



Hardware Manual

for

PMC-A429



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PMC-A429

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# PMC-A429 Hardware Manual

## Introduction

This manual provides detailed hardware information on the PMC-A429 interface card.

In addition to this information, the reader may also want to reference the following documents provided on the CD and our Web Site

- **AltaCore™** Specifications and User Manual: Detailed, low-level description of the card memory mapped registers and the A429 protocol engine of the card. Most people do not need this detail and will mainly reference the **AltaAPI** manual for their application development.
- **AltaAPI™** User's Manual: Detailed description of the application program interface (API) and device drivers of this software package.
- **AltaView™** User's Manual: AltaView is the latest A429 analyzer on the market and this manual details the usage of the product.
- A429 Tutorial and Reference. This document provides a review of A429 and other various ARINC standards.

## ESD and General Handling of Computer Interface Cards

The Alta warranty requires that the product be handled with proper ESD controls. The JEDEC standard on ESD handling, JESD625-A, is available for free download at [www.jesed.org](http://www.jesed.org). Please follow the standard's guideline for proper ESD handling methods. At a minimum the following guidelines should be followed:



- Avoid carpets in cool, dry areas.
- Leave the card in its anti-static packaging until ready to be installed.
- Dissipate static electricity before handling the card by touching a grounded metal object, such as the metal chassis of the system (the system should be plugged-in, but turned-off).
- Use antistatic devices, such as wrist straps and floor mats.
- Always hold the card by its edges. Avoid touching the components or connectors.
- Be sure to align card edge or assembly cable connector pins before installation. Misaligned connectors can cause damage to the card or system, especially at power-on.
- Take care when connecting or disconnecting cables. When disconnecting a cable, always pull on the cable connector, not on the cable itself.

## PMC-A429 Description

The Alta PMC-A429 card is a standard PMC module designed for commercial and rugged, conduction cooled installations. The main difference between these two configurations is the P4 connector is not installed on standard commercial models, and for conduction cooled models, the front panel is not installed, but the P4 connector is for rear panel I/O access. The customer has various order options for commercial rear-panel (P4), extended temperature (industrial grade) components and conformal coating.

The Alta PMC-A429 card supports multiple ARINC channels and is supported by the latest software technologies and are based on the industry's most advanced 32-bit A429 FPGA protocol engine, **AltaCore™**, and by a feature-rich application programming interface, **AltaAPI™**, which is a multi-layer ANSI C and Windows.NET 2.0 (MSVS 2005 C++, C#, VB .NET) architecture. This hardware and software package provides increased system performance and reduces integration time.

## Card Level Specifications

- Single-Wide PMC card
- 32-Bit PCI 33/66MHz Compatible
  - PCI-SIG PCI 2.1 Compliant
- +3.3V or 5V Universal PCI Signaling
- Up to 30 ARINC Channels – Various RX/TX Shared and Dedicated RX Channels
  - See Your Getting Started Sheet for Model Number
  - Standard ARINC-419/429/575/573/717 Configurations Include:
    - 4 RX/TX Shared Channels
    - 8 RX/TX Shared Channels
    - 16 Channels: 8 RX/TX Shared – 8 RX
    - 24 Channels: 12 RX/TX Shared – 12 RX
    - 30 Channels: 16 RX/TX Shared – 14 RX
    - For Shared Channels, RX Function is Always Available and TX is Software Selectable.
    - Channels are Fixed on Request
- 2 Mbytes of ZBT Memory for ARINC Buffering
- IRIG-B Receiver (DC or AM)
- One RS-485 Discrete
- One LV-TTL Input and Output Trigger
- External Input and Output Clocks (LVTTL or RS-485 Selectable)
- Two Temperature Sensors
- 3.0 Watts Max (30 Channels @ 40% Bus Loading With Two Receiver Load)
- Operating Temperature range: 0-70C Standard
  - -40 to +85C Extended Temp Parts with –E Option (as applicable).
- Relative humidity: 5 to 95% (non-condensing).
- RoHS Compliant

## Power Specifications

Measured values at 25C:

Table 1. Idle Power

| IDLE    |                      |                        |             |
|---------|----------------------|------------------------|-------------|
| Channel | Voltage              | Amps                   | Total Power |
| N/A     | 3.3V<br>+12V<br>-12V | 323mA<br>80mA<br>-60mA | 2.74W       |

Table 2. 40% Bus Loading Power

| 40% Bus Loading With Two Receiver Load |                      |                        |       |
|----------------------------------------|----------------------|------------------------|-------|
| Channel                                | Voltage              | Amps                   | Power |
| 2 Tx to 4 Rx                           | 3.3V<br>+12V<br>-12V | 328mA<br>80mA<br>-60mA | 2.76W |
| 4 Tx to 8 Rx                           | 3.3V<br>+12V<br>-12V | 330mA<br>80mA<br>-60mA | 2.77W |
| 8 Tx to 16 Rx                          | 3.3V<br>+12V<br>-12V | 338mA<br>80mA<br>-60mA | 2.79W |
| 16 Tx to 30 Rx                         | 3.3V<br>+12V<br>-12V | 353mA<br>80mA<br>-60mA | 2.84W |



## MTBF

The MTBF numbers shown below are highly conservative calculations and should be considered absolute worst case for the environment they are calculated for. Please contact your Local Sales Representative or Alta Technical Support for additional information regarding any concerns or questions that may arise regarding MTBF for the this board.

Environment: Ground Benign, 25C

Table 3. MTBF Front IO Option

| Configuration                        | MTBF         |
|--------------------------------------|--------------|
| 4 RX/TX Shared Channels              | 284,723 hrs  |
| 8 RX/TX Shared Channels              | 261,463 hrs  |
| 16 Channels: 8 RX/TX Shared – 8 RX   | 252, 865 hrs |
| 30 Channels: 16 RX/TX Shared – 14 RX | 206,627hrs   |

Environment: Ground Benign, 25C

Table 4. MTBF Rear IO Option

| Configuration                        | MTBF        |
|--------------------------------------|-------------|
| 4 RX/TX Shared Channels              | 293,912 hrs |
| 8 RX/TX Shared Channels              | 269,193 hrs |
| 16 Channels: 8 RX/TX Shared – 8 RX   | 260,087 hrs |
| 28 Channels: 16 RX/TX Shared – 12 RX | 211,424 hrs |

## PMC-A429 Photograph

The following picture shows the front side of the PMC-A429 card.

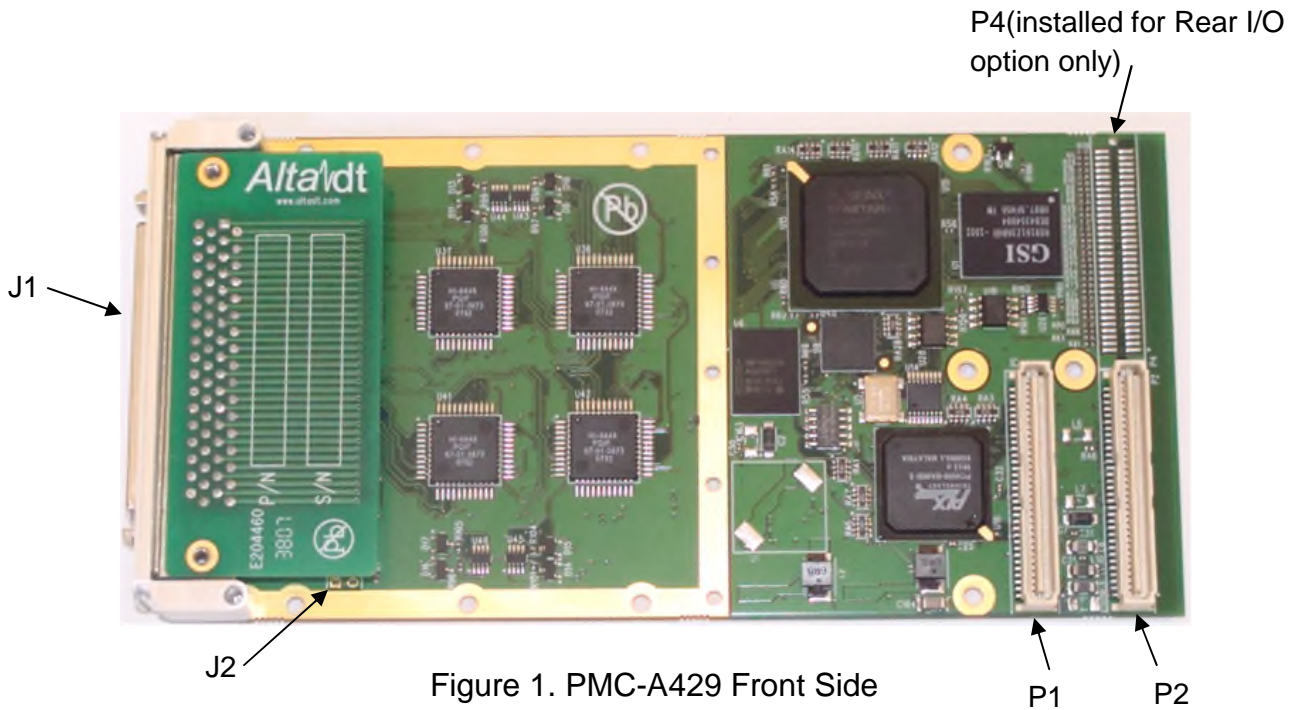


Figure 1. PMC-A429 Front Side

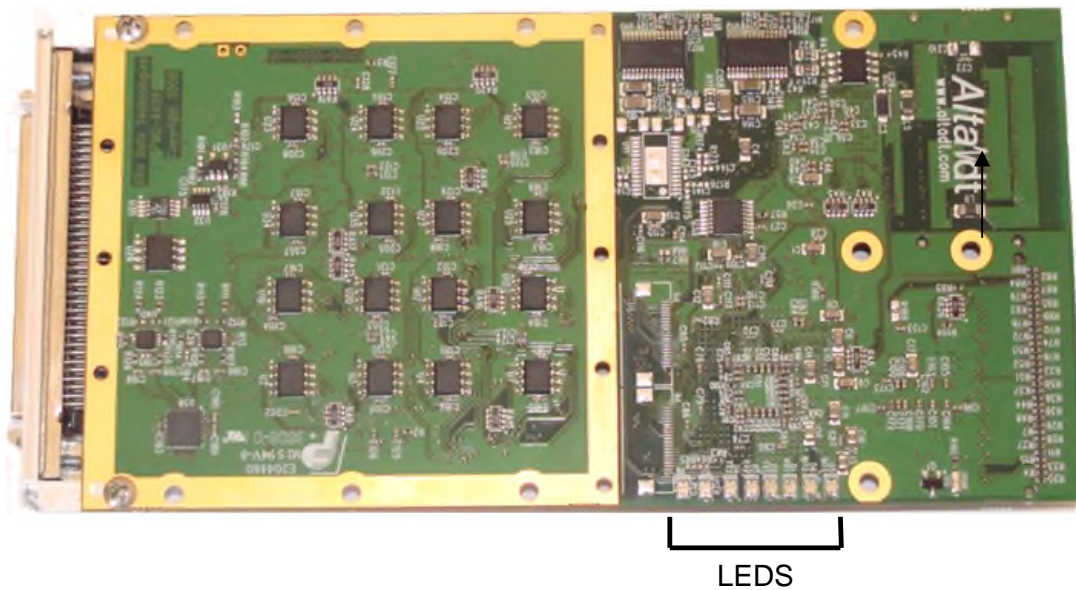


Figure 2. PMC-A429 Back Side

## LED Descriptions

Table 5. LED Descriptions

| LED | Name                   | Description                                                        |
|-----|------------------------|--------------------------------------------------------------------|
| D1  | Bank 1 RX Bus Activity | Green=No Errors, Red=Errors Detected                               |
| D2  | Bank 1 TX Bus Activity | Green=No Errors, Red=Errors Detected                               |
| D3  | Bank 2 RX Bus Activity | Green=No Errors, Red=Errors Detected                               |
| D4  | Bank 2 TX Bus Activity | Green=No Errors, Red=Errors Detected                               |
| D5  | Bank 1 BIT Status      | Green=No Errors, Red=Errors Detected                               |
| D6  | Bank 2 BIT Status      | Green=No Errors, Red=Errors Detected                               |
| D7  | User LED               | Set to Green or Red by the User                                    |
| D9  | Board Status           | Green=No Error, Red=FPGA Load Error<br>Amber= Power Supply Failure |
| D12 | FPGA Loaded            | Green=FPGA Loaded, Off=FPGA Not Loaded                             |

## Jumpers

Table 6. Jumpers

| Jumper | Description                                                                                                                                                                                         |
|--------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| J2     | Install to put board in auto-test mode. Before installing this jumper and applying power, special test connectors (supplied by request by Alta) must be placed on all populated IO connectors (J1). |

## Connectors

### SCSI Connector Pin-outs

Table 7. J1- 68-pin SCSI Connector

| J1 Pin# | Signal      | J1 Pin# | Signal       |
|---------|-------------|---------|--------------|
| 1       | RX1+/TX1+   | 35      | RX1-/TX1-    |
| 2       | RX2+/TX2+   | 36      | RX2-/TX2-    |
| 3       | RX3+/TX3+   | 37      | RX3-/TX3-    |
| 4       | RX4+/TX4+   | 38      | RX4-/TX4-    |
| 5       | RX5+/TX5+   | 39      | RX5-/TX5-    |
| 6       | RX6+/TX6+   | 40      | RX6-/TX6-    |
| 7       | RX7+/TX7+   | 41      | RX7-/TX7-    |
| 8       | RX8+/TX8+   | 42      | RX8-/TX8-    |
| 9       | RX9+        | 43      | RX9-         |
| 10      | RX10+       | 44      | RX10-        |
| 11      | RX11+       | 45      | RX11-        |
| 12      | RX12+       | 46      | RX12-        |
| 13      | RX13+       | 47      | RX13-        |
| 14      | RX14+       | 48      | RX14-        |
| 15      | RX15+       | 49      | RX15-        |
| 16      | RX16+       | 50      | RX16-        |
| 17      | RX17+/TX17+ | 51      | RX17-/TX17-  |
| 18      | RX18+/TX18+ | 52      | RX18-/TX18-  |
| 19      | RX19+/TX19+ | 53      | RX19-/TX19-  |
| 20      | RX20+/TX20+ | 54      | RX20-/TX20-  |
| 21      | RX21+/TX21+ | 55      | RX21-/TX21-  |
| 22      | RX22+/TX22+ | 56      | RX22-/TX22-  |
| 23      | RX23+/TX23+ | 57      | RX23-/TX23-  |
| 24      | RX24+/TX24+ | 58      | RX24-/TX24-  |
| 25      | RX25+       | 59      | RX25-        |
| 26      | RX26+       | 60      | RX26-        |
| 27      | RX27+       | 61      | RX27-        |
| 28      | RX28+       | 62      | RX28-        |
| 29      | RX29+       | 63      | RX29-        |
| 30      | RX30+       | 64      | RX30-        |
| 31      | AV Trig In1 | 65      | AV Trig Out1 |
| 32      | RS-485 - 1+ | 66      | RS-485 - 1 - |
| 33      | IRIG In     | 67      | IRIG GND     |
| 34      | TTL I/O     | 68      | GND          |

## P4 Connector Pin-outs

Table 8. P4-Rear Panel Connector Pin-Outs (Rear Panel Models Only)

| Pin# | Signal      | Pin# | Signal       |
|------|-------------|------|--------------|
| 1    | TTL I/O     | 2    | GND          |
| 3    | IRIG In     | 4    | IRIG GND     |
| 5    | RS-485+     | 6    | RS-485-      |
| 7    | AV Trig In1 | 8    | AV Trig Out1 |
| 9    | RX28+       | 10   | RX28-        |
| 11   | RX27+       | 12   | RX27-        |
| 13   | RX26+       | 14   | RX26-        |
| 15   | RX25+       | 16   | RX25-        |
| 17   | RX24+/TX24+ | 18   | RX24-/TX24-  |
| 19   | RX23+/TX23+ | 20   | RX23-/TX23-  |
| 21   | RX22+/TX22+ | 22   | RX22-/TX22-  |
| 23   | RX21+/TX21+ | 24   | RX21-/TX21-  |
| 25   | RX20+/TX20+ | 26   | RX20-/TX20-  |
| 27   | RX19+/TX19+ | 28   | RX19-/TX19-  |
| 29   | RX18+/TX18+ | 30   | RX18-/TX18-  |
| 31   | RX17+/TX17+ | 32   | RX17-/TX17-  |
| 33   | RX16+       | 34   | RX16-        |
| 35   | RX15+       | 36   | RX15-        |
| 37   | RX14+       | 38   | RX14-        |
| 39   | RX13+       | 40   | RX13-        |
| 41   | RX12+       | 42   | RX12-        |
| 43   | RX11+       | 44   | RX11-        |
| 45   | RX10+       | 46   | RX10-        |
| 47   | RX9+        | 48   | RX9-         |
| 49   | RX8+/TX8+   | 50   | RX8-/TX8-    |
| 51   | RX7+/TX7+   | 52   | RX7-/TX7-    |
| 53   | RX6+/TX6+   | 54   | RX6-/TX6-    |
| 55   | RX5+/TX5+   | 56   | RX5-/TX5-    |
| 57   | RX4+/TX4+   | 58   | RX4-/TX4-    |
| 59   | RX3+/TX3+   | 60   | RX3-/TX3-    |
| 61   | RX2+/TX2+   | 62   | RX2-/TX2-    |
| 63   | RX1+/TX1+   | 64   | RX1-/TX1-    |

# Arinc-717 Operation

## TX Operation

When a channel is set to transmit in Harvard Bi-Phase mode, this forces a TX channel pair (channels 1&2 and 3&4 pairs of each bank) to differentially drive the 0-5V leg of the ARINC-429 drivers. The odd channel is the positive differential signal and the even channel is the negative differential signal used to create the Harvard Bi-Phase 717 encoding. This setting is provided for older ARINC-717 DFDRS systems. This setting ONLY applies to the first four TX channels of each bank. See the ARINC (RX & TX) Protocol Engine Specifications-Users Manual more for information on setting the channel to operate in Harvard bi-phase mode.

Table 9. Bank 1 TX Connections for ARINC-717 operation (Front IO)

| J1 Pin# | Signal    | J1 Pin# | Signal |
|---------|-----------|---------|--------|
| 1       | A717 TX1+ | 35      | N/C    |
| 2       | A717 TX1- | 36      | N/C    |
| 3       | A717 TX2+ | 37      | N/C    |
| 4       | A717 TX2- | 38      | N/C    |

Table 10. Bank 2 TX Connections for ARINC-717 operation (Front IO)

| J1 Pin# | Signal    | J1 Pin# | Signal |
|---------|-----------|---------|--------|
| 17      | A717 TX3+ | 51      | N/C    |
| 18      | A717 TX3- | 52      | N/C    |
| 19      | A717 TX4+ | 53      | N/C    |
| 20      | A717 TX4- | 54      | N/C    |

Table 11. Bank 1 TX Connections for ARINC-717 operation (P4 IO)

| J1 Pin# | Signal    | J1 Pin# | Signal |
|---------|-----------|---------|--------|
| 63      | A717 TX1+ | 64      | N/C    |
| 61      | A717 TX1- | 62      | N/C    |
| 59      | A717 TX2+ | 60      | N/C    |
| 57      | A717 TX2- | 58      | N/C    |

Table 12. Bank 2 TX Connections for ARINC-717 operation (P4 IO)

| J1 Pin# | Signal    | J1 Pin# | Signal |
|---------|-----------|---------|--------|
| 31      | A717 TX3+ | 32      | N/C    |
| 29      | A717 TX3- | 30      | N/C    |
| 27      | A717 TX4+ | 28      | N/C    |
| 25      | A717 TX4- | 26      | N/C    |

## RX Operation

When a channel is set to receive in Harvard Bi-Phase mode, the same connector inputs are used as when operating in standard ARINC-A429 mode. This ONLY applies to the first two RX channels of each bank. See the ARINC (RX & TX) Protocol Engine Specifications-Users Manual more for information on setting the channel to operate in Harvard bi-phase mode.

Table 13. Bank 1 RX Connections for ARINC-717 operation (Front IO)

| J1<br>Pin# | Signal    | J1<br>Pin# | Signal    |
|------------|-----------|------------|-----------|
| 1          | A717 RX1+ | 35         | A717 RX1- |
| 2          | A717 RX2+ | 36         | A717 RX2- |

Table 14. Bank 2 RX Connections for ARINC-717 operation (Front IO)

| J4<br>Pin# | Signal    | J4<br>Pin# | Signal    |
|------------|-----------|------------|-----------|
| 17         | A717 RX3+ | 51         | A717 RX3- |
| 18         | A717 RX4+ | 52         | A717 RX4- |

Table 15. Bank 1 RX Connections for ARINC-717 operation (P4 IO)

| J1<br>Pin# | Signal    | J1<br>Pin# | Signal    |
|------------|-----------|------------|-----------|
| 63         | A717 RX1+ | 64         | A717 RX1- |
| 61         | A717 RX2+ | 62         | A717 RX2- |

Table 16. Bank 2 RX Connections for ARINC-717 operation (P4 IO)

| J4<br>Pin# | Signal    | J4<br>Pin# | Signal    |
|------------|-----------|------------|-----------|
| 31         | A717 RX3+ | 32         | A717 RX3- |
| 29         | A717 RX4+ | 30         | A717 RX4- |

## Software Device vs. Physical Channel

The Alta PMC-A429 can contain one or more **devices**. A **device** is 30 channels (RX/TX configuration will vary). Another term for device is **bank**. **Device = Bank** (This is group of ARINC 30 or less channels). The following table serves as a cross reference between software designation of bank/channel and the cards physical channel.

Table 17. Software vs. Physical Channel

| Software Device    | Physical Channel |
|--------------------|------------------|
| Bank 1, Channel 1  | RX1+/TX1         |
| Bank 1, Channel 2  | RX2+/TX2         |
| Bank 1, Channel 3  | RX3+/TX3         |
| Bank 1, Channel 4  | RX4+/TX4         |
| Bank 1, Channel 5  | RX5+/TX5         |
| Bank 1, Channel 6  | RX6+/TX6         |
| Bank 1, Channel 7  | RX7+/TX7         |
| Bank 1, Channel 8  | RX8+/TX8         |
| Bank 1, Channel 9  | RX9              |
| Bank 1, Channel 10 | RX10             |
| Bank 1, Channel 11 | RX11             |
| Bank 1, Channel 12 | RX12             |
| Bank 1, Channel 13 | RX13             |
| Bank 1, Channel 14 | RX14             |
| Bank 1, Channel 15 | RX15             |
| Bank 1, Channel 16 | RX16             |
| Bank 2, Channel 1  | RX17+/TX17       |
| Bank 2, Channel 2  | RX18+/TX18       |
| Bank 2, Channel 3  | RX19+/TX19       |
| Bank 2, Channel 4  | RX20+/TX20       |
| Bank 2, Channel 5  | RX21+/TX21       |
| Bank 2, Channel 6  | RX22+/TX22       |
| Bank 2, Channel 7  | RX23+/TX23       |
| Bank 2, Channel 8  | RX24+/TX24       |
| Bank 2, Channel 9  | RX25             |
| Bank 2, Channel 10 | RX26             |
| Bank 2, Channel 11 | RX27             |
| Bank 2, Channel 12 | RX28             |
| Bank 2, Channel 13 | RX29             |
| Bank 2, Channel 14 | RX30             |



## PCI Device Information

PCI Device ID: 0x0110  
PCI Vendor ID: 0xAD00

The PMC-A429 product uses the PLX PCI9056<sup>®</sup> device for its PCI interface. The table below explains the memory regions that should be mapped by the host.

Table 18. Host Mapping

| Base Address Reg | Type   | Size (Bytes) | Description                                                                         |
|------------------|--------|--------------|-------------------------------------------------------------------------------------|
| BAR 0            | Memory | 512          | Local Configuration Registers (Mapped)                                              |
| BAR 1            | I/O    | 256          | This region is enabled, but should not be mapped by host applications. (Not Mapped) |
| BAR 2            | Memory | 4 Meg        | User Memory Space (Mapped)                                                          |
| BAR 3-5          | N/A    |              | Not Used                                                                            |

## Host Memory Map

The figure below shows the basic memory map configuration for a 4 channel PMC-A429 interface with one megabyte of RAM per channel. Special configurations may vary.

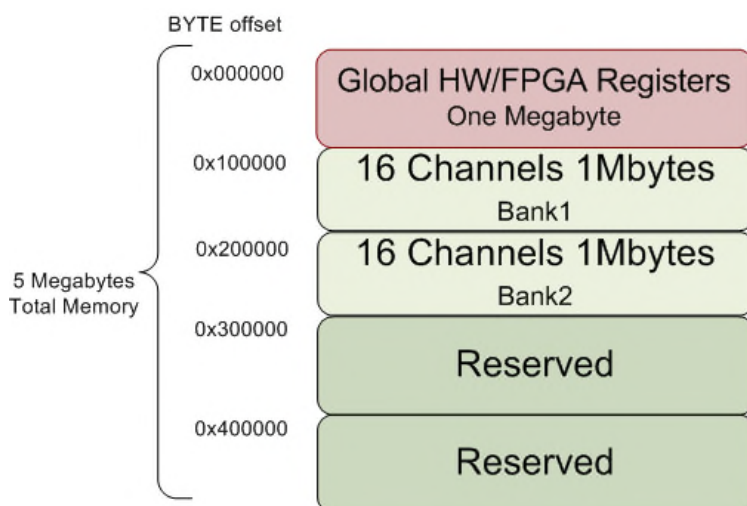


Figure 3. Card Basic Memory Map

## Global Registers

The first Megabyte of the PMC-A429 memory map contains backplane and global card level settings and status values that affect processing for all channels. Details on Global Registers may be found in the Alta Core-ARINC Spec User's manual.

### Manual Revision Information

| Date     | Rev | Description                                                                                 |
|----------|-----|---------------------------------------------------------------------------------------------|
| 9/09/08  | A   | Initial Release                                                                             |
| 02/22/09 | B   | Minor clean-up of A-717 description                                                         |
| 3/8/09   | C   | 717 Typo changes – Added Appendix A for Cable Assembly.                                     |
| 7/18/09  | C1  | Address Change – No Technical Data Changed                                                  |
| 4/05/10  | C2  | Changed NAICS#                                                                              |
| 4/20/10  | C3  | Added Bookmark to PDF                                                                       |
| 7/26/10  | C4  | Updated Power Information                                                                   |
| 2/14/11  | C5  | Removed Global Figure's                                                                     |
| 3/7/12   | C6  | Added SCSI-3 Cable Wire Color Code: 1011                                                    |
| 3/29/11  | D0  | Removed SCSI connector photo. Wrong photo for this document.                                |
| 12/13/13 | D1  | Measured and updated power numbers for the board                                            |
| 2/18/15  | D2  | Added Software vs. Physical Channel table<br>Updated connector information and NAICS number |

## Appendix A – Cable Assembly Information

### SCSI 3 & Cable Assembly (Color Codes) Information

(See Main Section of Hardware Manual for 717 Pin-Out Information)

**Information Applies for the following ARINC Card Models:**  
**PCI-A429, PCIC-A429, PMC-A429, CPCIC3U/6U-A429,**  
**PCIE4L-A429 and PCIEC-A429**

#### Cable Reorder Part Number and Description:

- Part Number: **SCSI-A429-3-01** or **SCSI-A429-3-01-T (Thumb Screw)**
- Description: SCSI 3, 68-pin Connector to Exposed (Flying) Leads with 3 feet (36 inches) Total Cable Length

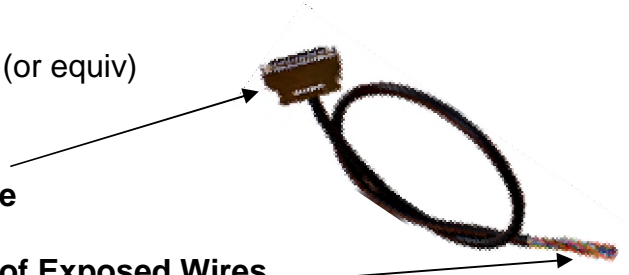
#### SCSI 3 Front Panel Connector Information:

- Clip Style
  - SCSI CON: AMP #1-5750913-7 (or equiv)
  - Backshell: Amp #5749195-2 (or equiv)
- Thumb Screw (-T)

CON and Backshell: Norcomp 989-068-130L121 (or equiv)

#### Cable Assembly Markings & Information:

- Shrink-wrap from SCSI to 1553/Aux Cable
  - **P1 – Alta Part No: SCSI-A429-3-01**
- Note on Flying Leads: Provide 3 inches of Exposed Wires



Cable is EU and China RoHS Compliant.

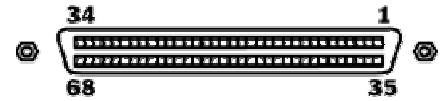


## SCSI 3 Pin Outs and Wire Color Codes on Following Pages

(See Main Section of Hardware Manual for 717 Pin-Out Information)

ARINC SCSI 3 Connector (P1) Pin Outs & Connector Orientation  
(See Main Section of Hardware Manual for 717 Pin-Out Information)

| SCSI Pin# | Signal      | SCSI Pin# | Signal       |
|-----------|-------------|-----------|--------------|
| 1         | RX1+/TX1+   | 35        | RX1-/TX1-    |
| 2         | RX2+/TX2+   | 36        | RX2-/TX2-    |
| 3         | RX3+/TX3+   | 37        | RX3-/TX3-    |
| 4         | RX4+/TX4+   | 38        | RX4-/TX4-    |
| 5         | RX5+/TX5+   | 39        | RX5-/TX5-    |
| 6         | RX6+/TX6+   | 40        | RX6-/TX6-    |
| 7         | RX7+/TX7+   | 41        | RX7-/TX7-    |
| 8         | RX8+/TX8+   | 42        | RX8-/TX8-    |
| 9         | RX9+        | 43        | RX9-         |
| 10        | RX10+       | 44        | RX10-        |
| 11        | RX11+       | 45        | RX11-        |
| 12        | RX12+       | 46        | RX12-        |
| 13        | RX13+       | 47        | RX13-        |
| 14        | RX14+       | 48        | RX14-        |
| 15        | RX15+       | 49        | RX15-        |
| 16        | RX16+       | 50        | RX16-        |
| 17        | RX17+/TX17+ | 51        | RX17-/TX17-  |
| 18        | RX18+/TX18+ | 52        | RX18-/TX18-  |
| 19        | RX19+/TX19+ | 53        | RX19-/TX19-  |
| 20        | RX20+/TX20+ | 54        | RX20-/TX20-  |
| 21        | RX21+/TX21+ | 55        | RX21-/TX21-  |
| 22        | RX22+/TX22+ | 56        | RX22-/TX22-  |
| 23        | RX23+/TX23+ | 57        | RX23-/TX23-  |
| 24        | RX24+/TX24+ | 58        | RX24-/TX24-  |
| 25        | RX25+       | 59        | RX25-        |
| 26        | RX26+       | 60        | RX26-        |
| 27        | RX27+       | 61        | RX27-        |
| 28        | RX28+       | 62        | RX28-        |
| 29        | RX29+       | 63        | RX29-        |
| 30        | RX30+       | 64        | RX30-        |
| 31        | AV Trig In1 | 65        | AV Trig Out1 |
| 32        | RS-485+     | 66        | RS-485-      |
| 33        | IRIG In     | 67        | IRIG GND     |
| 34        | TTL I/O     | 68        | GND          |





SCSI-3 Cable Wire Color Code: **0908** (match to cable label)

SCSI Cable Connector Pin Outs (HPDB) to Wire Color Code

| Pin |                      | Pin |                     |
|-----|----------------------|-----|---------------------|
| 1   | Black                | 35  | Black / White       |
| 2   | Brown                | 36  | Brown / White       |
| 3   | Red                  | 37  | Red / Black         |
| 4   | Orange               | 38  | Orange / Black      |
| 5   | Yellow               | 39  | Yellow / Black      |
| 6   | Green                | 40  | Green / Black       |
| 7   | Blue                 | 41  | Blue / White        |
| 8   | Purple               | 42  | Purple / White      |
| 9   | Gray                 | 43  | Gray / Black        |
| 10  | White                | 44  | White / Black       |
| 11  | Pink                 | 45  | Pink / Black        |
| 12  | Light Green          | 46  | Light Green / Black |
| 13  | Light Blue           | 47  | Light Blue / Black  |
| 14  | Blue / Red           | 48  | Purple / Red        |
| 15  | Purple / Green       | 49  | Purple / Blue       |
| 16  | GRAY / RED           | 50  | Gray / Blue         |
| 17  | Gray / Yellow        | 51  | Gray / Green        |
| 18  | White / Red          | 52  | White / Blue        |
| 19  | White / yellow       | 53  | White / Green       |
| 20  | Pink / Red           | 54  | Pink / Blue         |
| 21  | Pink / Yellow        | 55  | Pink / white        |
| 22  | Light Green / Red    | 56  | Green / Green       |
| 23  | Light Blue / yellow  | 57  | Light Blue / Green  |
| 24  | Light Blue / Red     | 58  | Light Blue / Blue   |
| 25  | Light Green / Yellow | 59  | Light Green / Green |
| 26  | Red / White          | 60  | Red / Blue          |
| 27  | Orange / Red         | 61  | Orange / Green      |
| 28  | Yellow / Red         | 62  | Yellow / Green      |
| 29  | Yellow / White       | 63  | Yellow / Black      |
| 30  | Yellow               | 64  | Yellow / Red        |
| 31  | Yellow / Green       | 65  | Yellow / Blue       |
| 32  | Green / White        | 66  | Light Blue / Blue   |
| 33  | Orange / White       | 67  | Gray / white        |
| 34  | Light Pink           | 68  | Light Pink / Red    |

## SCSI-3 Cable Wire Color Code: 1007 (match to cable label)

### SCSI Cable Connector Pin Outs (HPDB) to Wire Color Code

| Pin |                      | Pin |                      |
|-----|----------------------|-----|----------------------|
| 1   | Black                | 35  | Black / White        |
| 2   | Brown                | 36  | Brown / White        |
| 3   | Red                  | 37  | Red / Black          |
| 4   | Orange               | 38  | Orange / Black       |
| 5   | Dark Yellow          | 39  | Dark Yellow / Black  |
| 6   | Dark Green           | 40  | Dark Green / Black   |
| 7   | Dark Blue            | 41  | Dark Blue / White    |
| 8   | Purple               | 42  | Purple / White       |
| 9   | Dark Gray            | 43  | Gray / Black         |
| 10  | White                | 44  | White / Black        |
| 11  | Pink                 | 45  | Pink / Black         |
| 12  | Light Green          | 46  | Light Green / Black  |
| 13  | Light Blue           | 47  | Light Blue / Black   |
| 14  | Dark Blue / Red      | 48  | Purple / Red         |
| 15  | Purple / Green       | 49  | Purple / Blue        |
| 16  | Gray / Red           | 50  | Gray / Blue          |
| 17  | Gray / Yellow        | 51  | Gray / Green         |
| 18  | White / Brown        | 52  | White / Orange       |
| 19  | White / Red          | 53  | White / Blue         |
| 20  | White / yellow       | 54  | White / Green        |
| 21  | Pink / Red           | 55  | Pink / Blue          |
| 22  | Pink / Yellow        | 56  | Pink / Green         |
| 23  | Light Green / Red    | 57  | Light Green / Blue   |
| 24  | Light Green / Yellow | 58  | Light Green / Green  |
| 25  | Light Blue / red     | 59  | Light Blue / Green   |
| 26  | Light Blue / Yellow  | 60  | Light Blue / Blue    |
| 27  | Red / Pink           | 61  | Dark Green / White   |
| 28  | Orange / Red         | 62  | Yellow / Red         |
| 29  | Orange / Green       | 63  | Dark Yellow / Green  |
| 30  | Yellow / White       | 64  | Yellow / Black       |
| 31  | Light Yellow         | 65  | Light Yellow / Green |
| 32  | Yellow / Red         | 66  | Yellow / Blue        |
| 33  | Dark Green / Blue    | 67  | Dark Green / Pink    |
| 34  | Orange / White       | 68  | Gray / white         |

## SCSI-3 Cable Wire Color Code: 1011 (match to cable label)

### SCSI Cable Connector Pin Outs (HPDB68) to Wire Color Code

| Pin |                      | Pin |                         |
|-----|----------------------|-----|-------------------------|
| 1   | White / Red          | 35  | White / Black           |
| 2   | White / Green        | 36  | White / Blue            |
| 3   | White / Gray         | 37  | White / Pink            |
| 4   | White / Violet       | 38  | White / Brown           |
| 5   | White                | 39  | Red                     |
| 6   | Sky Blue / Red       | 40  | Sky Blue / Black        |
| 7   | Sky Blue / Green     | 41  | Sky Blue / Blue         |
| 8   | Sky Blue / Gray      | 42  | Colorless / Sky Blue    |
| 9   | Sky Blue / Violet    | 43  | Sky Blue / Brown        |
| 10  | Sky Blue             | 44  | Black                   |
| 11  | Yellow / Red         | 45  | Yellow / Black          |
| 12  | Yellow / Green       | 46  | Colorless               |
| 13  | Yellow / White       | 47  | Colorless / Yellow      |
| 14  | Yellow / Violet      | 48  | Yellow / Brown          |
| 15  | Yellow               | 49  | Green                   |
| 16  | Light Green / Red    | 50  | Light Green / Black     |
| 17  | Colorless / Brown    | 51  | Light Green / Blue      |
| 18  | Light Green / Gray   | 52  | Colorless / Light Green |
| 19  | Light Green / Violet | 53  | Light Green / Brown     |
| 20  | Light Green          | 54  | Blue                    |
| 21  | Pink / Red           | 55  | Pink / Black            |
| 22  | Pink / Green         | 56  | Pink / Blue             |
| 23  | Pink / Gray          | 57  | Colorless / Pink        |
| 24  | Pink / Violet        | 58  | Pink / Brown            |
| 25  | Pink                 | 59  | Gray                    |
| 26  | Gray / Red           | 60  | Gray / Black            |
| 27  | Colorless / Gray     | 61  | Gray / Blue             |
| 28  | Gray / Violet        | 62  | Gray / Brown            |
| 29  | Orange               | 63  | Brown                   |
| 30  | Red / Black          | 64  | Red / Blue              |
| 31  | Red / Brown          | 65  | Violet                  |
| 32  | Red / Violet         | 66  | Colorless / Red         |
| 33  | Blue / Violet        | 67  | Colorless / Blue        |
| 34  | Blue / Brown         | 68  | Blue / Green            |