6089-103

CMS APOLLO COMMAND MODULE W/ VU7P AND KU15P

HARDWARE MANUAL

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# Introduction

This manual can be found in the Windows directory:

[\\samba\accuser\cesrdaq\hardware\CMS\_Trigger\](file:///\\samba\accuser\cesrdaq\hardware\CMS_Trigger\)6089-103\_ATCA\_mezz\Docs

under the file name:

6089-103\_Hardware\_Manual\_1-1-1.docx

This manual will be updated routinely. Old versions will be saved in the same area.

# To Do:

1.

# Revision History:

## Version 1.1.1

1. Initial version

# Front Panel LEDs

There are 7 LEDs on the front panel. Starting at the top of the board near the JTAG connector, the LED functions are:

1) K DONE (GREEN) – The KU15P FPGA has successfully loaded a configuration file, either from the on-board EEPROM or by way of the JTAG chain. This LED is driven by the DONE\_0 pin on the KU15P. (SH 5.04)

2) K RGB (RGB) – This is an uncommitted LED that is driven by three signal lines from the KU15P. The firmware design determines the meaning of the display. (SH 2.11)

3) PWR OK (GREEN) – This LED is driven by the BLADE\_POWER\_OK signal from the TM4C controller. It will be activated when the TM4C has finished turning on all FPGA power supplies and they are all good. Since this is a GPIO pin on the TM4C, the programmer can use flashing to indicate a problem. (SH 2.11)

4) TM4C ACT (GREEN) – This LED is driven by the TM4C\_ACTIVE signal. It will be asserted when both the 3.3v and 1.8v management supplies are good, the BLADE\_POWER\_EN signal from the service blade is high, and the TM4C RESET switch is not activated. (SH 2.11)

5) TM4C RGB (RGB) – This is an uncommitted LED that is driven by three signal lines from the TM4C. The program determines the meaning of the display. (SH 2.11)

6) V DONE (GREEN) – The VU7P FPGA has successfully loaded a configuration file, either from the on-board EEPROM or by way of the JTAG chain. This LED is driven by the DONE\_0 pin on the VU7P. (SH 5.04)

7) V RGB (RGB) – This is an uncommitted LED that is driven by three signal lines from the VU7P. The firmware design determines the meaning of the display. (SH 2.11)

# Front Panel Switches

There are 3 switches on the front panel. Starting at the top of the board near the JTAG connector, the switch functions are:

1) K PROG – The KU15P FPGA will try to reload a configuration file from the on-board EEPROM. This switch is not needed when the reload is commanded by the TM4C, nor when the FPGA is being configured by way of the JTAG chain (SH 5.04)

2) TM4C RESET – The TM4C will go through a power-up reset sequence. All switched power supplies will first be disabled before being re-enabled in the proper sequence.

3) V PROG – The VU7P FPGA will try to reload a configuration file from the on-board EEPROM. This switch is not needed when the reload is commanded by the TM4C, nor when the FPGA is being configured by way of the JTAG chain (SH 6.04)

# Front Panel Connectors

There are 9 connectors on the front panel. Starting at the top of the board near the JTAG connector, the connector functions are:

1) JTAG (SH 2.04):

2) TM4C I2C (SH 4.01):

3) K OPTICS I2C (SH 4.01):

4) FPGA I2C (SH 4.01):

5) PWR I2C (SH 4.01):

6) AMC13 CLK IN (SH 2.08):

7) TM4C UART (SH 2.05):

8) CLOCK I2C (SH 4.01):

9) V OPTICS I2C (SH 4.01):

# On-Board Jumpers

There are 8 on-board jumper sites. They are all located near the front panel, between the AMC13 CLOCK IN connector and the JTAG connector. The jumper functions are:

1) JTAG (SH 2.04):

# On-Board Switches

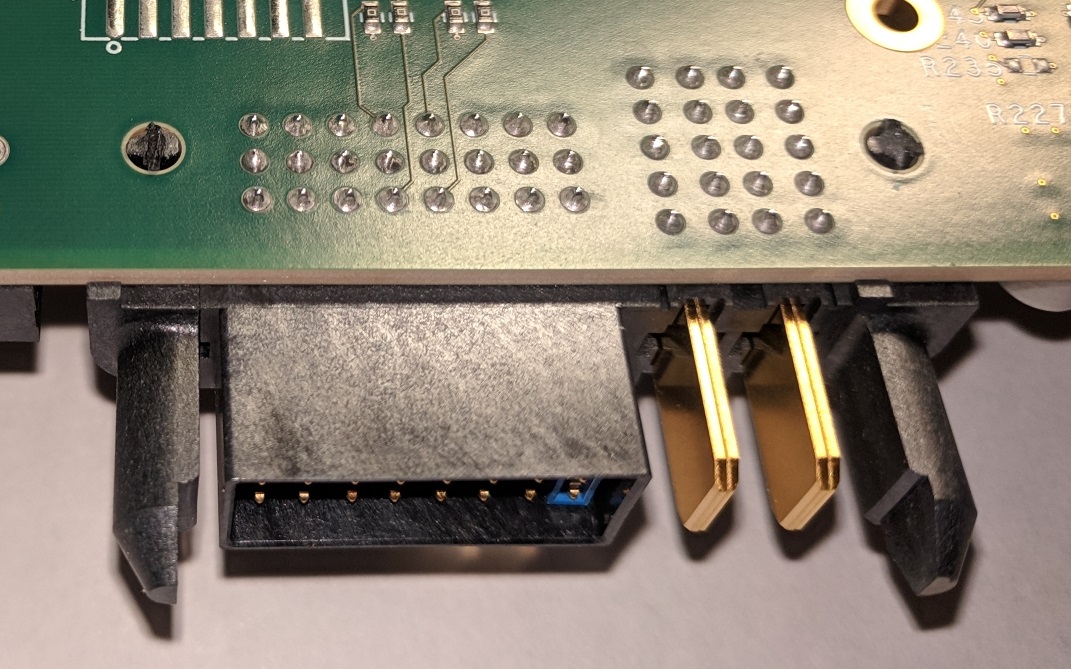
There are 2 on-board DIP switches.

1) JTAG (SH 2.04):

# New Board Setup

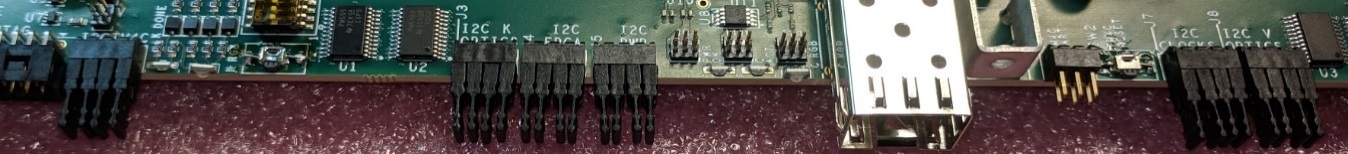
These steps need to be followed for all new boards.

1) Cut the protruding guideposts on side 2 from the P1 connector.



Cut guideposts

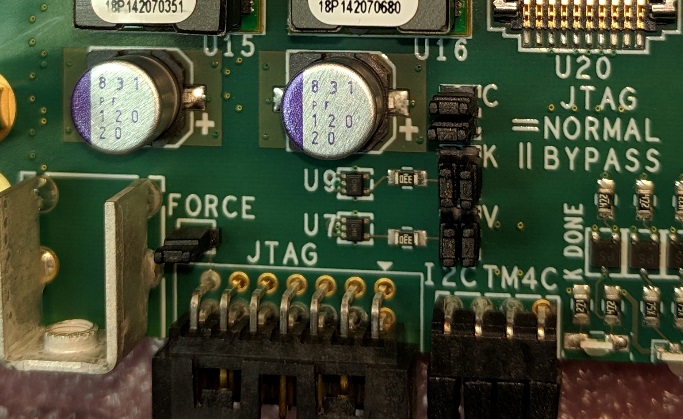
2) Install 4 2-mm jumpers on each of the 6 front panel I2C test connectors.



3) Install 3 sets of 2 50-mil jumpers to configure the JTAG chain. The TM4C should be set for NORMAL, and the KU15P and VU7P should be set for BYPASS. The silkscreen legend indicates how NORMAL has the jumpers parallel to the front panel, while BYPASS has them perpendicular to the front panel.

Set of 4 jumpers

Also install a 50-mil jumper on the pins labeled FORCE. This will force the JTAG chain to use only the front panel connector. Eventually, specially wired connectors will be used and the FORCE jumper will be removed. The special connector will connect pin #13 to GND.



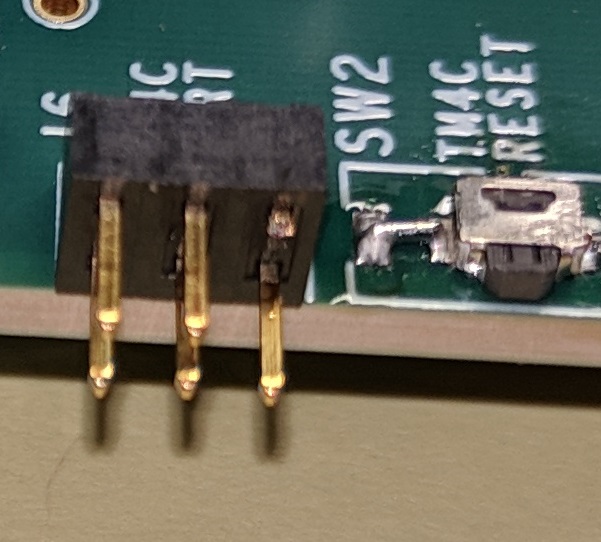
VU7P BYPASS

KU15P BYPASS

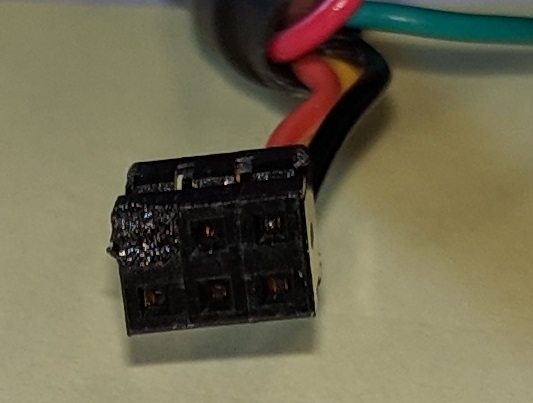
TM4C NORMAL

FORCE FRONT PANEL JTAG

4) Clip pin #6 from the TM4C UART connector on the front edge of the board. This will “key” the header so that the mating connector cannot be inserted in the wrong orientation.



Cut pin #6 (upper right)



Pin #6 is obstructed

# RTM CONNECTIONS