Hardware Manual
for
PMC-A429

Part Number: 15501-00000-D7
Cage Code: 4RK27 • NAICS: 334210 • UEID: LNNKMC7W4VM5

Alta Data Technologies LLC
4901 Rockaway Blvd, Building A
Rio Rancho, NM 87124 USA
(tel) 505-994-3111 • www.altadt.com

CUSTOMER NOTES:

Revision Control History

Rev D7 Release Date: 16 March 2023

Note to the Reader and End-User:

Contact:

We welcome comments and suggestions. Please contact us at 888-429-1553 (toll free in US) or 505-994-3111 or visit our web site for support submit forms at www.altadt.com.

PMC-A429

Table of Contents

~~~
~~~

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, is available for free download at www.jedec.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 (MSVS 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
            - Rear Panel Only 12 RX
        - For Shared Channels, RX Function is Always Available and TX is Software Selectable.
        - Channels are Fixed on Request
        - Note: Shared RX/TX channels could have severe RX voltage drain when not powered. Use dedicated RX only channels for embedded or critical systems. (See A429 Shared Channels Section for more detail).
- 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 +12V -12V	323mA 80mA -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 +12V -12V	328mA 80mA -60mA	2.76W
4 Tx to 8 Rx	3.3V +12V -12V	330mA 80mA -60mA	2.77W
8 Tx to 16 Rx	3.3V +12V -12V	338mA 80mA -60mA	2.79W
16 Tx to 30 Rx	3.3V +12V -12V	353mA 80mA -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 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.

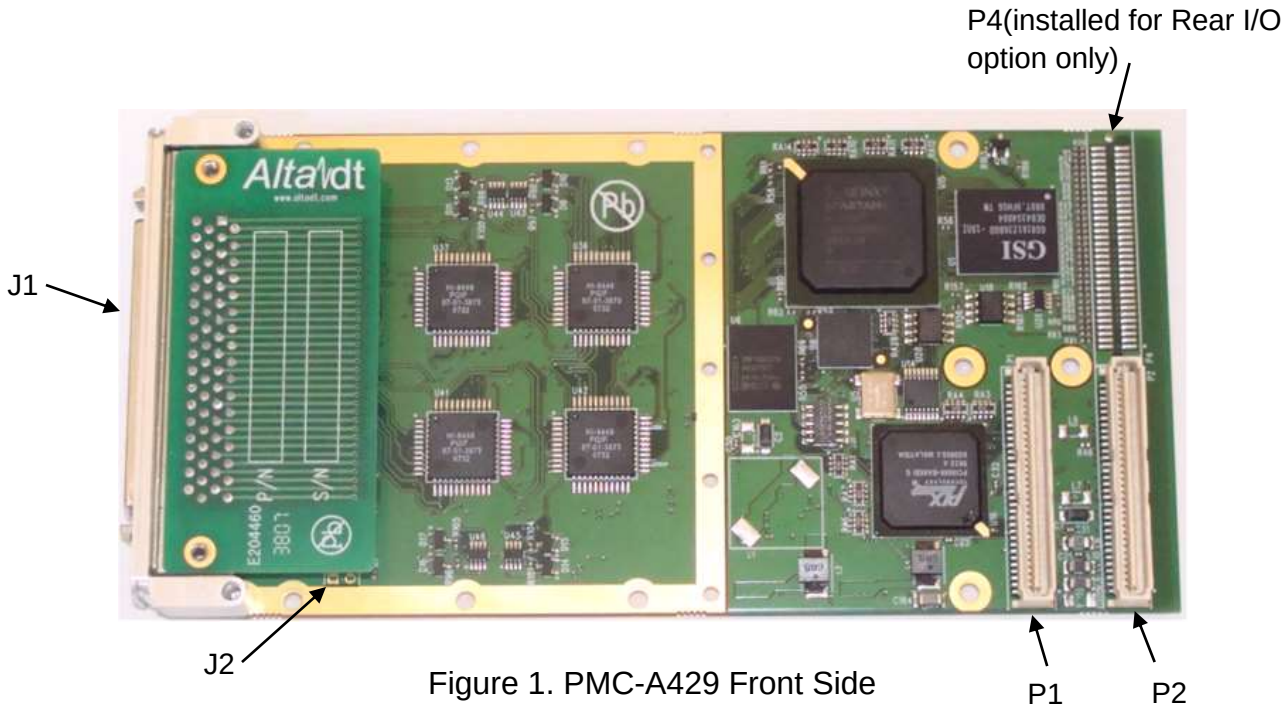


Figure 1. PMC-A429 Front Side

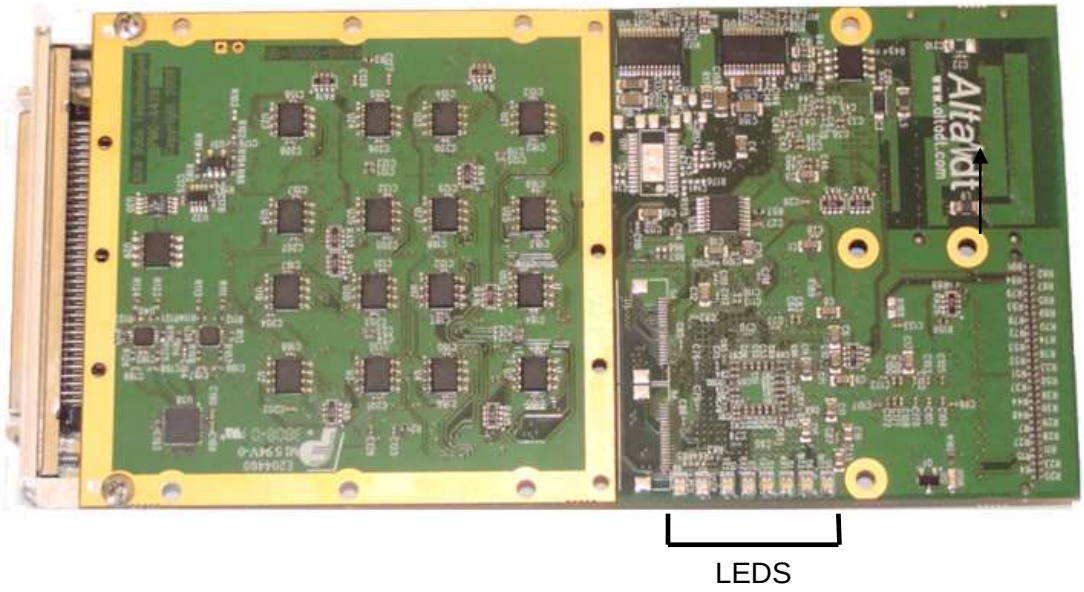


Figure 2. PMC-A429 Back Side

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 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) much 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-User's Manual for more information on setting the channel to operate in Harvard bi-phase mode.

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

J1Pin#	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)

J1Pin#	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-User's Manual for more 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 Pin#	Signal	J1 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 Pin#	Signal	J4 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 Pin#	Signal	J1 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 Pin#	Signal	J4 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

A429 Shared Channels

The PMC-A429 provides some shared RX/TX channels which include a line-driver for transmit operation and a receiver connected to the same pins. Under normal powered operation for a shared channel, the transmit channel may either drive the bus or act as high impedance allowing for receive operation. When the PMC-A429 does not have power applied during normal operation, the line-driver acts as a low impedance source on the bus which can cause the bus voltage to fall below the minimum of the ARINC 429 specification if an external device is transmitting on the bus. In this case, Alta recommends that RX only channels be used for the application instead of shared channels.

PCI Device Information

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

The PMC-A429 product uses the PLX PCI9056® 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.

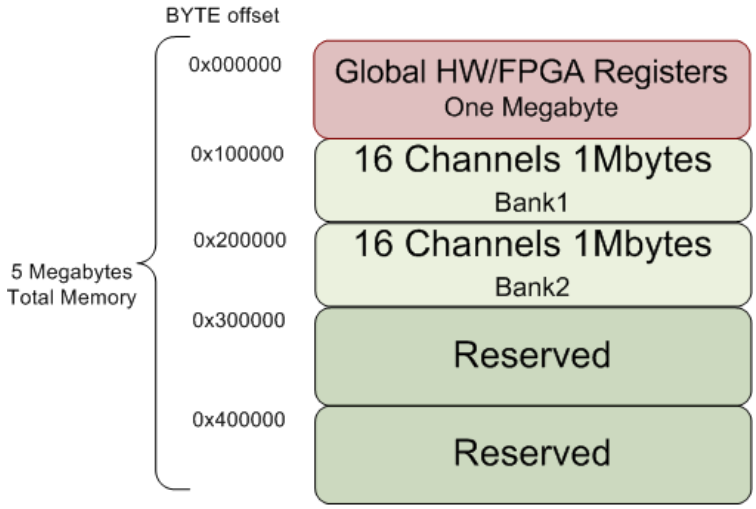


Figure 3. Card Basic Memory Map

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
09/09/08	A	Initial Release
02/22/09	B	Minor clean-up of A-717 description
03/08/09	C	717 Typo changes – Added Appendix A for Cable Assembly.
07/18/09	C1	Address Change – No Technical Data Changed
04/05/10	C2	Changed NAICS#
04/20/10	C3	Added Bookmark to PDF
07/26/10	C4	Updated Power Information
02/14/11	C5	Removed Global Figure's
030/7/12	C6	Added SCSI-3 Cable Wire Color Code: 1011
03/29/11	D0	Removed SCSI connector photo. Wrong photo for this document.
12/13/13	D1	Measured and updated power numbers for the board
02/18/15	D2	Added Software vs. Physical Channel table Updated connector information and NAICS number
01/31/17	D3	Updated cable information to include whether or not cables contain PVC
05/09/17	D4	Added A429 Shared Channels paragraph
07/20/18	D5	Added bullet about shared channels to specifications
01/16/23	D6	Removed revision and date from board description and updated contact info
03/16/23	D7	Updated Card Level Specifications to list RX channels for Rear Panel

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:

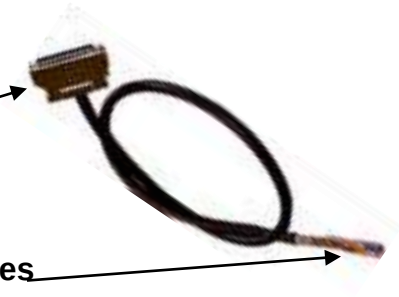
- **Part Number: SCSI-A429-3-01 (Clip**) or SCSI-A429-3-01-T (Thumb Screw**)**
- **Description: SCSI 3, 68-pin Connector to Exposed (Flying) Leads with 3 feet (36 inches) Total Cable Length**

* Does not contain PVC
** Contains PVC

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(-T)**
- **Note on Flying Leads: Provide 3 inches of Exposed Wires**

Cable is EU and China RoHS Compliant.

RoHS
2002/95/EC

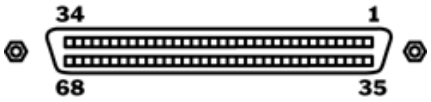
SCSI 3 Pin Outs and Wire Color Codes on Following Pages

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

ARINC SCSI 3 Connector (P1) Pin Outs & Connector Orientation

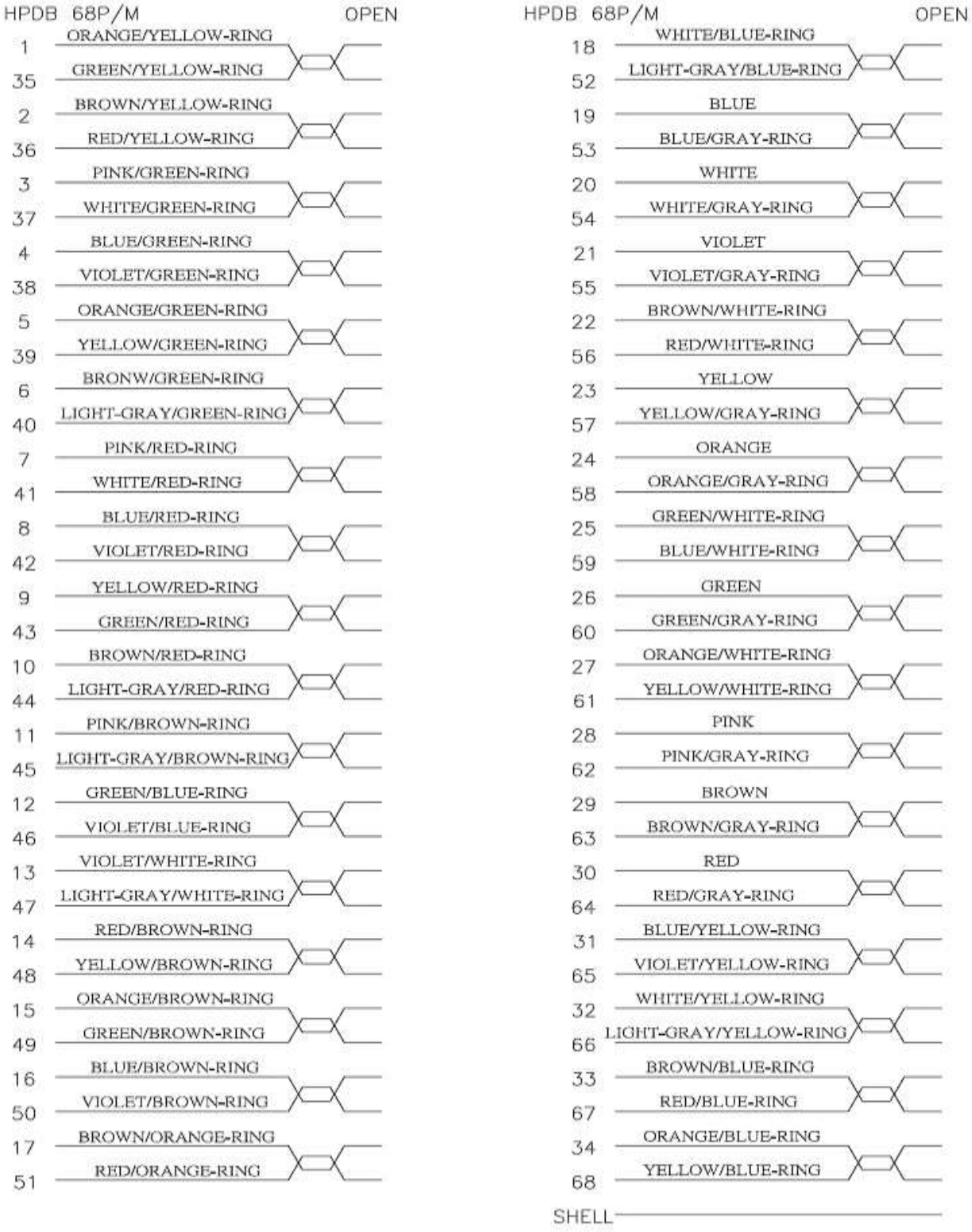
(See Main Section of Hardware Manual for 717 Pin-Out Information)

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 Cable Connector Pin Outs (HPDB) to Wire Color Code

PIN OUT



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