# SMARC Starter Kit
# Quick Start Guide

P/N 50-40260-5010
Rev 2.0




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### Revision History

| Revision | Reason for Change | Date |
|---|---|---|
| 1.0 | Initial Release | Apr/14 |
| 2.0 | Updated photos and added display Set Up, showing updated baseboard | May/14 |
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### Audience

This manual provides reference only for computer design engineers, including but not limited to hardware and software designers and applications engineers. ADLINK Technology, Inc. assumes you are qualified to design and implement prototype computer equipment.



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# 1 SMARC Starter Kit Setup

## 1.1 Using this Guide

This guide provides the most efficient way to set up and boot your SMARC Starter Kit system. The system consists of two circuit boards: the baseboard (LEC-BASE) and the module board (SMARC module). The instructions provided in this guide include:

- Removing the SMARC Starter Kit components from the shipping container
- Setting up the assembly work space
- Connecting peripherals to the SMARC Starter Kit baseboard
- Mounting the touchscreen display to the baseboard
- Installing the SMARC module
- Booting the SMARC Starter Kit system

Information not provided in this Quick Start Guide includes:

- Baseboard or module specifications
- Operating System BSP installation instructions
- Operating system programming or operating instructions

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**NOTE**: Refer to SMARC baseboard and SMARC module technical manuals for specifications on those boards. Please see specific ADLINK BSP ReadMe documents and installation manuals for BSP installation instructions, located in the SMARC Starter Kit USB Quick Drive. Refer to OS manufacturers' manuals for instructions when using OS software.

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## 1.2 Requirements

The following peripherals and devices are needed to make full use of the SMARC Starter Kit.

- Peripherals (user-provided):
  - USB keyboard
  - USB mouse
  - PC with terminal emulation software
  - RS-232 cable with null-modem adapter
  - COM port gender changer
  - USB-to-serial adapter

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**NOTE**: The items listed above are not available from ADLINK.

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- Power Supply:
  - AC Adapter (with plug-type mating cord)

## 1.3 Device/Peripheral Connections

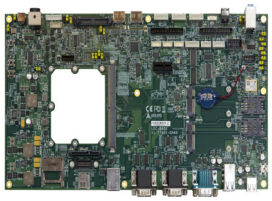
- USB device connections
- AC power outlet



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## 1.4 What's in the Box

This section provides a photo and description of each of the items in the starter kit. An enlarged photo of the baseboard appears at the end of the section showing locations of the baseboard connectors. Refer to the Contents List in the starter kit to verify all the items in the shipping box. The next section, Getting Started, provides a general contents list of the starter kit.

| | |
|---|---|
| 1) SMARC Module  | • P/N 91-72401-0000*; Not included. Order separately.<br>*LEC-3517 SMARC module shown; other modules available. |
| 2) Heatsink Assembly  | • P/N 32-20328-0000; passive heatsink for SMARC module CPU with thermal pad and fastening hardware |
| 3) LEC-BASE Baseboard  | • P/N 91-77A01-0020; baseboard for using SMARC module |
| 4) Flat Panel Touch Screen  | • P/N 29-90070-U000; 7", 800x480 400 nits flat panel with projected capacitive multi touch screen and EETI EXC7200 USB-based touch controller |
| 5) TTL Cable  | • P/N 30-20798-0000; YLH13042601 flat panel TTL Data and Power/Timing combination cable |
| 6) USB-to-Touch Screen Controller Cable  | • P/N 30-20799-0000; YXS13071101 USB cable with standard external USB connector and EXC7200 touch screen connector |



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| | |
|---|---|
| 7) Camera Interface Cable  | • P/N 30-20780-0000; 2x5 pin test cable (with one connector) for baseboard camera interface |
| 8) GPIO Cable  | • P/N 30-20781-0000; 2x6 pin test cable (with one connector) for baseboard GPIO interface |
| 9) Power Management Interface Cable  | • P/N 30-20783-0000; 2x7 pin test cable (with one connector) for baseboard power management |
| 10) SPI0 Interface Cable  | • P/N 30-20784-0000; 1x5 pin test cable (with one connector) for baseboard SPI0 interface |
| 11) SPI1 Interface Cable  | • P/N 30-20785-0000; 1x4 pin test cable (with one connector) for baseboard SPI1 interface |
| 12) I2S Interface Cable  | • P/N 30-20782-0000; 1x6 pin test cable (with one connector) for baseboard I2S audio interface |
| 13) LVDS Interface Cable [No Image Available] | • P/N 30-10198-0000; 2x17 pin test cable (with one connector) for baseboard LVDS interface |
| 14) eMMC Module  | • P/N 91-79006-0000; optional, 4GB Multi-Media Card, plug-in module for SD storage |
| 15) WiFi Dongle  | • US036NFM-Ralink RT5370 dongle for WiFi connectivity |
| 16) Bluetooth USB Dongle  | • Esense D7404 Bluetooth V4.0 Dongle EDR |

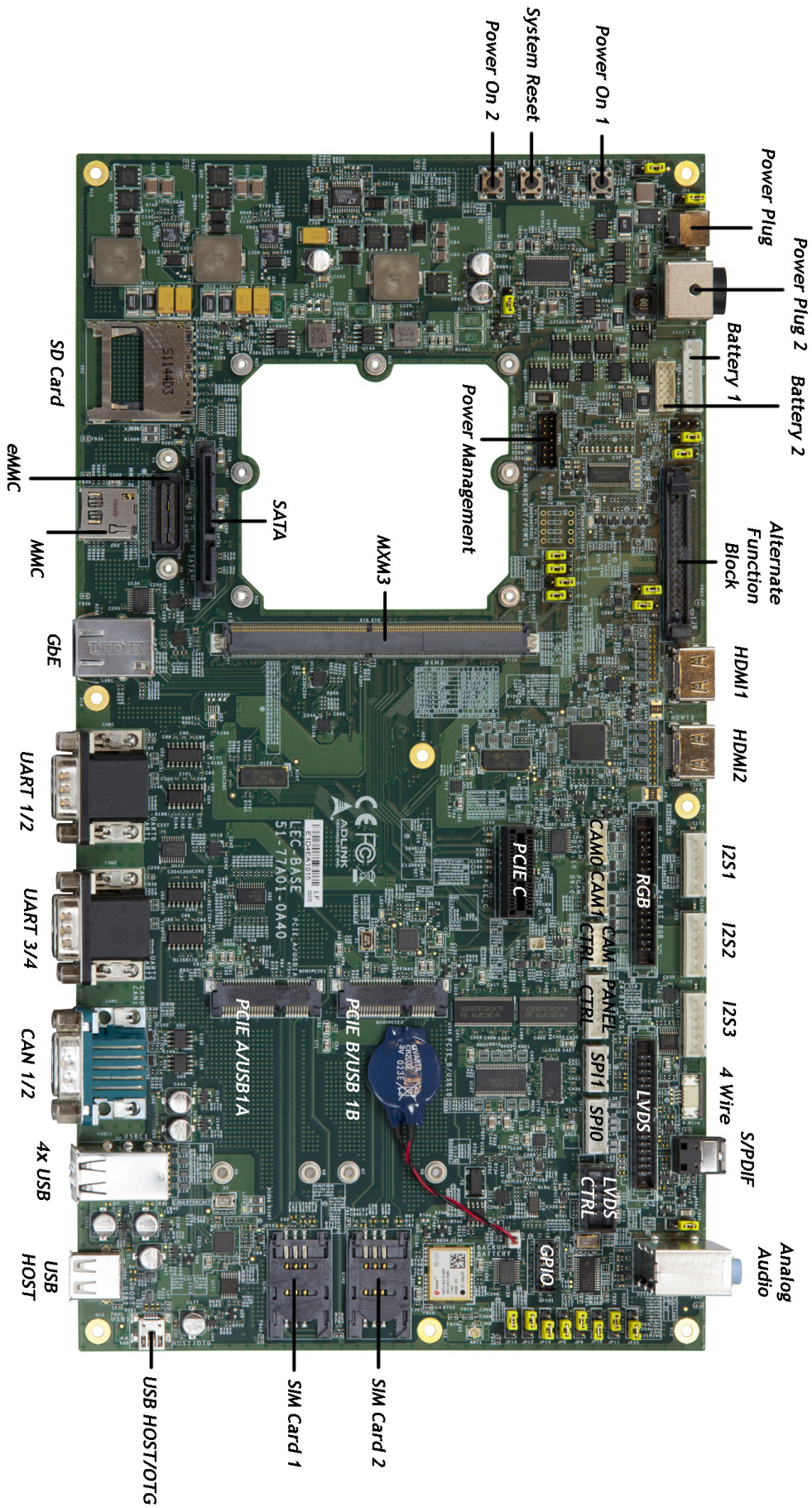


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| | |
|---|---|
| 17) SD Card<br> | • P/N 29-F0400-1000; Transcend TS4GSDHC6, 4GB standard SDHC Card (Class 10) |
| 18) AC Adapter<br> | • FSP090-DIEBN2, standard AC/DC 19V, 4.7A adapter |
| 19) Power Cord<br> | • P/N 30-00014-0000, standard US 10A, 125V AC power cord |
| 20) EU Power Adapter<br> | • P/N 30-52008-0000, 10-16A, 250V Female Universal Socket to Male EU Plug power adapter |



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## 1.5 Getting Started

Follow the preliminary setup steps in this section in the order listed.

| | |
|---|---|
| 1) Unpack the SMARC Starter Kit. | • Open the SMARC Starter Kit shipping box.<br>• Make sure you are grounded as described in Setting Up the Work Space on page 7.<br>• Unpack the contents of the shipping box and arrange the contents on an anti-static surface for verification. See “Setting Up the Work Space” on page 7.<br><br>CAUTION: When unpacking the touch screen, make sure to cover it with protective material before placing it in contact with another surface. |
| 2) Verify contents. | • Verify the contents of the shipping box against the following list of components:<br>▶ Printed shipping box<br>▶ Starter Kit accessory box<br>▶ Starter Kit cable box<br>▶ Internal foam (including small foam)<br>▶ EPE-top partition<br>▶ ESD-shielding bag for eMMC<br>▶ ESD shielding bag for SMARC module (optional, if module included)<br>▶ ESD shielding bag for LEC-BASE baseboard<br>▶ Standoff A, M3, H44.5, Ni<br>▶ Standoff A, M3H20<br>▶ Screws for standoff to baseboard<br>▶ Screws for module<br>▶ Zipper bags<br>▶ Heat sink<br>▶ LEC-BASE baseboard<br>▶ SMARC module (optional, if included)<br>▶ Flat panel bonded with touchscreen and panel frame<br>▶ Flat panel TTL cable<br>▶ USB touch-panel cable<br>▶ Several test cables with only one connector<br>▶ eMMC plug-in module (optional)<br>▶ Wifi dongle (optional)<br>▶ Bluetooth USB dongle (optional)<br>▶ SD card with software image<br>▶ AC/DC 19V adapter<br>▶ Power cord<br>▶ Universal socket to EU plug power adapter<br>• If anything is missing or damaged, call your sales representative. Refer to the ADLINK web page at http://www.adlinktech.com for contact information. |



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| | |
|---|---|
| 3) Obtain support documentation. | *(SMARC Module) Technical Reference*<br>This document provides detailed information on the SMARC module and is located on the ADLINK Computer-on-Module web page at http://www.adlinktech.com. |
| | *LEC-BASE Technical Reference*<br>This document provides detailed information on the LEC-BASE baseboard and is located on the ADLINK Computer-on-Module web page at http://www.adlinktech.com. |
| | *SMARC Linux BSP Installation Guide*<br>This document provides detailed information on installing the SMARC Linux BSP and is located in the Quick Drive of your SMARC Starter Kit . |
| | *Operating System Manual(s)*<br>These documents describe how to use the supported operating system (OS) with the SMARC Starter Kit system and provide more detailed operating information. |

## 1.6 Setting Up the Work Space

Use the following steps to set up an anti-static work surface and to unpack the SMARC base-board and module.

CAUTION: To prevent damage to the SMARC Starter Kit components, do not handle the components until you have taken Electrostatic Discharge precautions.
- Always touch a grounded, unpainted metal surface before touching any of the components.
- Always use an anti-static wrist strap connected to a grounding mat having static-dissipating characteristics and is attached to ground.

| | |
|---|---|
| 1) Select workbench location. | • The workbench location should have a flat clean, static-free surface for setup and operation (including the connection of any external peripherals and optional devices). |
| 2) Connect an ESD grounding strap to your body. | • Connect an ESD strap between your wrist or ankle and ground or the static-free work surface. |

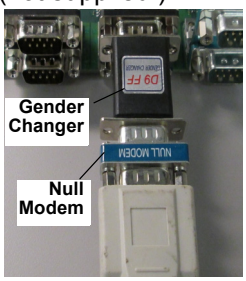


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## 1.7 Starting Up the SMARC Starter Kit System

Use the procedures provided in this section to assemble and boot your SMARC Starter Kit system.

1) Connect an RS-232 Serial Cable (not supplied.)



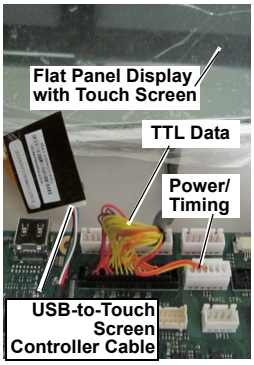


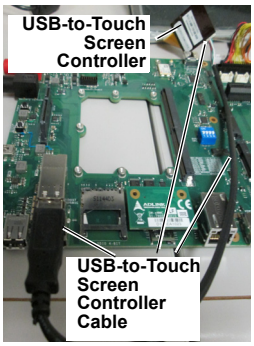


- Obtain an RS-232 cable with null-modem adapter and female gender changer and connect the gender-changer end to the COM port on the LEC-BASE shown in the photo on the left.
- Connect the free end of the cable to a PC running terminal emulation software with the following settings:
  - ▷ 115200 baud rate
  - ▷ no parity
  - ▷ 8 data bits
  - ▷ 1 stop bit
  - ▷ no hardware handshake

NOTE: Use a USB-to-Serial adapter if the PC has no serial interface. See second photo on the left.

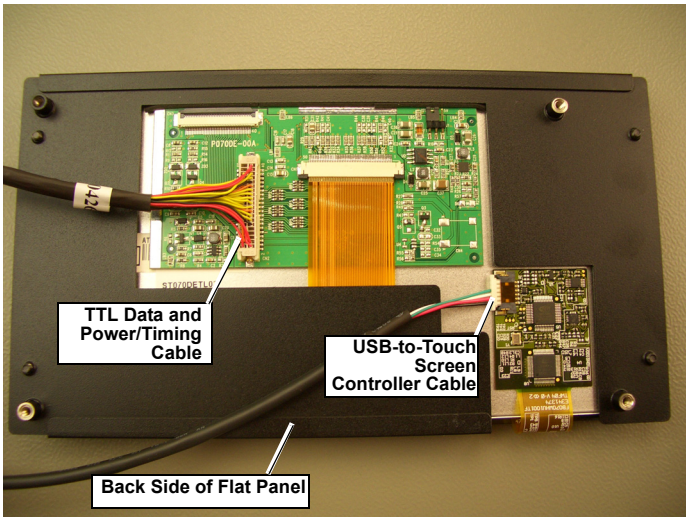
2) Connect the Flat Panel Touch Screen Display to the LEC-BASE.



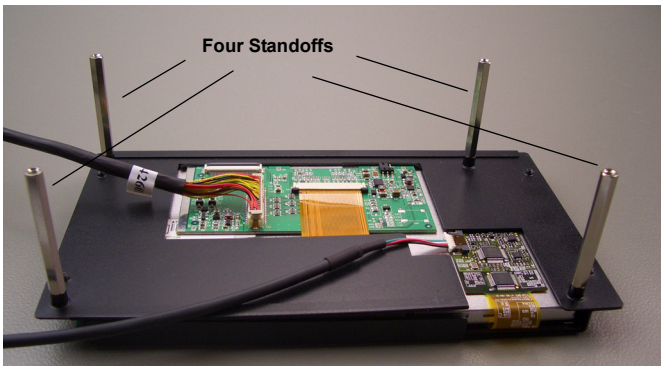
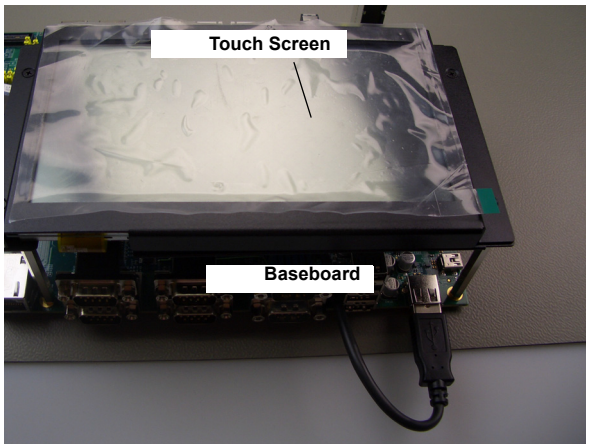

- Connect the flat panel TTL Data and Power/Timing combination cable from the back of the flat panel to the 18/24 Bit RGB connector and the Power/Timing connector on the LEC-BASE as shown in the first photo on the left. Refer to the enlarged photo of the baseboard in Getting Started or the LEC-BASE Technical Reference for connector locations.
- Connect the USB-to-Touch Screen Controller cable from a USB port on the LEC-BASE to the USB-to-Touch Screen Controller as shown in the first and second photos on the left.

NOTE: Make sure to connect the USB-to-Touch Screen Controller cable and the TTL cable in the same orientations as shown in the photo below.





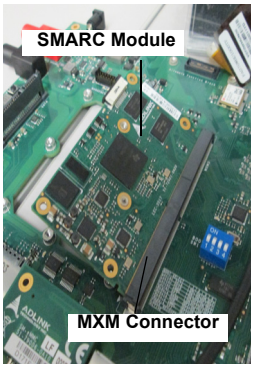

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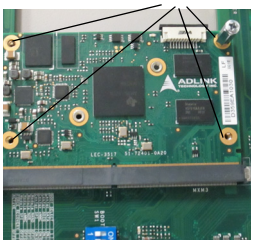
| | |
|---|---|
| 3) Mount the display to the baseboard. | • Install four standoffs to the back-side of the display.<br><br><br>• Fasten the display to the baseboard using four mounting holes from the bottom-side of the baseboard.<br><br> |

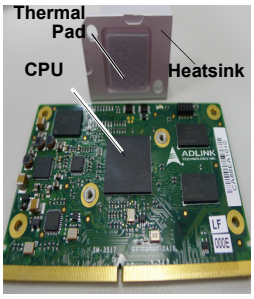


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4) Install the SMARC module on the LEC-BASE.







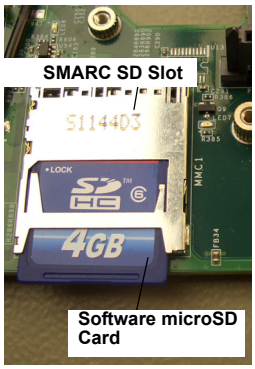
- Insert the edge fingers of the SMARC module into the MXM connector on the LEC-BASE as shown in the first photo on the left.
- Mount the module to the baseboard using 4, M2.5x5mm phillips screws. See the four mounting holes in second photo, showing one stand-off as a convenient alternative.




- Mount the heatsink onto the CPU if your operating environment is above room temperature. See third and fourth photos. (Mounting screws with springs not shown. Remove glue strip from thermal pad before mounting onto the CPU.)



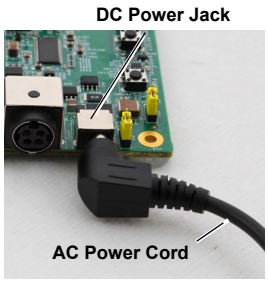
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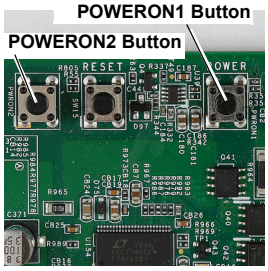
| | |
|---|---|
| 5) Install software microSD card.<br><br><br> | • Insert the software microSD card into the SD card slot on the LEC-BASE as shown in the photo on the left.<br><br>NOTE: The microSD card stores UBoot, Linux kernel, file system, and Utility/Application software. |
| 6) Connect keyboard and mouse.<br><br><br> | • Install USB keyboard and mouse to USB ports on the LEC-BASE as shown in the photo.<br><br>NOTE: An integrated mouse/keyboard is shown in the photo and requires only one USB port. |

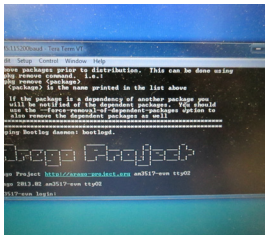


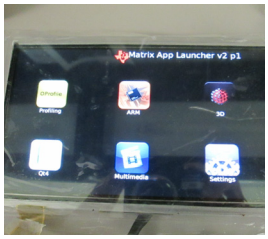
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7) Power On the system.






- Plug in the DC cord of the power adapter to the DC Power Jack on the LEC-BASE as shown in the first photo on the left.
- Plug the AC power cord into the power adapter and the free end of the AC power cord to an AC wall outlet.
- Press and hold the POWERON1 button on the LEC-BASE. See second photo. (Refer to LEC-BASE Technical Reference or the enlarged baseboard photo in Getting Started for locations of power-on buttons.)
- Release the POWERON1 button and press the POWERON2 button.
- Wait for the serial console screen to appear on the PC display as shown in the third photo.
- Wait for the LCD flat panel display to turn on and App Launcher to appear on the touch screen as shown in the fourth photo.
- Use the flat panel graphic display with USB mouse and TouchScreen to navigate the Matrix App Launcher. For more information on Matrix, see the Matrix User's Guide at: http://processors.wiki.ti.com/index.php/Matrix_Users_Guide
- Use the serial console login to run scripts, launch applications, get access to stored files, navigate U-Boot settings, and develop software.

NOTE: From the PC, you can log in to the serial console as root. Press Enter when prompted for a password.



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# Appendix A Technical Support

ADLINK Technology, Inc. provides a number of methods for contacting Technical Support listed in Table A-1 below. Requests for support through Ask an Expert are given the highest priorities, and usually will be addressed within one working day.

- ADLINK Ask an Expert – This is a comprehensive support center designed to meet all your technical needs. This service is free and available 24 hours a day through the ADLINK web site at http://www.adlinktech.com/AAE/. This includes a searchable database of Frequently Asked Questions, which will help you with the common information requested by most customers. This is a good source of information to look at first for your technical solutions. However, you must register online if you wish to use the Ask a Question feature.

ADLINK strongly suggests that you register with the web site. By creating a profile on the ADLINK web site, you will have a portal page called “My ADLINK”, unique to you with access to exclusive services and account information.

- Personal Assistance – You may also request personal assistance by creating an Ask an Expert account and then going to the Ask a Question feature. Requests can be submitted 24 hours a day, 7 days a week. You will receive immediate confirmation that your request has been entered. Once you have submitted your request, you must log in to go to the My Question area where you can check status, update your request, and access other features.
- Download Service – This service is also free and available 24 hours a day at http://www.adlinktech.com. For certain downloads such as technical documents and software, you must register online before you can log in to this service.

**Table A-1: Technical Support Contact Information**

| Method | Contact Information |
|---|---|
| Ask an Expert | http://www.adlinktech.com/AAE/ |
| Web Site | http://www.adlinktech.com |
| Standard Mail | Contact us should you require any service or assistance.<br><br>**ADLINK Technology, Inc.**<br>Address: 9F, No.166 Jian Yi Road, Zhonghe District<br>New Taipei City 235, Taiwan<br>新北市中和區建一路 166 號 9 樓<br>Tel: +886-2-8226-5877<br>Fax: +886-2-8226-5717<br>Email: service@adlinktech.com<br><br>**Ampro ADLINK Technology, Inc.**<br>Address: 5215 Hellyer Avenue, #110, San Jose, CA 95138, USA<br>Tel: +1-408-360-0200<br>Toll Free: +1-800-966-5200 (USA only)<br>Fax: +1-408-360-0222<br>Email: info@adlinktech.com<br><br>**ADLINK Technology (China) Co., Ltd.**<br>Address: 上海市浦东新区张江高科技园区芳春路 300 号 (201203)<br>300 Fang Chun Rd., Zhangjiang Hi-Tech Park,<br>Pudong New Area, Shanghai, 201203 China<br>Tel: +86-21-5132-8988<br>Fax: +86-21-5132-3588<br>Email: market@adlinktech.com |



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**Table A-1: Technical Support Contact Information (Continued)**

**ADLINK Technology Beijing**
Address: 北京市海淀区上地东路 1 号盈创动力大厦 E 座 801 室(100085)
Rm. 801, Power Creative E, No. 1,
Shang Di East Rd., Beijing, 100085 China
Tel: +86-10-5885-8666
Fax: +86-10-5885-8626
Email: market@adlinktech.com

**ADLINK Technology Shenzhen**
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A1 栋 2 楼 C 区 (518057)
2F, C Block, Bldg. A1, Cyber-Tech Zone, Gao Xin Ave. Sec. 7,
High-Tech Industrial Park S., Shenzhen, 518054 China
Tel: +86-755-2643-4858
Fax: +86-755-2664-6353
Email: market@adlinktech.com

**LiPPERT ADLINK Technology GmbH**
Address: Hans-Thoma-Strasse 11, D-68163, Mannheim, Germany
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Email: emea@adlinktech.com

**ADLINK Technology, Inc. (French Liaison Office)**
Address: 6 allée de Londres, Immeuble Ceylan
91940 Les Ulis, France
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Fax: +33 (0) 1 60 12 35 66
Email: france@adlinktech.com

**ADLINK Technology Japan Corporation**
Address: 〒101-0045 東京都千代田区神田鍛冶町 3-7-4
神田 374 ビル 4F
KANDA374 Bldg. 4F, 3-7-4 Kanda Kajicho,
Chiyoda-ku, Tokyo 101-0045, Japan
Tel: +81-3-4455-3722
Fax: +81-3-5209-6013
Email: japan@adlinktech.com

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802, Mointer B/D, 326 Seocho-daero, Seocho-Gu,
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| | |
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