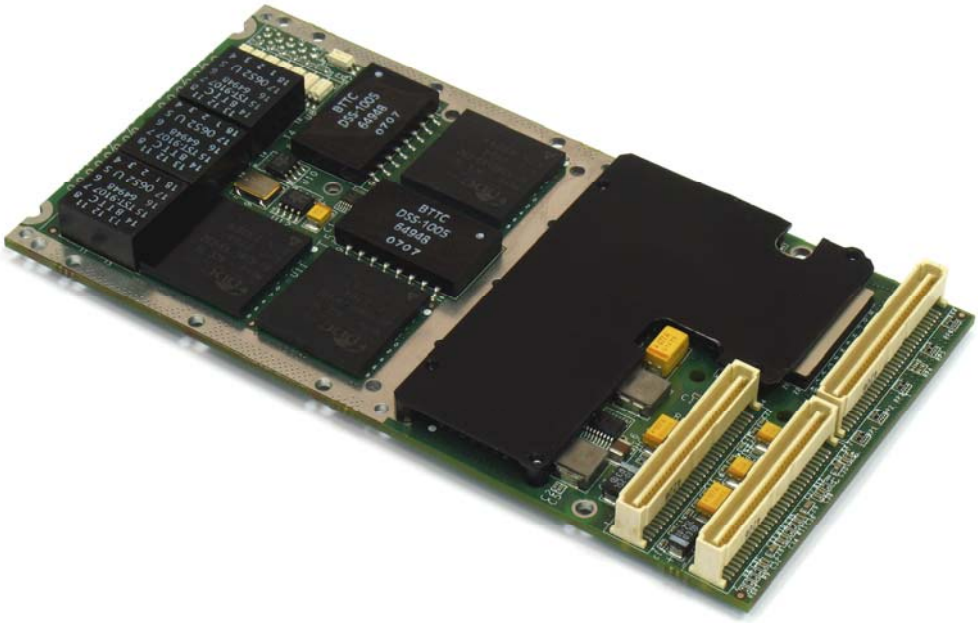
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Find the *Aitech Defense Systems M705* at our website: *Click HERE*

M705

Multi-I/O Communications PMC



- Single-Width PMC
- 5 MIL-STD-1553B Dual Redundant Channels
  - Full Support for BC/RT/MT Operation Modes
  - 64k x 16 Shared DPRAM per Channel
- ARINC-429 Channels
  - 16 ARINC-429 Receive Channels
  - 8 ARINC-429 Transmit Channels
  - High/Low-Speed Support
- 6 Serial Channels
  - Complete UART Operation
  - Support for RS-232/422/485 Physical Interface
  - 3 of the Channels are Configurable for Modem Hardware Flow Control (RS-232 only)
- 8 Opto-Isolated GND/OPEN Discrete Input Channels
- 32-bit @ 66 MHz PCI operation Compliant with PCI 2.2 Specification
- IEEE P1386 (Air-Cooled) or VITA 20-2001 (Conduction-Cooled)
- Front/Rear I/O
- Hardware BIT Capabilities
- Drivers for
  - Windows™
  - Linux®
  - VxWorks®
  - INTEGRITY®
- Military/Space Level Ruggedization
- Vibration and Shock Resistant

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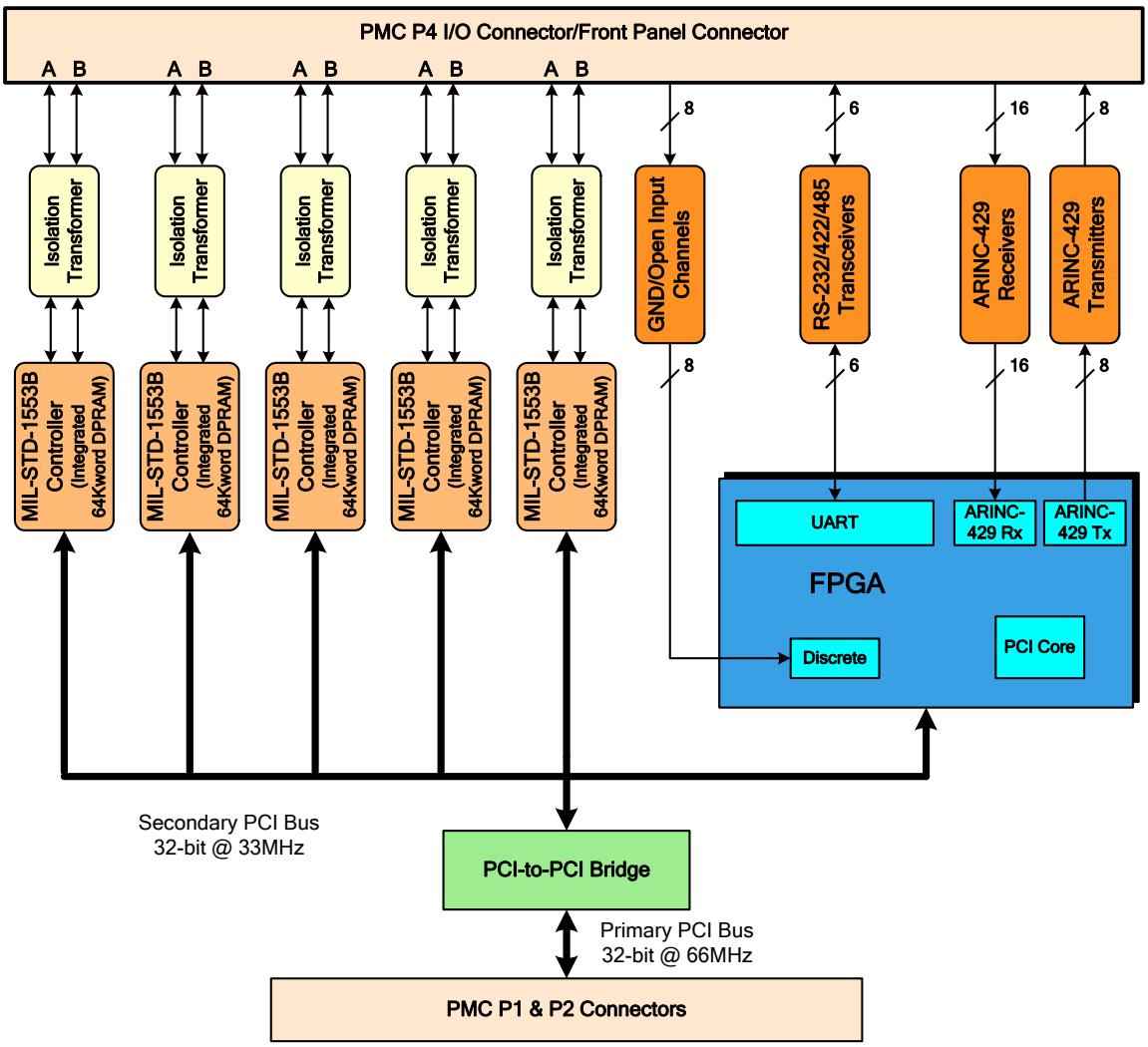
Overview

The M705 Multi-I/O Communications PMC provides multiple avionics style communication protocols (MIL-STD-1553, ARINC-429 and Serial I/O), all packed into a small single-width PMC form factor specifically designed for harsh environments. It offers a complete and unique solution for applications requiring diverse multiple avionics communication ports, eliminating the need for multiple cards and providing high flexibility for system integrators. The M705 integrates 5 dual redundant MIL-STD-1553 channels, 16 ARINC-429 receive channels, 8 ARINC-429 transmit channels, and up to 6 UART ports.

MIL-STD-1553B ports support BC/RT/MT operation modes, Serial ports support RS-422/RS-232/RS-485 physical layer. 3 of the 6 serial ports can be configured to provide modem hardware flow control (flow control signals support RS-232 only).

The M705 also features 8 opto-isolated digital discrete input channels, which may be used to externally assign a unique RT address to one of the MIL-STD-1553B ports.

M705 I/O signals can be routed to either the P4 or front panel connectors, according to the configuration.



M705 Block Diagram

Aitech

Features

Architecture

The M705 is a single-width PMC utilizing multiple diverse I/O interfaces. All its on-board I/O resources are PCI devices, and a PCI-PCI bridge interconnects the M705 sub-system to the host PCI system. The M705 sub-system implements a secondary 32-bit PCI bus operating at 33MHz, while the primary PCI bus operates at 66MHz to maintain high-speed PCI operation of the host PCI system.

MIL-STD-1553B

The M705 provides five independent dual redundant MIL-STD-1553B ports. Each of the controllers feature:

- Complete BC, RT, and MT operation, STANAG 3838 compliant
- Integrated 64K DPRAM with parity protection
- Simultaneous RT/Monitor mode
- Automatic BC frame retries
- Programmable BC gap timing
- Integrated built-in test capability
- Internal FIFOs for PCI burst transfers optimization
- Software programmable RT address

ARINC-429

The M705 PMC provides 16 ARINC-429 receivers and 8 transmitters. All channels fully comply with the AEEC adoptions of the ARINC-429 specification.

ARINC-429 Receivers

- Accept serial data and construct legal words (messages)
- Software control over all operation parameters
- High and low speed operation – 12.5 and 100 kbps
- Programmable time gap and timeout identification between consecutive words
- Programmable filters for incoming data by label/SAL and SDI
- Support for flip label order
- Status and error mechanism – damaged word, parity, partial word, sync loss
- Received data stored in 2 kB FIFO per channel
- Software control over FIFO operation – queue status, threshold level, interrupt generation
- Programmable interrupt with mask options

ARINC-429 Transmitters

- Construct and transmit serial data from received words (messages) transferred by the host processor
- Software control over all operation parameters
- High and low speed operation – 12.5 and 100 kbps
- Programmable time gap and timeout identification between consecutive words
- Support for flip label order
- Software programmable parity data calculation and transmission
- Channel status mechanism
- Transmitted data stored in 2 kB FIFO per channel
- Software control over FIFO operation – queue status, threshold level, interrupt generation
- Programmable interrupt with mask options

Serial I/O

The M705 can be configured to provide up to 6 serial ports, all of which implement the UART protocol:

- All ports support software programmable physical layer – RS-422/RS-232/RS-485
- 3 of the 6 transceivers can be configured to provide full modem flow control – RTS, CTS, DTR, and DSR (flow control signals support RS-232 physical layer only).
- Global interrupt source register for all 6 UART ports
- General purpose 16-bit timer/counter
- Each UART port features:
  - 16C550 compatible register set
  - 16-byte transmit and receive FIFOs
  - Transmits and receives FIFO level counters
  - Programmable Tx and Rx FIFO trigger level
  - Programmable data rate with Prescaler
- PCI data transfer in double-word
- Burst support (target only) for PCI data transfer

Discrete GND/OPEN Input Channels

The M705 includes 8 discrete input channels. These are general-purpose discrete channels, but their primary objective is to externally assign an RT address to one of the MIL-STD-1553B ports. These channels connect to the GPIO signals in one of the M705 PCI agents accessible to software.

- GND/Open logic
- Implemented through opto-isolated couplers
- Channels share a single common external source

PCI Bus Interface

The M705 supports 32-bit PCI bus operation at 66 MHz, and is fully compliant with PCI Rev. 2.2.

The M705 is a universal PMC that supports both +5 V and +3.3 V PCI I/O signaling levels.

I/O Routing

- The conduction-cooled M705 version routes all I/O signals to the PMC P4 I/O connector.
- Air-cooled versions of the M705 may be equipped with one or more front panel connectors, to which the I/O signals are routed.

  Two front panel connector configurations are available:
  - Four mini twinax connectors providing two dual redundant MIL-STD-1553B channels
  - One 68-pin connector providing all I/O
- The M705 is available in several configurations. One of these configurations is largely compatible with the Aitech M703 PMC and can be used as a drop-in replacement for many applications (refer to the M705 User's Guide for further detail). Other configurations provide various combinations of I/O. All standard configurations are described in the ordering information section. Custom configurations not listed may be available to meet specific customer requests and program requirements.

Software Drivers

The M705 PMC is delivered with a complete software package supporting all on-board resources.

Currently supported OS (Operating Systems):

- Microsoft Windows ™
- Linux ®
- WindRiver VxWorks ®
- Green Hills INTEGRITY ®

Mechanical Design and Format

The M705 PMC is a single-width PMC available in two mechanical formats:

- Air-cooled per IEEE 1386-2001 for installation on commercial and rugged air-cooled carrier boards
- Conduction-cooled per ANSI/VITA20-2001 for installation on IEEE 1101.2 conduction-cooled carrier boards

The M705 high power components are cooled through aluminum heatsinks. This applies to both mechanical formats – air-cooled and conduction-cooled.

Dimensions

Air-cooled:	per IEEE 1386-2001
Conduction-cooled:	per ANSI/VITA 20-2001

Power Requirements

Typical total power consumption (highest power configuration): 5.5 W

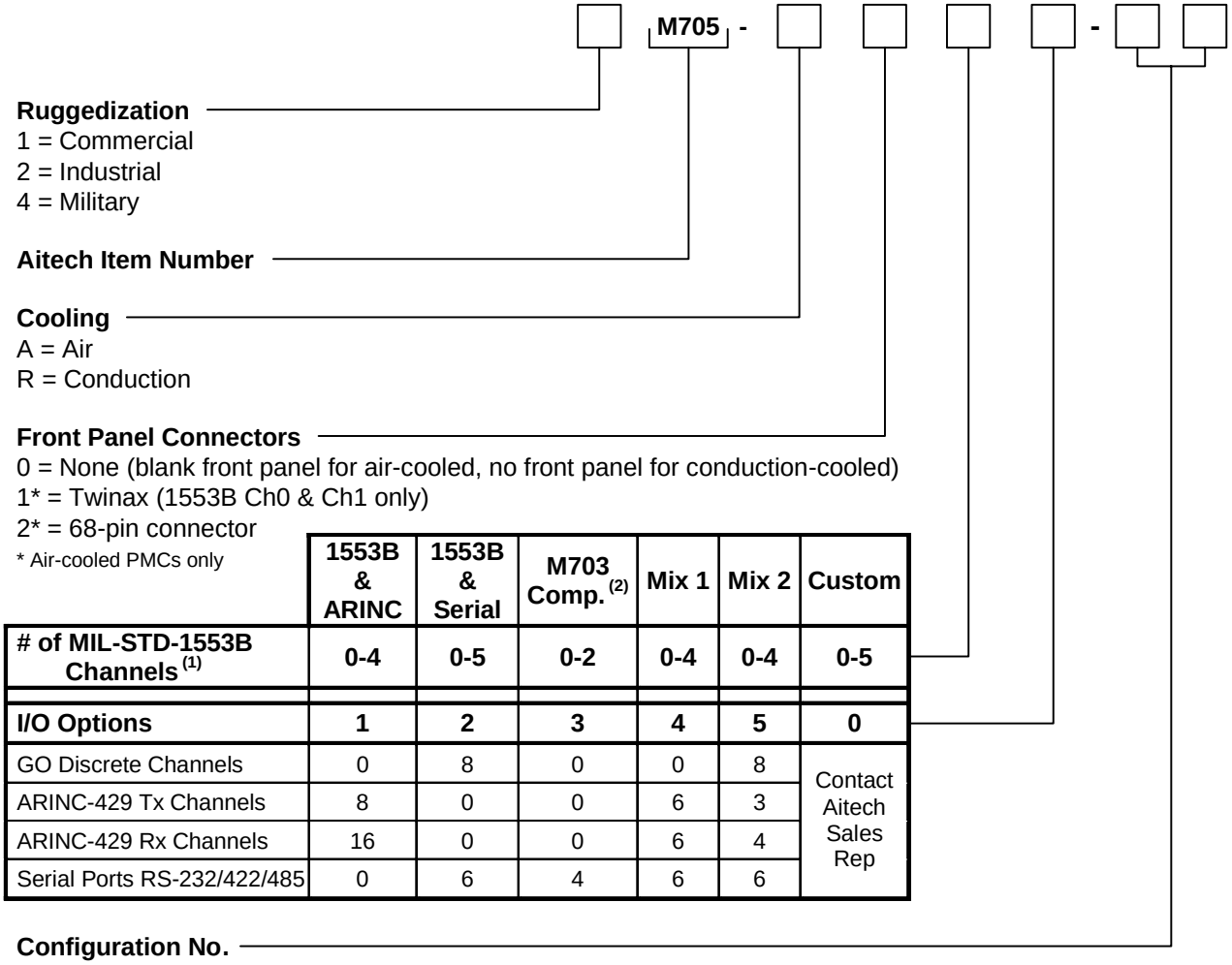
+5 V	0.4 A
+3.3 V	0.6 A
+12 V	0.06 A *
-12 V	0.06 A *

* ±12 V is used for ARINC-429 only. M705 configurations that do not provide ARINC-429 I/O do not require a ±12 V supply.

Environmental Features

Please refer to the Aitech ruggedization datasheet.

Ordering Information for the M705



Ruggedization
1 = Commercial
2 = Industrial
4 = Military

Aitech Item Number

Cooling
A = Air
R = Conduction

Front Panel Connectors
0 = None (blank front panel for air-cooled, no front panel for conduction-cooled)
1* = Twinax (1553B Ch0 & Ch1 only)
2* = 68-pin connector
* Air-cooled PMCs only

	1553B & ARINC	1553B & Serial	M703 Comp. (2)	Mix 1	Mix 2	Custom
# of MIL-STD-1553B Channels (1)	**0-4**	**0-5**	**0-2**	**0-4**	**0-4**	**0-5**
I/O Options	**1**	**2**	**3**	**4**	**5**	**0**
GO Discrete Channels	0	8	0	0	8	Contact Aitech Sales Rep
ARINC-429 Tx Channels	8	0	0	6	3	
ARINC-429 Rx Channels	16	0	0	6	4	
Serial Ports RS-232/422/485	0	6	4	6	6	

Configuration No.
To be assigned by Aitech

Example: 4M705-R041-01

(1) By default, all channels are configured as transformer-coupled. Direct coupling is available as a custom configuration.
(2) This configuration must be selected for M705 backwards compliance with the M703.

For more information about the M705 or any Aitech product, please contact Aitech Defense Systems sales department at (888) Aitech-8 (248-3248).

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