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INSTALLATION GUIDE

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ISSUE 1

PMC-Sierra

PM2353-KIT AAL1GATOR-32/
TEMUX DEVELOPMENT KIT

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1   ABOUT THE AAL1GATOR-32/TEMUX DEVELOPMENT KIT

The AAL1gator-32/TEMUX Development Kit is a self-contained hardware and software reference design tool designed to operate on a Pentium-based PC platform running VxWorks. The kit is designed to help you learn about and evaluate the operation of the PM8315 TEMUX, PM73122 AAL1gator-32 and PM7350 S/UNI-DUPLEX devices.

The AAL1gator-32/TEMUX Development Kit requires a standard PCI platform with:

- Intel-based Pentium motherboard (minimum 233 MHz) with a standard 1.44 MB Floppy and IDE Hard Disk Drive (recommended minimum size 2.1 GB)

- Keyboard

- VGA Video Adapter

- VGA Compatible Monitor

- Available PCI slot

- Minimum of 16 MB of RAM

CAUTION: Before handling the AAL1gator-32/TEMUX Development Board, please make direct contact with the unpainted metal chassis of your PC to discharge any static charge. Maintain grounding by wearing a wrist strap attached to the chassis. Handle the board by top or side edges. Do not touch the edge connector or any components on the board.

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2   HARDWARE INSTALLATION

Follow these steps to install the AAL1gator-32/TEMUX Development Kit Board:

1. Ground yourself using an anti-static wrist strap.

2. Open the shipping container.

3. Ensure that PC power is off. Inspect the AAL1gator-32/TEMUX Development Board for visible damage. Check for obvious mechanical damage and ensure that no components have come loose during shipping.

4. Choose an empty PCI slot.

5. Insert the AAL1gator-32/TEMUX Development Board into an empty PCI slot. Make sure that the board is firmly seated.

6. Apply power to the PC. Confirm that the board is receiving power by checking that the power supply LEDs are lit on both the PC and the AAL1gator-32/TEMUX Development Board.

    The hardware installation is now complete.

2.1   Making the VXWORKS Boot Diskette

The PC containing the AAL1gator-32/TEMUX Development Kit board boots up off a VxWorks boot diskette. All the necessary files and utilities necessary to create a VxWorks boot diskette are provided on the AAL1gator-32/TEMUX distribution CD-ROM.

The following steps are required to create a VxWorks boot diskette:

1. Put the AAL1gator-32/TEMUX Development Kit distribution CD-ROM into your host machine CD-ROM drive.

2. Open Windows Explorer and change to the CD-ROM directory /SOFTWARE/TARGET/UTIL/MKVXBOOT.

3. Label a blank floppy diskette "VxWorks Hard Disk Boot" and ensure that the floppy disk is not write protected. Place the diskette into your floppy drive.

4. Doubleclick on the mvxwbd.bat file. This action will open a MS-DOS window and create the bootable VxWorks floppy. When complete you must close the MS-DOS window yourself.

Once the MS-DOS window has been closed, the VxWorks bootable floppy disk is ready and the user can remove it from the host machine floppy drive. The file bootrom.sys will be on the bootable floppy.

Note: The MS-DOS window may not close automatically after the MS-DOS task has been finished. In that case the MS-DOS box will have "Finished…" in the top left corner. The user can then close the window manually.

2.1.1 Software Binaries Installation

These steps describe how to load a binary version of the application onto the target platform.

Assumption: The hard drive on the target has been formatted and has a FAT16 (i.e. MS-DOS, Windows 95) operating system installed.

1. Reboot the target platform in MS-DOS.

2. Insert the distribution CD-ROM into the target machine CD-ROM drive.

3. Set the current directory to the root directory of your CD-ROM (e.g. "cd d:\").

4. Run the install.bat program which will copy the necessary files to the target platform hard drive.

5. Insert the VxWorks boot diskette and hard reboot the target system.

   - The target system will boot from the diskette containing the VxWorks loader.

   - The VxWorks loader will access the hard drive and load the VxWorks OS image and its symbol table.

   - The VxWorks OS image will run the startup script.

   - The startup script will load the object modules.

6. You should now be at the VxWorks shell.　Type the test command "al32SelfTest %a,%b" where:

   - %a is the slot number of the AAL1gator-32/TEMUX card

   - %b is the "animate" mode parameter. Animate mode steps through each of the writes to the registers at a visible pace and displays the values on the terminal. This parameter can be 0 or 1 (1 for animate mode).

Note that the `%b` parameter is optional and defaults to 0.

This self-test performs two board level tests. The first test uses the pseudo-random sequence generator and detector to test the line side of the TEMUX. A PRBS 23 pattern is transmitted by the generator into the DS3 LIU. The DS3 LIU is configured for loopback using the jumper (J5). Alternatively, an external loopback cable can be used to loopback the data, but the cable is not provided. The receive line interface of the TEMUX receives the data and verifies that the pattern is being received without errors.

The second test transmits cells with framed DS3 AIS data from the TALP of the AAL1gator. The S/UNI-DUPLEX then loops the cells back on the UTOPIA interface. The test then checks the AAL1gator for dropped cells and sequence number errors. The data is then transmitted across the SBI bus and verified by the TEMUX.

You will see status information on the screen that indicates the progress of the self-test. Once the test has been finished the following message on the target machine screen will appear:

```
AAL1-32/TEMUX board in slot [%d] self-test PASSED!
```

7. Configure the board for COMET-QUAD operation by shorting jumper J8. Type the test command "`al32SelfTest_CometQ %a,%b`" where:

- `%a` is the slot number of the AAL1gator-32/TEMUX card

- `%b` is the "animate" mode parameter. Animate mode steps through each of the writes to the registers at a visible pace and displays the values on the terminal. This parameter can be 0 or 1 (1 for animate mode).

Note that the `%b` parameter is optional and defaults to 0.

The AAL1gator-32/COMET-QUAD Self Test verifies the ability of the development kit to configure the AAL1gator-32, COMET-QUAD, and S/UNI-DUPLEX for correct operation. This test also verifies the datapaths between the three devices. The test configures the COMET-QUAD to overwrite the entire frame transmitted on the lowspeed link with PRBS data. The AAL1gator-32 is then configured to circuit emulate the 4 unframed T1 links. The AAL1 cells are then transmitted across the UTOPIA bus where they are looped back by the S/UNI-DUPLEX.

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2.1.2 Software Source Code Installation

The following steps install the software development environment and are specific to the Tornado 2.0 VxWorks environment. Users installing the code on a different environment should use this as a reference only.

1. Modify your `config.h` by unconditionally including `prjparams.h` file (provided on the distribution CD-ROM) at the bottom of the file. Modify `sysLib.c` to include the file `sysPci.c` provided in the BSP directory. Add the following code fragment to the `sysLib.c`, function sysHwInit:

Existing code:

```
#if defined (INCLUDE_FEI) || defined (INCLUDE_FEI_END)

sys557PciInit();

#endif /* INCLUDE_FEI || INCLUDE_FEI_END */
```

Add the following code:

```
/* PMC PCI support */

#ifdef INCLUDE_PMC_PCI_LIB

sysfPmcAdapterPciInit ();

#endif /* INCLUDE_PMC_PCI_LIB */
```

Existing Code:

```
#ifdef INCLUDE_LN_97X_END

sysLan97xPciInit ();

#endif /* INCLUDE_LN_97X_END */
```

2. Add the supplied `sysPci.c` and `sysPci.h` files to your BSP directory, e.g. `D:\tornado2\target\config\pc486.`

3. Compile VxWorks and create a boot floppy.

4. Create a Tornado project. Select "Create a bootable VxWorks Image". Fill in the project, location and description. Next, select "Add to a New or Existing Workspace". In the next dialog box when asked, "Would you like to base your

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project on:" select "A BSP" and select the BSP directory from above. VxWorks will then generate a project. You can now build a VxWorks image from the workspace. Please, see Tornado2 documentation for more details.

5. Create the root directory for your project (e.g. `c:\project\al32Board`).

6. Create the following subdirectories in your project directory:

    - al32
    - temux
    - duplex
    - Cometq
    - shared

7. Unzip the driver source code from the distribution CD-ROM to the corresponding directory on the host hard drive.

8. If necessary, modify the directory variable names in the makefiles, to reflect your actual driver and directory names.

9. Compile the source files using the makefiles supplied with each software driver. Note that the shared component doesn't have the makefile and it is not necessary to compile it. This component represents the shared files used by the rest of the applications in the system.

2.2   Target Console Application Level Debug Messages

During the development cycle of the product it is extremely important to know what is happening in the system at any given point in time. Debugging messages are therefore provided and appear on the target system console during command execution.

AAL1gator-32/TEMUX Development Kit drivers offer the following application level debug message settings:

- **dbgAppLogOn** - turn on application level debug messages.

- **dbgAppLogOff** - turn off application level debug messages.

- **dbgAppLogLvlNone** - no application level debug messages.

- **dbgAppLogLvlVerb** - verbose application level debug messages. In this mode all application level debug messages will be displayed on the terminal console.

- **DbgAppLogLvlMed** - medium application level debug messages. In this mode only more significant application level debug messages will appear on the terminal console.

- **dbgAppLogLvlErr** - error application level debug messages. In this mode only critical application level debug messages will appear on the terminal console.

- **dbgAppLogLvlCstmr** - customer application level debugging messages. In this case only the customer application level debug messages will appear on the terminal console.

- **getAppLogLvl** – returns the application debug messages level (NONE, VERB, MED, ERR, CSTMR).

- **getAppLog** – returns the application debug messages status (ON or OFF).

The application level debug messages must be turned ON in order for application debug messages to appear on the target system console (dbgAppLogOn). The application debug message level can be set at the target console or from the remote machine.

CONTACTING PMC-SIERRA, INC.

PMC-Sierra, Inc.
105-8555 Baxter Place Burnaby, BC
Canada V5A 4V7

Tel: (604) 415-6000

Fax: (604) 415-6200

Document Information: document@pmc-sierra.com
Corporate Information: info@pmc-sierra.com
Application Information: apps@pmc-sierra.com
Web Site: http://www.pmc-sierra.com