



DEVELOPMENT GUIDE

VIA AMOS-825

Linux BSP v3.0.4

**Copyright**

Copyright © 2018 VIA Technologies Incorporated. All rights reserved.

No part of this document may be reproduced, transmitted, transcribed, stored in a retrieval system, or translated into any language, in any form or by any means, electronic, mechanical, magnetic, optical, chemical, manual or otherwise without the prior written permission of VIA Technologies, Incorporated.

Trademarks

All brands, product names, company names, trademarks and service marks are the property of their respective holders.

Disclaimer

VIA Technologies makes no warranties, implied or otherwise, in regard to this document and to the products described in this document. The information provided in this document is believed to be accurate and reliable as of the publication date of this document. However, VIA Technologies assumes no responsibility for the use or misuse of the information (including use or connection of extra device/ equipment/add-on card) in this document and for any patent infringements that may arise from the use of this document. The information and product specifications within this document are subject to change at any time, without notice and without obligation to notify any person of such change.

VIA Technologies, Inc. reserves the right to make changes to the products described in this manual at any time without prior notice.



Revision History

Version	Date	Remarks
1.00	10/04/2018	Initial release



Table of Contents

1. Introduction	1
1.1 BSP Package Contents	1
1.1.1 Source Code Folder Contents	1
1.1.2 Firmware Folder Contents	1
1.1.3 Document Folder Contents	2
1.1.4 Tools Folder Contents	2
1.2 Version Information and Supported Features	3
2. Build Environment Setup	4
2.1 Configuring Linux Host Machine	4
3. Image Build	5
3.1 Extracting the VIA AMOS-825 BSP	5
3.2 Machine Configuration	5
3.3 Building an SD Card Image	5

1. Introduction

This Development Guide explains how to setup the necessary build environment in order for users to customize the Linux kernel and create their own system image for the VIA AMOS-825 system (Bare board: VIA VAB-820 with NXP i.MX 6Quad Cortex-A9 processor).

The VIA AMOS-825 Linux BSP v3.0.4 is developed based on the NXP fsl-yocto-3.14.28_1.0.0 (Yocto 1.7 Dizzy) and enables hardware features that are defined on the VIA AMOS-825 system.

1.1 BSP Package Contents

There are four folders in the package as listed below.

Source code folder	Description
AMOS-825-yocto-bsp-v3.0.4..tar.bz2	Source code
Firmware folder	Description
via-image-gui-imx6qamos825.sdcard	SD card image
u-boot.imx	U-Boot boot loader
zImage	Kernel
zImage-imx6q-amos825.dtb	Device tree
modules-imx6qamos825.tgz	All module drivers
Document folder	Description
AMOS-825_Linux_EVK_v3.0.4_Quick_Start_Guide_v1.00.pdf_20181004.pdf	Quick Start Guide
AMOS-825_Linux_BSP_v3.0.4_Development_Guide_v1.00.pdf_20181004.pdf	Development Guide
Tools folder	Description
BT_Config.zip	Bluetooth A2DP configuring file

VIA AMOS-825 Linux BSP contents

1.1.1 Source Code Folder Contents

AMOS-825-yocto-bsp-v3.0.4.tar.bz2: A complete and static Yocto BSP including the VIA AMOS-825 meta-files and all the pre-downloaded required software packages to enable a complete offline build.

1.1.2 Firmware Folder Contents

via-image-gui-imx6qamos825.sdcard: is the precompiled image for evaluating the VIA AMOS-825 system with an Open Embedded filesystem.

u-boot.imx: is the U-Boot boot loader file which can be flashed to either the onboard SPI ROM or a Micro SD card.

zImage: is a self-extracting compressed Linux kernel image.

zImage-imx6q-amos825.dtb: is the device tree binary. It is a database that represents the hardware components of the VIA AMOS-825 system.

modules-imx6qamos825.tgz: contains the drivers for the Wi-Fi & Bluetooth module and the VIA EMIO-2550 miniPCIe Mobile Broadband module.

1.1.3 Document Folder Contents

AMOS-825_Linux_EVK_v3.0.4_Quick_Start_Guide_v1.00_20181004.pdf: The Quick Start Guide provides an overview of how to boot the Linux EVK system image on the VIA AMOS-825 system and configure the supported hardware function in the build.

AMOS-825_Linux_BSP_v3.0.4_Development_Guide_v1.00_20181004.pdf: The Development Guide explains how to setup the necessary build environment in order for users to customize the Linux kernel and create their own system image for the VIA AMOS-825 system.

1.1.4 Tools Folder Contents

BT_Config.zip: contains the Bluetooth A2DP configuring file.

1.2 Version Information and Supported Features

- U-Boot version: 2014.04
- Kernel version: 3.14.28
- Evaluation image: OpenEmbedded-core built with Yocto 1.7 Dizzy
- Development based on NXP fsl-yocto-3.14.28_1.0.0 (Yocto 1.7 Dizzy)
- Supports SPI with eMMC or Micro SD boot (default)
- Supports 7" Projective capacitive touch monitor (800 x 480) (through I²C interface)
- Supports COM as debug port
- Supports two FlexCAN TX/RX
- Supports Gigabit Ethernet
- Supports Line-out and Mic-in
- Supports IEEE 802.11b/g/n Wi-Fi
- Supports Bluetooth 4.0
 - A2DP and SPP profile
- Supports u-blox MAX-7 GPS/GNSS module
- Supports VIA EMIO-2550 miniPCIe Mobile Broadband module
- Supports Watchdog timer, and RTC

2. Build Environment Setup

This section guides you through setting up the build environment for development. All instructions are based on using Ubuntu 12.04 LTS and later versions.

To make sure that the build process completes successfully, we recommend at least 120GB of disk space and 15GB of combined memory and swap space on the host machine.

2.1 Configuring Linux Host Machine

The following packages are required for the Yocto development environment. The required packages can be installed using the bash script below:

```
#!/bin/bash

# Install dependant packages
$ sudo apt-get install gawk wget git-core diffstat unzip texinfo gcc-multilib build-essential chrpath socat

$ sudo apt-get install libsdl1.2-dev xterm sed cvs subversion coreutils texi2html docbook-utils python-pysqlite2 help2man make gcc g++ desktop-file-utils libgl1-mesa-dev libglu1-mesa-dev mercurial autoconf automake groff curl lzop asciidoc
```

The tool to create images for use with the U-Boot boot loader, “**mkimage**”, is provided by different packages in Ubuntu 12.04 and in newer Ubuntu releases.

On Ubuntu 12.04 install it as below.

```
$ sudo apt-get install uboot-mkimage
```

On Ubuntu 14.04 and newer versions install it as below.

```
$ sudo apt-get install u-boot-tools
```


3. Image Build

The section explains how to use the source code to build and update the U-Boot and image to the SD card on the VIA AMOS-825 system.

3.1 Extracting the VIA AMOS-825 BSP

Use the following command to extract the contents of the base BSP.

```
$ tar jxvf VIA_AMOS-825-yocto-bsp-v3.0.4.tar.bz2
```

3.2 Machine Configuration

The **via-setup-release.sh** script creates the build directory with the Yocto configuration files for your target machine.

This script has the following optional parameter:

- **-b**: set the name of the build directory. For example “-b build-amos825” in the command below.

```
$ cd via-release-bsp
$ MACHINE=imx6amos825 source via-setup-release.sh -b build-amos825
```

3.3 Building an SD Card Image

This BSP provides the “via-image-gui” Yocto image as default. Use the “bitbake” command to create the U-Boot and image file.

```
$ bitbake via-image-gui
```

After the compilation, the **via-release-bsp/build-amos825/tmp/deploy/images/imx6qamos825** directory will contain the resulting binaries, as shown in the table below.

Binary	Description
u-boot.imx	U-Boot boot loader
zImage	Kernel
zImage-imx6q-amos825.dtb	Device tree
via-image-gui-imx6qamos825.sdcard	SD card image

Binary files generated by bitbake



Taiwan Headquarters

1F, 531 Zhong-zheng Road,
Xindian Dist., New Taipei City 231
Taiwan

Tel: 886-2-2218-5452
Fax: 886-2-2218-9860
Email: embedded@via.com.tw



USA

940 Mission Court
Fremont, CA 94539,
USA

Tel: 1-510-687-4688
Fax: 1-510-687-4654
Email: embedded@viatech.com



Japan

3-15-7 Ebisu MT Bldg. 6F,
Higashi, Shibuya-ku
Tokyo 150-0011
Japan

Tel: 81-3-5466-1637
Fax: 81-3-5466-1638
Email: embedded@viatech.co.jp



China

Tsinghua Science Park Bldg. 7
No. 1 Zongguancun East Road,
Haidian Dist., Beijing, 100084
China

Tel: 86-10-59852288
Fax: 86-10-59852299
Email: embedded@viatech.com.cn



Europe

Email: embedded@via-tech.eu