



DEVELOPMENT GUIDE

**VAB-820**

Linux BSP v4.1.2

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## Revision History

Version	Date	Remarks
1.00	11/07/2017	Initial release



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# 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 VAB-820 board.

The VAB-820 Linux BSP v4.1.2 is developed based on the NXP fsl-yocto-L4.1.15\_1.1.0-ga (Yocto 2.0 Jethro) and enables the hardware features that are defined on the VAB-820 board.

## 1.1 BSP Package Content

There are three folders in the package as listed below.

Source code folder	Description
VIA_iMX_Yocto2.0_SRC_v4.1.2.tar.bz2	Source code
Firmware folder	Description
VAB-820_Yocto2.0_BIN_v4.1.0.tar.gz	Yocto EVK system image and installation script files
Document folder	Description
VAB-820_Linux_EVK_v4.1.2_Quick_Start_Guide_v1.00_20171107.pdf	Quick Start Guide
VAB-820_Linux_BSP_v4.1.2_Development_Guide_v1.00_20171107.pdf	Development Guide

AMOS-820 Linux BSP content

### 1.1.1 Source Code Folder Contents

**VIA\_iMX\_Yocto2.0\_SRC\_v4.1.2.tar.bz2:** A complete and static Yocto BSP including the VAB-820 meta-files and all the pre-downloaded required software packages to enable a complete off-line build.

### 1.1.2 Firmware Folder Contents

**VAB-820\_Yocto2.0\_BIN\_v4.1.2.tar.gz:** contains installation script files and the precompiled U-boot and image for evaluating the VAB-820 board.

### 1.1.3 Document Folder Contents

**VAB-820\_Linux\_EVK\_v4.1.2\_Quick\_Start\_Guide\_v1.00\_20171107.pdf:** This Quick Start Guide provides an overview on how to boot the Linux EVK system image on the VAB-820 board and configure the supported hardware functions in the build.

**VAB-820\_Linux\_BSP\_v4.1.2\_Development\_Guide\_v1.00\_20171107.pdf:** 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 VAB-820 board.

## 1.2 Version Information and Supported Features

- U-Boot version: 2015.04
- Kernel version: 4.1.15
- Evaluation image: OpenEmbedded-core built with Yocto 2.0 Jethro
- Development based on NXP fsl-yocto-L4.1.15\_1.1.0-ga (Yocto 2.0 Jethro)
- Supports SPI with eMMC or Micro SD boot (default)
- Supports HDMI and LVDS display
- Supports HDMI audio output
  - AUO 10.4" G104XVN01.0 (1024×768)
  - AUO 7" G070VW01 V0 (800×480)
- Supports S-Video and CVBS
- Supports COM 1 DTE mode, COM 2 as debug port
- Supports 2 FlexCAN TX/RX
- Supports Gigabit Ethernet
- Supports Line-in, Line-out, Mic-in
- Supports VNT9271 USB Wi-Fi dongle
- Supports EMIO-1533 USB Wi-Fi module
- Supports EMIO-5531 USB Wi-Fi & Bluetooth module
  - Supports Bluetooth A2DP and SPP profile
- Supports EMIO-1541 miniPCle Wi-Fi module
- Supports EMIO-2531 miniPCle Wi-Fi & Bluetooth module
  - Supports Bluetooth A2DP and SPP profile
- Supports EMIO-2550 miniPCle Mobile Broadband module
- Supports Watchdog, GPIO 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 u-boot-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 firmware installer on the VAB-820 board.

### 3.1 Extracting the VAB-820 BSP

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

```
$ tar xvf VIA_iMX_Yocto2.0_SRC_v4.1.2.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-vab820” in the command below.

```
$ cd via-release-bsp
$ MACHINE=imx6qvab820 source via-setup-release.sh -b build-vab820
```

### 3.3 Building an SD Card Image

This BSP provides the “via-image-gui” Yocto image as default. Use the “bitbake” command to create an SD Card compatible image.

```
$ via-release-bsp/build-vab820$ bitbake via-image-gui
```

After the compilation, the **via-release-bsp/build-vab820/tmp/deploy/images/imx6qvab820**, directory will contain the resulting binaries, as shown in the table below.

Binary	Description
u-boot.bin	U-Boot boot loader
zImage	Kernel
zImage-imx6q-vab820.dtb	Device tree
via-image-gui-imx6qvab820.sdcard	SD card image

Binary files generated by bitbake

Extract EVK/VAB820\_Yocto2.0\_BIN\_v4.1.2.tar.gz file.

Next to copy the new image folder to /sd\_installer to replace the original image folder in order to update Firmware Installer.





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