Acacia

Getting Started Manual
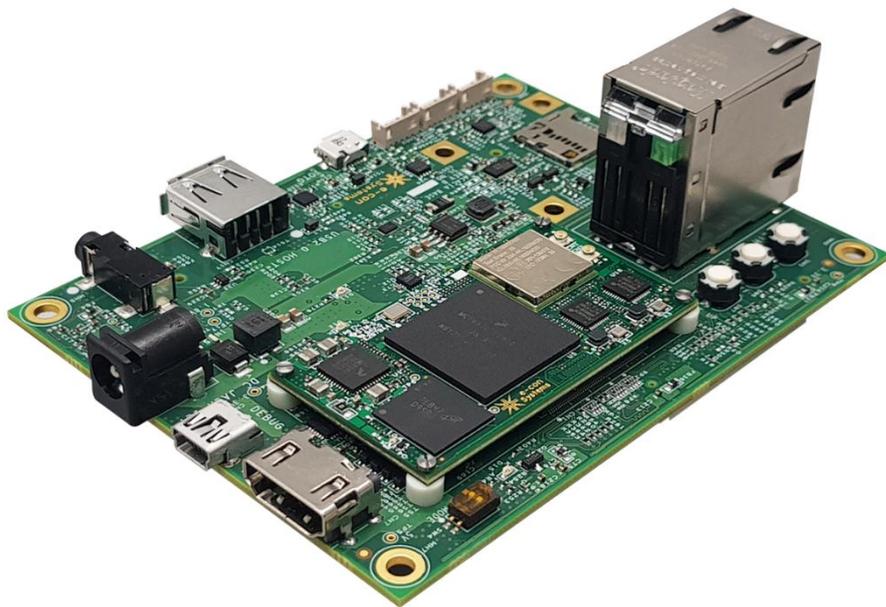
e-con Systems

Your Product Development Partner

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Contents

Acacia is the carrier board designed for eSOMiMX7 System on Module (SOM). It is an evaluation board to evaluate all the interfaces supported by eSOMiMX7 SOM. The eSOMiMX7 is a low power cost effective SOM based on NXP's iMX7 Dual or Solo ARM® Cortex™-A7 Processor running up to 1 GHz (Dual). This iMX7 System-on-Chip (SoC) also features a M4 core which can be used for real-time processing.

The i.MX 7 Solo and i.MX 7 Dual are highly integrated multi-market applications processors designed to enable secure and portable applications within the Internet of Things. The i.MX 7 Solo and i.MX 7 Dual utilize both the ARM® Cortex®-A7 and Cortex-M4 cores for general purpose programmable processing. The heterogeneous asymmetric architecture provides the ultimate flexibility for customers by enabling a single-chip solution that can run sophisticated operating systems (in A7) and provide real-time responsiveness (in M4).

This document gives an overview of Acacia kit accessories, interfaces and boot procedure for Acacia.

Description

The eSOMiMX7 SOM has LPDDR3 RAM configurable up to 2 GB and eMMC or NAND flash with capacity configurable up to 32 GB. The eSOMiMX7 module also has a wireless LAN cum Bluetooth combo module. eSOMiMX7 is provided with source package for Linux with Yocto Poky based custom root file system. The eSOMiMX7 comes with Dual Ethernet PHY for iMX7 Dual configuration and single Ethernet PHY for iMX7 Solo configuration.

The eSOMiMX7 SOM is aimed at reducing the time to market for customers by making use of the stabilized and ready to market iMX7 SoC based modules. The outer and inner view of the eSOMiMX7 evaluation Kit are shown in the following figures.

Figure 1: eSOMiMX7 Evaluation Kit Outer View

Figure 2: eSOMiMX7 Evaluation Kit Inner View

Accessories Supplied with Acacia Kit

The following table lists the accessories supplied with the Acacia Kit.

Table 1: Acacia Kit Accessories and its Quantity

Items	Quantity
Acacia Development Board	1
eSOMiMX7 Dual SOM	1
12V DC Power Adapter for Acacia Board	1
Debug Cable-Mini B to Type A USB Cable	1

HDMI-A Male to HDMI-A Male Cable	1
Wi-Fi Antenna	1

Note: Refer to the Developer Resource website link - https://developer.e-consystems.com for downloading the documents and BSP Release packages.

The following figure shows the components supplied with eSOMiMX7 evaluation Kit.

Figure 3: Components of eSOMiMX7 Evaluation Kit

Peripherals and Connectors of Acacia Kit

The Acacia Kit provides support for peripherals such as HDMI v1.4, USB 2.0 host, USB 2.0 OTG. The Acacia board also features a RS-232 UART port, CAN Header, RJ45 Connector, ADC pin, 3.5 mm Audio connector, Mini PCIe connector DC Power Jack, Debug UART as USB, MIPI CSI camera connector and MIPI DSI display connector.

The following figure shows the top and bottom view of the Acacia board.
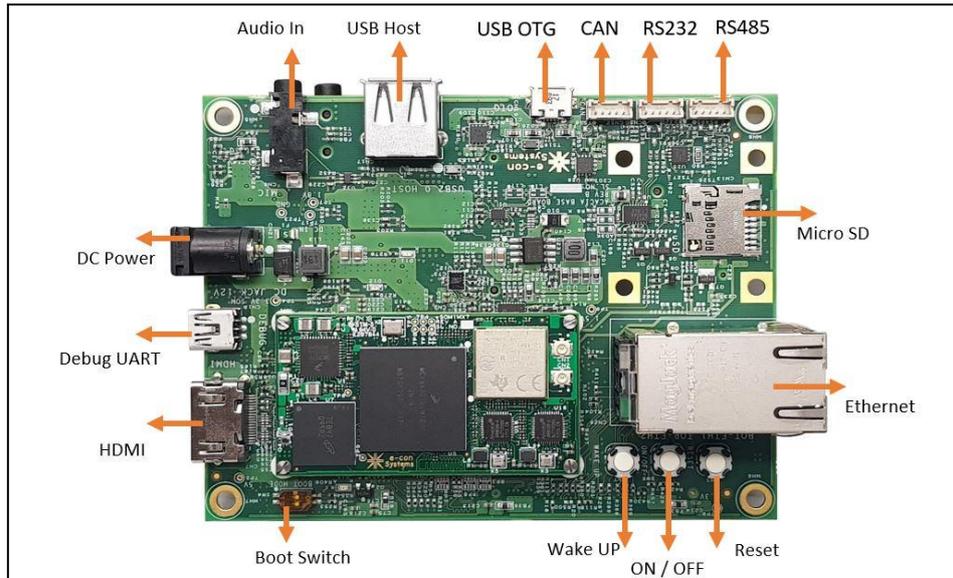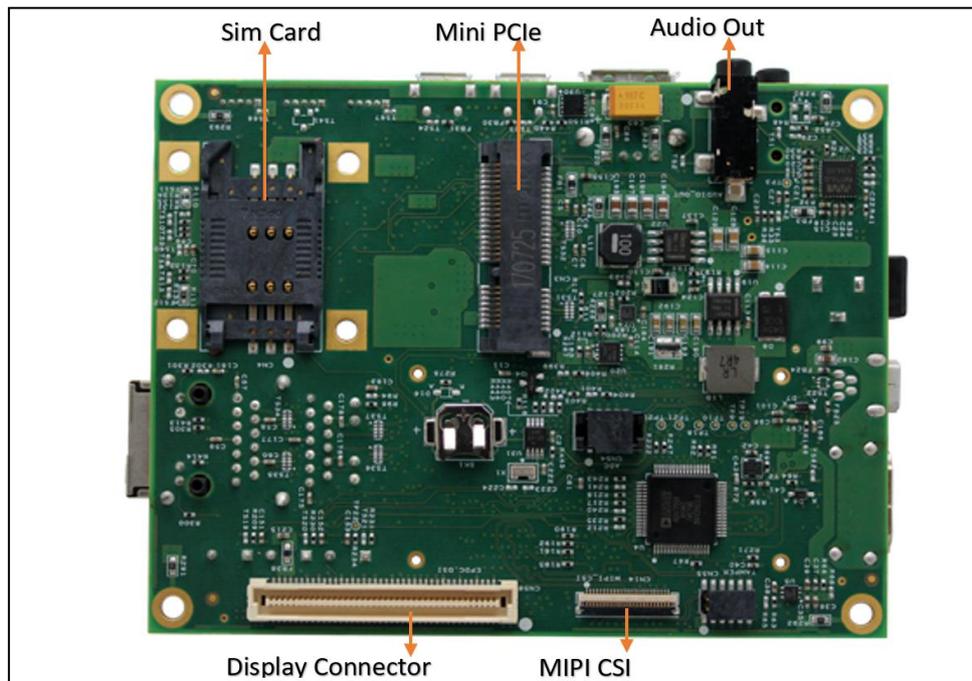
Figure 4: Acacia Board Top View

Figure 5: Acacia Board Bottom View

Note: Refer to *e-con_eSOMiMX7_Datasheet.pdf* and *econ_Acacia_HW_UserManual.pdf* documents, for more details about Acacia peripherals and connectors.

Procedure to Boot Acacia Board

This section describes how to boot Acacia board.

Note: For viewing the demo of Acacia development board running Linux, click
https://www.youtube.com/watch?v=IGEduO-6FxU.

To boot the Acacia board, follow these steps:

1. Place the eSOMiMX7 SOM on the connector (CN1 and CN2) of the Acacia development board.
2. Plug in the HDMI cable to the CN7 connector of Acacia and plug the other end to a HDMI monitor.
3. Insert the USB Mini B to USB type A cable to the (Debug port) CN18 connector of Acacia and other end to your development PC.

   Note: In your Linux development system, you can view the debug UART port as ttyUSBx (x can be any number) under /dev directory.

   For example, /dev/ttyUSB0.

   You can view 2 ttyUSBx entry in development system for A7 core debug port and M4 debug port.

4. Run the following command to open minicom in your Linux PC.

```
$ sudo minicom -s /dev/ttyUSB1
```

5. Connect the power adapter to power jack CN21 of Acacia.
6. Power **ON** the Acacia board to view the boot messages in terminal.

Files and Documents

The documents and other supporting files are available in the Developer Resources website link - https://developer.e-consystems.com.

You can click the **Documents** tab, to view the available documents. Click the **Files** tab to view the update tools and prebuilt binary packages.

Files

The prebuilt binaries, update tools and camera binaries are available in the files section, you can download all the packages from the Developer Resources website.

Prebuilt Binary

The prebuilt binary package contains all the binaries required to boot the Acacia board. The package structure for the prebuilt binaries is shown below.

Package: Acacia_XXXX_Linux_Prebuilt_binaries_vX.Y

Where,

> XXXX - Solo for eSOMiMX7 Solo and Dual for eSOMiMX7 Dual

> vX.Y - BSP package release version

For example, v1.0.

Note: Please refer to the *e-con_Acacia_Linux_Yocto_Prebuilt_Binaries_UserManual.pdf* for more details about prebuilt binary package.

Update Tool

The binaries can be flashed to the Acacia board using MfgTools utility. The MfgTools application is a simple windows application to update the binaries through the USB OTG boot. MfgTools for fusing and flashing are available inside the same package, fusing is used to fuse the boot device to the eMMC or NAND and flashing is used to flash the binaries. Please refer to the *e-con_Acacia_Linux_MFGTools_Flash_Programming_UserManual.pdf* and *e-con_Acacia_Linux_MFGTools_Fusing_UserManual.pdf* documents available inside the MfgTools package, for more details.

Package: mfgtool_xxxx_vX.Y.tar.bz2

Where,

> xxxx - Solo for eSOMiMX7 Solo and Dual for eSOMiMX7 Dual

vX.Y - Mfgtool's release version

For example, v1.0.

Documents

The reference documents such as BSP document, Hardware document, Camera documents and Application documents are available in the Developer Resources website.

BSP Documents

The following table shows the description of BSP documents.

Table 2: Description of BSP Documents

S. No.	What I need	Documents to Refer
1	I got the board, I need to flash the prebuilt binaries.	e-con_Acacia_Linux_BSP_Yocto_Prebuilt_Binaries_UsageManual.pdf
2	Boot, kernel, device tree and rootfs	e-con_Acacia_Linux_Yocto_BSP_Build_Guide.pdf
3	I need to know about peripherals details, how to test peripherals and BSP details of each peripherals.	e-con_Acacia_Linux_UserManual.pdf
4	I have built my binaries and need to flash the binaries to eMMC or NAND.	e-con_Acacia_Linux_MFGTools_Flash_Programming_UserManual.pdf *
5	I need to fuse the SOM for boot device eMMC or NAND.	e-con_Acacia_Linux_MFGTools_Fusing_UserManual.pdf *

*These documents are available with the MfgTools package.

Hardware Documents

The following table shows the description of hardware documents.

Table 3: Description of Hardware Documents

S. No.	Documents Name	Description
1	e-con_eSOMiMX7_Datasheet.pdf	Describes the hardware details and usage about the eSOMiMX7 SOM peripherals.
2	e-con_Acacia_HW_UserManual.pdf	Describes the hardware details and usage about the baseboard peripherals.

Camera Documents

The following table shows the description of camera documents.

Table 4: Description of Camera Documents

S. No	Documents Name	Description
1	e-con_Acacia_Linux_ACC-iMX7-OV8865CAM_Camera_UserManual.pdf	Provides information about the MIPI 8MP camera module for Acacia board.

In this section, you can view the list of commonly occurring issues and their troubleshooting steps.

What must I do when I did not get any messages from debug serial port on power-up?

To solve this issue, follow these steps:

1. Check whether the debug cable (USB Mini B) is properly connected to PC and Acacia device (CN18).
2. Check the USB to serial driver is loaded and debug port is enumerated.
3. Check for ttyUSBx in /dev in case of Linux and check device manager in case of windows.

   Note: Refer to the *Serial Console Connection Details* section in *e-con_Acacia_Linux_UserManual.pdf*, for more details about the loading serial driver and configuring terminal application.

4. Check the SOM LED Status after powering **ON** the Acacia. If SOM LED remains in the **OFF** state, then boot images might be corrupted.

   Note: Refer to the *Preparing a Bootable eMMC or NAND* section in *e-con_Acacia_Linux_BSP_Yocto_Prebuilt_Binaries_UserManual.pdf*, to flash the binaries.

1. **What are the different variants of the eSOMiMX7 SOM?**

   The different variants of the eSOMiMX7 are Solo eSOMiMX7 and Dual eSOMiMX7.

2. **What is the supported kernel version?**

   The supported kernel version is 4.9.11.

3. **What is the supported build tool?**

   The supported build tool is Yocto Poky.

4. **What type of boot devices are supported?**

   The supported boot devices are eMMC or SD for Dual and NAND or SD for Solo.

5. **What is the username to login to the Kernel?**

   You can login to the Kernel using the username root.

6. **How to enable the particular camera module?**

   You can select the camera module using setcam command in U-Boot.

   For example,

   Run the following command to select OV8865 driver module.

   U-boot > setcam 8MP_MIPI_OV8865

7. **What is the power consumption in low power mode?**

   In the low power state retention (LPSR) mode, Solo consumes only x mA and Dual consumes y mA.

8. **What is the power consumption in idle state?**

   In the idle state, Solo consumes only a mA and dual consumes b mA.

9. **I have purchased the product and it arrives today. But how could I get the software and all the necessary documents to use this kit?**

   Once you receive the product, our operations team will send you the confirmation e-mail with the required information. You can download it from Developer Resources website - http://developer.e-consystems.com/.

10. **We are unable to login using the Developer Resources website login credentials.**

The login credentials might be expired. Please write to techsupport@e-consystems.com with your requirement in detail, to get immediate support.

11. **Where could I get the latest binaries for the kit I have purchased from e-con Systems?**

    You can download the latest binaries from Developer Resources website - http://developer.e-consystems.com/.

12. **While attempting to download the documents from e-con Systems website, a particular download link is not working.**

    Please write to techsupport@e-consystems.com with your requirement in detail, to get immediate support.

13. **I am unable to register in e-con Systems website with my personal e-mail ID. It is asking to enter corporate ID for registration.**

    Yes, you are requested to register with a valid corporate e-mail ID. We will save your corporate e-mail id in our database to allow you to download any documents in e-con Systems website.

14. **I tried to register with my corporate e-mail ID while downloading the documents but failed.**

    You are requested to register again using the https://www.e-consystems.com/auth/Account/Register link. After this, if you still face the same issue then please write to techsupport@e-consystems.com with your requirement in detail to get immediate support.

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After understanding the specifications of Acacia evaluation Kit and procedure on how to boot the Acacia board, you can refer to the following documents to understand more about Acacia.

- *e-con Acacia Hardware User Manual*
- *e-con Acacia Linux BSP User Manual*
- *e-con eSOMiMX7 Datasheet*

ARM: Advanced RISC Machines.

USB: Universal Serial Bus.

LAN: Local Area Network.

HDMI: High-Definition Multimedia Interface.

Contact Us

If you need any support on Acacia product, please contact us using the Live Chat option available on our website - https://www.e-consystems.com/

Creating a Ticket

If you need to create a ticket for any type of issue, please visit the ticketing page on our website - https://www.e-consystems.com/create-ticket.asp

RMA

To know about our Return Material Authorization (RMA) policy, please visit the RMA Policy page on our website - https://www.e-consystems.com/RMA-Policy.asp

General Product Warranty Terms

To know about our General Product Warranty Terms, please visit the General Warranty Terms page on our website - https://www.e-consystems.com/warranty.asp

Revision History

Rev	Date	Description	Author
1.0	07 May 2018	Initial Draft	SOM Team