Set-Top-Box Software for Broadcom Reference Designs

Installation Guide Supplement, Version 1.1

Revision History

Revision	Date	Change Description
97125-SWUM101-D1	04/22/10	**Updated:** • Table 5: "BCM7125 Family SoC Linux Kernels," on page 13 • Table 6: "Platform CFE Selection," on page 15 • Code examples in "Booting the Reference Board" on page 18 • "MoCA® Setup and Use (BCM97x25 boards only)" on page 20 • Serial Input (DVB-ASI) definition in Table 9: "Transport Streamer Selection," on page 23
97125-SWUM100-R	12/07/09	Initial release

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Section 1: Introduction

About This Document

Purpose and Scope

This document provides information on installing and running Broadcom's Brutus™ application and Set-Top Box (STB) reference software on its BCM7125 family of single-chip, DOCSIS/DSG reference design platforms.

While it would be generally applicable to the dual-chip DOCSIS/DSG platforms, there are some differences, and some files mentioned here that aren't included in their releases.

Unless otherwise stated, the information provided in this document applies to the following DOCSIS/DSG reference boards:

- BCM97019
- BCM97119
- BCM97025
- BCM97125

For detailed information on the reference software, refer to *Reference Platform Installation Guide for Linux Systems* (document number STB_Platform-SWUM101-R).

Audience

This document is for software developers and other engineers using one of the reference platforms in the BCM7125 family for testing or demonstration purposes.

Technical Support for Registered Customers

Broadcom provides customer access to technical documentation and software updates through its Customer Support Portal (CSP). To access the CSP, go to http://support.broadcom.com.

To request access to the CSP or other restricted Broadcom sites, contact your Broadcom Sales or Engineering representative.

Reference Documents On DocSAFE

Title	Document Number
BCM7125 Hardware Module 1 (General Information)	7125-1HDM100-R
Reference Platform Installation Guide for Linux Systems	STB_Platform-SWUM101-R
Brutus Usage Guide	STB_Brutus-SWUM300-R

Other Online References

Documentation	Online Location
Broadband Studio 3.0 (for BCM97125 and BCM97019 reference boards)	http://bcgbu.broadcom.com/bse/software/tools/bbs/default.aspx.

Available Reference Schematic Diagrams

Title	Filename
BCM97019CBMBZ, Rev. P2	824-118358-0000_p2.pdf
BCM97019CBMBZ_EURO, Rev. P2	824-118358-0001_p2.pdf
BCM97125CBMBV10_00 BCM97125CBMBV10_01 BCM97125CBMBV10_02 DDR2 board, Rev. P3	BCM97125CBMBV10_P3_DDR2.pdf
BCM97125CBMBV00_00 BCM97125CBMBV00_01 BCM97125CBMBV00_02 DDR3 board, Rev. P3	BCM97125CBMBV00_P3_DDR3.pdf

Product Descriptions

BCM7125 Family SoCs

Broadcom's BCM7125 family of SOCs is a highly integrated, cable STB, System-on-Chip (SoC) solutions, with HD and AVC (H.264/MPEG-4 Part 10), MPEG-4 Part 2, MPEG-2, and VC-1 video decoding technology support. The BCM7125 family of SoCs integrates two MIPS processor cores into a single IC device. The front-end MIPS processor, which is associated with the BNM software (see "BNM Software Binary Files"), provides the Data Over Cable Service Interface Specification (DOCSIS)/Quadrature Amplitude Modulation (QAM) cable modem. The back-end MIPS processor, which acts as the host, runs the Linux®-based STB software, including the Brutus™ application software (see "Brutus Application" on page 11). The BCM7125 family of SoCs also provides the peripherals required to run STB applications such as IR receivers, UARTs, SPI, BSC, LED/keypads, smart cards, USB, Ethernet, SATA, and GPIOs.

The following devices comprise the BCM7125 family of SoCs:
- BCM7125
- BCM7019
- BCM7025
- BCM7119
- BCM7116

QAM Tuner/Demodulators (BCM97125 boards only)

Note: Unlike the BCM97125 reference board, the BCM97019 board does not have external QAM tuner/demodulators.

BCM7125 SoCs have two internal downstream BCM3112 QAM tuner/demodulators, one of the QAM tuner/demodulators (BCM3112A) is mapped as Nexus Tuner Device 1 and controlled by the BNM software. BCM3112A can be used for QAM broadcast reception by the host or DOCSIS channel bonding. The second QAM tuner/demodulator (BCM3112B) is only used for channel bonding.

In addition to the BCM7125 SoC's internal QAM tuner/demodulators, the BCM97125 reference board has two BCM3112 QAM tuner/demodulators, also controlled by the BNM software. These QAM tuner/demodulators can be used for DOCSIS channel bonding or QAM broadcast reception. The first QAM tuner/demodulator (BCM3112A) is mapped as Nexus Tuner Device 1 and is available in the standard board configuration. The second QAM tuner/demodulator (BCM3112B) is mapped as Nexus Tuner Device 2, but is not available in the standard board configuration.

To use the QAM tuner/demodulator BCM3112B on the reference board, FPGA TS1 must be disconnected from the BCM7125's PKT1 input and 0 ohm resistors installed to connect the BCM3112B TS1 signals. To accomplish this, remove the resistors at positions RN2711 and R2711 and reinstall them in positions RN2712 and R2702.

Software

BNM Software

The BNM software provides the following QAM tuner/demodulators:

- Nexus Tuner Device 0Nexus Tuner Device 0, which corresponds to BNM DS1, is used by the Brutus application (see "Brutus Application" on page 11) for digital broadcast reception.

- Nexus Tuner Device 2Nexus Tuner Device 2, which corresponds to BNM DS0, is reserved for DOCSIS. It is not used by the Brutus application. Nexus Tuner Device 2 can be used for QAM broadcast tuning by issuing the -tuner 2 option.

Table 1 lists the Nexus tuner devices on the BCM97125 board.

Table 1: BCM97125 Board Nexus Tuner Devices

Nexus Tuner Device	Device	Comment
0	BCM7125 DS1	–
1	BCM3112A	–
2	BCM3112B	Reworked board
3	BCM7125 DS0	Reserved for DOCSIS
4	BCM7125	Out-of-Band

Table 2 lists the Nexus tuner devices on the BCM97019 board.

Table 2: BCM97019 Board Nexus Tuner Devices

Nexus Tuner Device	Device	Comment
0	BCM7125 DS1	–
1	Invalid	–
2	Invalid	–
3	BCM7125 DS0	Reserved for DOCSIS
4	Invalid	–

BNM Software Binary Files

The BNM software images are provided in separate files (see Table 3).

> **Note:** Some software releases may not include all the files listed in Table 3.

Table 3: BNM Software Files

Filename	Description
ecram_sto.bin.97125	DOCSIS software executable for BNM, debug version
ecram_sto_slim.bin	DOCSIS software executable for BNM, non-debug version
bootl7125.bin	BNM bootloader

Host-side Software Components

The host-side software components provide communications and non-volatile storage for the BNM software. These software components are included in the 97125bnm.tar.gz file (see Table 4) provided in the reference software release.

Note: Some software releases may not include all the files listed in Table 4.

Table 4: Host-Side Software Components (97125bnm.tar.gz)

Filename	Description
bcmscbeth.ko	Interprocessor network device driver
mtdocap.ko	Driver for using an MTD device (flash partition) for nonvolatile storage
rnonvolhost	Host program provides nonvolatile storage service to BNM
rc.user	Start-up script

Brutus Application

The Brutus application, which runs on the host MIPS processor, utilizes the QAM tuning services provided by the BNM front-end software. Communication between host MIPS processor and the BNM software is via an Ethernet-class network device driver (bcmscbeth.ko) that uses shared memory space for interprocessor communication.

The Brutus application can be used to demonstrate QAM broadcast reception, IPSTB (Internet Protocol STB) functionality, transport stream decoding (from parallel (LVDS) and serial (ASI) streamers), personal video recording (PVR) record and playback functionality, still picture decoding, and MP3 audio decoding.

For information on using the Brutus application, refer to *Brutus Usage Guide* (document number STB_Brutus-SWUM300-R).

Optional/Demonstration Software

A Trinity reference software release is available for demonstrating DOCSIS/DSG features. The Trinity reference software release bundle includes the source for the DOCSIS software. The Brutus reference software release can be obtained separately or it can be included in the Trinity reference software release bundle. If bundled separately, the Brutus reference software does not contain the DOCSIS source, it only the binaries.

To obtain a copy of the Trinity reference release, contact your Broadcom Sales or Engineering representative.

Section 2: Software Installation and Configuration

This section contains instructions for installing and configuring the BNM software on the BCM97125 and BCM97019 reference boards.

Memory and Kernel Support

Memory Support

Different binaries may be provided for NAND and NOR flash memory configurations. Though NOR flash is the standard memory type used, reference boards can be special ordered with NAND flash memory.

Kernel Support

Table 5 lists appropriate Linux kernel executable for the Broadcom devices included in the BCM7125 SoC family.

Table 5: BCM7125 Family SoC Linux Kernels

Device	Revision(s)	Kernel
BCM7125	A0, B0, B1	vmlinuz-7125a0
	C0	vmlinuz-7125c0
BCM7019	A0, B0, B1	vmlinux-7125a0
	C0	vmlinux-7125c0
BCM7025	A0, B0, B1	vmlinux-7125a0
	C0	vmlinux-7125c0
BCM7119	A0, B0, B1	vmlinux-7125a0
	C0	vmlinux-7125c0
BCM7116	A0, B0, B1	vmlinux-7125a0
	C0	vmlinux-7125c0

Installing and Configuring the BNM Software

To install and configure the BNM software on the reference board, complete the following tasks in the order listed:

Install the BNM Software

To install and configure the BNM software, complete these steps:

Note: Throughout these instructions, <xx:xx:xx:xx> refers to the IP address of the TFTP server. In addition, the command examples may not specify the specific subdirectories on the TFTP server being used.

1. Save the common firmware environment (CFE), BNM bootloader, default non-vol, DOCSIS, kernel, and rootfs binary image files to a TFTP server (for instructions on setting up the TFTP server, refer to *Reference Platform Installation Guide for Linux Systems,* document number STB_Platform-SWUM1XX-R).

   Note: Developed at Broadcom, CFE is a standard bootloader for the MIPS processors in STB SoCs.

2. Using a USB Ethernet adapter, connect the reference board to the local network.

3. Configure the USB Ethernet adapter to communication on the local network.

   Note: If the local network is set up for DHCP service, the `ifconfig eth0 -auto` command can be used to configure the USB Ethernet adapter. For information on the ifconfig command, run the `help ifconfig` command. As a convenience, the ifconfig eth0 -auto command can be attached to a function key using the setenv -p F2 'ifconfig eth0 -auto' command.

4. Program the updated CFE into flash memory (see Table 6 for platform-specific information).

   Example: `flash -noheader <xx:xx:xx:xx>:/97125/ cfe_ddr533_zg.bin flash0.cfe.`

Table 6: Platform CFE Selection

Reference Board	Revision(s)	Common Firmware Environment (CFE)
BCM97019	A0, B0, B1	cfe_97019_ddr400_le_zg.bin[a] [b] cfe_97019_ddr533_le_zg.bin[c] [b] cfe_97019_ddr400_be_zg.bin[a] [d] cfe_97019_ddr533_be_zg.bin[c] [d]
	C0	cfe_97019_ddr400_le.bin[a] [b] cfe_97019_ddr533_le.bin[c] [b] cfe_97019_ddr400_be.bin[a] [d] cfe_97019_ddr533_be.bin[c] [d]
BCM97125 (with DDR2)	A0, B0, B1	cfe_ddr533_zg.bin[e] [b] cfe_ddr533_nor_plus_nand_le_zg.bin[f] [b]
BCM97125 (with DDR3)	A0, B0, B1	cfe_ddr667_zg.bin[e] [b] cfe_ddr667_nor_plus_nand_le_zg.bin[f] [b]
	C0	cfe_ddr667_le.bin[e] [b] cfe_ddr667_be.bin[e] [d] cfe_ddr667_nor_plus_nand_le.bin[f] [b] cfe_ddr667_nor_plus_nand_be.bin[f] [d]

a. To operate the DDR2 at 400 MHz, little-endian (older boards).
b. "le" in the CFE file name denotes little-endian. Unspecified CFEs are also little-endian.
c. to operate the DDR2 at 533 MHz, little-endian (newer boards).
d. "be" in the CFE file name denotes big-endian.
e. NOR or NAND Flash.
f. Boot from NOR Flash, NAND Flash also available.

> **Note:** The flashing method described in Step 4 assumes a working CFE is currently loaded. If it is not, the initial CFE must be flashed using Broadcom's Broadband Studio (BBS) utility. BBS, which comprises a suite of proprietary development and runtime tools designed to assist engineers test and characterize Broadcom products, is not provided with the reference software release.

5. Boot the initrd kernel via TFTP.

Example: `boot -z -elf <xx:xx:xx:xx>:/97125/vmlinuz-initrd-7125a0.`

6. Do the following to program the root file system into flash memory:

a. Run the stbutil command to install a UBIFS root file system.

Example: `stbutil <xx:xx:xx:xx>:/97125/`

> **Note:** The stbutil command installs a read/write UBIFS root file system. Other root file systems can be used.

b. Select option 2, **Install UBIFS rootfs to flash (RW/RO)**.

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c. Run the reboot command to reboot the reference board to the CFE.

> **Note:** Rootfs images, which may provide advantages for certain flash memory types, are provided for other file systems.

7. Flash the kernel.

Example: `flash -noheader <xx:xx:xx:xx>:/97125/vmlinuz-7125a0 flash0.kernel`

8. Flash the BNM bootloader.

Example: `flash -noheader <xx:xx:xx:xx>:/97125/bootl7125.bin flash0.ecmboot`

9. Flash the DOCSIS software image.

Example: `flash -noheader <xx:xx:xx:xx>:/97125/ecram_sto.bin.97125 flash0.docsis0`

10. Flash the default DOCSIS nonvolatile settings (optional).

Example: `flash -noheader <xx:xx:xx:xx>:/97125/p.bin.nor.mtd flash0.permcfg`
`flash -noheader <xx:xx:xx:xx>:/97125/d.bin.nor.mtd flash0.dyncfg`

11. Boot the newly flashed kernel.

Example: `boot -z -elf flash0.kernel: 'ubiroot'`

12. Do the following to save the BNM drivers and utilities and the rc.user file to the /root directory:

a. Save the 97125bnm.tar.gz file to the NFS server, and then mount the NFS export containing the file onto the reference board.

b. Change to the cd /root directory.

c. Run the following command to untar the 97125bnm.tar.gz file: `tar -xvzf 97125bnm.tar.gz`

> **Note:** The rc.user script runs at start-up and sets up network communications between the host and the BNM software.

13. Reboot the reference board to the CFE.

Disable the DHCP Server

The reference board's onboard Ethernet port has a DHCP server which is operated by the BNM DOCSIS software. To avoid DHCP server conflicts, do not connect the Ethernet port to a network served by a DHCP server when the reference board's internal DHCP server is enabled.

The DHCP server can be disabled at run time using the default non-vol images provided in the software release. To disable the DHCP server, run the following command sequence at the BNM console prompt (CM>):

```
cd /non-vol/estb
dhcp_enable 0
wr
```

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Set the MAC Address

The first time the reference board runs, a message from the interprocessor network driver (bcmscbeth.ko) may appear, prompting the user to use macprog to set a MAC address.

> **Note:** The interprocessor network driver (bcmscbeth.ko) is a Linux driver on the host that provides an Ethernet-class network interface (using shared memory) for establishing communication between the Linux host and the BNM MIPS processor.

To obtain information on the correct command format to use, run one of the following commands at the CFE> prompt on the host serial console:

- For NOR Flash memory: `CFE> help macprog`
- For NAND Flash memory: `CFE> setenv -p ETH0_HWADDR 00:10:18:xx:xx:xx`

Where: xx:xx:xx is the reference board's MAC address, derived using numbers that uniquely identify the board such as the serial number, revision number, etc.

> **Note:** Ideally, the MAC address is a globally unique Broadcom-registered MAC address. However, during development it is sufficient for the MAC address to simply be a unique number on the user's LAN.

Regardless of the type of memory being used, the printenv command in the CFE can be used to ensure that an eth0 hardware address (ETH0_HWADDR) exists, and that it specifies a reasonable MAC address.

Disable Auto-Configuration

The touch command creates an empty file that prevents the Linux start-up scripts from configuring the interprocessor interface using DHCP.

At the Linux prompt (on the STB), run the following command to disable auto-configuration of interprocessor interface:

```
touch /etc/config/ifup.bcm0
```

> **Caution!** Failure to run the touch command may result in problems mounting an NFS share on the STB when a DHCP server and the NFS server operate on the same network.

Section 3: Operations

Booting the Reference Board

To boot the reference board, run the following command:

```
ecm 32 32;boot -z -elf flash0.kernel: 'bmem=163808K@64M bmem=32800K@229344K
ubiroot'
```

Programming the Boot Command

For convenience, the command for booting the reference board can be programmed to a CFE environment variable using a function key name or a STARTUP that runs automatically when the CFE starts (to interrupt STARTUP, press the **CTRL+C**).

For example, the following command attaches two boot commands to the F4 key:

```
setenv -p F4 "ecm 32 32;boot -z -elf flash0.kernel: 'bmem=163808K@64M
bmem=32800K@229344K ubiroot'"
```

> **Note:** In the command example (above), the two boot commands are separated using a semicolon. The first command boots the BNM MIPS CPU and the second command boots Linux on the host MIPS processor, using a UBIFS root file system in flash memory.

Since the BCM7125 family SoC devices use a unified memory architecture (UMA) where the BNM software shares the host's DDR memory, the boot command must include additional parameters that specify the memory sharing arrangement. For example, the boot command in the example specifies that a 32 meg + 32k memory block at the top of the 256 MB memory is to be allocated and used as a unified memory area. In addition, the boot command uses a bmem option to direct Linux to exclude this block from its available space. The first bmem option reserves memory for the host STB drivers, which is to be used for audio and video decode, display, etc.

Operating Brutus Without the BNM Software

For development and testing activities that do not require BNM QAM, the reference software can be run with the `no_3255=y` option in the environment (use config="no_3255=y" in kernel/proxy mode). In this configuration, the QAM tuners are not available. However, streamers can be used on the BCM97125 reference board, and payback can be used on any reference board that supports this function.

Verifying BNM Software Operation

To verify that the BNM software is operating properly, connect a terminal emulator to the BNM serial console. The start-up banner should appear following the `CM>` prompt.

If the BNM software is not running properly or the interprocessor network adapter is not configured correctly, Brutus will stall during Nexus initialization (when it attempts to initialize a BNM tuner via RPC and does not receive a response from the BNM software.

If Brutus stalls, the following message displays repeatedly:

```
nexus_frontend_3255: waiting for 3255 booting up!
```

> **Note:** Occasionally, even when the BNM software is operating properly, this message may appear a few times before the start-up banner is displayed.

Using Annex A

The reference board can be configured to use the ITU-T j83 Annex A standard (used in PAL countries). To make the change, run the following command sequence at the BNM console (CM>) prompt:

```
cd non-vol/halif
cm_annex 1
write
```

To change back to the default Annex B standard (used in NTSC countries), run the following command sequence at the BNM console (CM>) prompt:

```
cd /non/halif
cm_annex 0
write
```

For information on how to specify channel modulation formats in the channels.txt file, refer to *Brutus Usage Guide*, document number STB_Brutus-SWUM3XX-R.

MoCA® Setup and Use (BCM97x25 boards only)

BCM97X25 reference boards support Multimedia over Coax Alliance (MoCA®) network functionality. The required drivers are included in the nonfree tarball bundled with the software release (make sure the tarball is saved to the TFTP server with the kernel images).

Some kernel releases may include MoCA drivers already installed. If MoCA is installed, the file /bin/mocacfg will be present. Remove or rename that file to disable MoCA.

To connect reference board to a MoCA network, complete these steps:

1. Run the stbutil command to install the MoCA drivers in the root file system.

    Example: `stbutil <xx:xx:xx:xx>:/97125/`

2. Select option 8, **Install nonfree drivers**.

3. Configure the IP address of the network interface used to connect to the MoCA network.

    Example:
    ```
    ifdown eth0
    ipcfg eth0 static 192.168.200.1 255.255.255.0
    ifup eth0
    ```

The kernel scripts automatically start the MoCA network adapter at boot time.

The MoCA network adapter appears as eth0 for 2.6.31-based kernels. Make sure the network adapter is configured on the same subnet as the MoCA bridge.

> **Note:** Each device on the MoCA network must be have a valid MAC address. For the MAC address to be valid, it must be unique on the MoCA network to which the device is connected.

If the reference board's MAC address is not valid, the MoCA driver defaults to use a hardcoded address. If two Broadcom STBs reside on the same network and both boxes have defaulted to use the hardcoded MAC address, they cannot communicate.

4. Run the `printenv` command to verify that the reference board's MAC address (ETH0_HWADDR) is valid.

5. If the reference board's MAC address is not valid, run the macprog command to assign a unique address.

Section 4: Reference Board Information

This sections contains connection and configuration information specific to each reference board.

Ethernet Adapters

A USB Ethernet adapter is required to connect the reference board to the LAN. Compatible adapters are listed in Appendix A: "USB Ethernet Adapters".

Switch and Jumper Connections

This section contains descriptions of the principal interfaces on the BCM97125 and BCM97019 reference boards.

BCM97125 Reference Board

Table 7 describes the principle interfaces on the BCM97125 reference board.

Table 7: BCM97125 Reference Board Interfaces

Interface	Connection Point	Description
UART0	J2271	Host serial console [a]
	J2292	BNM serial console footnote a
UART1	J2281	AVD outer loop UART (for video decoder debugging)
Transport Inputs	JP2801	Parallel LVDS transport stream In
	J2801	Serial ASI transport stream In
Keypad [b]	J2321	Keypad (BCM97038FP) with 7-segment LEDs

    a. Hardware settings: 115,200, n, 8, 1

    b. If the keypad is not connected, Brutus comes up in the Info menu instead of the Main menu. In addition, since the IR receiver is on the keypad board, the remote control will not work.

BCM97019 Reference Board

The BCM93348 serial adapter (BCM93348_RS232_ADAPTER) is required to connect a serial console to the BCM97019 reference board.

Table 8 the principle interfaces on the BCM97019 reference board.

Table 8: BCM97019 Reference Board Interfaces

Interface	Ref. Designator	Description
Jumper	J904	Host serial console [a]
	J903	BNM serial console footnote a
	JP101	Place jumpers on pins 1-2 and 5-6.
Switch	SW101	Down
Transport input	None	
Keypad	None	

   a. Hardware settings: 115,200, n, 8, 1

DOCSIS Start-Up

The default non-volatile settings provided in the software release may be set to start the DOCSIS operation automatically. To disable DOCSIS start-up and only provide QAM broadcast tuning, the default non-volatile setting can be changed using the following command sequence:

```
cd non-vol/bfcApp
auto_console 1
write
```

With this setting, the BNM software will issue a prompt at its serial console to start the DOCSIS application.

Transport Streamers (BCM97125 board only)

DIP switch SW2801 on the BCM97125 reference board allows users to specify the transport streamer input as either parallel (LVDS) or serial (ASI).

To specify the transport streamer input, complete these steps:

1. Using a text editor, open the channels.txt text file.

2. Edit the streamer line to specify the transport, as follows:
   ```
   STREAMER 0 0
   ```

3. Set DIP switch SW2801 to the select parallel (LVDS) or serial (DVB-ASI) streamer input (see Table 9).

> **Note:** Switch S1 on DIP switch SW2801 is identified by the white dot on the DIP switch.
> The On position is selected by positioning the switch (S1 - S4) away from the white dot.

Table 9: Transport Streamer Selection

Transport Selection	Switch	Position
Parallel Input (LVDS)	S1	On
	S2	On
	S3	Off
	S4	Off
Serial Input (DVB-ASI)	S1	Off
	S2	On
	S3	Off
	S4	Off

Note: An adapter for the ASI connector can be ordered from Broadcom.

Appendix A: USB Ethernet Adapters

Tested Adapters

Note: Broadcom does not plan to continue CFE support for USB 1.1 adapters. However, more USB 2.0 adapter support will be provided as new adapters based on the ASIX chip are identified.

Table 10 lists the USB Ethernet adapters supported in Broadcom's CFE.

Table 10: Broadcom Supported USB Ethernet Adapters

USB 2.0 Devices [a]
NETGEAR® FA120
Hawking UF200
D-Link® DUB-E100
Linksys® USB200M
Intellinet ST Lab
D-Link DUB-E100
D-Link DUB-E100...H/W Version B1
TrendNet® TU2-ET100 and Airlink101® (or generic ASIX reference device)
Linksys USB200M...ver 2
Linksys USB1000
Hawking HGU1
ADMtek USB 2.0
USB 1.1 Devices [b]
3Com® 3C460B
Linksys USB100TX
Linksys USB10T
Linksys USB100M
Hawking HUF11
Belkin® F5D5050
Siemens Speedstream® SS1001
TrendNet TU-ET100C
Hawking HUF1

a. Only supported in Full-Speed mode.
b. Some USB 1.1 devices timeout during CFE TFTP and Linux NFS accesses. If this error occurs, use the USB 2.0 adapters.

Untested Adapters

Untested USB adapters, based on the ADMtek Pegasus chipset may work with Linux in the CFE. Table 11 lists companies that manufacturer these untested adapters.

Table 11: ADMtek Pegasus-Based USB Ethernet Adapters

Maunfacturer	Model Number
D-Link	DRU-E100
D-Link	DSB-650TX
Hawking	UF100
I-O DATA	ET/TX-S
Kingston	KNU101TX
MELCO BUFFALO™	LUA2-TX
MELCO	LUA-TX
NETGEAR®	FA101
SMC	202
SMC	2206
ABOCOM	Model numbers unavailable.
AEI	
Allied	
GOLDPFEIL	
EasiDock	
Elsa	
HP	
LANEED	
smartNIC	
SOHOware®	

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