Freescale Semiconductor
Hardware Getting Started Guide

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MSC8156 AMC Hardware Getting Started Guide

This document describes how to connect the MSC8156 AMC card and verify its basic operation. It also shows how to set the switches and jumpers, and lists the instructions for connecting peripheral devices. In addition, instructions for connecting the MSC8156 AMC to an integrated development environment (IDE), such as Freescale's CodeWarrior, are included; however, instructions for working with the IDE are beyond the scope of this document.

Contents

1 Required Reading

It is assumed that the reader is familiar with the *MSC8156 DSP* and the content of the *MPC8156AMC Design Description (MSC8156AMCDD)*.

2 Definitions, Acronyms, and Abbreviations

Table 1. Definitions, Acronyms, and Abbreviations

AMC	Advanced Mezzanine Card
ATCA	Advanced Telecommunications Computing Platform
BDM	Background Debug Mode
CPLD	Complex Programmable Logic Device
DIP	Dual In Line Package
DSP	Digital Signal Processor
EEPROM	Electrically Erasable Programmable Read Only Memory
GETH	Gigabit Ethernet
HW	Hardware
I^2C (bus)	Inter-IC bus
RCW	Reset Configuration Source
SRIO	Serial Rapid IO
UART	Universal Asynchronous Receiver/Transmitter
MicroTCA	Micro Telecommunications Computing Platform

3 Checking Switches

Perform the following steps to verify the switch settings on the board:

1. The MSC8156 AMC board has two dual in line package (DIP) switches. The default DIP switch positions can provide set up values for the board. Check the default positions and verify the board is operational before changing the switches. The settings for the switches are shown with their default positions in Figure 1, and are described in Table 2.

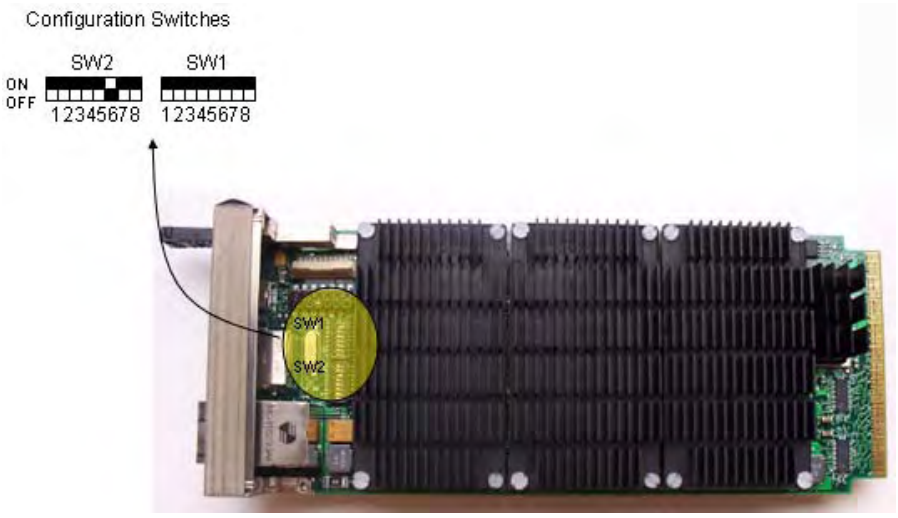


Figure 1. Default Switch Settings

Table 2. Default Switch Settings

Feature	Settings [OFF = 1 ON = 0]	Comments
SW2.1	ON	JTAG chain of three MSC8156s
SW2.2	ON	
SW2.3	ON	Select UART from Ethernet switch
SW2.4	ON	
SW2.5	ON	CPS10Q SRIO switch frequency = 3.125 GHz
SW2.6	OFF	
SW2.7	ON	DSP1 SRIO1 routed to SRIO switch
SW2.8	ON	RCW source from I^2C, Boot Port=SRIO
SW1.1	ON	MSC8156 debug mode is Off [EE0=0]
SW1.2	ON	CPS10Q in master mode
SW1.3	ON	I^2C Bus = default operation
SW1.4	ON	DSP1 SRIO1/PCI Clock source is 125 MHz SRIO
SW1.5	ON	
SW1.6	ON	Future use
SW1.7	ON	Chassis operation
SW1.8	ON	Future use

4 Assembling and Connecting the Board

The following steps should be performed to assemble and connect the board:

1. Freescale recommends running the AMC in an ATCA, MicroTCA, picoTCA chassis, or equivalent to deliver the correct power and air flow to the board. The board should be inserted into the carrier chassis as per the specific carrier instructions as shown in Figure 2.
2. An optional external 12 V power supply connector can be supplied for stand-alone operation as shown in Figure 4.

   In this mode the user must ensure that adequate cooling is provided for the board. Note that this connector violates the AMC component envelope. The MSC8156ADS power supply can be used here.
3. The user should ensure that the heat sinks are fitted securely.

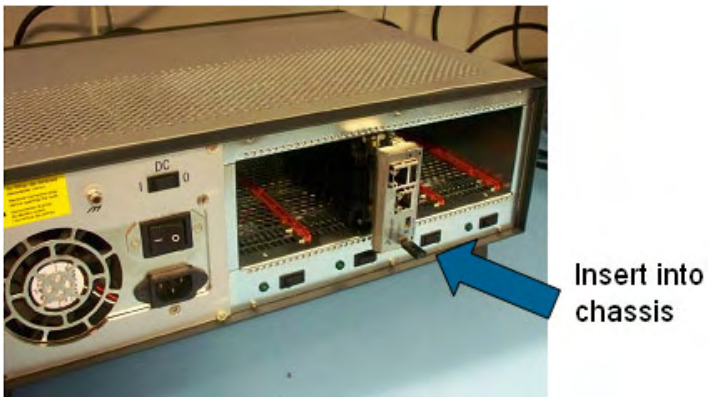


Figure 2. Inserting AMC into Chassis

5 Applying Power to the Board and Checking LEDs

The following steps should be performed to apply power to the board and check the LED operation:

1. Switch on the power to the chassis (or to the stand-alone connector).
2. Check for completion of the reset sequence indicated by the LEDs (see Figure 4 and Figure 5 for locations). A full description of the LED operation is given in Table 3.
3. When powered up:
   a) The five LEDs (D1–D5) flash ON and then turn OFF. D5 then blinks to indicate the board is powered up and alive.
   b) Any Ethernet activity is indicated by D4.
4. Pressing the front panel reset button resets the AMC.
5. Pressing the reset button on the AMC secondary side resets the AMC.

Table 3 shows the list of LED operations.

Table 3. LED Operation

Description	Ref	Color	LED ON	LED OFF
DSP1	D1	Green	User programmable	User programmable
DSP2	D2	Green	User programmable	User programmable
DSP3	D3	Green	User programmable	User programmable
Port 0 Ethernet Activity	D4	Yellow	Flash: Ethernet Activity ON: Link	No link
Board Alive Indicator	D5	Yellow	Flash for board running	Payload power Off
Front Panel [Blue Hot Swap]	D7	Blue	Hot Swap Status	Hot Swap status
Front Panel [Red: Out of Service]]	D8	Red	Error condition	Normal operation
Front Panel [Green: In Service]	D9	Green	Not implemented	Not implemented
UART Activity	D32	Orange	Flash for activity	OFF for no activity

6 Connecting the JTAG Connectivity Unit to the Board

The JTAG connectivity unit (USB tap) enables the CodeWarrior software to work with the board. Use the following steps to complete this connection:

1. Connect the JTAG connectivity unit to the JTAG/ONCE 14-pin connector
2. Switch ON power to the board.
3. Check for completion of the reset sequence (see Section 5, “Applying Power to the Board and Checking LEDs).
4. Continue as per standard CodeWarrior instructions.

Figure 3. Connecting the JTAG

7 Setting the Board for User-Specific Development

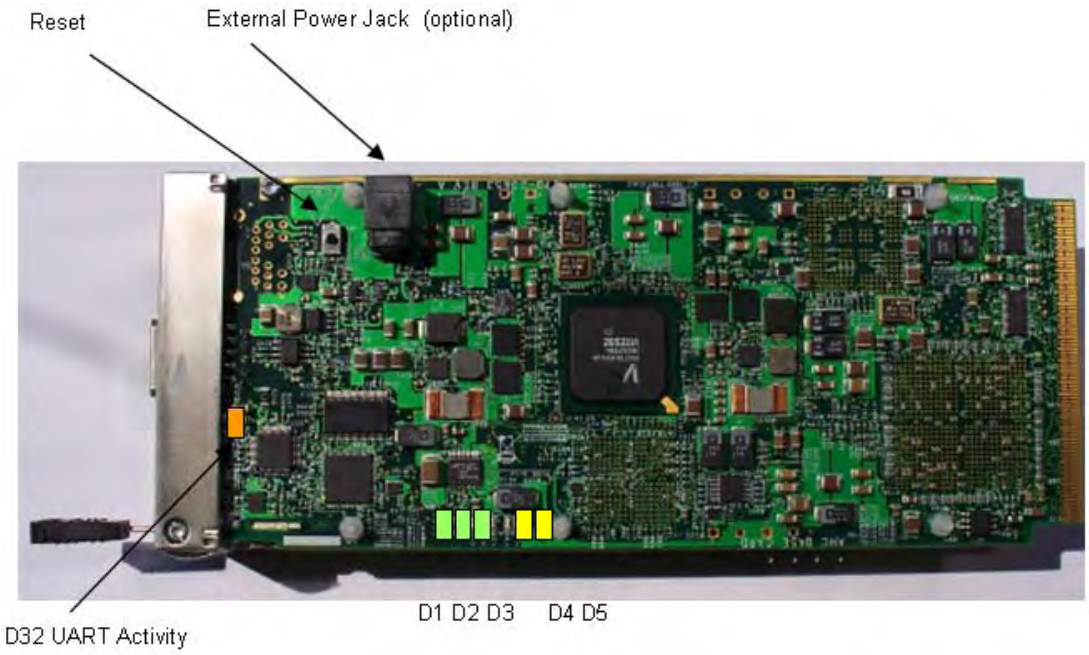
There are two main programming headers on the board, as follows:

1. J7, which can be used to program the MSC8156
2. J12, the expansion connector is designed to offload programming headers and test interfaces from the board. An expansion card, shown in Figure 6, is fitted to the connector that gives access to the following:
   a) COP Header (for QorIQ Mezzanines)
   b) MMC payload UART
   c) MMC serial debug interface UART
   d) MMC JTAG
   e) FPGA JTAG

Table 4 explains the number of configurations that can be set depending on the user mode of application.

Table 4. User Option Switch Settings

Feature	Settings [OFF = 1 ON = 0]	Comments
SW2.1 SW2.2	SW2.1/SW2.2 ON ON ON OFF OFF ON OFF OFF	Select JTAG chain Full chain (x3) DSP1 only DSP2 only DSP3 only
SW2.3 SW2.4	SW2.3/SW2.4 ON ON ON OFF OFF ON OFF OFF	UART selection Ethernet switch DSP1 DSP2 DSP3
SW2.5 SW2.6	SW2.5/SW2.6 ON ON ON OFF OFF ON OFF OFF	CPS10Q SRIO switch frequency 1.25 GHz 3.125 GHz 2.5 GHz Illegal Mode
SW2.7	ON OFF	DSP1 SerDes Port 1: SRIO1 Port connects to SRIO Switch DSP1 SerDes Port 1: SRIO1/PCIe connects direct to backplane Port [4:7]
SW2.8	ON OFF	RCW Source: I^2C, Boot Port=SRIO RCW Source: Hard Coded Option 1
SW1.1	ON OFF	MSC8156 Debug Mode: Off [EE0=0] MSC8156 Debug Mode: On [EE0=1]
SW1.2	ON OFF	CPS10Q Boot Mode: Master mode [reads configuration] CPS10Q Boot Mode: Slave mode
SW1.3	ON OFF	I^2C Bus: Separate CPS10Q & Mezzanine I^2C Bus [default] I^2C Bus: Single CPS10Q and Mezzanine I^2C Bus [EEPROM programming]
SW1.4 SW1.5	SW1.4/SW1.5 ON ON ON OFF OFF ON OFF OFF	DSP 1 SRIO1/PCI Clock source is 125 MHz SRIO 125 MHz SRIO Clock n/a 100 MHz PCIe from backplane 100 MHz PCIe from on board oscillator
SW1.6	ON	Future use
SW1.7	OFF ON	Board power up: Stand-alone mode Board power up: Chassis operation
SW1.8	ON	Future use



D1: DSP1
D2 :DSP2
D3: DSP3
D4: Port 0 Ethernet Activity
D5: Board alive LED

Figure 4. Secondary Side Main Features

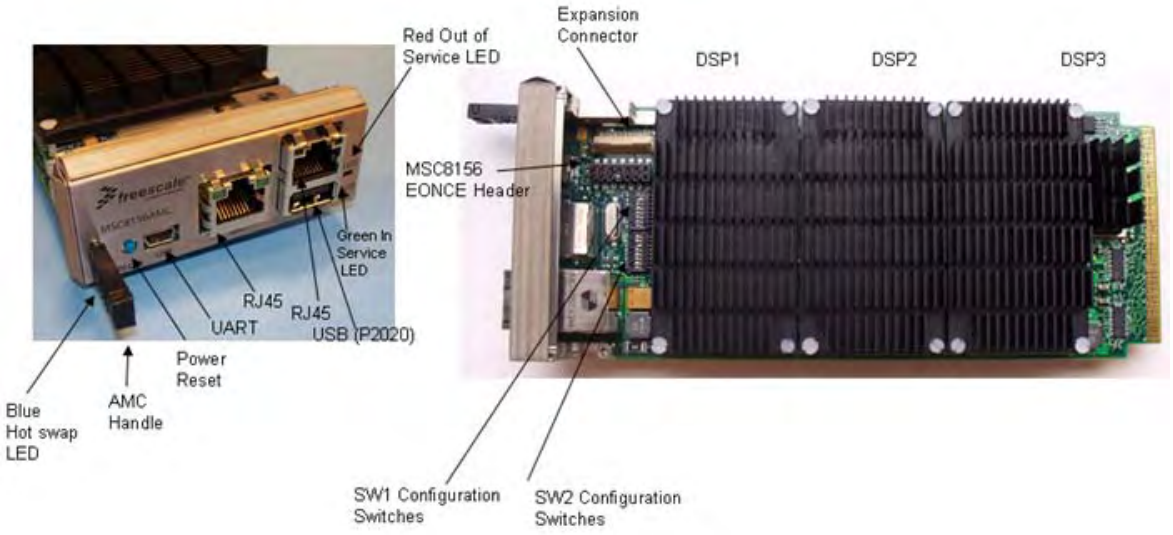


Figure 5. Primary Side Main Features

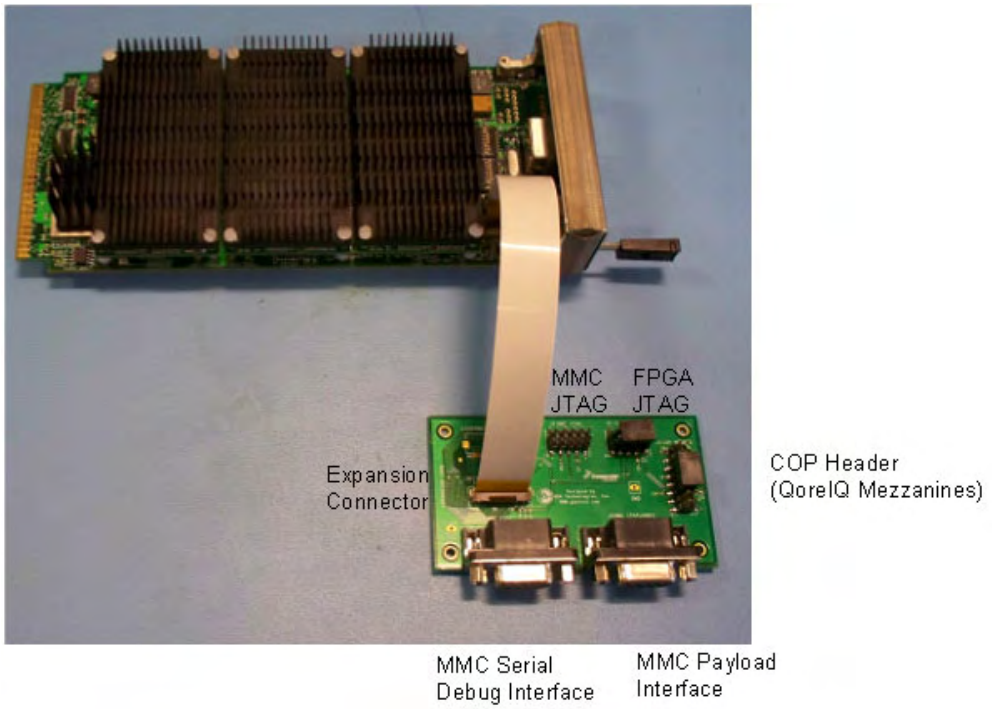


Figure 6. Expansion Board

8 Revision History

Table 5. Document Revision History

Revision Number	Date	Substantive Change(s)
0	01/2010	Initial release.

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