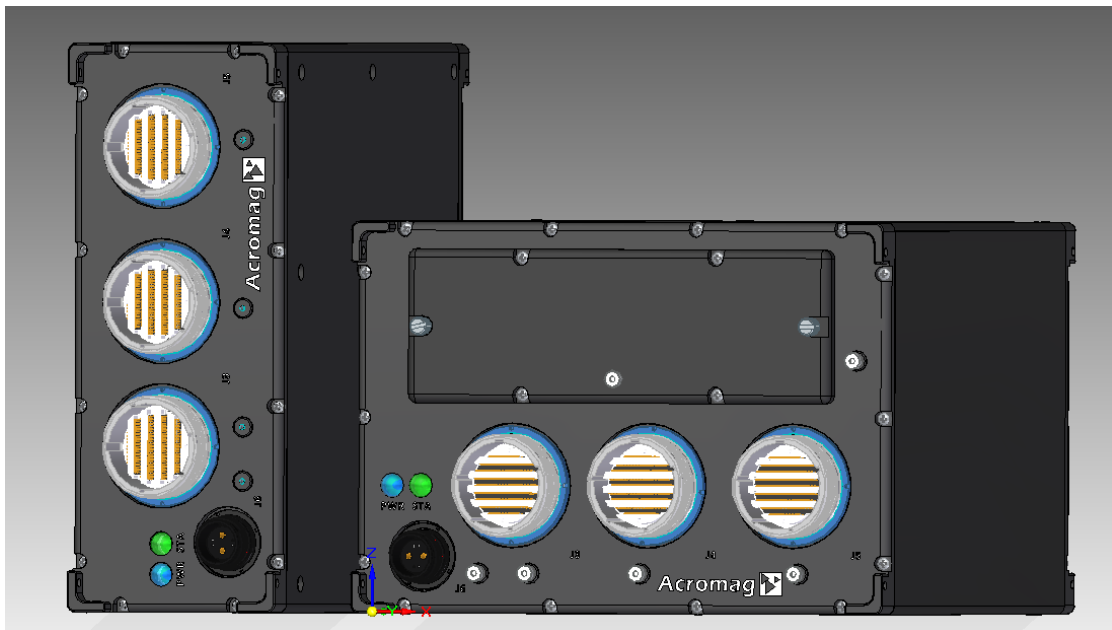![Acromag logo — THE LEADER IN INDUSTRIAL I/O]

ARCX 4122 High Speed Series
Ruggedized/Military/Industrial Computer
USER'S MANUAL

ACROMAG INCORPORATED
30765 South Wixom Road
Wixom, MI 48393-2417 U.S.A.
Tel: (248) 295-0310
Fax: (248) 624-9234

8501075D

Table of Contents

1.0 GENERAL INFORMATION

1.1 Intended Audience

This user's manual was written for technically qualified personnel who will be working with ARCX series devices using the XCOM-6400 COM Express module. It is not intended for a general, non-technical audience that is unfamiliar with computer-on-module (COM) devices and their application.

1.2 Preface

The information contained in this manual is subject to change without notice, and Acromag, Inc. (Acromag) does not guarantee its accuracy. Acromag makes no warranty of any kind with regard to this material, including, but not limited to, the implied warranties of merchantability and fitness for a particular purpose. Further, Acromag assumes no responsibility for any errors that may appear in this manual and makes no commitment to update, or keep current, the information contained in this manual. No part of this manual may be copied or reproduced in any form, without the prior written consent of Acromag,

1.2.1 Trademark, Trade Name and Copyright Information

© 2015 by Acromag Incorporated.

All rights reserved. Acromag and Xembedded are registered trademarks of Acromag Incorporated. All other trademarks, registered trademarks, trade names, and service marks are the property of their respective owners.

1.2.2 Class A Product Warning

This is a Class A product. In a domestic environment this product may cause radio interference, in which case the user may find it necessary to take adequate corrective measures.

1.2.3 Environmental Protection Statement

This product has been manufactured to satisfy environmental protection requirements where possible. Many components used (structural parts, circuit boards, connectors, batteries, etc.) are capable of being recycled. Final disposition of this product after its service life must be conducted in accordance with applicable country, state, or local laws or regulations.

1.3 ARCX 412X High Speed Series

The ARCX 412X High Speed Series offers Ruggedized/Military/Industrial Computer for the Acromag Com Express processor modules. The ARCX- 412X offers two PMC/XMC expansion sites.

The ARCX 412X High Speed Series has the following option:

- Expansion size

1.3.1 Key Features

- Designed to meet requirements of MIL-STD-810F environmental specification.

- Designed to meet IP67 NEMA Rating.

- Power Filter to meet requirements of MIL-STD-704F, MIL-STD-1275E, FCC and CE.

- Programmable Power Limits.

- Wide range input power, 10Vdc-36Vdc through a Size #12 38999 Type connector.

- Power indicator and Status LEDs.

- Supports Acromag Type 6 COM CPU modules.

- Provides access to standard computer peripherals of the Type 6 COM Express CPU module through size #23 38999 Type connectors.

  - Three DisplayPorts

  - One VGA port

  - Three USB 2.0 Ports

  - Two RS-232/485 Communication ports

  - Two Gigabit Ethernet Ports

  - Audio (One Line in and One Line out)

- PMC/XMC expansion (two sites)

  o PMC/XMC Rear I/O access provided through the front of the ARCX 412X via High Speed #23 38999 type connector. Supports x12d + x8d + x24s on both the J3 and J5.

  o PMC/XMC Front I/O access available through the rear panel of the ARCX 412X.

  o Pocket and PMC/XMC cutout outline indicated on rear panel

  o IP67 rating voided when hole is cut out

- Quad SSD Drive Bay

  o Up to Four SATA SSD Drive Bays (2.5-inch drive's supported)

  o Supports RAID 1,5,10

- One additional SATA port is available internally.

- Reset available via J6 Power connector (Integrated on power cable 5028-577).

- Regulated 12V out available J6 (Designed for ATMD-02 only).

CPU Module (XCOM-6400)

Intel Core™ i7 processor (4th generation, codename Haswell)

i7-4700EQ: 2.4GHz, quad core, 6Mb cache, 47W.

Chipset

Intel 8-Series QM87 PCH chipset (codename Lynx Point)

Intel DH82QM87 Platform Controller Hub

Memory

16GB of 1600 DDR3L ECC memory (**see section 6.6 for more information**)

1.4 Ordering Information

Models:

ARCX412X-_ _

CPU
   1 = i7

Expansion size
   2 = Double PMC/XMC

Drive Bay
   2 = Quad SSD

Options

   03 = High Speed with Power Filter
XX = Reserved
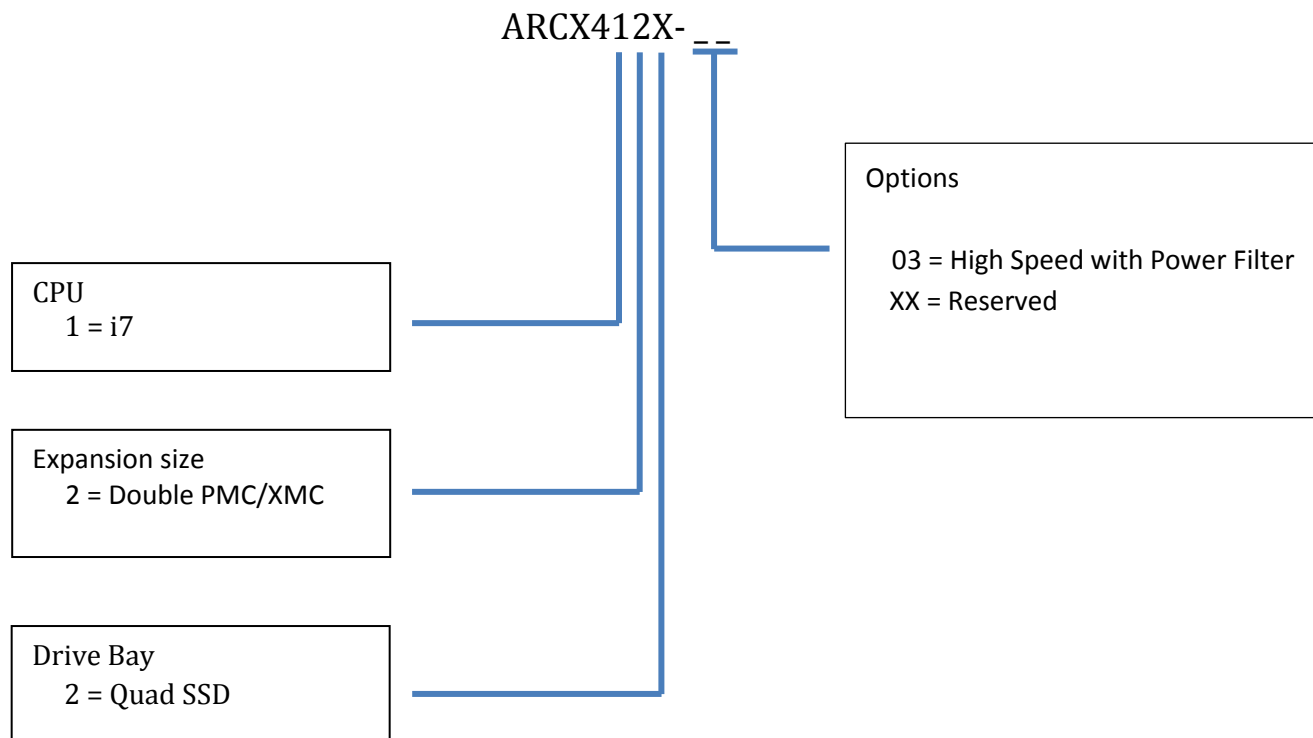
Example:

ARCX-4122-03 (i7 CPU, High Speed Double PMC/XMC Expansion size, Power Filter)

Only Lead Free models are available.

Note: Customers requiring lead solder electronics in the ARCX box will be handled as a special with appropriate NRE to cover cost of documenting and lead-time to build.
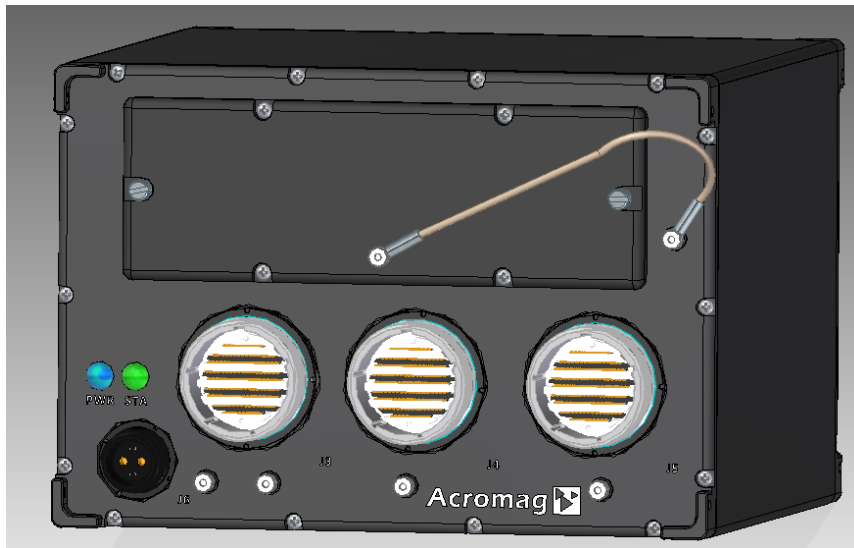
ARCX- 4122-03

1.4.1 Accessories

Accessories (optional)	
5028-573	38999 #23 size High Speed, CPU I/O Peripheral Breakout Cable
5028-557	38999 #12 size , Power Cable pigtail
5028-603	38999 #23 size High Speed Keyed "A" mating pigtail cable
5028-604	38999 #23 size High Speed Keyed "B" mating pigtail cable
5028-605	38999 #23 size High Speed Keyed "C" mating pigtail cable
5028-561	38999 #12 size Keyed A mating cable connector only
5028-600	PROTECTIVE 38999 CAP 12 SIZE
5028-602	PROTECTIVE 38999 CAP 23 SIZE HIGH SPEED
5028-574	ARCX **QUAD** SSD Drive Tray (Spare Drive Tray for Quad SSD Drive Bay)
5028-575	ARCX **QUAD** SSD Drive Tray with lock (Spare Drive Tray for Quad SSD Drive Bay)
ATMD-02	Air cooled heatsink
ATMD-03	Cold Plate, 8" x 10" Assembly

Note: The "High Speed" mating connectors require a special assembly technique to build a custom cable harness. Once the end application harness has been determined, please contact Meritec, Inc. for your custom harness requirements. See contact information below.

Note: The cables/connectors in the table above are for development and are not IP67 rated. Customers that need 23 Size IP67 cables must contact Meritec Inc. See contact information below.

Electro-welding of conductors; provides the precise consistency in electrical joints necessary to maintain critical impedance matching...

For custom cables contact Meritec

Phone: 1-888-637-4832
email: cs@meritec.com
Web: www.meritec.com

Customers that need IP67 Power cable can use the following:

Amphenol Part Number	Connector Description	Straight Shrink boot Part number	Right Angle Shrink boot Part number
2M805-001-16ZNU12-201PA	CONN P 6 CIR 38999 #12 Keyed A PLUG IP67	2M809S060-4H	2M809A060-4H
Aero Electric Part Number	**Connector Description**	**Straight Shrink boot Part number**	**Right Angle Shrink boot Part number**
AE96MM-26-Y12-201PA-001	38999 III plug, shell size 12, integral rear, normal/A Keyed	AE94MM-809S060-4H	AE94MM-809A060-4H

1.5   References

The following resources regarding COM Express modules, the XCOM-4600 EDK board, and the Haswell© family of Intel® core processors are available for download on Acromag's website or by contacting your sales representative.

- XCOM-6400 COM Express CPU Module User's Manual
  www.acromag.com
- APTIO^{TM} Core BIOS Manual (for Acromag® Products featuring the Intel® 4th Generation "Haswell" Core Processor Family)
  www.acromag.com
- ACEX-4620 COM Express Carrier Board User's Manual
  www.acromag.com
- ACEX-FP-XMC-02-LF Front Panel Board User's Manual
  www.acromag.com
- XCOM-4600-EDK Engineering Design Kit Board
  www.acromag.com
- Intel® document No. 328901, "Mobile 4th Generation Intel® Core™ Processor Family Datasheet – Volume 1 of 2", Rev: 002; September, 2013.
  www.intel.com/content/www/us/en/processors/core/CoreTechnicalResources.html
- COM Express Module Base Specification Rev. 2.1
  www.picmg.org

1.6   Operating System Compatibility
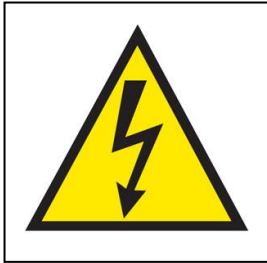
Microsoft Windows 8.1 (32bit & 64bit)

Microsoft Windows 7 (32bit & 64bit)

PMC and XMC modules may require hardware device driver's specific to your operating system to operate properly. Refer to your PMC or XMC manual for more information.

2.0 PREPARATION FOR USE

IMPORTANT PERSONAL AND PRODUCT SAFETY CONSIDERATIONS

It is very important for the user to consider the possible safety implications of power, wiring, component, sensor, or software failures in designing any type of control or monitoring system. This is especially important where personal injury or the loss of economic property or human life is possible. It is important that the user employ satisfactory overall system design. It is understood and agreed by the Buyer and Acromag that this is the Buyer's responsibility.

WARNING: This board utilizes static sensitive components and should only be handled at a static-safe workstation. This product is an electrostatic sensitive device and is packaged accordingly. Do not open or handle this product except at an electrostatic-free workstation. Additionally, do not ship or store this product near strong electrostatic, electromagnetic, magnetic, or radioactive fields unless the device is contained within its original manufacturer's packaging. Be aware that failure to comply with these guidelines will void the Acromag Limited Warranty.

2.1 Unpacking and Inspecting

Upon receipt of this product, inspect the shipping carton for evidence of mishandling during transit. If the shipping carton is badly damaged or water stained, request that the carrier's agent be present when the carton is opened. If the carrier's agent is absent when the carton is opened and the contents of the carton are damaged, keep the carton and packing material for the agent's inspection.

For repairs to a product damaged in shipment, refer to the Acromag Service Policy to obtain return instructions. It is suggested that salvageable shipping cartons and packing material be saved for future use in the event the product must be shipped.

This product is physically protected with packing material and electrically protected during shipment. However, it is recommended that the product be visually inspected for evidence of mishandling prior to applying power.

3.0　Block Diagrams and Connector Pin out Tables

3.1　ARCX- 412X Block Diagrams

The ARCX- 412X is made up from 3 main components

- XCOM-6400 COM Express CPU Module

- ACEX-4620 Carrier Board

- ACEX-FP-XMC-02 High Speed Front Panel Board

The block diagrams for each component are shown below in Figs. 3.1.1, 3.1.2, and 3.1.3. These may be a helpful reference as you review the connector pin out tables in this section.

3.1.1　XCOM-6400 COM Express CPU Module Block Diagram
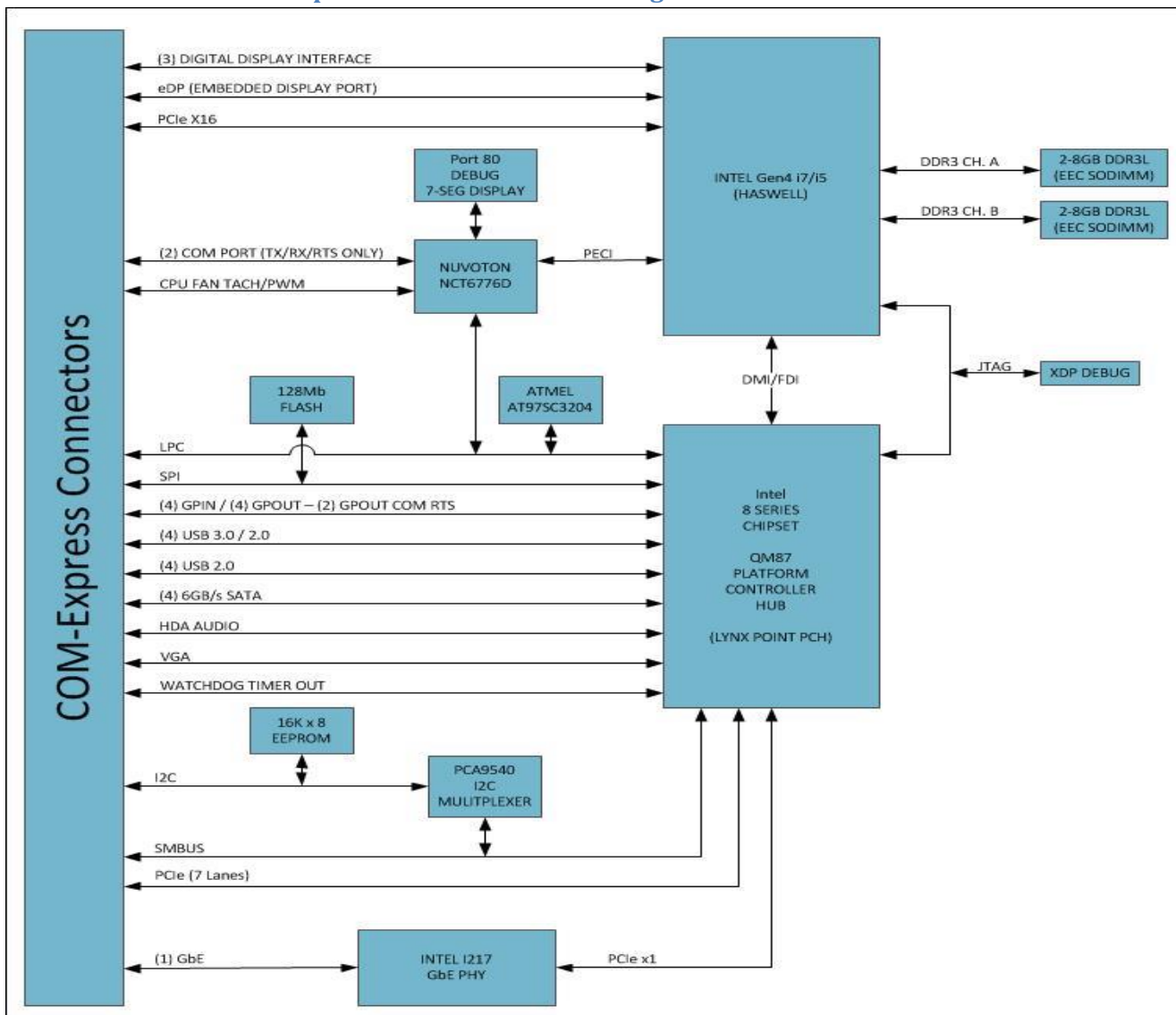
3.1.2 Model ACEX-4620 Carrier Block Diagram
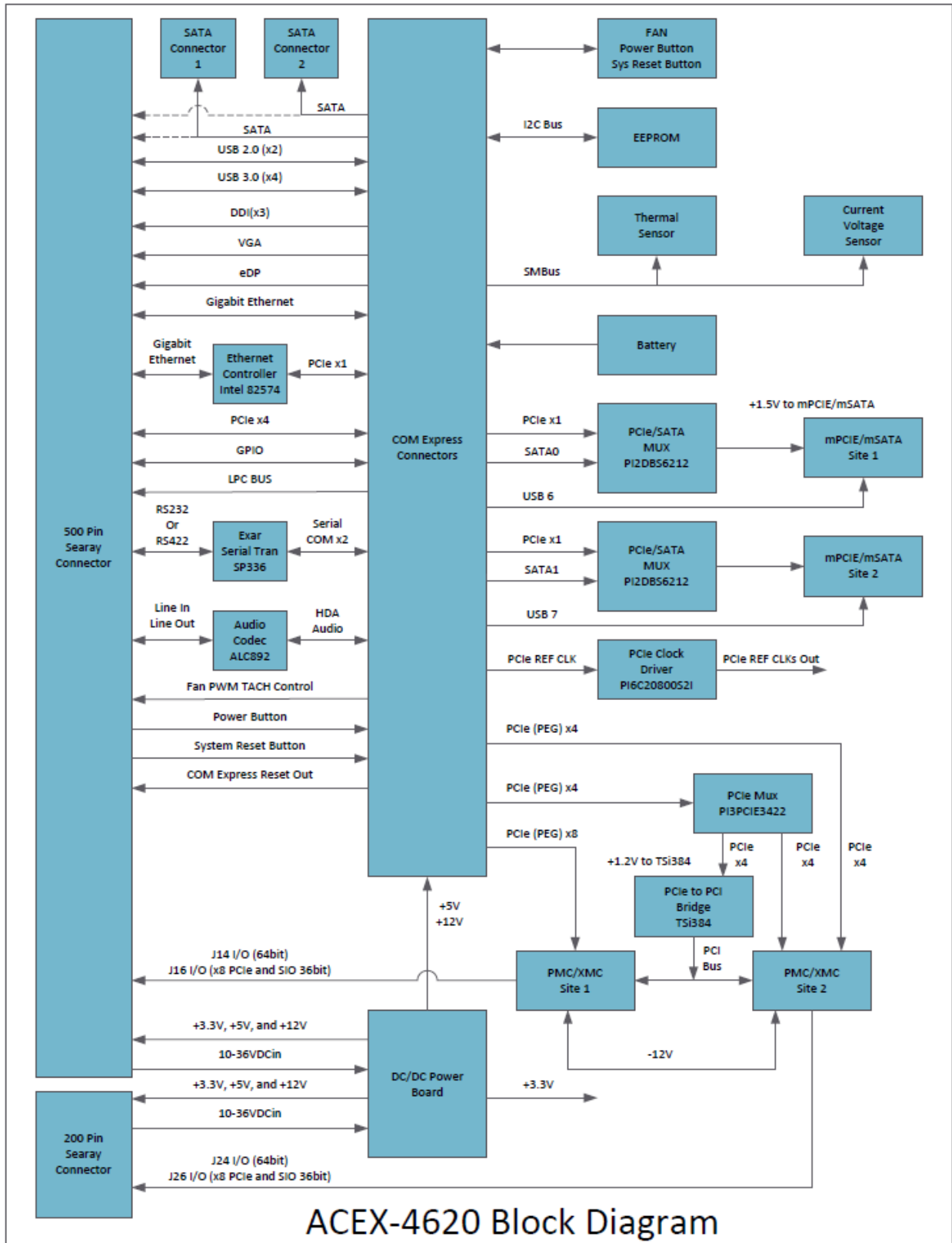
ACEX-4620 Block Diagram

3.1.3   Model ACEX-FP-XMC-02 High Speed Front Panel Block Diagram
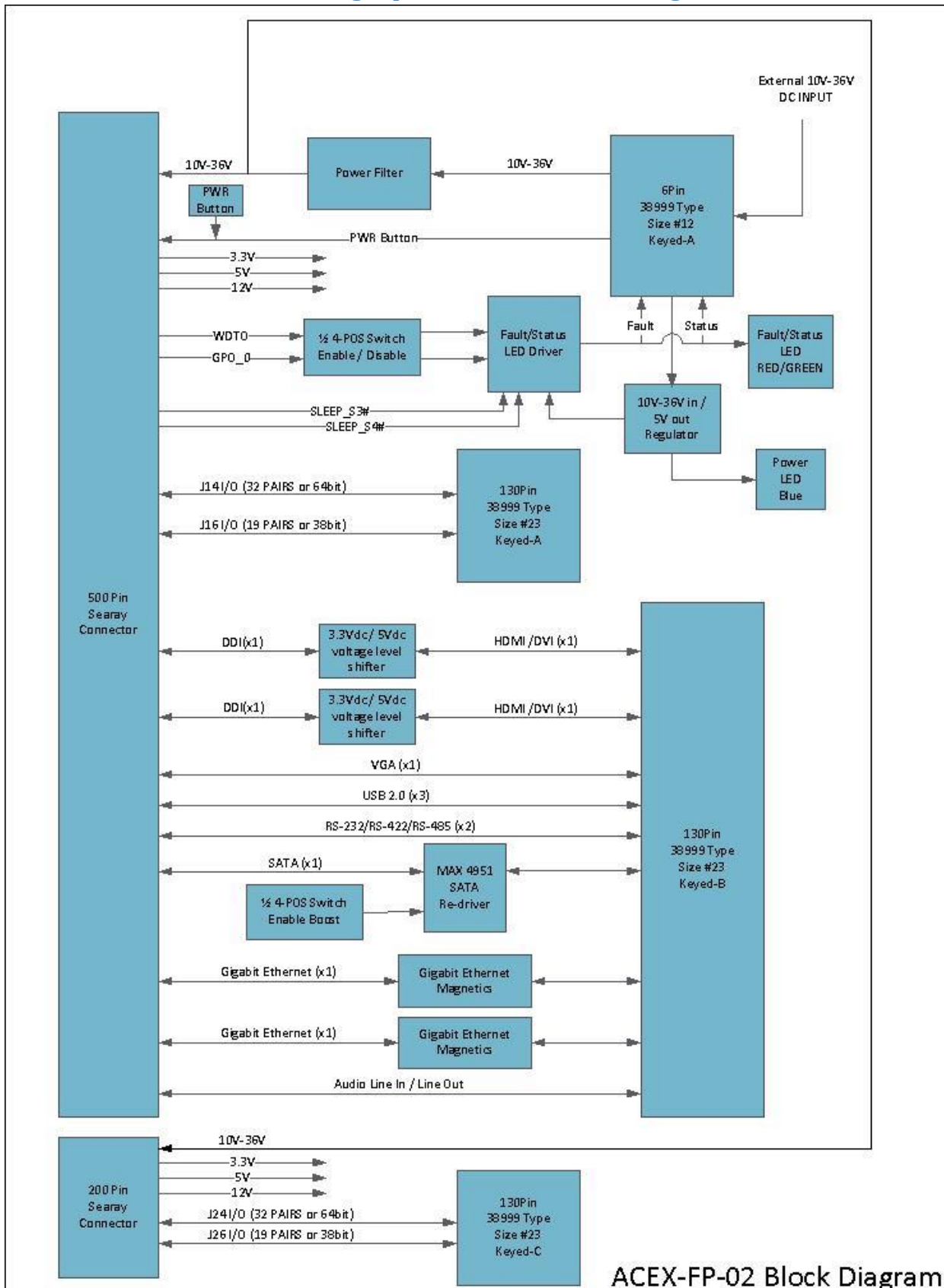
ACEX-FP-02 Block Diagram

3.1.4   ARCX- 412X, Top view

Conduction Ring

Conduction Ring

mPCIe / mSATA Site 1

J2800

J2900

mPCIe / mSATA Site 2

XMC / PMC Expansion site 1

J16   J15

J26   J25

XMC / PMC Expansion site 2

J13   J11

J23   J21

XMC site 1 JTAG Connector

SATA 1

J14   J12

J24   J22

SATA 2

ACEX-4620 Carrier

8 POS Dip Switch

Front Panel I/O PCB
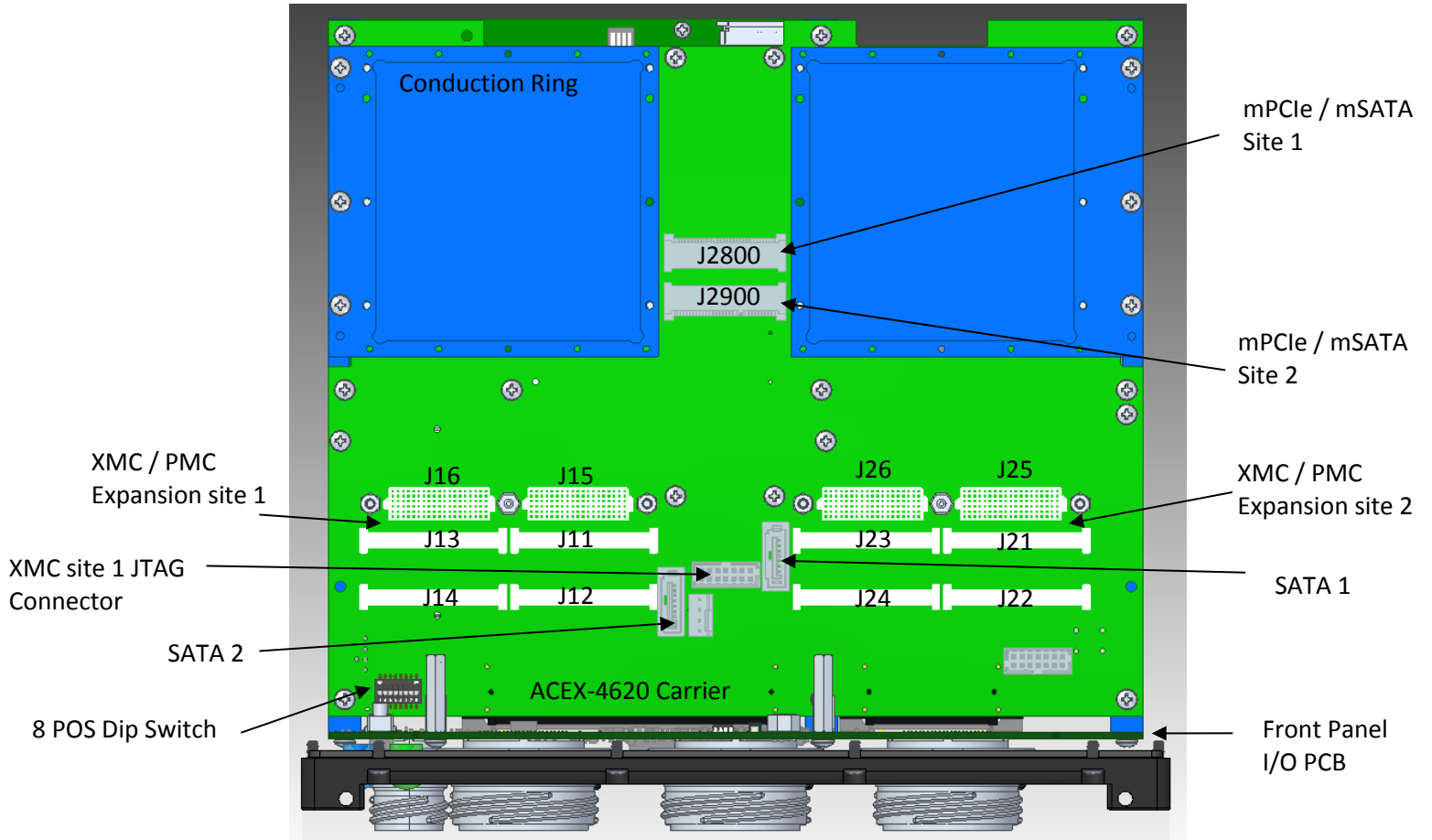
3.1.5   ARCX- 412X, Front Panel view
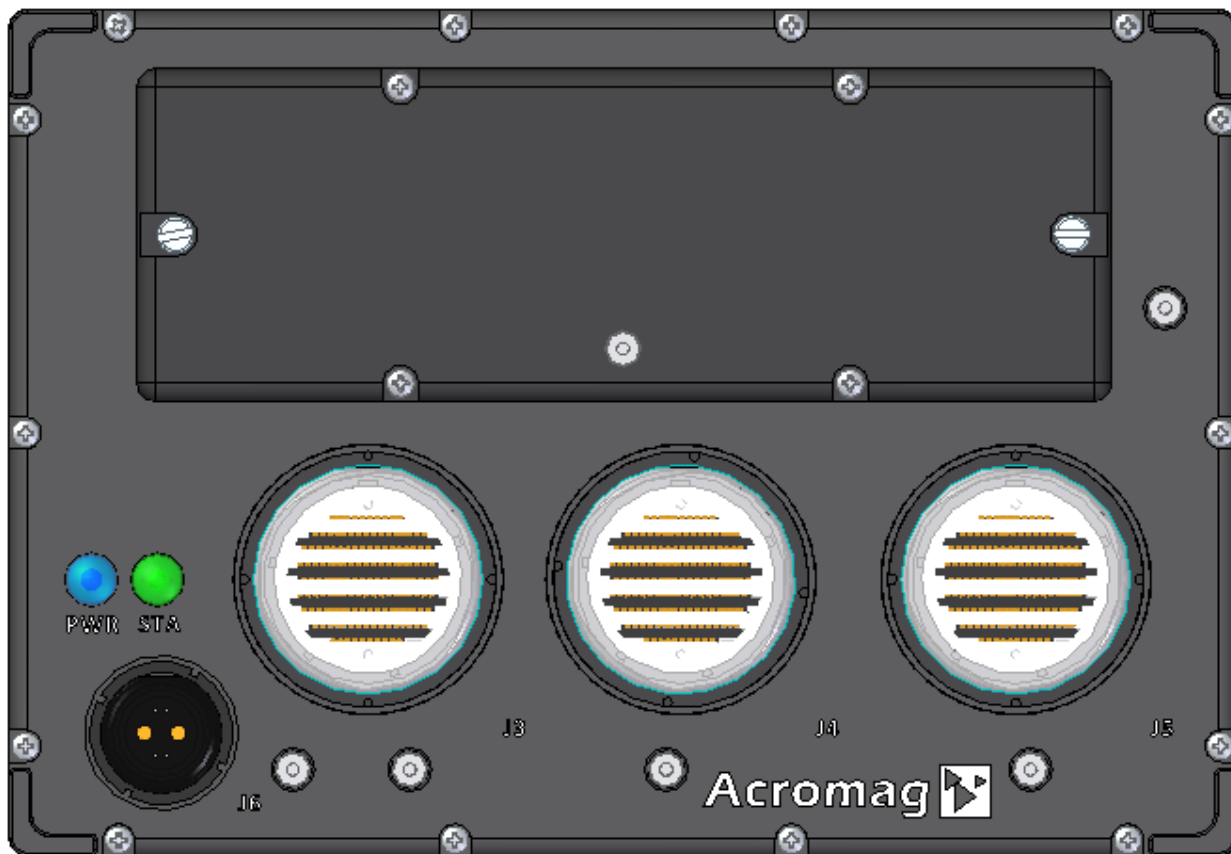
3.1.6 ARCX- 412X, Bottom view

POST code diagnostics

SODIMM

XCOM 6400 COM Express CPU

Internal Power supply

ACEX-PWR-xx

200 - Pin SEARAY Connector

500 - Pin SEARAY Connector
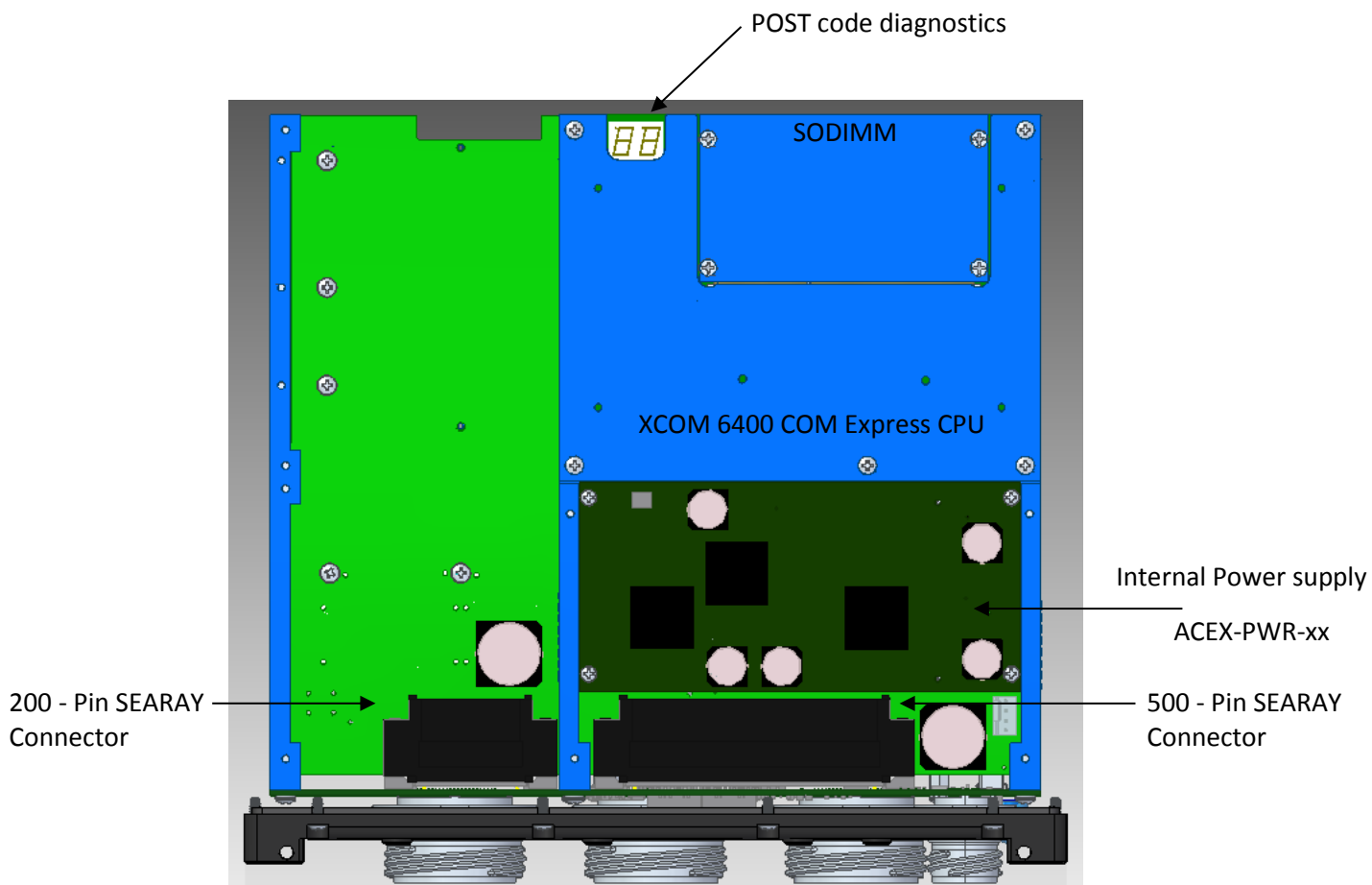
3.3 Connector Pin Outs

J3, J4, J5 are 145-pin size #23 38999 high speed connectors, keyed – A, B and C respectively. These connectors provide 44 high speed differential pairs. They provide access to the Rear I/O coming from the PMC/XMC (J3, J5) site on the carrier board (ACEX-46xx) as well as the standard peripheral I/O (J4) coming from the processor. The I/O configuration supported for the PMC/XMC sites is x24s + x8d + x12d as defined in VITA 46.9. If a unique I/O configuration is required, please contact the factor for a quote.

There is a development cable available that breaks out all the standard peripheral I/O from the processor for J4. Acromag part number 5028-573
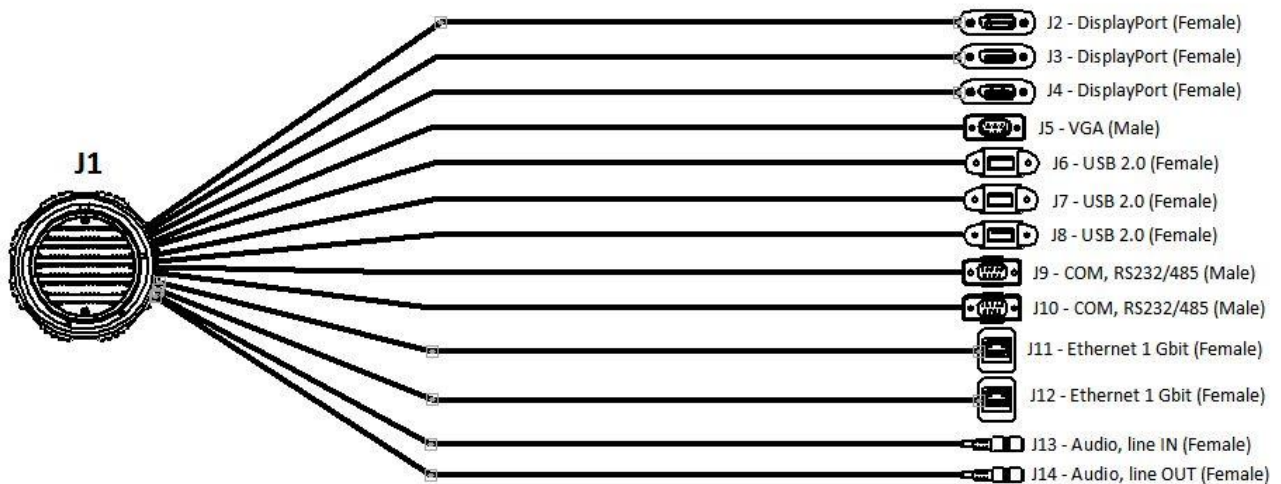
J3 - Keyed-A (Front View looking into the connector)

J3 – Front View looking into connector

	A	B	C	D	E	F	G	H	I
1			J14_RIO0_P (J14 Pin 1)	GND	GND	GND	J14_RIO1_P (J14 Pin 2)		
2		GND	J14_RIO0_N (J14 Pin 3)	J16_DP13_P (J16 Pin D13)	J16_DP19_P (J16 Pin E19)	J16_SIO5_P (J16 Pin F15)	J14_RIO1_N (J14 Pin 4)	GND	
3		J16_DP03_P (J16 Pin D3)	GND	J16_DP13_N (J16 Pin E13)	J16_DP19_N (J16 Pin D19)	J16_SIO5_N (J16 Pin F14)	GND	J14_RIO6_P (J14 Pin 13)	
4		J16_DP03_N (J16 Pin E3)	J16_DP08_P (J16 Pin A9)	GND	GND	GND	J16_SIO11_P (J16 Pin F9)	J14_RIO6_N (J14 Pin 15)	
5	GND	GND	J16_DP08_N (J16 Pin B9)	J16_DP14_P (J16 Pin A15)	J16_SIO0_P (J16 Pin C19)	J16_SIO6_P (J16 Pin C13)	J16_SIO11_N (J16 Pin F8)	GND	
6	J16_DP00_P (J16 Pin A1)	J16_DP04_P (J16 Pin A5)	GND	J16_DP14_N (J16 Pin B15)	J16_SIO0_N (J16 Pin C18)	J16_SIO6_N (J16 Pin C12)	GND	J14_RIO7_P (J14 Pin 14)	GND
7	J16_DP00_N (J16 Pin B1)	J16_DP04_N (J16 Pin B5)	J16_DP09_P (J16 Pin D9)	GND	GND	GND	J14_RIO2_P (J14 Pin 5)	J14_RIO7_N (J14 Pin 16)	J14_RIO11_P (J14 Pin 22)
8	GND	GND	J16_DP09_N (J16 Pin E9)	J16_DP15_P (J16 Pin D15)	J16_SIO1_P (J16 Pin F19)	J16_SIO7_P (J16 Pin F13)	J14_RIO2_N (J14 Pin 7)	GND	
9	J16_DP01_P (J16 Pin D1)	J16_DP05_P (J16 Pin D5)	GND	J16_DP15_N (J16 Pin E15)	J16_SIO1_N (J16 Pin F18)	J16_SIO7_N (J16 Pin F12)	GND	J14_RIO8_P (J14 Pin 17)	GND

	10	11	12	13	14	15	16	17	18	19
A	J16_DP01_N (J16 Pin E1)	GND	J16_DP02_P (J16 Pin A3)	J16_DP02_N (J16 Pin B3)	GND					
B	J16_DP05_N (J16 Pin E5)	GND	J16_DP06_P (J16 Pin A7)	J16_DP06_N (J16 Pin B7)	GND	J16_DP07_P (J16 Pin D7)	J16_DP07_N (J16 Pin E7)	GND		
C	J16_DP10_P (J16 Pin A11)	J16_DP10_N (J16 Pin B11)	GND	J16_DP11_P (J16 Pin D11)	J16_DP11_N (J16 Pin E11)	GND	J16_DP12_P (J16 Pin A13)	J16_DP12_N (J16 Pin B13)	GND	
D	GND	J16_DP16_P (J16 Pin A17)	J16_DP16_N (J16 Pin B17)	GND	J16_DP17_P (J16 Pin D17)	J16_DP17_N (J16 Pin E17)	GND	J16_DP18_P (J16 Pin A19)	J16_DP18_N (J16 Pin B19)	GND
E	GND	J16_SIO2_P (J16 Pin C17)	J16_SIO2_N (J16 Pin C16)	GND	J16_SIO3_P (J16 Pin F17)	J16_SIO3_N (J16 Pin F16)	GND	J16_SIO4_P (J16 Pin C15)	J16_SIO4_N (J16 Pin C14)	GND
F	GND	J16_SIO8_P (J16 Pin C11)	J16_SIO8_N (J16 Pin C10)	GND	J16_SIO9_P (J16 Pin F11)	J16_SIO9_N (J16 Pin F10)	GND	J16_SIO10_P (J16 Pin C9)	J16_SIO10_N (J16 Pin C8)	GND
G	J14_RIO3_P (J14 Pin 6)	J14_RIO3_N (J14 Pin 8)	GND	J14_RIO4_P (J14 Pin 9)	J14_RIO4_N (J14 Pin 11)	GND	J14_RIO5_P (J14 Pin 10)	J14_RIO5_N (J14 Pin 12)	GND	
H	J14_RIO8_N (J14 Pin 19)	GND	J14_RIO9_P (J14 Pin 18)	J14_RIO9_N (J14 Pin 20)	GND	J14_RIO10_P (J14 Pin 21)	J14_RIO10_N (J14 Pin 23)	GND		
I	J14_RIO12_P (J14 Pin 25)	J14_RIO12_N (J14 Pin 27)	GND	J14_RIO13_P (J14 Pin 26)	J14_RIO13_N (J14 Pin 28)	GND				

J4 - Keyed-B (130-Pin size #23 38999 type Connector)

J4 – Front View looking into connector

	1	2	3	4	5	6	7	8	9
A					GND	VGA_DATA	VGA_CLK	GND	DPB_CONF_SEL
B			GND	UART_TX1_P	UART_TX1_N	GND	UART_RX1_P	UART_RX1_N	GND
C	LAN2_DI0_P	LAN2_DI0_N	GND	LAN2_DI1_P	LAN2_DI1_N	GND	LAN2_DI2_P	LAN2_DI2_N	GND
D	GND	DPB_DP_PWR	DPB_Port1_HPD	GND	DPB_Port1 AUX_P	DPB_Port1 AUX_N	GND	DPB_Port1 LANE0_P	DPB_Port1_LANE 0_N
E	GND	DPC_DP_PWR	DPC_Port2_HPD	GND	DPC_Port2 AUX_P	DPC_Port2 AUX_N	GND	DPC_Port2 LANE0_P	DPC_Port2 LANE0_N
F	GND	DPD_DP_PWR	DPD_Port3_HPD	GND	DPD_Port3 AUX_P	DPD_Port3 AUX_N	GND	DPD_Port3 LANE0_P	DPD_Port3 LANE0_N
G	LAN1_DI0_P	LAN1_DI0_N	GND	LAN1_DI1_P	LAN1_DI1_N	GND	LAN1_DI2_P	LAN1_DI2_N	GND
H		GND	USB2_P	USB2_N	GND	USB2_SSRX_P	USB2_SSRX_N	GND	USB2_SSTX_P
I					.	GND	USB0_P	USB0_N	GND

	A	B	C	D	E	F	G	H	I
10	DPC_CONF_SEL	VGA_PWR	LAN2_DI3_P	GND	GND	GND	LAN1_DI3_P	USB2_SSTX_N	USB1_P
11	GND	VGA_RED	LAN2_DI3_N	DPB_Port1 LANE1_P	DPC_Port2 LANE1_P	DPD_Port3 LANE1_P	LAN1_DI3_N	GND	USB1_N
12	DPD_CONF_SEL	GND	GND	DPB_Port1 LANE1_N	DPC_Port2 LANE1_N	DPD_Port3 LANE1_N	GND	USB2_+5V	GND
13	WDTO	VGA_GREEN	UART_TX0_P	GND	GND	GND	LINE_IN_R	AUDIO_GND	USB0_+5V
14	GND	VGA_BLUE	UART_TX0_N	DPB_Port1 LANE2_P	DPC_Port2 LANE2_P	DPD_Port3 LANE2_P	LINE_IN_L	GND	USB1_+5V
15		GND	GND	DPB_Port1 LANE2_N	DPC_Port2 LANE2_N	DPD_Port3 LANE2_N	GND	GPI1	GND
16		VGA_HSYNC	UART_RX0_P	GND	GND	GND	LINE_OUT_R	GPO1	
17		VGA_VSYNC	UART_RX0_N	DPB_Port1 LANE3_P	DPC_Port2 LANE3_P	DPD_Port3 LANE3_P	LINE_OUT_L	GND	
18		GND	GND	DPB_Port1 LANE3_N	DPC_Port2 LANE3_N	DPD_Port3 LANE3_N	GND		
19				GND	GND	GND			

J5 - Keyed-C (130-Pin size #23 38999 type Connector)

J5 - Front View looking into connector

	A	B	C	D	E	F	G	H	I
1			J24_RIO0_P (J24 Pin 1)	GND	GND	GND	J24_RIO1_P (J24 Pin 2)		
2		GND	J24_RIO0_N (J24 Pin 3)	J26_DP13_P (J26 Pin D13)	J26_DP19_P (J26 Pin E19)	J26_SIO5_P (J26 Pin F15)	J24_RIO1_N (J24 Pin 4)	GND	
3		J26_DP03_P (J26 Pin D3)	GND	J26_DP13_N (J26 Pin E13)	J26_DP19_N (J26 Pin D19)	J26_SIO5_N (J26 Pin F14)	GND	J24_RIO6_P (J24 Pin 13)	
4		J26_DP03_N (J26 Pin E3)	J26_DP08_P (J26 Pin A9)	GND	GND	GND	J26_SIO11_P (J26 Pin F9)	J24_RIO6_N (J24 Pin 15)	
5	GND	GND	J26_DP08_N (J26 Pin B9)	J26_DP14_P (J26 Pin A15)	J26_SIO0_P (J26 Pin C19)	J26_SIO6_P (J26 Pin C13)	J26_SIO11_N (J26 Pin F8)	GND	
6	J26_DP00_P (J26 Pin A1)	J26_DP04_P (J26 Pin A5)	GND	J26_DP14_N (J26 Pin B15)	J26_SIO0_N (J26 Pin C18)	J26_SIO6_N (J26 Pin C12)	GND	J24_RIO7_P (J24 Pin 14)	GND
7	J26_DP00_N (J26 Pin B1)	J26_DP04_N (J26 Pin B5)	J26_DP09_P (J26 Pin D9)	GND	GND	GND	J24_RIO2_P (J24 Pin 5)	J24_RIO7_N (J24 Pin 16)	J24_RIO11_P (J24 Pin 22)
8	GND	GND	J26_DP09_N (J26 Pin E9)	J26_DP15_P (J26 Pin D15)	J26_SIO1_P (J26 Pin F19)	J26_SIO7_P (J26 Pin F13)	J24_RIO2_N (J24 Pin 7)	GND	J24_RIO11_N (J24 Pin 24)
9	J26_DP01_P (J26 Pin D1)	J26_DP05_P (J26 Pin D5)	GND	J26_DP15_N (J26 Pin E15)	J26_SIO1_N (J26 Pin F18)	J26_SIO7_N (J26 Pin F12)	GND	J24_RIO8_P (J24 Pin 17)	GND

	10	11	12	13	14	15	16	17	18	19
A	J26_DP01_N (J26 Pin E1)	GND	J26_DP02_P (J26 Pin A3)	J26_DP02_N (J26 Pin B3)	GND					
B	J26_DP05_N (J26 Pin E5)	GND	J26_DP06_P (J26 Pin A7)	J26_DP06_N (J26 Pin B7)	GND	J26_DP07_P (J26 Pin D7)	J26_DP07_N (J26 Pin E7)	GND	GND	
C	J26_DP10_P (J26 Pin A11)	J26_DP10_N (J26 Pin B11)	GND	J26_DP11_P (J26 Pin D11)	J26_DP11_N (J26 Pin E11)	GND	J26_DP12_P (J26 Pin A13)	J26_DP12_N (J26 Pin B13)	GND	
D	GND	J26_DP16_P (J26 Pin A17)	J26_DP16_N (J26 Pin B17)	GND	J26_DP17_P (J26 Pin D17)	J26_DP17_N (J26 Pin E17)	GND	J26_DP18_P (J26 Pin A19)	J26_DP18_N (J26 Pin B19)	GND
E	GND	J26_SIO2_P (J26 Pin C17)	J26_SIO2_N (J26 Pin C16)	GND	J26_SIO3_P (J26 Pin F17)	J26_SIO3_N (J26 Pin F16)	GND	J26_SIO4_P (J26 Pin C15)	J26_SIO4_N (J26 Pin C14)	GND
F	GND	J26_SIO8_P (J26 Pin C11)	J26_SIO8_N (J26 Pin C10)	GND	J26_SIO9_P (J26 Pin F11)	J26_SIO9_N (J26 Pin F10)	GND	J26_SIO10_P (J26 Pin C9)	J26_SIO10_N (J26 Pin C8)	GND
G	J24_RIO3_P (J24 Pin 6)	J24_RIO3_N (J24 Pin 8)	GND	J24_RIO4_P (J24 Pin 9)	J24_RIO4_N (J24 Pin 11)	GND	J24_RIO5_P (J24 Pin 10)	J24_RIO5_N (J24 Pin 12)	GND	
H	J24_RIO8_N (J24 Pin 19)	GND	J24_RIO9_P (J24 Pin 18)	J24_RIO9_N (J24 Pin 20)	GND	J24_RIO10_P (J24 Pin 21)	J24_RIO10_N (J24 Pin 23)	GND		
I	J24_RIO12_P (J24 Pin 25)	J24_RIO12_N (J24 Pin 27)	GND	J24_RIO13_P (J24 Pin 26)	J24_RIO13_N (J24 Pin 28)	GND				

J6 is a 6-pin size #12 38999 type connector, keyed - A. This connector is used to provide External input power 10V to 36V DC to the Carrier board (ACEX-46xx). This connector has a PWR_BTN line to allow power switch.

J6 - Keyed-A (6-Pin size #12 38999 type Connector)

Pin	Signal Name
1	PWR_BTN
2	GND
3	INPUT_PWR
4	INPUT_GND
5	+12V Out (For ATMD-02 only)
6	GND

4.0   LED Function

4.1   Power LED

The Blue Power LED indicates 10V-36V DC power is applied at the external power input.

4.2   Status LED

The Status LED is used to show the status of the system power state S3 and S4.

4.3 System power state definitions

System power state S3 the "sleep state":

All power is off except memory. If power is removed at this point you will lose your current session.

System power state S4 the "hibernate state":

Safe to remove power, will always resume the current session when power is reapplied.

There are three basic states indicated by the Status LED:

- Status LED steady "Green On" when the system is running.
- Status LED "Blink Green" when the system enters sleep state S3.
- Status LED will turn off when the system enters Sleep state S4 Hibernate.

Signal Activity		Status LED		
Sleep S3#	Sleep S4#	Green On	Blink Green	LED Off
0	0			✓
0	1		✓	
1	1	✓		

✓ - Condition of the Status LED
0 - Represents a Low state
1 - Represents a High state

Note:

1. S3# and S4# are active low signals (# indicates active low).

2. *It is ok to remove power from the system when the Status LED is off.*

3. S5 State is not monitored by the LED however the Status LED will go off during a S5 or shutdown condition.

5.0   Switch Configuration

5.1   8-Position Dip switch (located on the Carrier board)

(optional configuration) Bold indicates default setting		
1	ON	J15 JTAG voltage = 2.5Vdc
	OFF	**J15 JTAG voltage = 3.3Vdc**
2	ON	J25 JTAG voltage = 2.5Vdc
	OFF	**J25 JTAG voltage = 3.3Vdc**
3	ON	*J25 MPRESENT#, Signal low , Enable (XMC Site 2)*
	OFF	***J25 MPRESENT# , Signal High, Disable (XMC Site 2)***
4	**ON**	SER_MODE0 (see Serial Port Configuration below)
	OFF	SER_MODE0 (see Serial port configuration below)
5	**ON**	SER_MODE1 (see Serial Port Configuration below)
	OFF	SER_MODE1 (see Serial Port Configuration below)
6	**ON**	**mPCIe/mSATA site 1 = mPCIe enabled**
	OFF	mPCIe/mSATA site 1 = mSATA enabled
7	**ON**	**mPCIe/mSATA site 2 = mPCIe enabled**
	OFF	mPCIe/mSATA site 2 = mSATA enabled
8	ON	PCI_SEL_100 = 25, 50, 100MHz
	OFF	**PCI_SEL_100 = 33, 66, 133MHz**

Serial Port Configuration	*SER_Mode0*	*SER_Mode1*
Dual RS-232	*0*	*0*
COM0: RS-232 / COM1:RS-485	*0*	*1*
Dual RS-485	*1*	*0*
Low Power Shutdown	*1*	*1*

See the ACEX-4620 Carrier user's manual for more information.

SW2 – (located on the Front panel PCB)

SW2 Reserved for future use.

SW2 - Bold indicates default factory settings		
SW2 - 1	ON	Reserved
	OFF	Normal operation
SW2 - 2	ON	Reserved
	OFF	Normal operation
SW2 - 3	ON	Reserved
	OFF	Normal operation
SW2 - 4	ON	Reserved
	OFF	Normal operation

6.0 Installing Expansion Modules, Memory and Battery.

The ARCX 412X High Speed Series provides expansion sites for PMC or XMC expansion. This section describes how to install these modules. Although system memory and battery are low maintenance items this section will also show you how to access these items.

6.1 ARCX- 412X, disassembly

1. Remove 11 screws (M2.5 x 6mm) from the bottom of the unit.
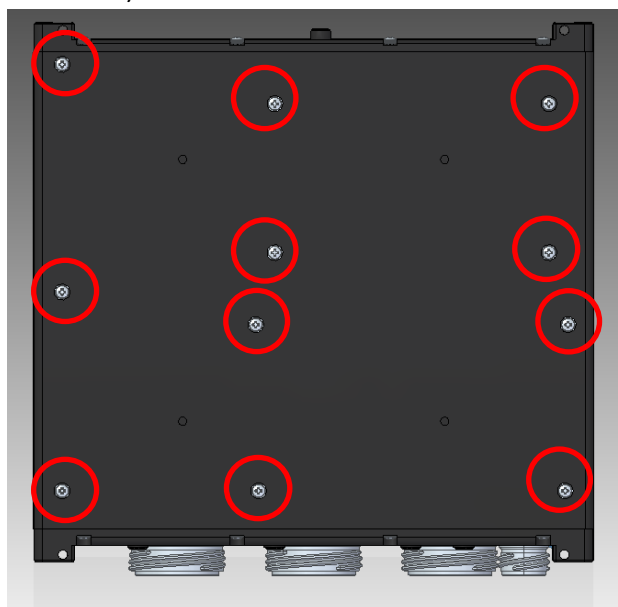
2. Remove the 14 screws (M2.5 x 6mm) that secure the front panel.
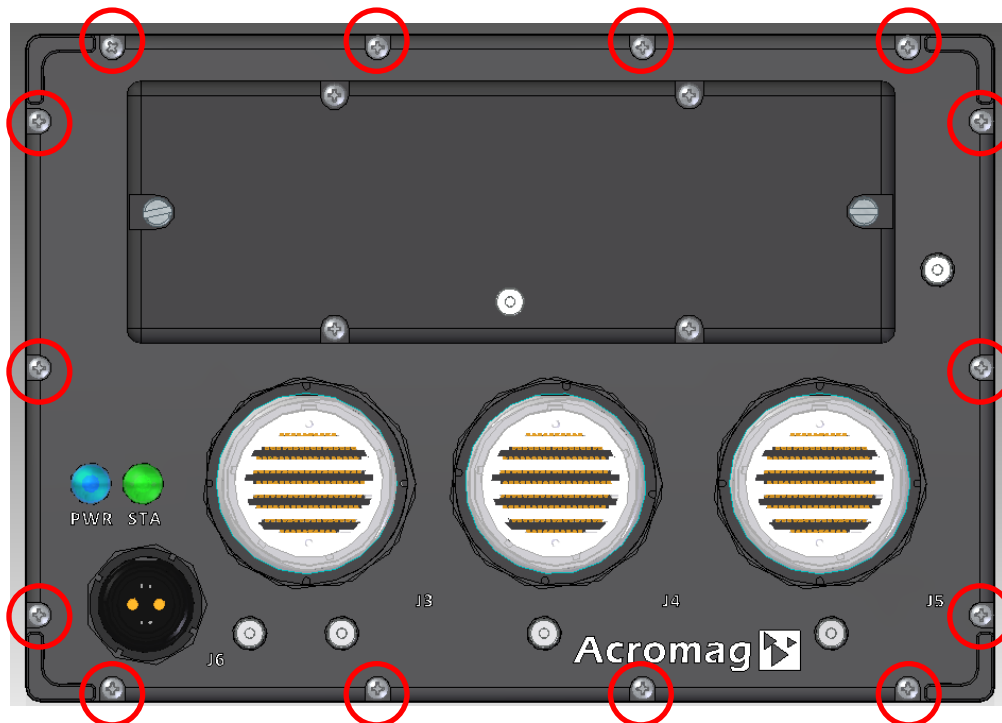
3. Carefully pull/slide the assembly out of the enclosure as shown.
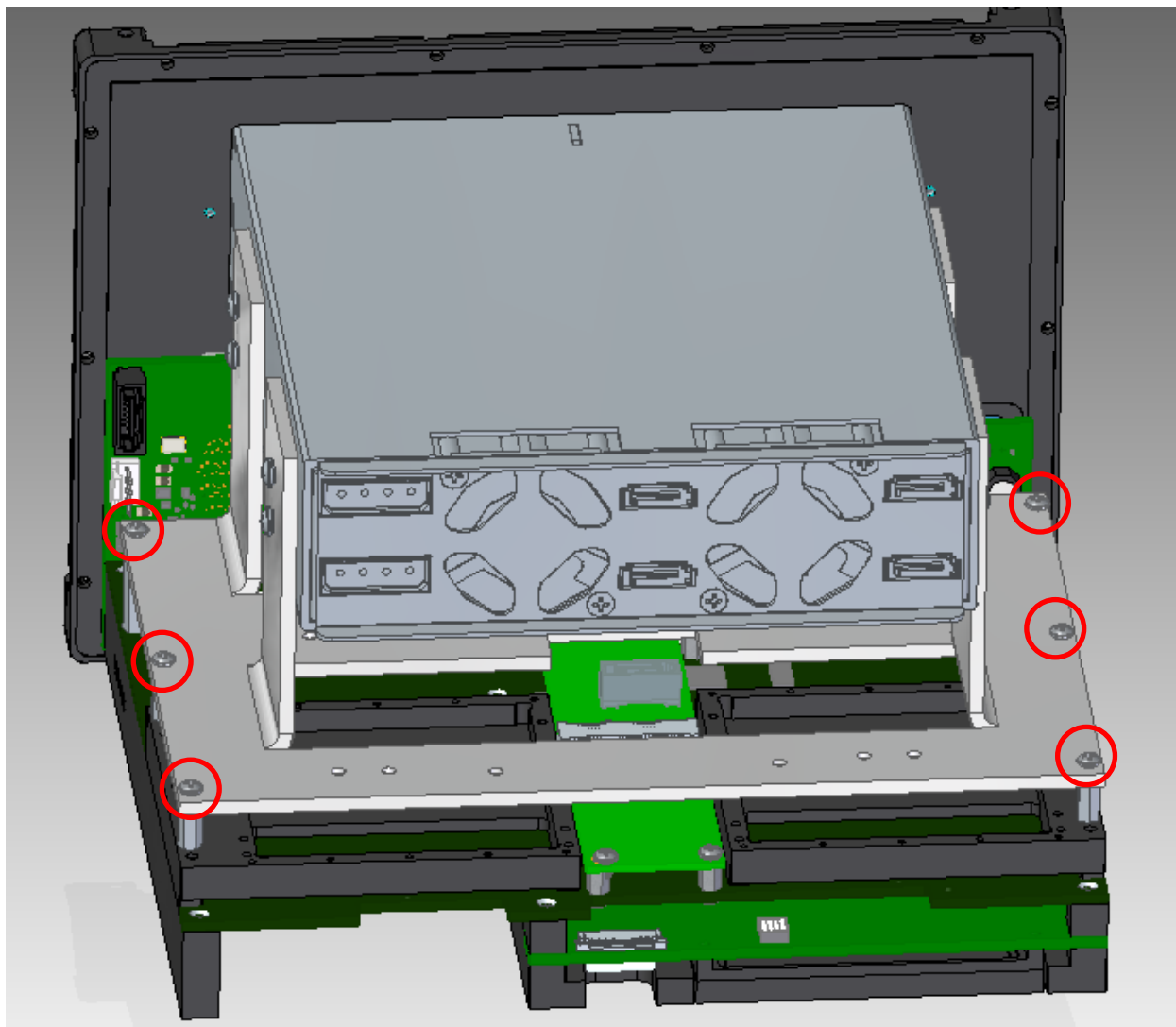
4. Remove six screws, disconnect cables and set QUAD SSD drive bay aside.

Note: When re-assembling, **t**orque these screws (M2.5x 6mm) to 5 in-lbs.
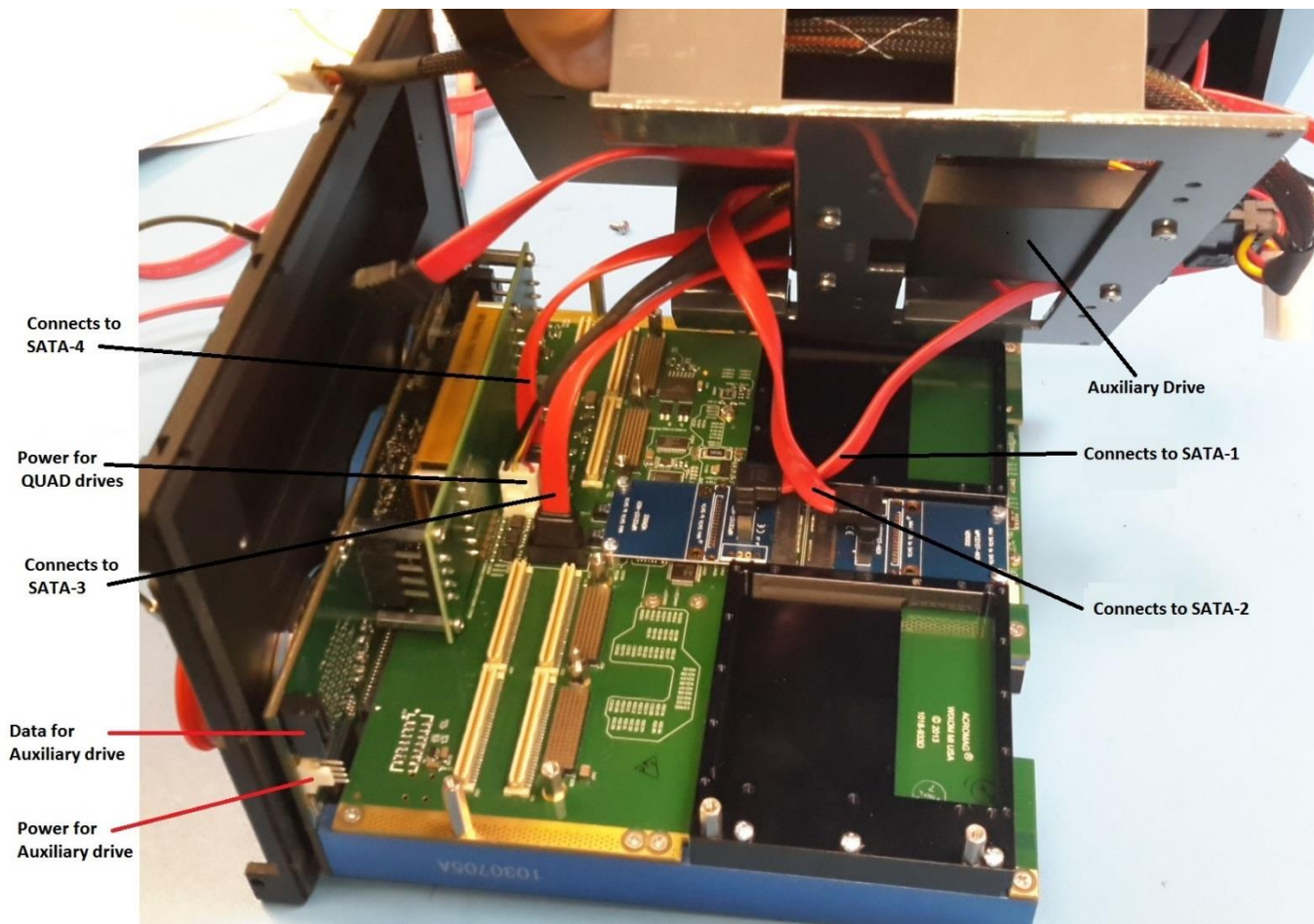
ARCX- 412X Disassembly is complete.

6.2 ARCX- 412X, installing a PMC or XMC module

See the disassembly instructions in section 6.2 then proceed to step one.
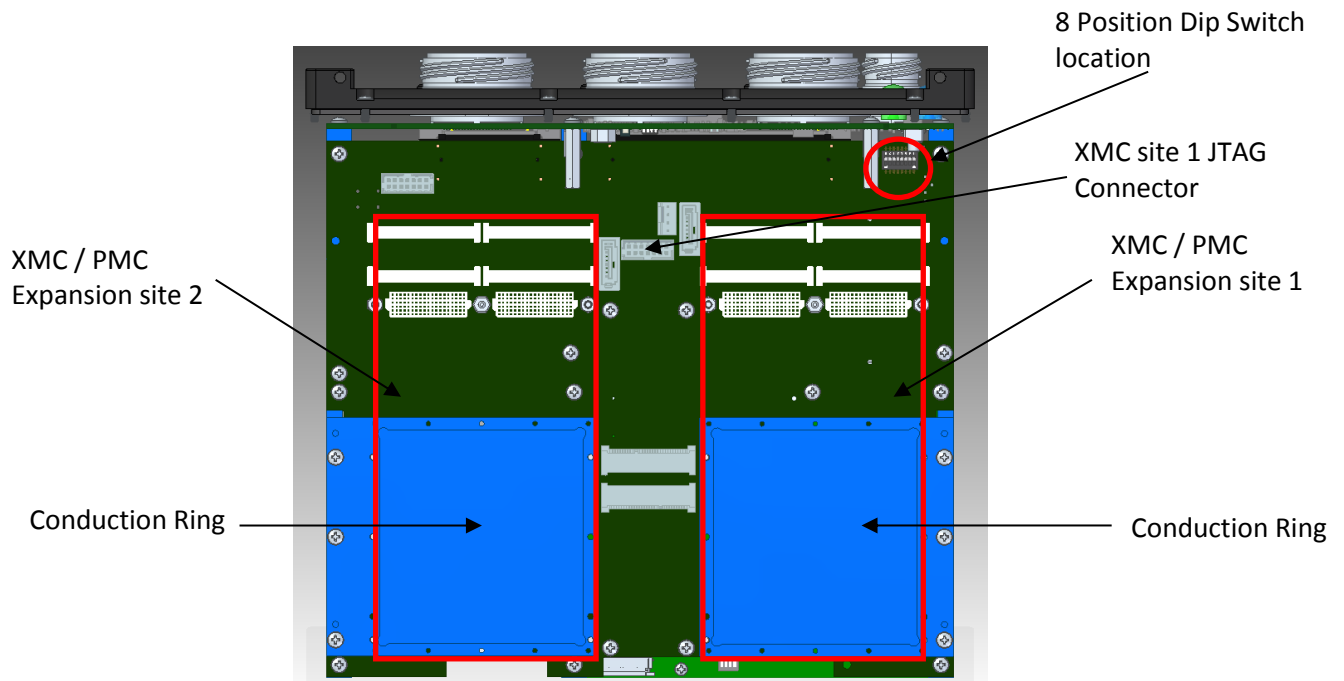
XMC or PMC configuration:

- A single XMC or PMC module can be used in site 1 or site 2.

- Two XMC modules can be installed in site 1 and site 2 at the same time.

- Two PMC modules can be installed in site 1 and site 2 at the same time.

Note:

If an XMC and a PMC module are used together, you must install the XMC card in site 1 and the PMC card in site 2.

See section **5.0 "Switch Configuration"** for information about J-tag voltage setting and the use of MPRESENT# signal.

Generally, the XMC module will drive the MPRESENT# signal low indicating an XMC module is present. If the module you are using does not support this feature, then you will need to set SW3 to the "**on**" position to allow the system to detect your XMC module. When a PMC module is installed in site 2 SW3 must set to the "**off**" (default) position.

Recommendation:

If you have a high powered XMC card, it is best to install it in Expansion Site 2. This is the opposite side of the CPU module.

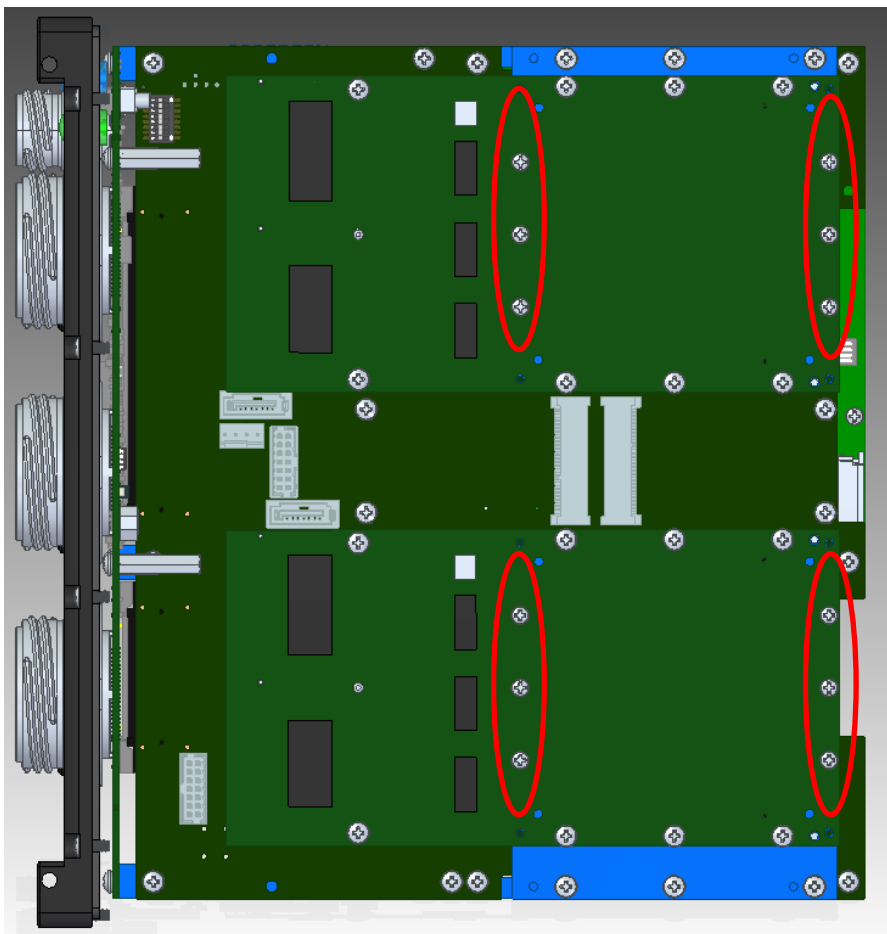**NOTE:** Remove these screws and standoffs from your XMC or PMC module if they exist.
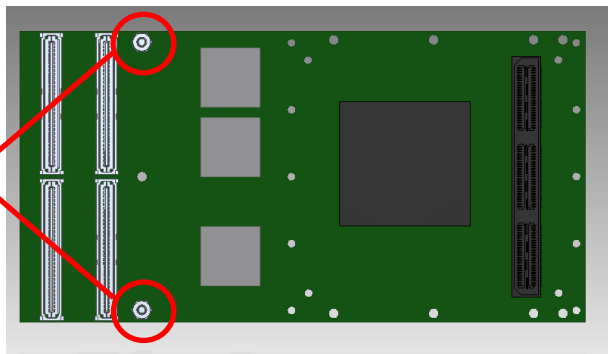
1. Plug your module in into the expansion site and secure the module in each site to the conduction ring with a quantity of 8 (M2.5 x 6mm) screws per site.
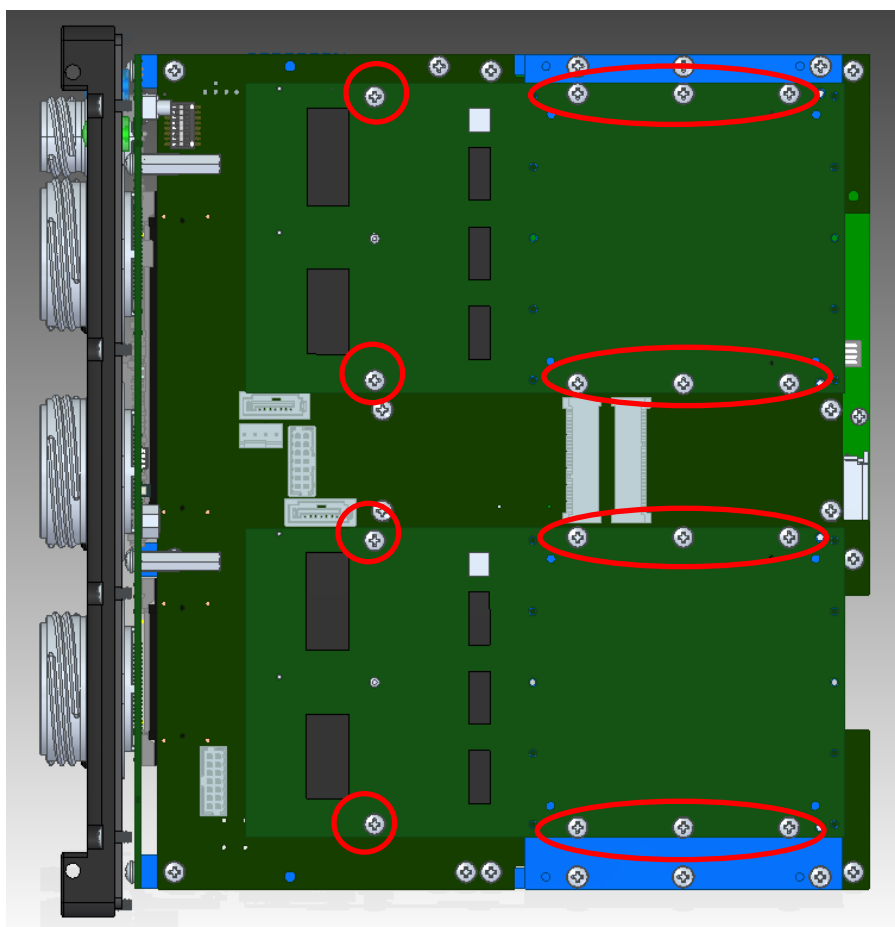
Torque screws (M2.5x 6mm) to 5 in-lbs.

2. Install a quantity of 6 (M2.0 x 6mm) screws per site.

Torque screws (M2.0 x 6mm) to 3 in-lbs.

Installation of XMC or PMC module is complete.

Proceed *to section 6.9 (ARCX- 412X) to reassemble ARCX box.*

6.3 ARCX- 412X, memory access

There are two SODIMM sockets located on the XCOM-6400 CPU module. This section describes how to access the memory modules. The ARCX 412X High Speed Series supports a maximum of 16GB (2 x 8GB SODIMM) of system memory.

Single or Dual Ranked x8 un-buffered ECC 204-pin SODIMMs using 1Gb, 2Gb, or 4Gb DRAM technologies.

Single/Dual Rank	DIMM Capacity	DRAM Organization	# DRAM Devices	# Row/Col Address Bits	# of Banks Inside DRAM	Page Size
Single	1GB	128M x8	9	14/10	8	8K
Single	2GB	256M x8	9	15/10	8	8K
Single	4GB	512M x8	9	16/10	8	8K
Dual	2GB	128M x8	18	14/10	8	8K
Dual	4GB	256M x8	18	15/10	8	8K
Dual	8GB	512M x8	18	16/10	8	8K

SODIMM Memory Module Removal

See the disassembly instructions in section 6.2 (ARCX- 412X) then proceed to step one.

1. Remove the XCOM-6400 CPU Module from the Carrier by removing the 5 (M2.5 x 6mm) screws.
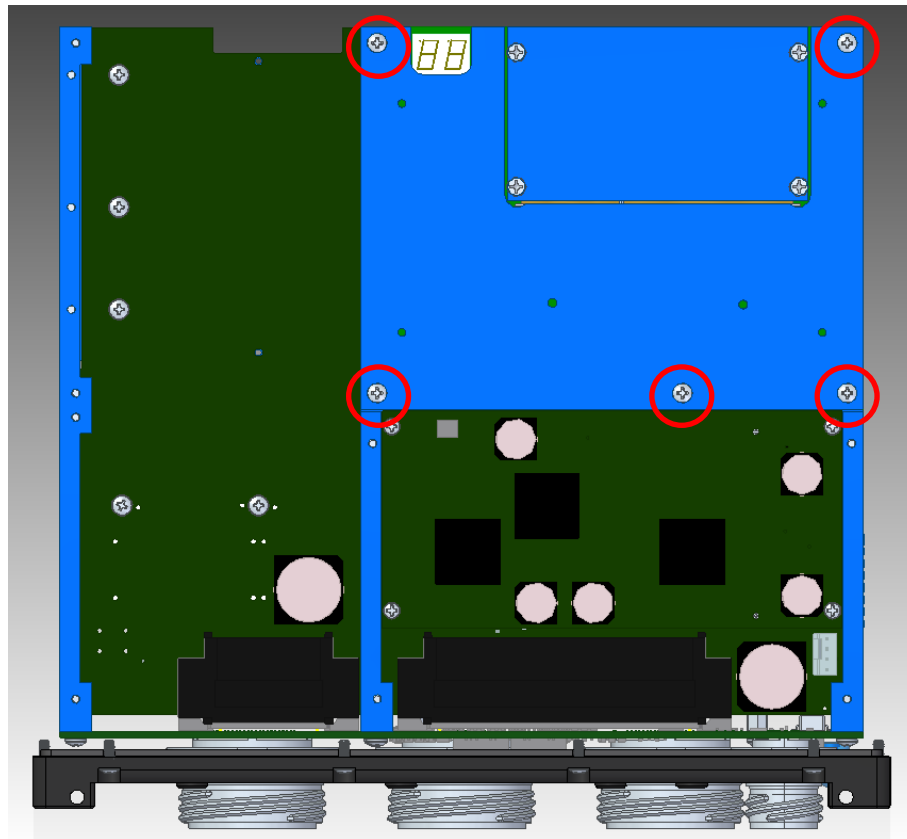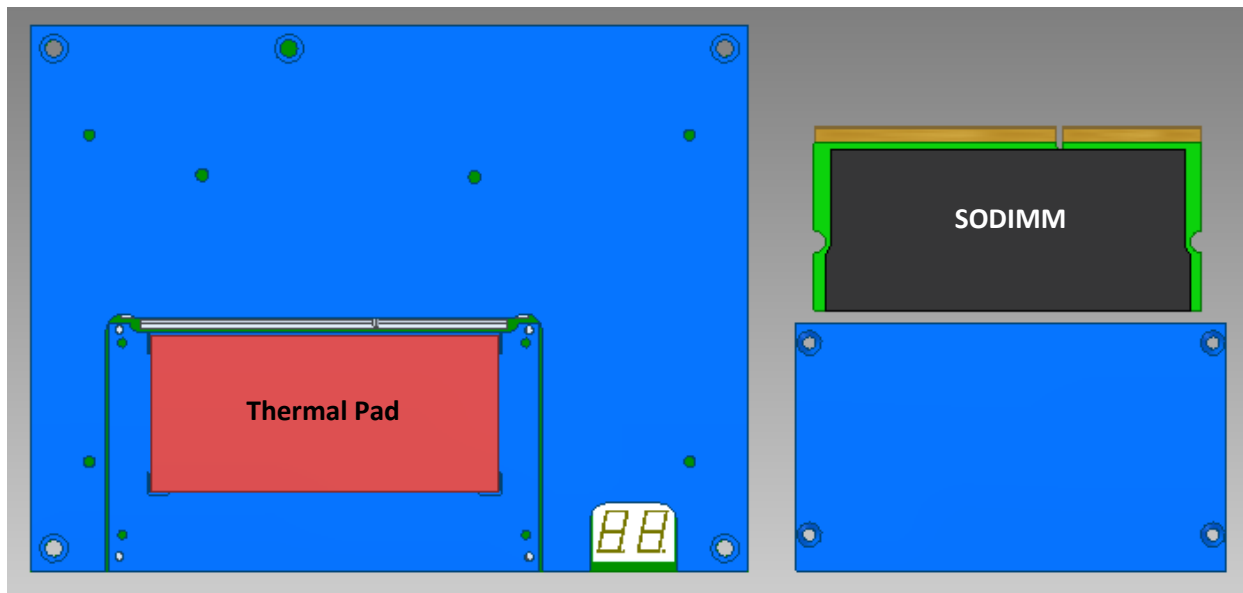
2. Carefully lift the XCOM-6400 CPU module up and away from the carrier (ACEX-46xx) board.
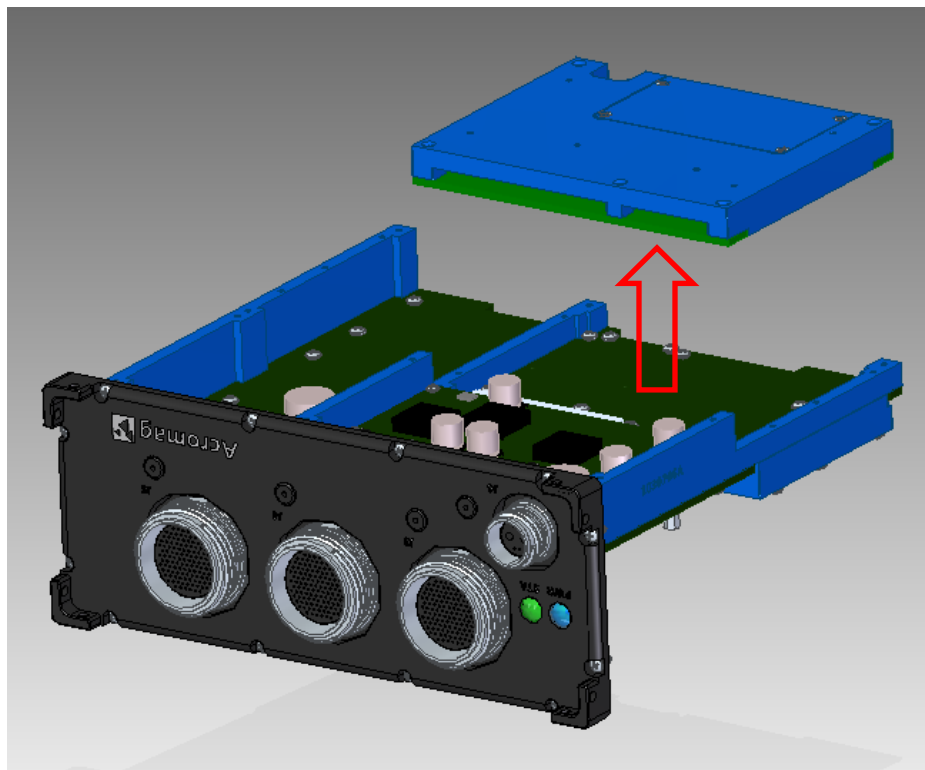
3. Remove the 4 (M2.0 x 8mm) Flat Head screws that secure the top of the memory hold down mechanism (Secure Conduction Memory Latch Technology).
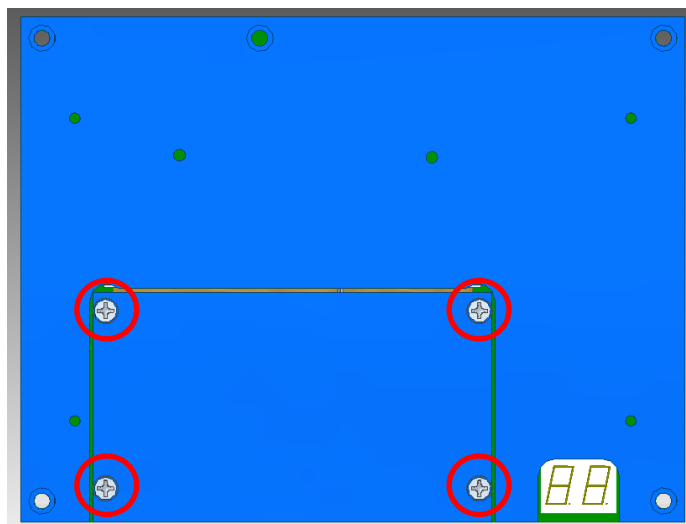
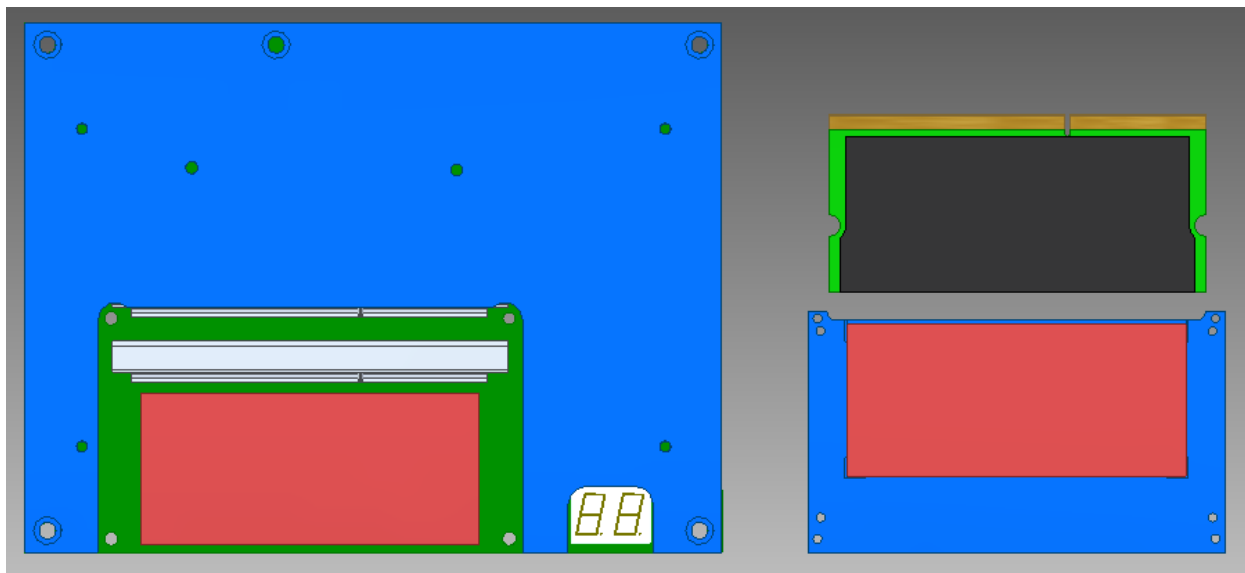4. Remove the top of the hold down mechanism (top SODIMM site) and the memory module.

5. Remove the 4 (M2.0 x 6mm) Pan Head screws on the bottom side of the XCOM-6400 CPU module.
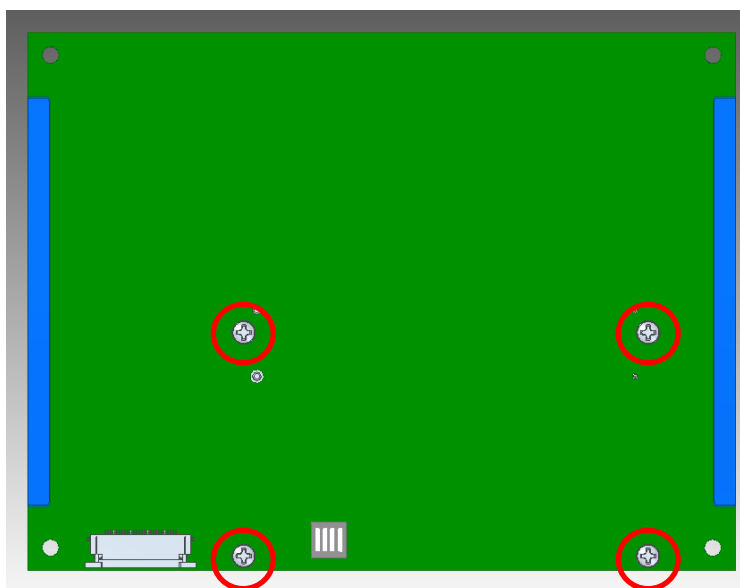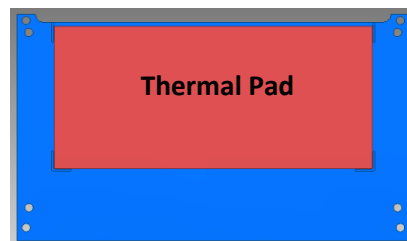

Bottom side of the XCOM-6400 CPU module

6.   Remove the bottom of the hold down mechanism (bottom SODIMM Site) and the memory module.
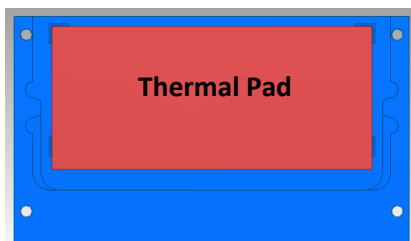

SODIMM Memory Module Removal is complete.
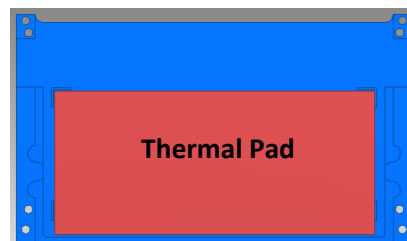

Upper (top view)

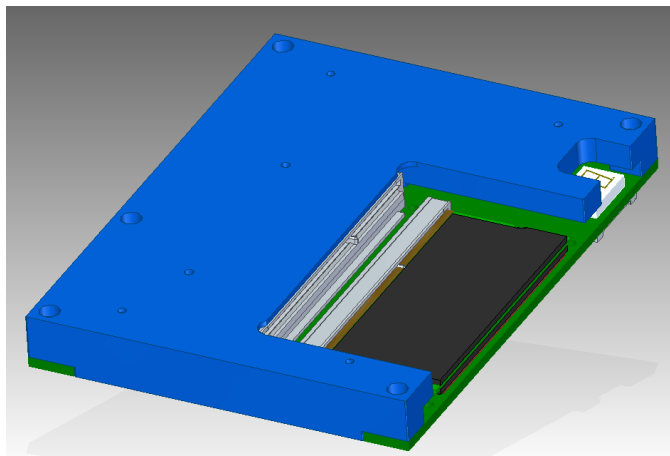Lower (top view)

Upper (bottom view)


Lower (bottom view)

"Secure conduction memory latch technology" hold down mechanism

Installing SODIMM memory and reassembling the "Secure Conduction Memory Latch Technology" hold down mechanism.
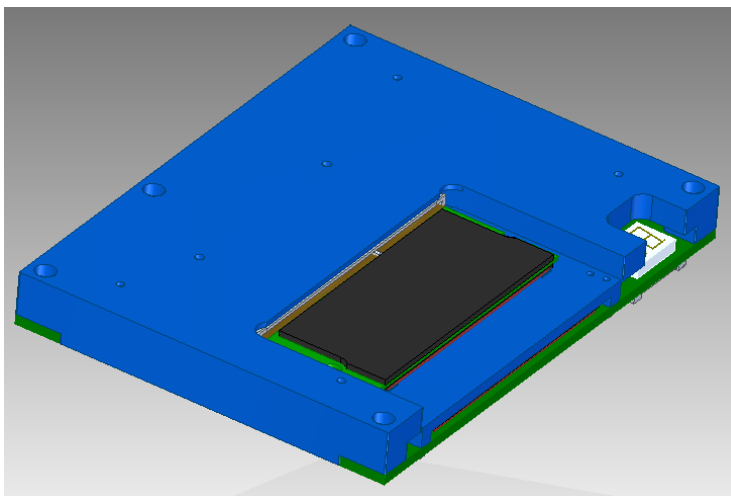
1. Install SODIMM into the lower memory socket.

2. Align the notch on the bottom of the lower hold down mechanism with the notch opening on the memory module, hold in place while turning the XCOM-6400 CPU module over and install the 4 (M2.0 x 6mm) Pan Head screws.
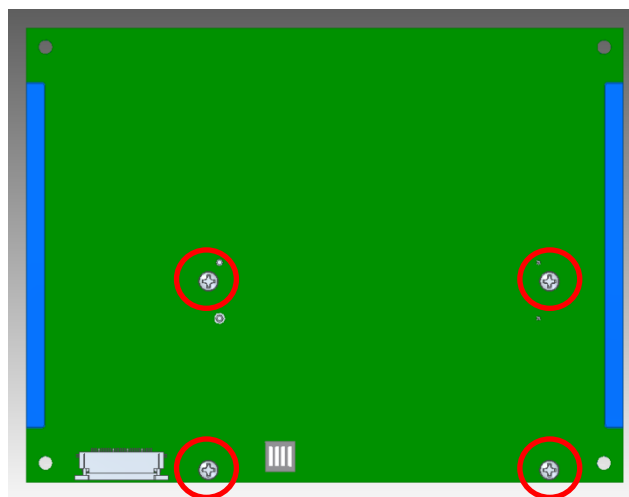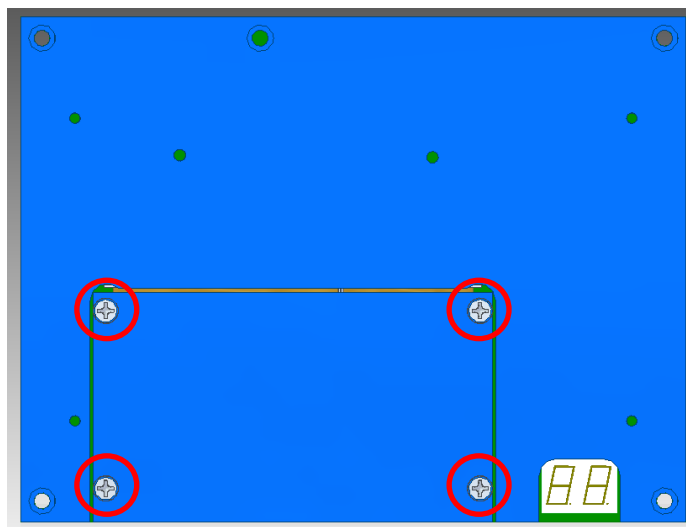

Torque screws (M2.0 x 6mm) to 3 in-lbs.

Bottom side of the XCOM-6400 CPU module

3. Install SODIMM into the Upper memory socket.


4. Align the notch on the bottom of the upper hold down mechanism with the notch opening on the memory module, hold in place and install the 4 (M2.0 x 8mm) Flat Head screws
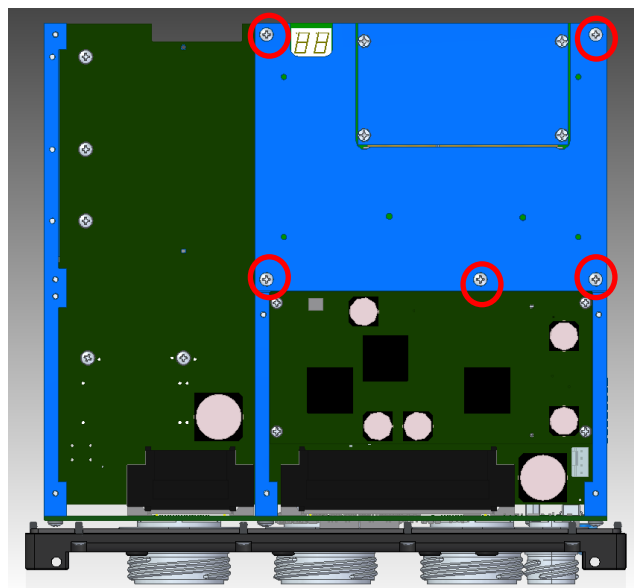

Torque screws (M2.0 x 6mm) to 3 in-lbs.

5. Carefully attach the XCOM-6400 CPU module to the carrier by aligning the XCOM CPU to the Rails on the ACEX carrier and press into place. (This mates the CPU to the carrier via the COM express connector)

Rail
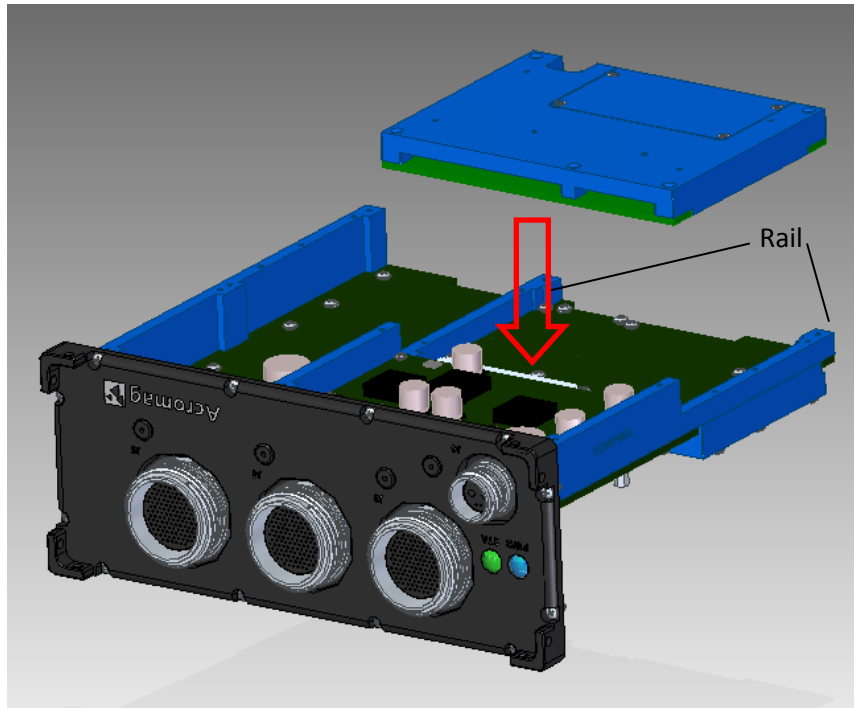
6. Install 5 (M2.5 x 8mm) screws to secure the XCOM-6400 CPU module to the Carrier board (ACEX-46xx).

Torque to 5 in-lbs.

SODIMM reassembly is complete.

Proceed *to section 6.9 (ARCX- 412X) to reassemble ARCX box.*

6.4 ARCX- 412X, battery access

See the disassembly instructions in section 6.2 (ARCX- 412X) then proceed to step one.
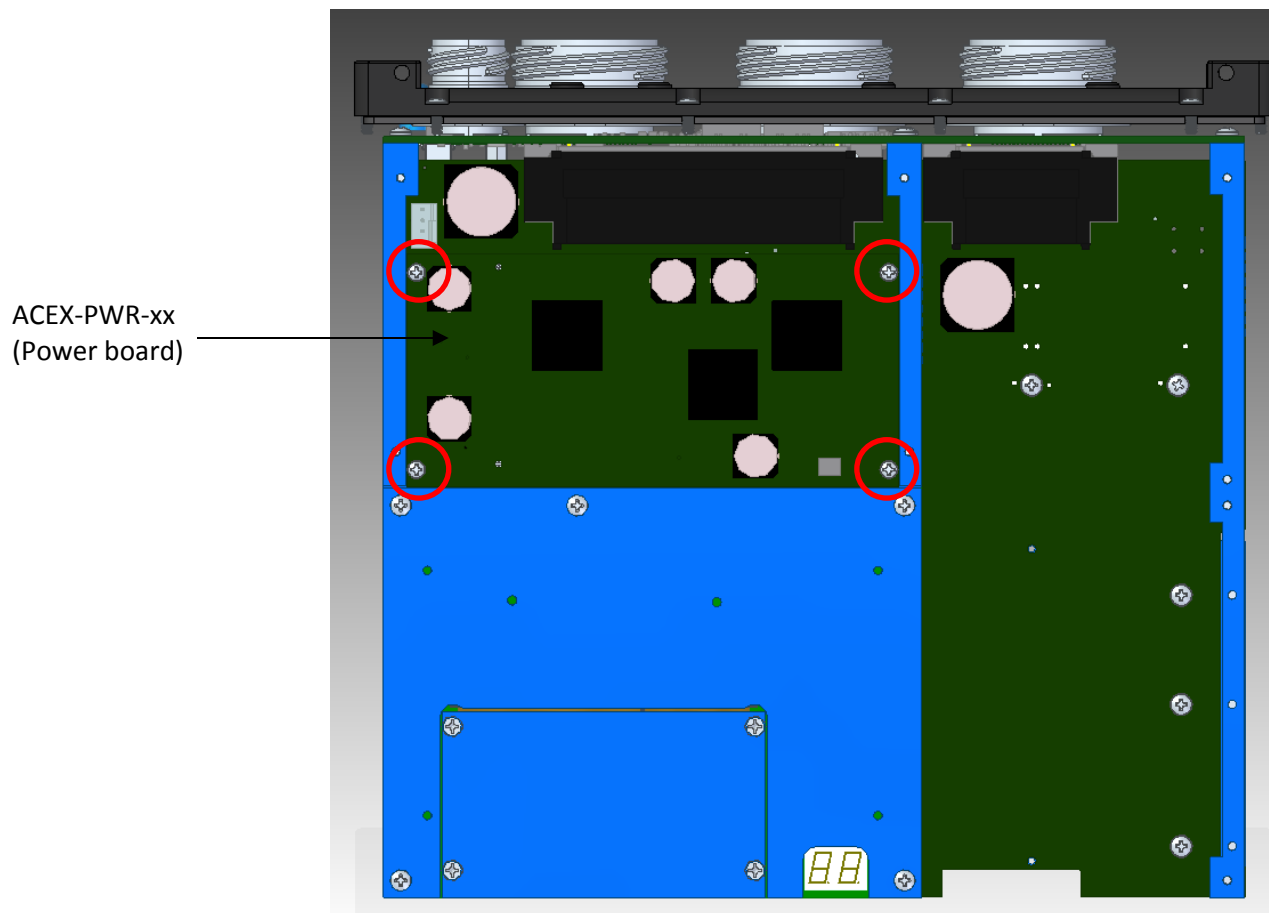
Replacing the battery:

The battery is located on the bottom side of the carrier board (ACEX-46xx) under the ACEX-PWR-xx board.

Battery: CR1225

      3V Lithium Battery

1. Remove the 4 (2M x 6mm) screws from the power board.

ACEX-PWR-xx
(Power board)

2. Remove the power board by lifting straight up.

Battery location
3V / CR1225
+ sign up
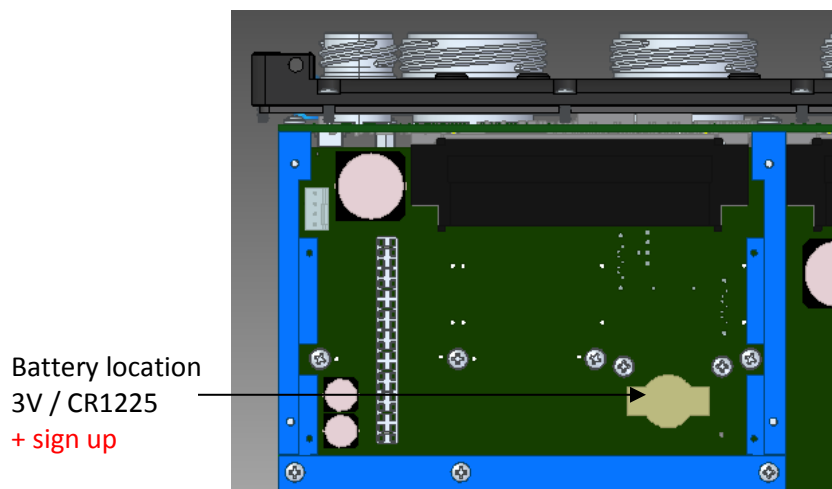
3. Reinstall the power board and secure with 4 (M2.0 x 6mm) screws.

ACEX-PWR-xx
(Power board)

Torque to 3 in-lbs.
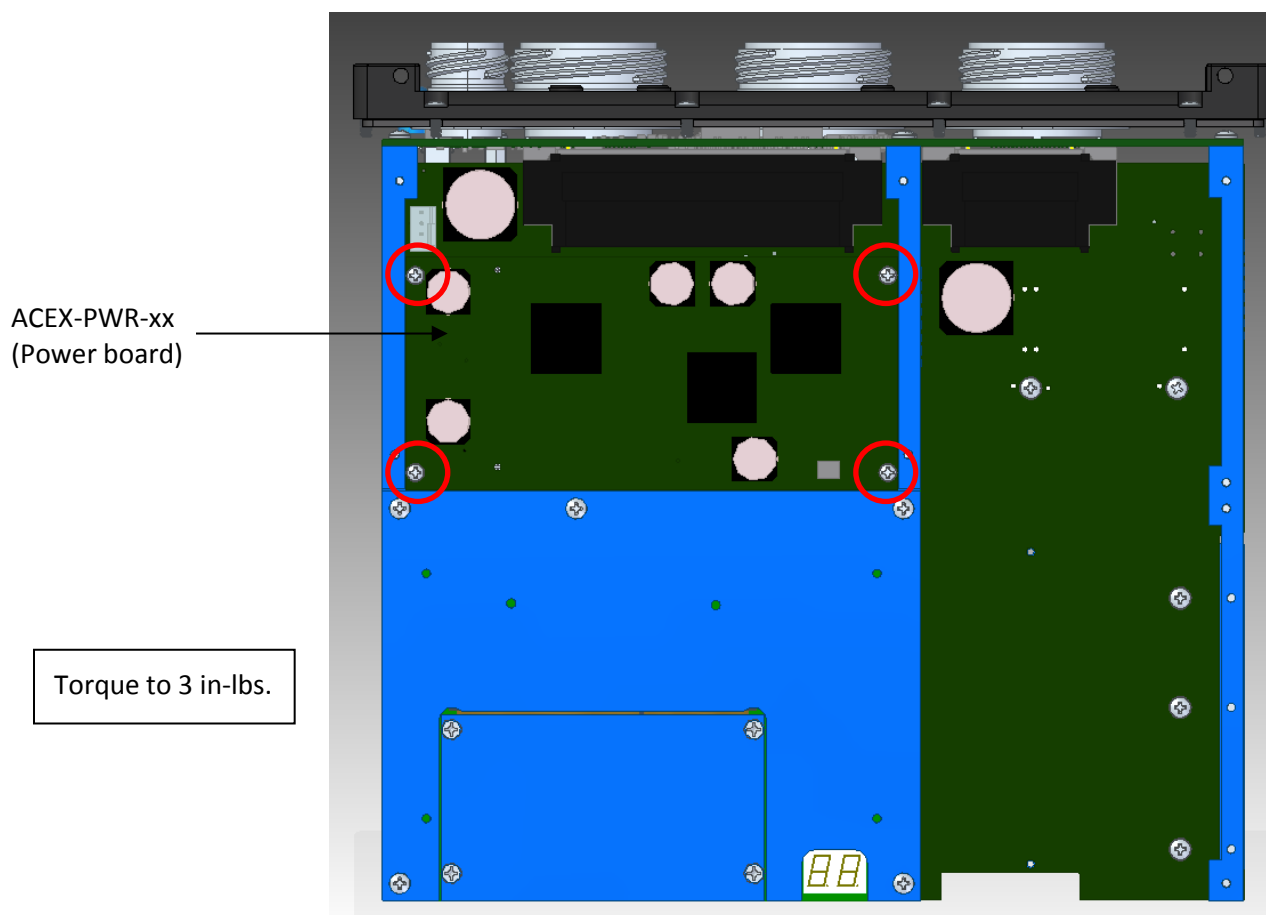
Battery replacement complete

6.5 ARCX- 412X, assembly

1. Carefully slide the ARCX- 412X assemblies back into the enclosure.
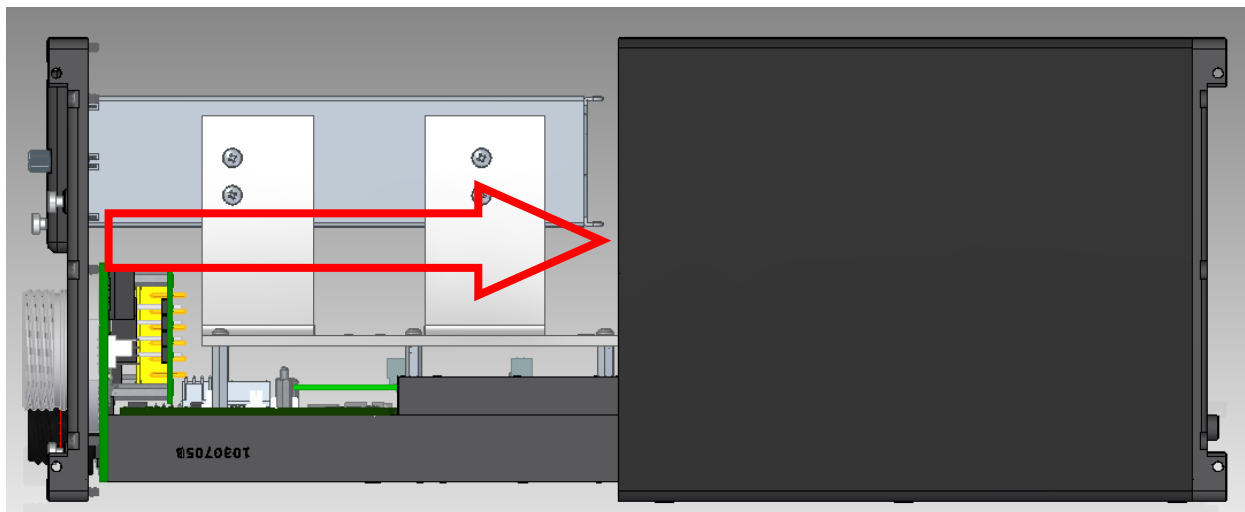
2. Install the 14 screws (M2.5 x 6mm) that secure the front panel only hand tight.
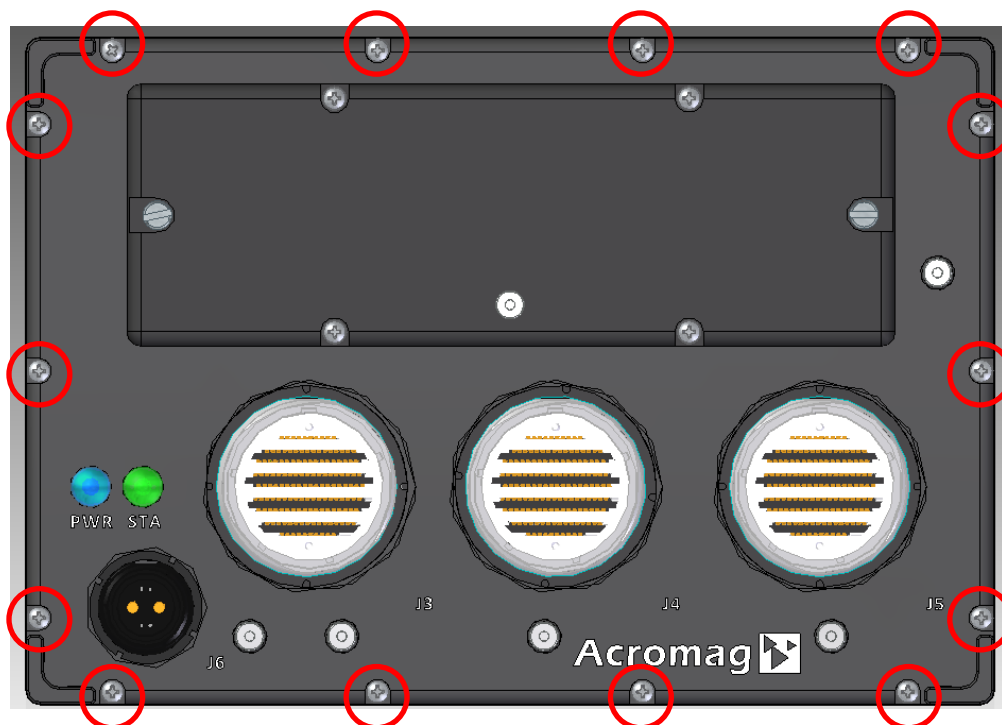
3. Install the 11 screws (M2.5 x 6mm) on the bottom of the unit only hand tight.

4. Torque the 14 screws that secure the front panel to 5in-lbs.
5. Torque the 11 screws on the bottom of the unit to 6in-lbs.

Reassembly of the ARCX- 412X is complete.

7.0 SERVICE AND REPAIR

7.1 Service and Repair Assistance

Acromag has automated diagnostic and test equipment that thoroughly checks the performance of suspect boards. Furthermore, when any repair is made, the board is first tested, then placed in a burn-in room at an elevated temperature, and finally retested before return shipment to the customer.
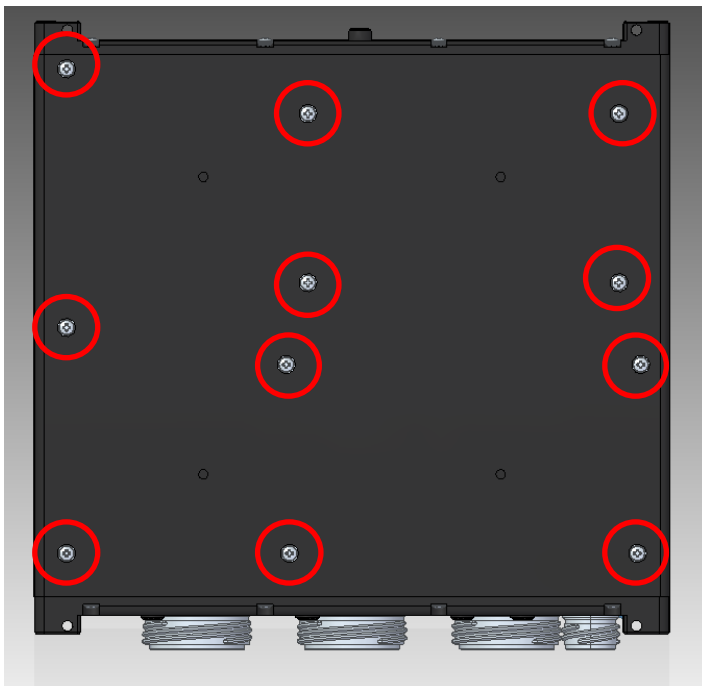
Please refer to Acromag's Service Policy Bulletin or contact Acromag for complete details on how to obtain parts, or return parts for repair.

7.2 Preliminary Service Procedure

CAUTION: POWER MUST BE TURNED OFF BEFORE SERVICING BOARDS

Before beginning repair, be sure that all the procedures in the "Preparation for Use" section have been followed. Also, refer to the documentation of your carrier board to verify that it is correctly configured. Replacement of the board with one that is known to work correctly is a good technique for isolating a faulty part.

7.3 Where to Get Help

If you continue to have problems, your next step should be to visit the Acromag worldwide web site at www.acromag.com. Our web site contains the most up-to-date product and software information.

Go to the "Support" tab to access:
- Application Notes
- Frequently Asked Questions (FAQ's)
- Product Knowledge Base
- Tutorials
- Software Updates/Drivers

Acromag's application engineers can also be contacted directly for technical assistance via email, telephone, or FAX through the contact information listed below. Note that an email question can also be submitted from within the Knowledge Base or directly from the "Contact Us" tab. When needed, complete repair services are also available.
- Email: solutions@acromag.com
- Phone: 248-624-1541
- Fax: 248-624-9234

8.0 SPECIFICATIONS
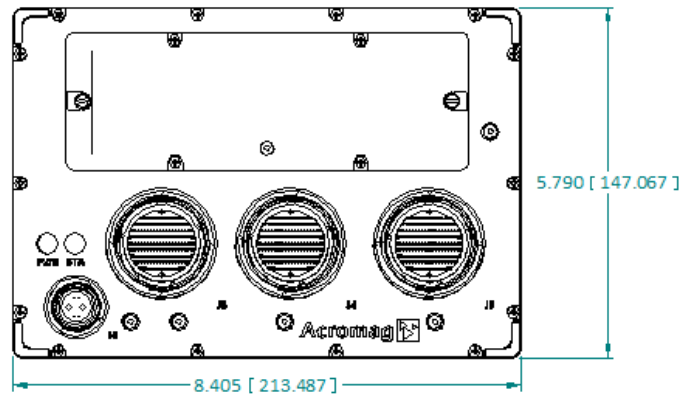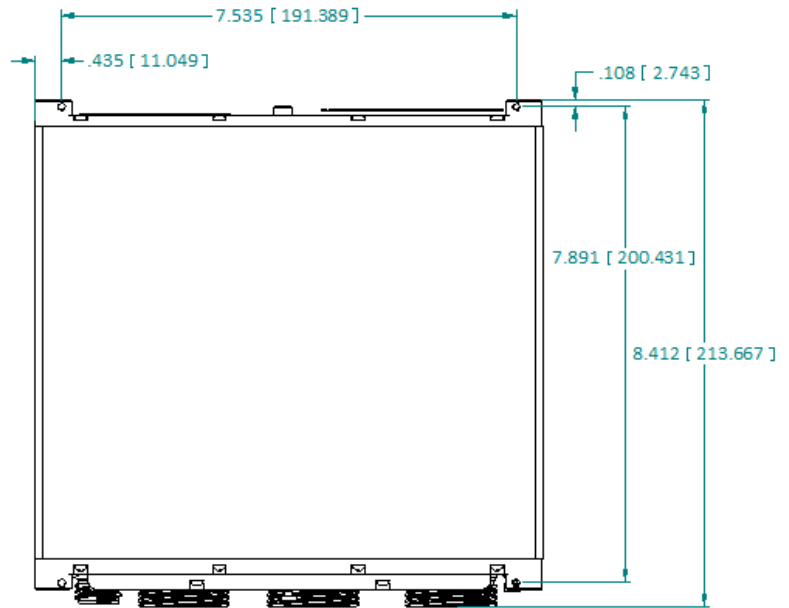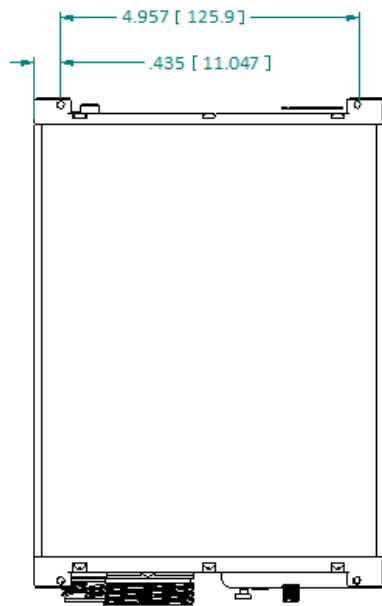
8.1 Physical

ARCX-4122-03:

Height:	5.79 in (147.07 mm)
Width:	8.41 in (213.49 mm)
Depth:	8.41 in (213.67 mm)

Unit Weight (does not include PMC/XMC modules or shipping material):

ARCX-4122-03	12.25 lbs. (5.56 kg)

Mechanical Dimensions ARCX-4122

8.2 Environmental Considerations

Summarized below are the operating temperature range, airflow and other environmental requirements and applicable standards for the ARCX 412X High Speed Series. ATMD-02 (Air cooled heatsink) and ATMD-03 (Cold Plate 8" x 10") are available accessories. See Appendix for additional details.

8.2.1 Operating Temperature and Airflow Requirements

Below are graphs for the 412X series of products. The graphs indicate the maximum allowable ambient air temperature for air cooled applications and the maximum allowable cold plate temperature for cold plate applications.

HOW TO USE THE GRAPHS

In all cases, it is the area under the curve(s) that is the acceptable operating range for the intended end application.

Example: The end application will have a total of 95W in the ARCX-412X enclosure with no additional cooling assistance other than 800lfm of air provided by the user via a fan or by some other air flow resource.

See power tables at the end of this document to help estimate power consumption. The total power would include CPU power plus all other PMC/XMC, etc. boards in the enclosure. The power consumption can vary widely depending on the end application. The user should measure the input power with his end application running to get a better estimate

Using the graph labeled "ARCX 412X AIR COOLED" pick the 95W mark on the horizontal axis (WATTS), draw a line up to the AIR WITHOUT HSK line. From where it intersects that line, draw a line to the left to where it intersects the vertical axis MAX AIR TEMPERATURE. This will indicate that with 95W of power the maximum air temperature allowed is approximately 27C. The user must keep the air at or below 27C for a 95W air cooled application. This application will be limited to "room" temperatures and below. Additional cooling capability must be added if the operating temperature is to be above room temperature.

Disclaimer: These graphs are believed to be conservative. They are believed to indicate typical to worse case customer applications. It is the end user's responsibility to verify the end application power consumption in the ARCX enclosure. Acromag does not take any responsibility for the user applications.

ARCX 412X AIR COOLED

ARCX 4X10/4X20 CONDUCTION COOLED
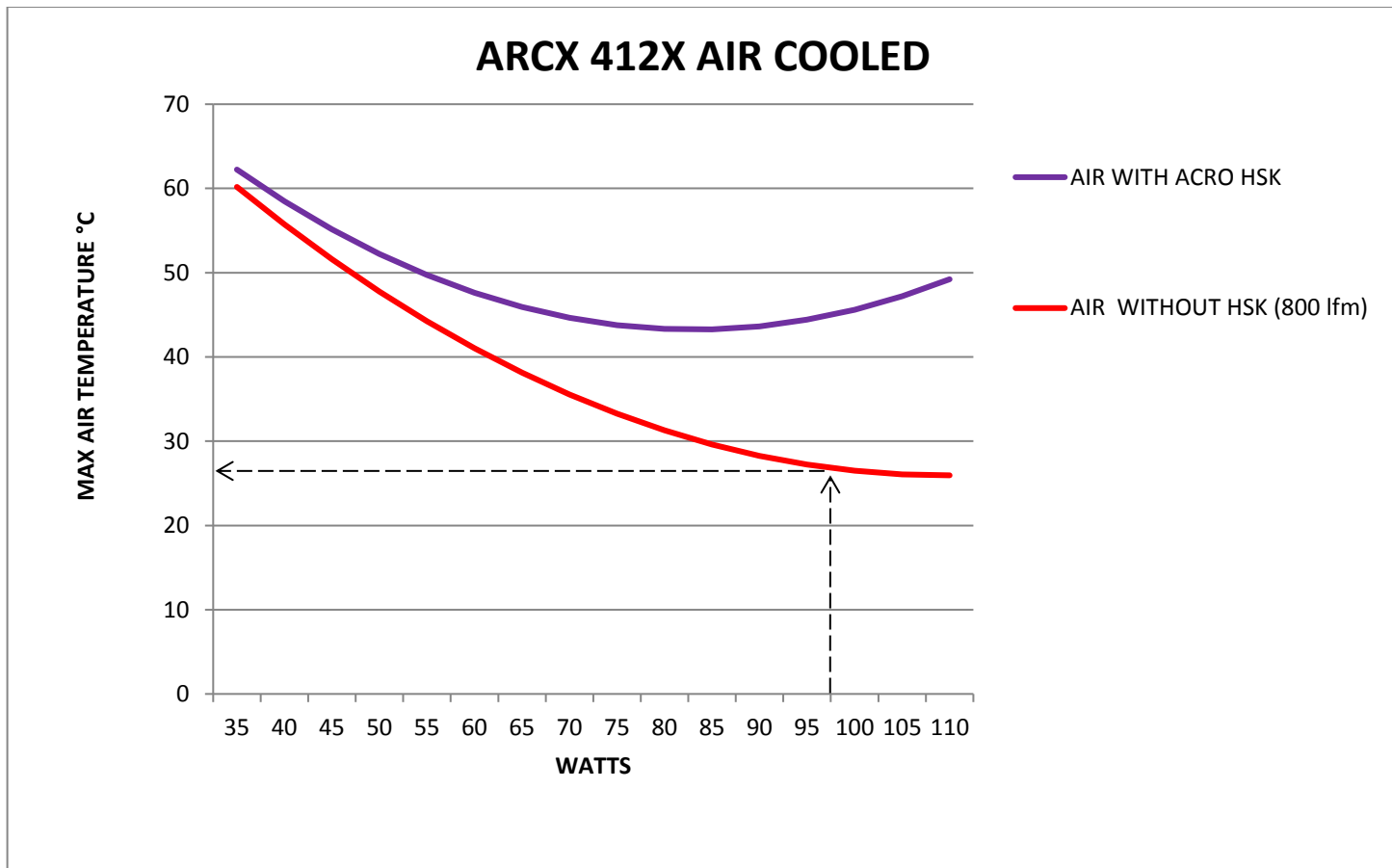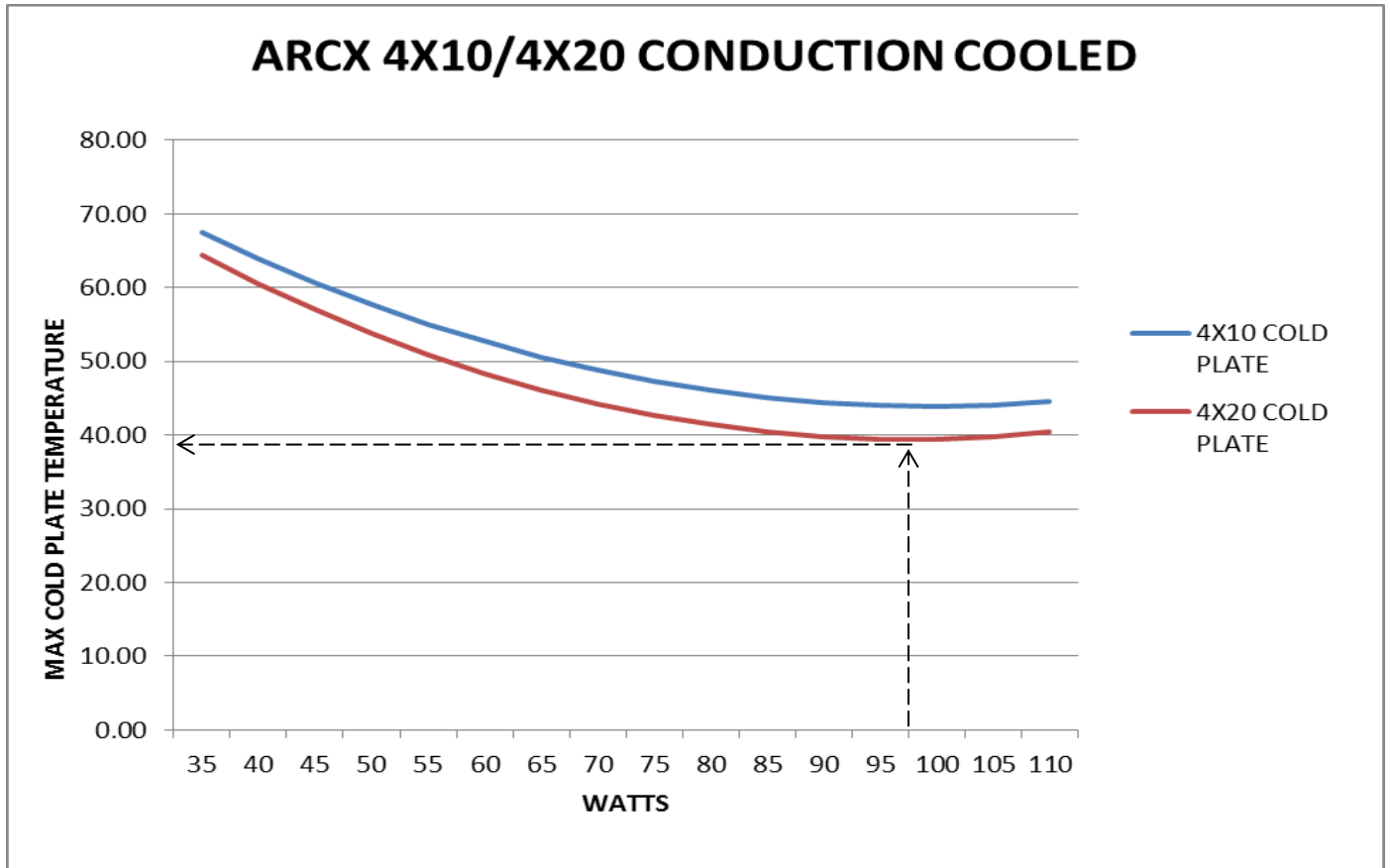
AIR vs COLD PLATE APPLICATIONS

There are two curves that are usable for air applications. It should be understood that the ARCX enclosure was designed to be a conduction cooled enclosure. The performance is limited using air cooling only. There is a forced air heat sink assembly (ATMD-02) available for users that would like to purchase a means to cool the enclosure. Refer to the curves labeled "AIR WITH ACRO HSK" For the previous example; using the Acromag forced air heat sink accessory would widen the allowable "ARCX-412X Air Cooled" ambient temperature at 95W to approximately 45C. If the environment is relatively cool like a server room, then it is possible that the enclosure will work without any additional cooling assistance. In the end application, it will be the user's responsibility to validate whether there is enough cooling capacity for the wattage being drawn.

The ARCX was designed to be a conduction cooled enclosure. The user is responsible for mounting the ARCX to a cold plate and maintaining the cold plate temperature. The cold plate can be a water-cooled plate like the (ATMD-03) or to any surface that will continuously conduct the heat away from the ARCX enclosure. Controlling the cold plate temperature is essential in keeping the ARCX system within its operating temperature range.

The preferred mounting method is with the bottom of the ARCX enclosure mounted directly to the cold plate. The ARCX is capable of being mounted on the other three sides but it will be the user's responsibility to verify the system is being properly cooled. The enclosure was designed to conduct heat away from any of the four

sides. The heat is concentrated on the bottom so that is the preferred mounting surface whenever possible. All the graphs provided are with the bottom of the system mounted to the cooling device.

The graphs are non-linear and should not be misapplied. Only the graph with the intended cooling method should be considered.

Note – The ARCX is capable of applications above 110 Watts.

The preferred method above 110W is with the CONDUCTION COLD PLATE where the cold plate temperature can be controlled / maintained. Air cooled applications above 110W are also conceivable.

Consult factory for any applications beyond 110 watts.

The graphs **cannot** be used to extrapolate beyond 110W.

8.3 Power Requirements

Minimum input Voltage +10V DC

Maximum input Voltage +36V DC

Note: The Maximum current cannot exceed 15 Amps.

8.3.1 POWER ESTIMATION TABLES

The following tables can be used to estimate power consumption.

ARCX- 412X Typical Configurations & Their Power Requirements							
Configuration	i7 CPU Power (Watts)	#1 XMC/ PMC (Opt.) (Watts)	#2 XMC/ PMC (Opt.) (Watts)	Ext. Fan Acc. (Opt.) (Watts)	Power Conv. Dissip. @85% Eff. (Watts)	Total Input Power Req. (Watts)	Total Power Dissip Encl. (Watts)
i7 CPU maximum, Two XMC's @ maximum, with fan accessory	47.0	25.0	25.0	25.2	23.3	155.5	130.3
i7 CPU maximum, Two XMC's @ maximum, no fan accessory	47.0	25.0	25.0	0.0	18.9	125.9	125.9
i7 CPU maximum, XMC #2 @ maximum, no fan accessory	47.0	0.0	25.0	0.0	13.6	90.6	90.6
i7 CPU maximum, no XMC's, no fan accessory	47.0	0.0	0.0	0.0	9.2	61.2	61.2
i7 CPU limited @ 25 watts, no XMC's, no fan accessory	25.0	0.0	0.0	0.0	5.3	35.3	35.3

8.4 Other Environmental Requirements

8.4.1 Relative Humidity

The range of acceptable relative humidity is 5% to 95% non-condensing.

8.4.2 Storage Temperature

The range of acceptable storage temperatures is –40º C to +85º C.

8.4.3 Vibration (operating and Non-operating)

Designed to meet the following:

MIL-STD-810G, Method 514.6

Procedure I (General Vibration)

Category 20 (Ground vehicles/ground mobile)

8-500Hz, Sinusoidal 5Grms X, Y and Z axis. 1hr per axis (15 minute sweep up / 15 minute sweep down)

8.4.4 Mechanical Shock (operating and Non-operating)

Designed to meet the following:

MIL-STD-810G, Method 516.6

Procedure I (functional Shock)

50g , 11ms 1/2 sine 3 positive/negative per axis

(18 drops)

8.4.5 Ingress Protection Water/Dust proof

IEC 60529, IP67

6 - Totally protected against dust

7 - Protection against the effect of immersion between 15cm and 1m

8.4.6 CE

For Model ARCX-4122-03 only
Designed to meet the following:
EMC Directive 2014/30/EU

Immunity per EN 61000-6-2:
Electrostatic Discharge Immunity (ESD), per IEC 61000-4-2.
Radiated Field Immunity (RFI), per IEC 61000-4-3.
Electrical Fast Transient Immunity (EFT), per IEC 61000-4-4.
Surge Immunity, per IEC 61000-4-5.
Conducted RF Immunity (CRFI), per IEC 61000-4-6.
Emissions per EN 61000-6-4:
Enclosure Port, per CISPR 16.
Low Voltage AC Mains Port, per CISPR 16.
Telecom / Network Port, per CISPR 22.
Note: This is a Class A product.
RoHS Directive 2011/65/EU – All Models
In compliance per EN 50581.

8.4.7 FCC US/Canada

For Model ARCX-4122-03 only
Designed to meet the following:
FCC Part 15, Class A Digital Device.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Note: This is a Class A product.

Note: To achieve CE and FCC compliance, the use of ferrite cores were used on some of the cables.
See the following drawings for cable and placement.
Use Laird 28A2029-0A2 or similar European ferrites (order Acromag # 4001135)

CE/FCC SET-UP: ARCX-4122-03
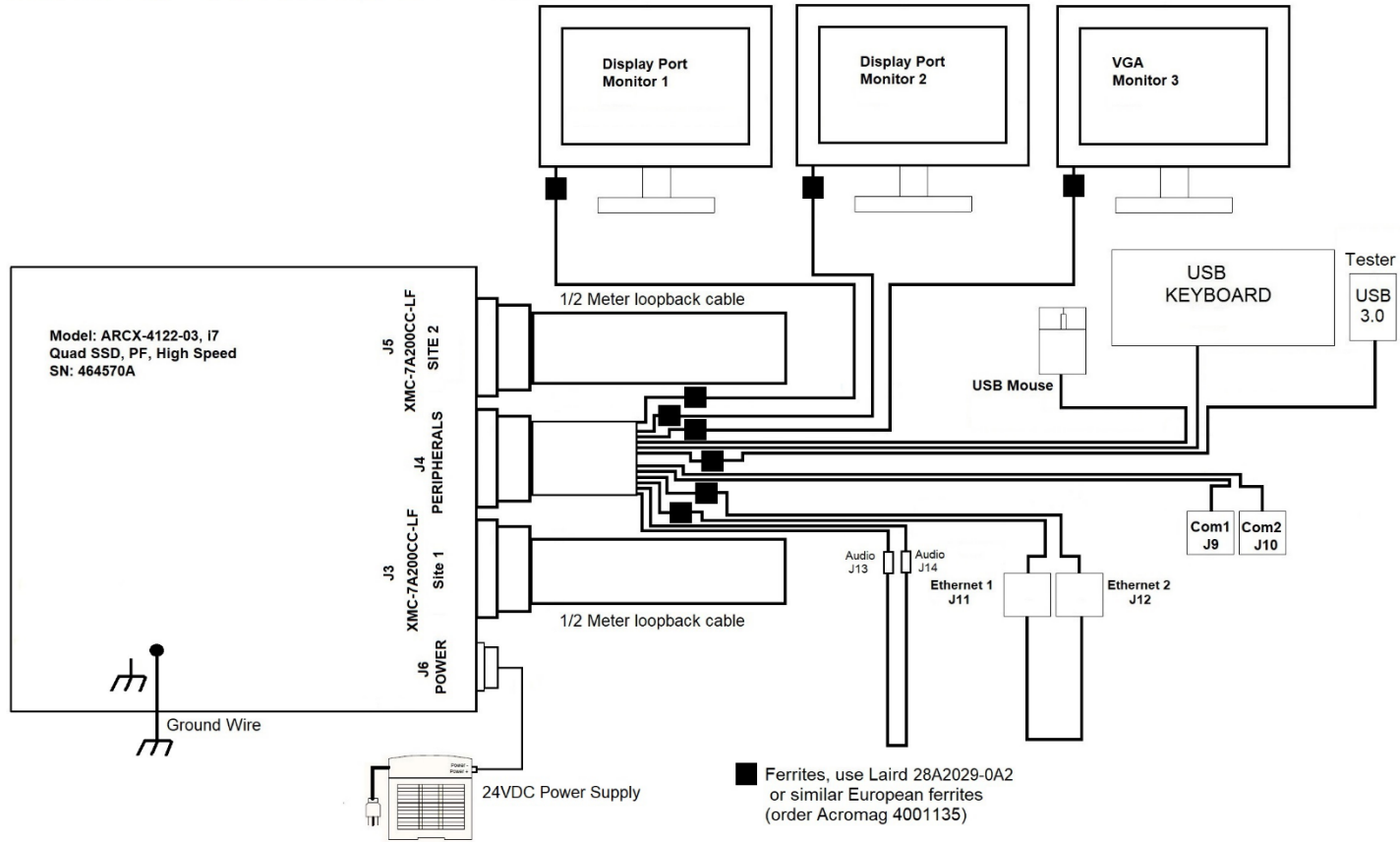
8.5 Reliability Prediction

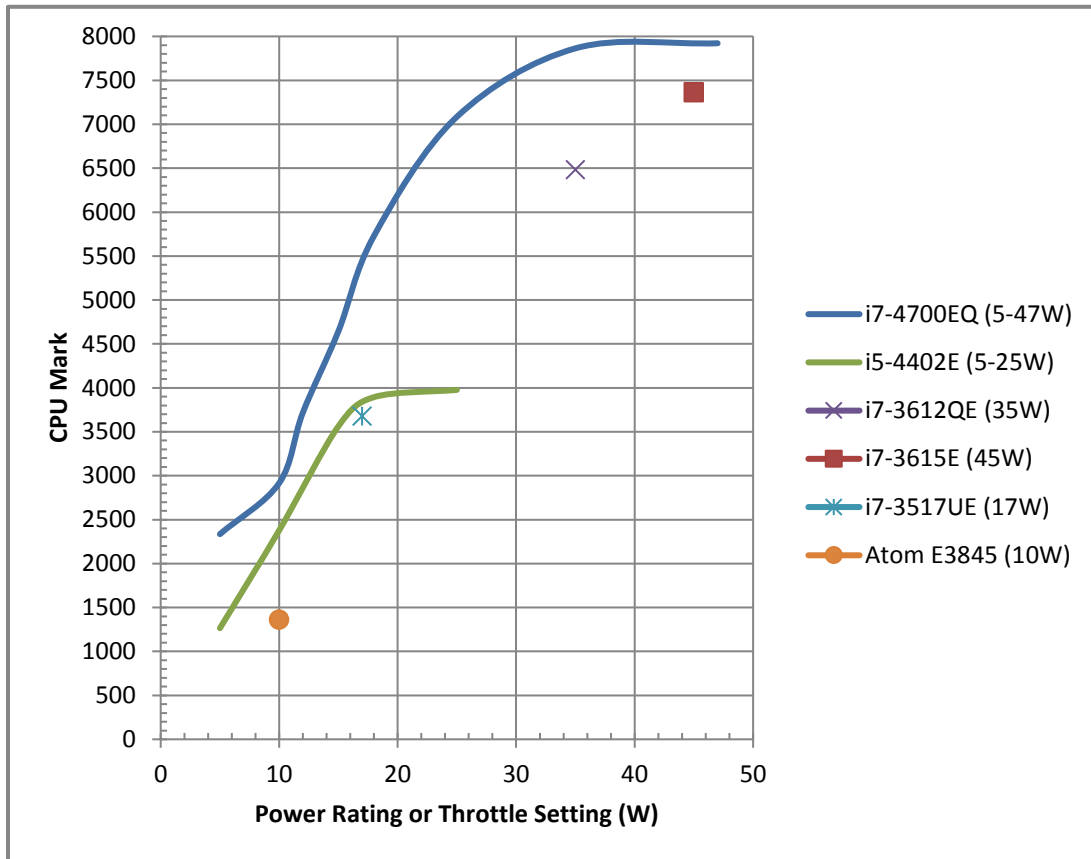Mean Time Between Failure (MTBF) = 110,080 hours @ 25C,

Using MIL-HDBK-217F, Notice 2.

Appendix

Programmable Power Limits

Programmable CPU Power Limit Runs Cool

Acromag's XCOM-6400, ARCX units feature programmable power limits, allowing the user to 'dial-down' the maximum power consumption of the CPU in systems where power is a concern. The graph above shows that the i7-4700EQ CPU outperforms other available embedded Intel CPU's at every power point from 5W - 47W, even the i5-4402E.

By simply programming a lower power limit in the BIOS setup, the 47W i7-4700EQ CPU can be used in applications where less power is available or heat removal is an issue. This is accomplished by the CPU automatically under clocking its frequency to maintain a power level at the set limit[1].

Note: that once the minimum frequency of 800MHz is reached that the programmed limit could be exceeded. Extremely large workloads have a realistic minimum power of around 20W. However, light to medium workloads can effectively maintain a power limit as low as 5-10W.

There are two programmable CPU limits. These are the long-term average Power Limit 1 (PL1) and the short-term Power Limit 2 (PL2). Depending on a windowed Power Limit 1 Time 'constant' Tau, the CPU can spend a short time above power level PL1 up to a maximum of PL2, allowing a significant performance boost for short workloads. If the CPU power remains above PL1 at the end of this time the power is then limited back to PL1. The power must drop below the PL1 limit before it allowed to increase back to PL2 again. For time spent above PL1, an equivalent amount of time must be spent below PL1, to allow it to rise again to PL2. The maximum time could be as much 2.5x the value of Tau.

The default values for each CPU are as follows:

CPU	PL1	PL2	Tau
I7-4700EQ	47W	59W	28 seconds
I5-4402E	25W	31W	28 seconds

PL1 and PL2 can be programmed in watts to any value below the default. Entering a value above the default will result in the default value being used. Entering 0 also results in the default value being used.

Tau can be programmed to any number of seconds up to 256, however it is recommended by Intel to always use the default value of 28. This value maximizes the effectiveness of the short-term performance boost while ensuring that the life of the part is not jeopardized by spending too much time above PL1.

More details about programming these power limits using the BIOS setup utility are provided in *The Acromag Core BIOS Manual*.

Power Filter

Synqor
MQME-28-P-U-ES
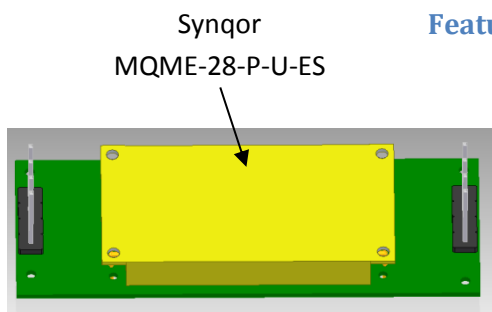
Features

• 20 amps output current
• Very low DC resistance
• > 80 dB differential-mode attenuation at 500kHz
• > 60 dB common-mode attenuation at 500kHz
• Stabilizing bulk capacitor and damping resistor included
• All capacitors are X7R multi-layer ceramic
• Designed to meet all MIL-STD 461 EMI and most RTCA/
  D0-160E Section 22 lightning requirements

Note: The ARCX 412X High Speed Series input current cannot exceed 15 amps
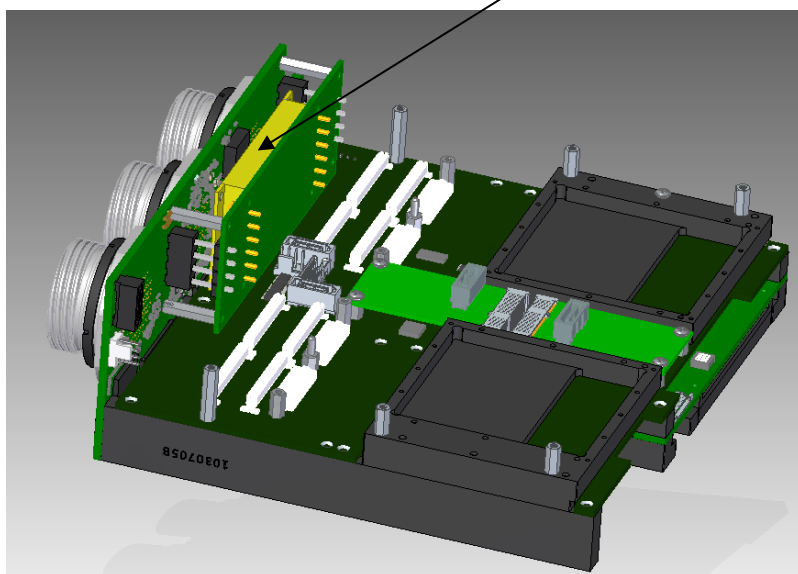
Specification Compliance

MQME series filters (with MQFL converters) are designed to meet:
• MIL-HDBK-704-8 (A through F)
• RTCA/DO-160E Section 16
• MIL-STD-1275B
• DEF-STAN 61-5 (part 6)/5
• MIL-STD-461 (C, D, E)
• RTCA/DO-160E Section 22

The Power filter component is a SynQor P/N MQME-28-P-U-ES (www.synqor.com)

Power Filter module

Quad SSD Drive Bay

The Quad SSD Drive Bay option provides the ability to use 4 SATA SSD hard disk drives in your ARCX 412X High Speed Series unit while maintaining IP67 standard.

The drive bays are housed differently with respect to Quad drives in a fully sealed enclosure. These Drive Bays can be configured with 4 SATA SSD hard disk drives and setup to use RAID 0,1, 5 or 10 depending on the amount of drives used. The QUAD SSD Drive Bays are design for quick and easy removal. The lock feature is not available on the QUAD SSD drive bay but is available as an accessory. Additional Drive Trays (QUAD - P/N 5028-574 and with lock is 5028-575) are also available for quick drive changes.

Access Panel

ARCX-4122-03

Lanyard keeps Access Panel with the Unit while doing quick SSD drive changes
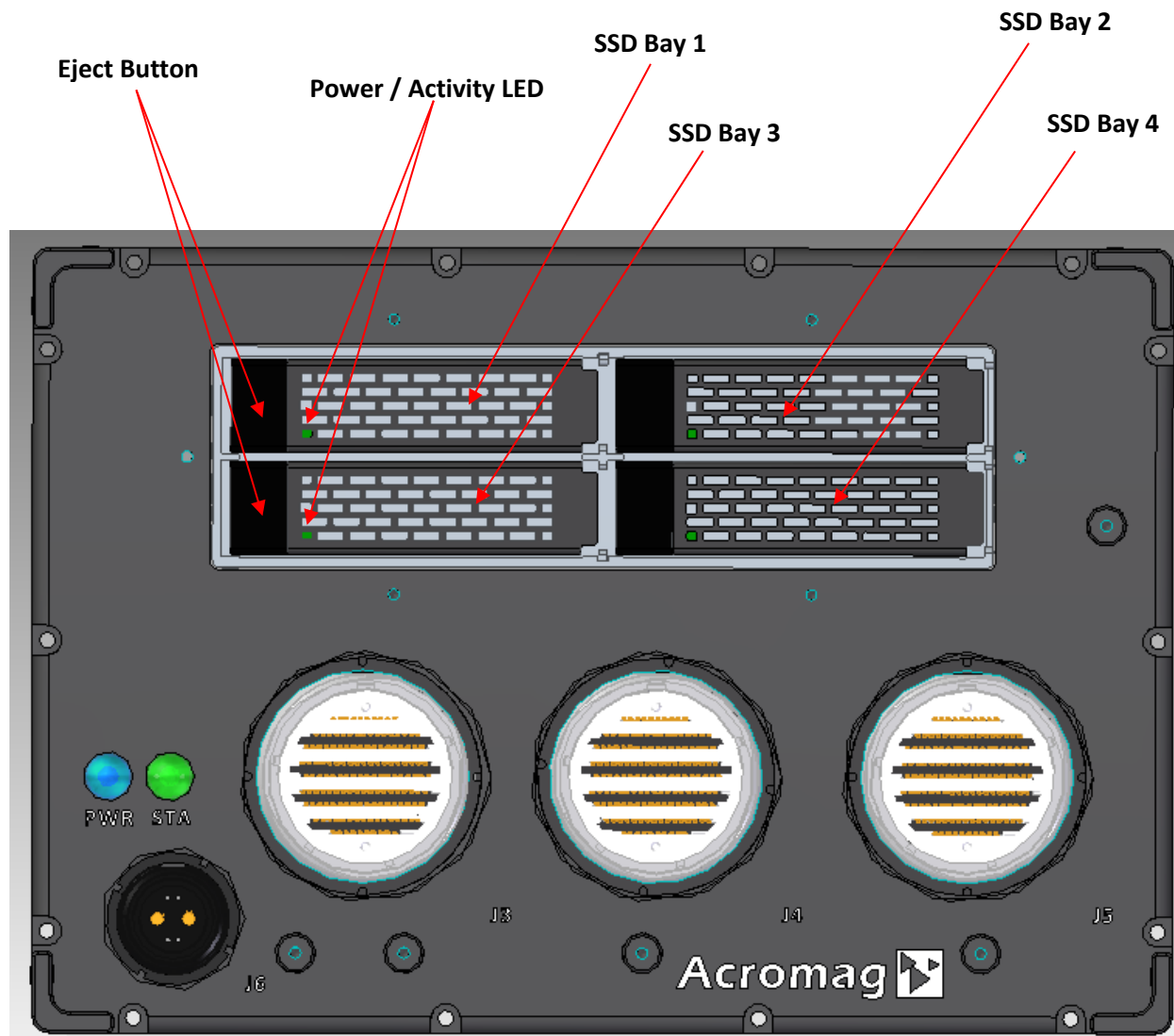
SSD Drive Bays - SATA 2.5 inch drives.

LED (Power / Activity)

- The LED is Green when power is on.

- The LED will flash yellow showing activity.

Note: The SSD Drive power is on when the 10V to 36VDC voltage is on.
Turn off all power before adding or removing SSD Drives to prevent Data loss or corruption.

Quad SSD Drive Bay - SSD (Solid State Drive) Installation

QUAD Drive Bay – Standard configuration is without locks. Separate drive trays can be ordered with locks when required.


WARNING - The extra drive trays are similar for both the DUAL and QUAD SSD drive options but they cannot be interchanged.

5028-574 – Extra tray with no lock for QUAD SSD drive bay only

5028-575 – Extra tray with lock for QUAD SSD drive bay only

<p style="text-align: center; color: red;">Ensure power is off before starting</p>

1. Remove access plate on front of system.
2. Eject drive tray.
3. If drive tray comes with Tray Stabilizer (See figure) it must be removed and discarded.
4. With the screws supplied install SSD drive.
5. Reinstall tray into drive bay.
6. Replace access plate on front of system.

Tray Stablizer

Screws, M3 x 4

2.5 INCH SSD
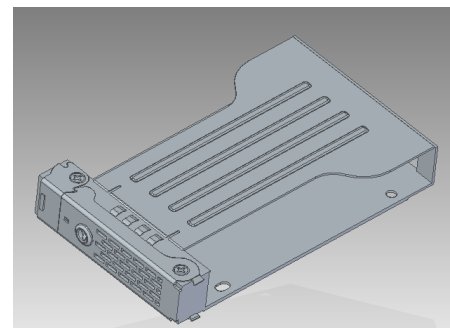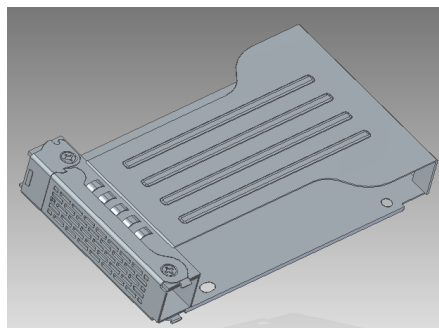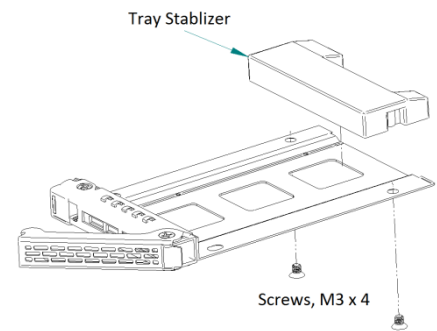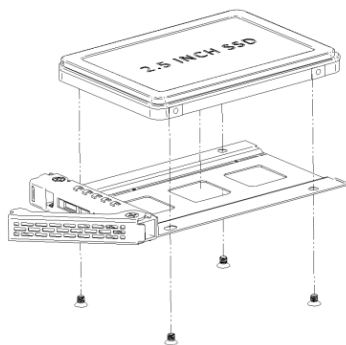
Custom XMC/PMC conduction rings

If you are going to use an XMC or PMC card(s) that are more than 5 watts, it is recommended to have a custom conduction ring(s). Please contact your Sales Engineer to assist you.

If you are planning to create your own, first contact your Sales Engineer. They can assist by suppling the STEP file for the generic conduction ring. This will be a good starting point.

To remove the generic conduction ring(s) that are on the standard box, please follow the guide below.

1. Disassemble the box as show starting in section 6. This includes removing the QUAD drive bay assembly.
2. Lay the assembly upside down to expose the CPU. Remove the 5 M2.5x8MM screws as shown. Carefully pull the CPU straight away from the carrier.
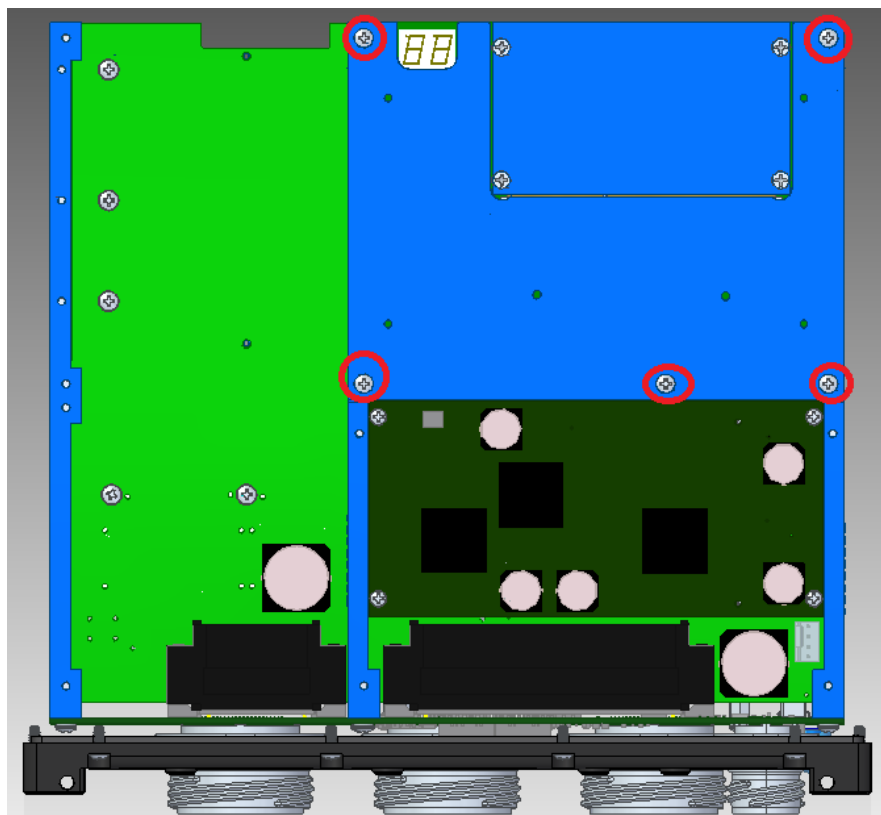
3. This will expose four M2.5x6MM screws that need to be removed.
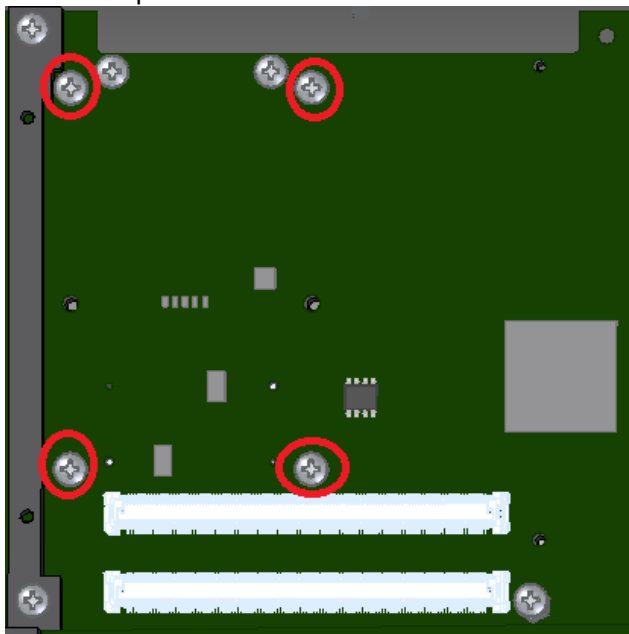
4. Now flip the system back over so the top is exposed. Remove the 6 M2.5x16MM screws shown.
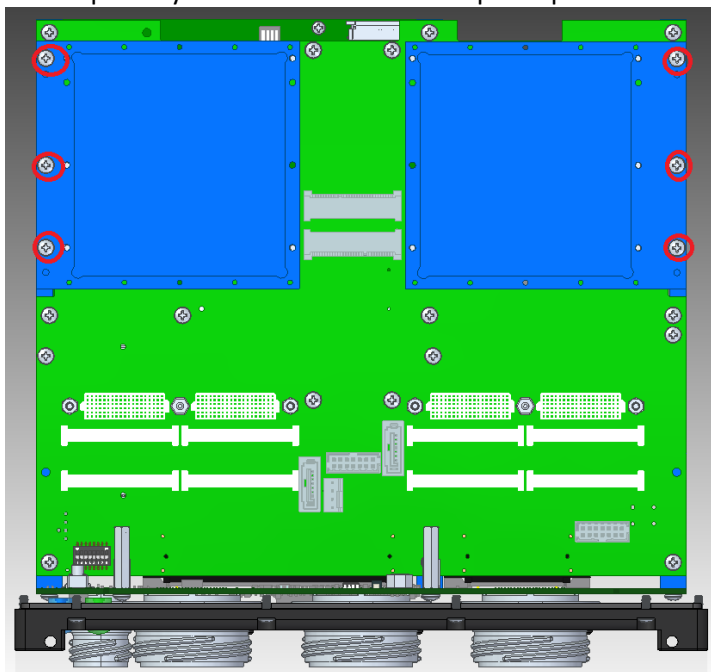
5. The conductions rings can now be removed.

ATMD-02 Air Cooled Heatsink

The ATMD-02 Heatsink is an optional external device that can be purchased. This will allow for product development in the laboratory for the case when no airflow is not enough to cool the system.

The ATMD-02 Air cooled heatsink assembly comes with the following hardware:

- Heatsink assembly.
- Special 38999 #12 power cable with power cable for the fan (No need to order 5028-557 power cable).
- Quantity 4, M3 x 12MM screws to mount the ARCX 412X to the heatsink.

The ATMD-02 is designed to accommodate both the single wide or double wide ARCX computer.

The ARCX box must be revision D or greater. Consult the factory if you have an older version, your system might be upgradable.

Weighs 5.6 lbs.

Approximate dimensions H: 2" x W: 8.2" x D: 9"

ATMD-03 Cold Plate

The ATMD-03 Cold Plate is an optional external device that can be purchased. This will allow for product development in the laboratory for the case when air cooling is not enough.
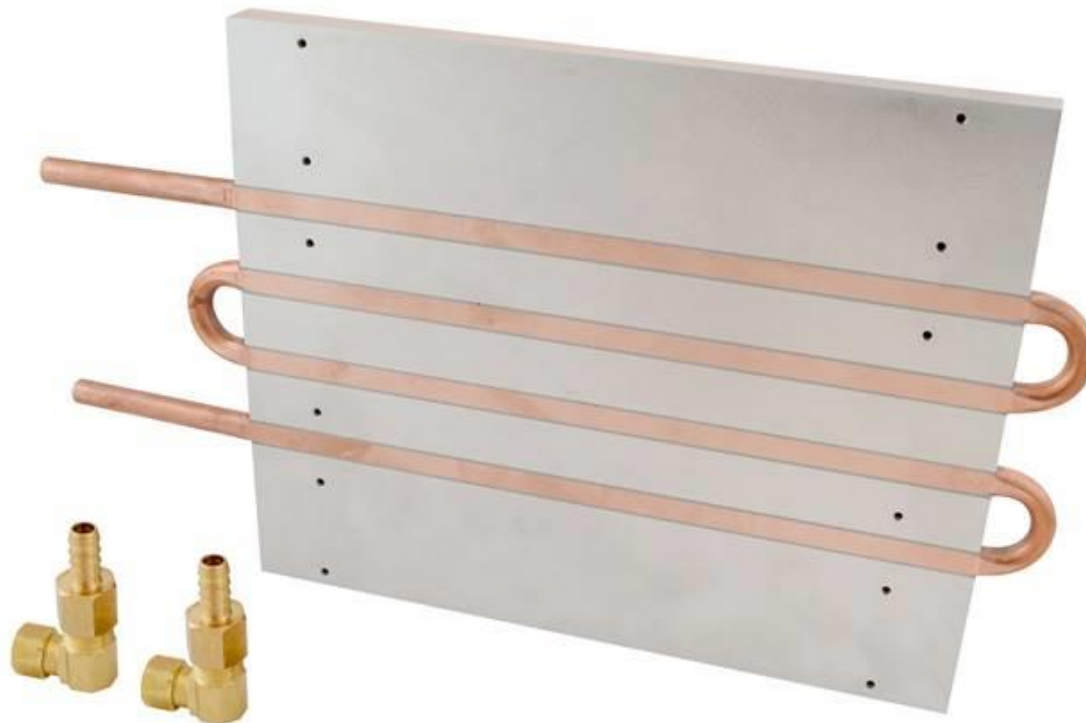
The ATMD-03 Cold Plate assembly comes with the following hardware:

- Cold Plate 8" x 10"
- A pair of 90-degree compression fittings
- A pair of barbed hose fittings for 3/8" hose to allow for a quick installation.
- Quantity 4, M3 x 12MM screws to mount the ARCX 412X to the cold plate

The ATMD-03 is designed to accommodate both the single wide or double wide ARCX computer.

The ARCX computer can be mounted with either the front I/O facing the pipe fittings or away from them.

Weights 5.5 lbs.

Certificate of Volatility

Acromag Model ARCX-4xxx-xx	Manufacturer: Acromag, Inc. 30765 Wixom Rd Wixom, MI 48393			
Volatile Memory				
Does this product contain Volatile memory (i.e. Memory of whose contents are lost when power is removed) ■ Yes □ No				
Type (SRAM, SDRAM, etc.) SDRAM **(located on the XCOM-6400-xxxx)**	Size: Up to 16GB (depends on the SODIM modules installed)	User Modifiable ■Yes □ No	Function: Storage of code/data for CPU	Process to Sanitize: Power Down
Type (SRAM, SDRAM, etc.) PCH internal CMOS SRAM **(located on the XCOM-6400-xxxx)**	Size: 256 bytes	User Modifiable ■ Yes □ No	Function: Data storage for system/BIOS	Process to Sanitize: Momentarily close switches SW1-3 and SW1-4
Non-Volatile Memory				
Does this product contain Non-Volatile memory (i.e. Memory of whose contents is retained when power is removed) ■ Yes □ No				
Type (EEPROM, Flash, etc.) Flash **(located on the XCOM-6400-xxxx)**	Size: 16Mbyte	User Modifiable ■ Yes □ No	Function: Storage of code and data for system/bios	Process to Sanitize: Clear Flash memory by erasing all sectors of the Flash
Type (EEPROM, Flash, etc.) EEPROM **(located on the XCOM-6400-xxxx)**	Size: 16Kbyte	User Modifiable ■ Yes □ No	Function: Storage of Module ID and/or User data	Process to Sanitize: Clear EEPROM by erasing all bytes
Type (EEPROM, Flash, etc.) EEPROM **(located on the ACEX-4620)**	Size: 32Kb (4096 x 8)	User Modifiable ■ Yes □ No	Function: Storage of MAC ID and register setting for operation of Ethernet controller	Process to Sanitize: Clear EEPROM memory by erasing all bytes
Type (EEPROM, Flash, etc.) EEPROM **(located on the ACEX-4620)**	Size: 2Kb	User Modifiable ■ Yes □ No	Function: Storage of User data	Process to Sanitize: Clear EEPROM memory by erasing all bytes
Acromag Representative				
Name:	Title: Sales and Marketing	Email: solutions@acromag.com	Office Phone: 248-295-0310	Office Fax: 248-624-9234

Revision History

The following table shows the revision history for this document:

Release Date	Version	EGR/DOC	Description of Revision
04/21/2016	A	MRT/ARP	Initial Acromag release.
10/12/16	B	DAG	Updated cable drawing and added QUAD shelf removal picture.
24 JUL 2017	C	DAG/ARP	Adding Custom heat rings info, Note about XMC over CPU. Removed references to the 4121.
05 MAR 2018	D	DAG/ARP	Updates for CE compliance.