



**THE DATASHEET OF  
TMDXL138LOGICEXP**



# MONO



We fast forward  
the evolution of  
new products.

---

# Table of Contents

|          |  |           |
|----------|--|-----------|
| <b>1</b> | <b>Introduction</b>                              | <b>4</b>  |
| 1.1      | Scope of Document                                | 4         |
| 1.2      | Zoom OMAP-L138 eXperimenter Kit Contents         | 4         |
| 1.3      | Unpack the System                                | 5         |
| 1.4      | Baseboard Connection Diagram                     | 6         |
| <b>2</b> | <b>Development Kit Set-up</b>                    | <b>8</b>  |
| 2.1      | Register your Development Kit                    | 8         |
| 2.2      | Connect the SOM-M1 to the Baseboard              | 8         |
| 2.3      | Connect eXperimenter Kit to PC                   | 10        |
| 2.3.1    | Connect via Null-Modem Serial Cable              | 10        |
| 2.3.2    | Connect via USB A to mini-B Cable                | 11        |
| 2.4      | Baseboard DIP Switches                           | 13        |
| 2.5      | Terminal Emulation Installation                  | 14        |
| 2.6      | Get to the Linux Kernel or a U-Boot Prompt       | 15        |
| <b>3</b> | <b>Product Notices</b>                           | <b>17</b> |
| <b>4</b> | <b>Product Ordering Information</b>              | <b>18</b> |
| 4.1      | Optional Zoom Display Kits                       | 18        |
| <b>5</b> | <b>Support</b>                                   | <b>19</b> |
| 5.1      | Documentation and Software Downloads             | 19        |
| 5.2      | Frequently Asked Questions                       | 19        |
| 5.3      | Technical Discussion Group                       | 19        |
| 5.4      | Warranty Statement                               | 19        |
| 5.5      | Additional Support Services Available from Logic | 20        |

# List of Figures and Tables

---

|  |    |
|--|----|
| Figure 1.1 –Kit Hardware Contents                            | 5  |
| Figure 1.2 –Connection Diagram for the Baseboard             | 6  |
| Figure 2.1 –Align the SOM-M1 over the Baseboard              | 9  |
| Figure 2.2 –Connect the SOM-M1 to the Baseboard              | 9  |
| Figure 2.3 –Connect the Null-Modem Serial Cable to Baseboard | 10 |
| Figure 2.4 –Connect Power Supply and Adapter                 | 11 |
| Figure 2.5 –Connect Power to the Baseboard                   | 11 |
| Figure 2.6 –Connect the USB A to mini-B Cable to Baseboard   | 12 |
| Figure 2.7 –Connect Power Supply and Adapter                 | 12 |
| Figure 2.8 –Connect Power to the Baseboard                   | 13 |
| Figure 2.9 –DIP Switch Settings                              | 13 |
| Table 2.10 –S7 DIP Switch Functions                          | 14 |
| Table 2.11 –S7 DIP Switch Boot Modes                         | 14 |
| Figure 2.12 –Tera Term: Serial Port Set-up Window            | 15 |
| Figure 2.13 –Switch Power On                                 | 16 |

# 1 Introduction

---

Congratulations on your purchase of the Zoom™ OMAP-L138 eXperimenter Kit. This Zoom Development Kit provides a product-ready hardware and software platform for evaluating the functionality of the Texas Instruments™ OMAP-L138 processor and the Logic System on Module (SOM).

## 1.1 Scope of Document

This QuickStart Guide will list the contents of the eXperimenter Kit, point out the features of the major components, and provide the instructions necessary to verify your development kit is in working order. Any additional usage instructions or details fall outside the scope of this document. Additional resources will be listed at the conclusion of this QuickStart Guide.

## 1.2 Zoom OMAP-L138 eXperimenter Kit Contents

### **Boards**

- +OMAP-L138 SOM-M1
- +Application baseboard

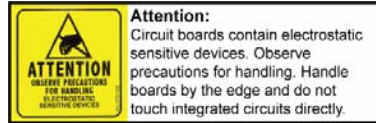
### **Cables and Accessories**

- +5 volt power supply with power adapters for the US, UK, Japan, and Europe
- +USB A to mini-B cable

### 1.3 Unpack the System

Once you have verified that all the development kit items are present, carefully remove the boards from their protective anti-static bags. Check the boards for any visible damage and ensure that there are no broken, damaged, or missing parts.

**Note:** Avoid touching the MOS devices. Static discharge can and will damage these devices.

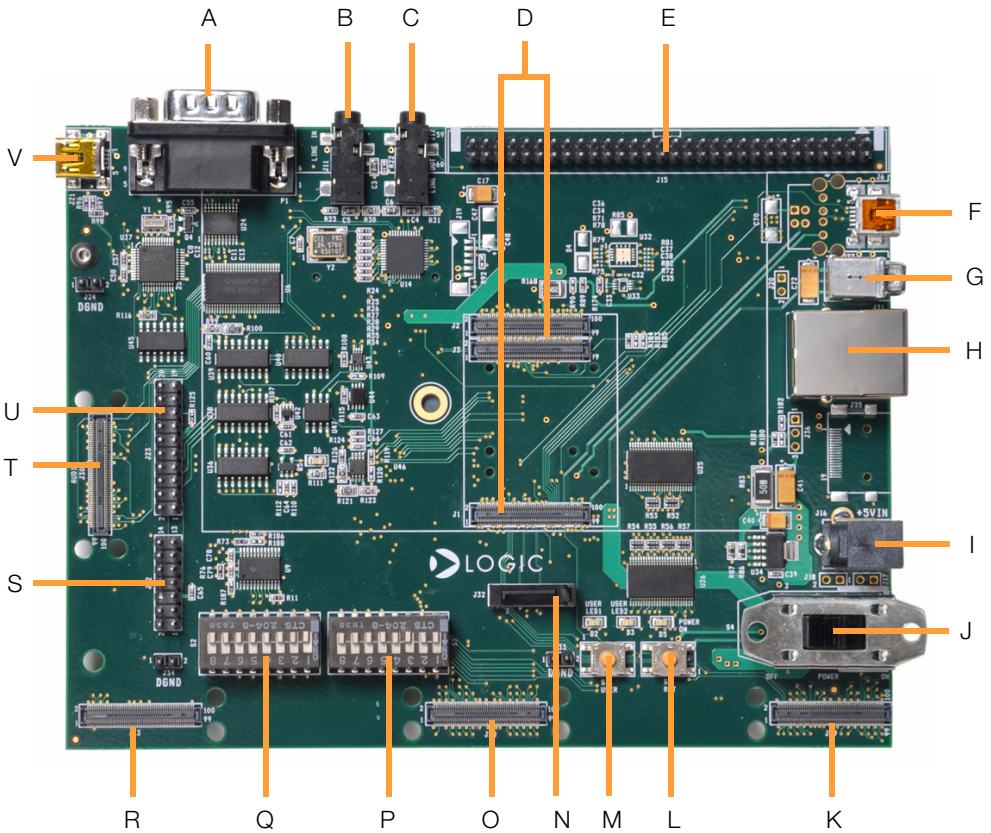


**Figure 1.1 – Kit Hardware Contents**



## 1.4 Baseboard Connection Diagram

Figure 1.2 – Connection Diagram for the Baseboard



## Connection Diagram Details

- A – RS232 serial debug port
- B – Line-in stereo 3.5 mm jack
- C – Line-out stereo 3.5 mm jack
- D – Three 100-pin board-to-board (BTB) socket connectors for SOM-M1
- E – 60-pin header for integrated LCD, touch, backlight, connector power
- F – USB On-the-Go mini-AB port (USB0)
- G – USB host Type A port (USB1)
- H – RJ45 Ethernet jack with magnetics
- I – Power-in from 5 volt regulated power supply
- J – Power on/off switch
- K – Video port interface (VPIF) BTB expansion connector
- L – System reset button
- M – System user button
- N – SATA connector
- O – External memory interface (EMIF) BTB expansion connector
- P – Boot mode / FET mux DIP switches (S7)
- Q – General purpose user DIP switches (S2)
- R – Power measurement daughter card (PMDC) BTB expansion connector
- S – JTAG header for TI processor
- T – Audio expansion connector
- U – JTAG header for ARM core
- V – USB mini-B port (emulation USB)

## 2 Development Kit Set-up

---

### 2.1 Register your Development Kit

Registration provides you access to the latest revision of this QuickStart Guide, as well as other documentation and software tools. In addition to downloads access, registration provides future notifications when Logic releases documentation and software updates for your product.

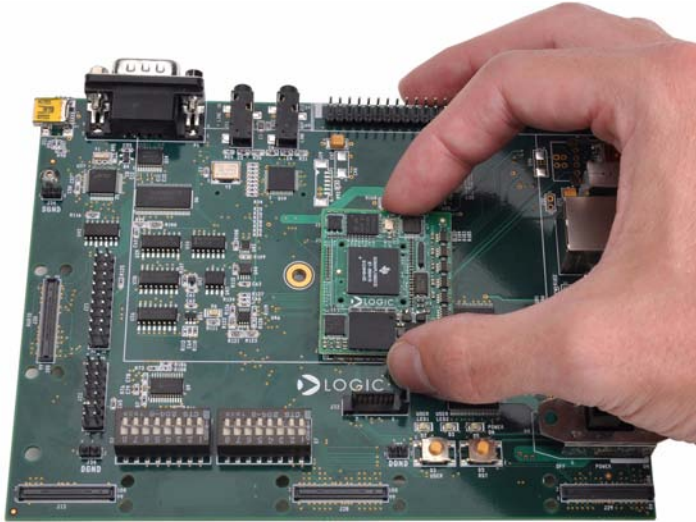
1. To register, visit the Logic Support website at [www.logiccpd.com/product-support](http://www.logiccpd.com/product-support) and click on “Create Account”.
2. Fill in the on-screen form and click the “Submit” button.
3. You will receive an e-mail with a URL link to confirm account creation. Click on the link to finalize account creation.
4. You will be directed to a page on Logic’s website that states “Account Activated”. At this point you can register your product. Click on the link to “register your development kit and get access to downloads”.
5. Fill in the on-screen form (all fields are required) and click the “Submit” button.
6. Your product is now registered. Click on the “Return to your Account Overview” link and you will see the list of registered products for your account.

Under the heading for “OMAP-L138 eXperimenter Kit”, click the “All Downloads” link to access the downloads associated with your Zoom OMAP-L138 eXperimenter Kit.

### 2.2 Connect the SOM-M1 to the Baseboard

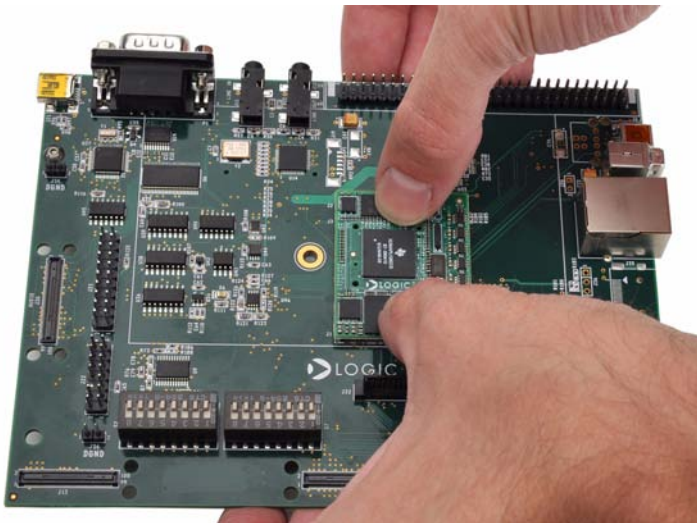
1. Align the SOM-M1 over the three board-to-board (BTB) socket connectors in the center of the baseboard (there is an outline of the SOM-M1 on the baseboard silkscreen to show proper placement). See Figure 2.1.

**Figure 2.1 – Align the SOM-M1 over the Baseboard**



2. Press straight down on the SOM-M1, applying even pressure over the baseboard BTB socket connectors. See Figure 2.2.

**Figure 2.2 – Connect the SOM-M1 to the Baseboard**



3. Visually verify that the BTB socket connectors on the SOM-M1 and baseboard have mated correctly. To remove the SOM-M1, pull up on the board above the socket connectors. Attempt to pull straight up and refrain from flexing the printed circuit board (PCB) to avoid damaging the SOM-M1.

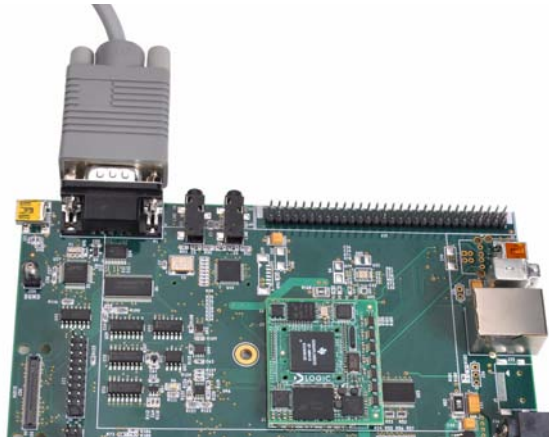
## 2.3 Connect eXperimenter Kit to PC

In order to communicate with the OMAP-L138 SOM-M1, the eXperimenter Kit needs to be connected to a PC. There are two methods for this: via a null-modem serial cable to access the U-Boot and Linux kernel in SPI flash or via a USB cable to access the processor using Code Composer Studio™. The following sections will walk you through each method.

### 2.3.1 Connect via Null-Modem Serial Cable

1. Connect a null-modem serial cable (**not** supplied in the kit) to the serial port connector on the baseboard and to an empty COM port on your PC. See Figure 2.3.

**Figure 2.3 – Connect the Null-Modem Serial Cable to Baseboard**



2. Connect the regulated 5V power supply to the appropriate power adapter for the region in which you are using the eXperimenter Kit.

**Figure 2.4 – Connect Power Supply and Adapter**



3. Plug the power adapter into an electrical outlet and the 5V line output connector into the power-in connector on the baseboard.

**Figure 2.5 – Connect Power to the Baseboard**

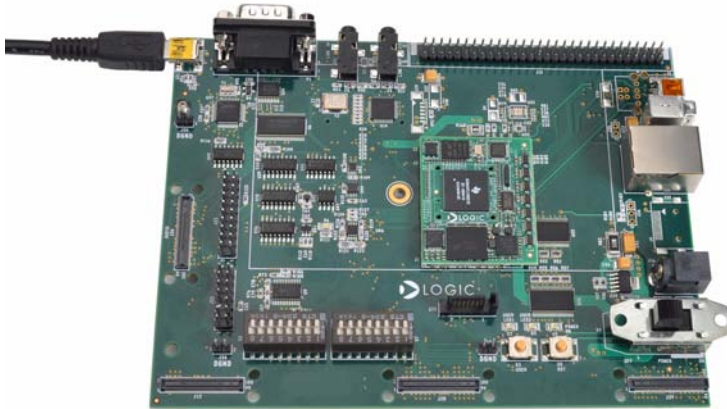


4. Before powering on your kit, you will have to verify the baseboard DIP switches are in the correct positions. Please proceed to Section 2.4 for details.

### 2.3.2 Connect via USB A to mini-B Cable

1. Connect the USB A to mini-B cable (supplied in the kit) to the emulation USB mini-B port on the baseboard and to a USB port on your PC. See Figure 2.6.

**Figure 2.6 – Connect the USB A to mini-B Cable to Baseboard**



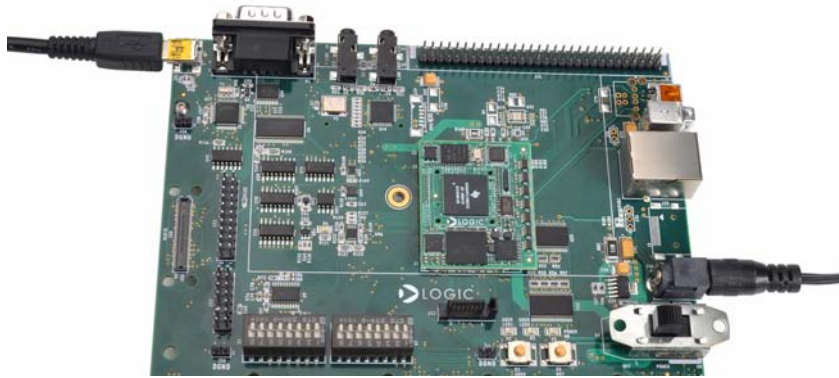
2. Connect the regulated 5V power supply to the appropriate power adapter for the region in which you are using the development kit.

**Figure 2.7 – Connect Power Supply and Adapter**



3. Plug the power adapter into an electrical outlet and the 5V line output connector into the power-in connector on the baseboard.

**Figure 2.8 – Connect Power to the Baseboard**

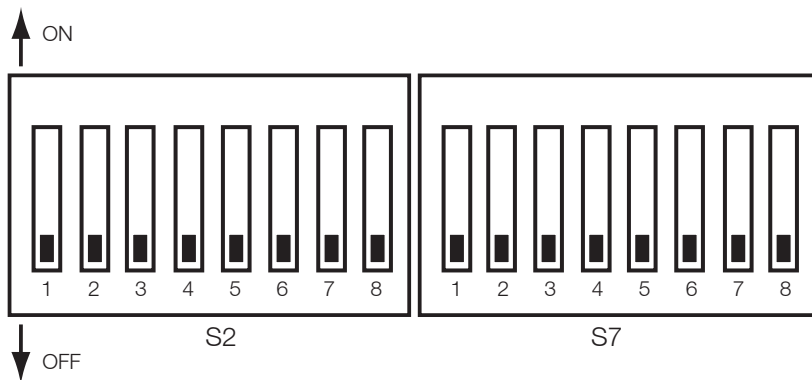


4. Before powering on your kit, you will have to verify the baseboard DIP switches are in the correct positions. Please proceed to the next section for details.

## 2.4 Baseboard DIP Switches

There are the two 8-position DIP switches located on the application baseboard at reference designators S2 and S7. By default, all of the switches are set to the “OFF” position and should remain in that position when completing the steps in this QuickStart Guide.

**Figure 2.9 – DIP Switch Settings**



The S2 DIP switch is reserved for user application general purpose. The S7 DIP switch controls the processor's boot mode and several FET muxes on the baseboard. Table 2.10 describes the function of each switch.

**Table 2.10 – S7 DIP Switch Functions**

| Switch | OFF Position  | ON Position   |
|--------|---|---|
| S7:1*  | Baseboard LCD drive enabled.  | Baseboard LCD drive disabled.   |
| S7:2   | Baseboard audio enabled.<br>Associated McASP lines connect to baseboard audio only. | Baseboard audio disabled.<br>Associated McASP lines are available on audio expansion connector. |
| S7:3   | OMAP-L138 I/O runs at 3.3V  | OMAP-L138 I/O runs at 1.8V  |
| S7:4   | No connection   |   |
| S7:5   | BOOT[1]   |   |
| S7:6   | BOOT[2]   |   |
| S7:7   | BOOT[3]   |   |
| S7:8   | BOOT[4]   |   |

**\*Note:** S7:1 indicates slide 1 on the S7 DIP switch, S7:2 indicates slide 2 on the S7 DIP switch, and so on.

A default boot mode has been defined by pulling all boot pins (BOOT[0:7]) to a default state on the SOM. The default boot mode is SPI1 Flash; for the purpose of this QuickStart Guide, leave the boot mode set to SPI1 Flash. All available boot modes are described in Table 2.11; however, the use of these boot modes fall outside the scope of this document.

**Table 2.11 – S7 DIP Switch Boot Modes**

|         |              | DIP Switch Setting—S7[5:8] |         |         |         |
|---------|--------------|----------------------------|---------|---------|---------|
|         |              | BOOT[4]                    | BOOT[3] | BOOT[2] | BOOT[1] |
|         |              | S7:8                       | S7:7    | S7:6    | S7:5    |
|         | NOR EMIFA    | OFF                        | ON      | ON      | ON      |
|         | NAND-8 EMIFA | OFF                        | OFF     | OFF     | ON      |
| Default | SPI1 Flash   | OFF                        | OFF     | OFF     | OFF     |
|         | UART2        | ON                         | ON      | OFF     | OFF     |
|         | EMU Debug    | ON                         | OFF     | OFF     | ON      |

## 2.5 Terminal Emulation Installation

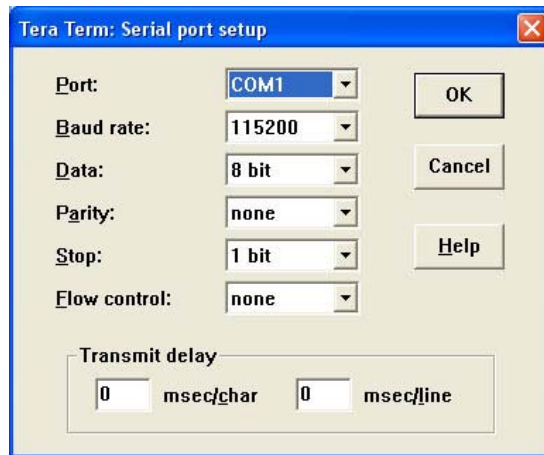
The Zoom OMAP-L138 eXperimenter Kit is designed to communicate with terminal emulation programs using a null-modem serial cable (**not** included in kit). The terminal emulation

program must support binary transfers in order to download software to the kit. Although Logic does not support any particular terminal emulation program, we suggest using Tera Term Pro for Windows 2000 or XP (Tera Term Pro is not available for Linux users). Tera Term Pro can be downloaded for free from Logic's website. To install Tera Term:

1. Download the.zip file from Logic's website and unzip the contents:  
<http://support.logicpd.com/downloads/240/>
2. After unzipping the contents, locate the "setup.exe" file and double-click it.
3. Follow the on-screen instructions to install Tera Term.

Once the terminal emulation program has been installed on your PC, open a new serial port connection using the COM port where the null-modem serial cable is connected to the host PC. Set the 'baud-rate' to 115200, 'data' to 8-bit, 'parity' to none, 'stop' to 1-bit, and 'flow control' to none. (**Hint:** In Tera Term, you can save these serial port settings by selecting 'Setup -> Save setup...' from the file menu. After saving, these serial port settings will be in place every time you launch the Tera Term application.)

**Figure 2.12 – Tera Term: Serial Port Set-up Window**

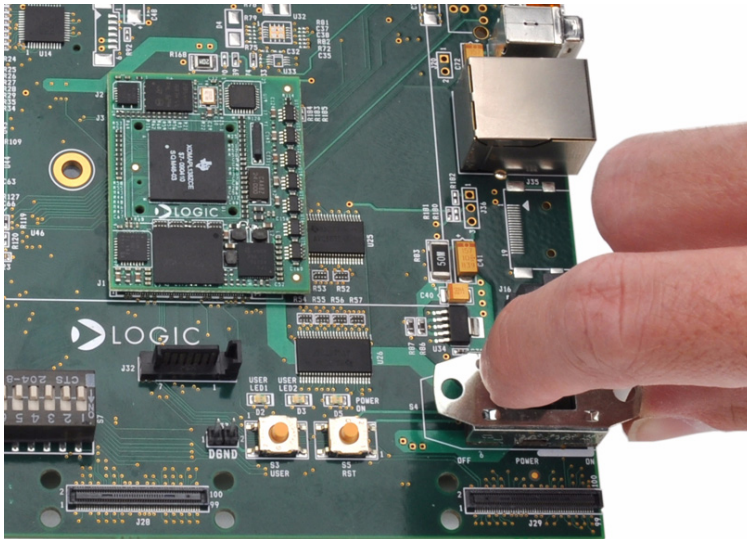


## 2.6 Get to the Linux Kernel or a U-Boot Prompt

The U-Boot bootloader, Linux kernel, and file system are burned to flash memory (SPI1) during manufacture and provide the necessary commands to interact with the OMAP-L138 SOM-M1 and boot into an operating system.

1. Make sure the development kit is set-up as described in the "Connect eXperimenter Kit to PC" Section and the boot mode is set to SPI1 as explained in the "Baseboard DIP Switches" Section.
2. Start the terminal program you installed on your PC in the "Terminal Emulation Installation" Section.
3. Verify that the serial port settings are correct. See Figure 2.12.
4. Move the "POWER ON/OFF" switch to the "ON" position to boot the development kit.

**Figure 2.13 – Switch Power On**



5. In your PC's terminal emulation program, you should see U-Boot launch. If you press any key before 3 seconds elapse, you will receive a U-Boot > prompt to modify the boot settings. Otherwise, after 3 seconds elapse from power on, U-Boot will launch the Linux kernel, culminating with a login prompt that will allow you to log in as root (no password).
6. You are now ready to work with the OMAP-L138 SOM-M1 using the Linux kernel or U-Boot.

**Note:** The OMAP-L138 SOM-M1 can also use Code Composer Studio™ to load board support library (BSL) sample programs and interact with the DSP core on the processor. To use Code Composer Studio with the OMAP-L138 SOM-M1, the EVM must be connected to the PC using the USB A to mini-B cable, as described in Section 2.3.2, instead of the null-modem serial cable. Additional instructions are available in the *Zoom OMAP-L138 Development Kit User Manual* (<http://support.logicpd.com/downloads/1214/>).

## 3 Product Notices

---

This development kit is intended for use for **ENGINEERING DEVELOPMENT, DEMONSTRATION, OR EVALUATION PURPOSES ONLY** and is not considered by TI and Logic to be a finished end-product fit for general consumer use. Persons handling the product(s) must have electronics training and observe good engineering practice standards. As such, the goods being provided are not intended to be complete in terms of required design-, marketing-, and/or manufacturing-related protective considerations, including product safety and environmental measures typically found in end products that incorporate such semiconductor components or circuit boards. This development kit does not fall within the scope of the European Union directives regarding electromagnetic compatibility, recycling (WEEE), FCC, CE or UL, and therefore may not meet the technical requirements of these directives or other related directives.

### ESD

The user assumes all responsibility and liability for proper and safe handling of the goods. Further, the user indemnifies TI and Logic from all claims arising from the handling or use of the goods. Due to the open construction of the product, it is the user's responsibility to take any and all appropriate precautions with regard to electrostatic discharge.

### FCC Warning

This development kit is intended for use for **ENGINEERING DEVELOPMENT, DEMONSTRATION, OR EVALUATION PURPOSES ONLY** and is not considered by TI and Logic to be a finished end-product fit for general consumer use. It generates, uses, and can radiate radio frequency energy and has not been tested for compliance with the limits of computing devices pursuant to part 15 of FCC rules, which are designed to provide reasonable protection against radio frequency interference. Operation of this equipment in other environments may cause interference with radio communications, in which case the user at his own expense will be required to take whatever measures may be required to correct this interference.

## 4 Product Ordering Information

---

Zoom OMAP-L138 eXperimenter Kits and OMAP-L138 SOM-M1 modules are available from Logic distributors. Please visit Logic's website for configuration options and ordering information:

+[www.logicpd.com/products/development-kits/zoom-omap-l138-experimenter-kit](http://www.logicpd.com/products/development-kits/zoom-omap-l138-experimenter-kit)

+[www.logicpd.com/products/system-modules/texas-instruments-omap-l138-som-m1](http://www.logicpd.com/products/system-modules/texas-instruments-omap-l138-som-m1)

### 4.1 Optional Zoom Display Kits

Zoom Display Kits are ideal for embedded solutions requiring a graphical user interface and are available in different display sizes and resolutions. Zoom Display Kits are sold separately. Contact Logic for other display requirements.

Visit Logic's website at [www.logicpd.com/products/display-kits](http://www.logicpd.com/products/display-kits) for a complete listing of Display Kits and specifications.

# 5 Support

---

## 5.1 Documentation and Software Downloads

Logic provides additional documentation and software resources for the Zoom OMAP-L138 eXperimenter Kit. These additional resources are available as downloads from the “My Account” section of the Logic website. Click on the “Log In” link at the top of any logicpd.com web page and enter your username and password to access the downloads available for your product.

Additional documentation includes:

- +OMAP-L138 SOM-M1 Schematics (.pdf), Layout Files (.pdf), and BOM (.pdf)
- +Application Baseboard Schematics (.pdf & .dsn), Layout Files (.pdf & .max), and BOM (.pdf)
- +*Zoom OMAP-L138 Development Kit User Manual*
- +*OMAP-L138 SOM-M1 Hardware Specification*
- +White Papers, Application Notes, and Product Change Notifications (PCNs) as they become available

## 5.2 Frequently Asked Questions

Visit [www.logicpd.com/product-support](http://www.logicpd.com/product-support) for FAQs regarding the Zoom OMAP-L138 eXperimenter Kit and SOMs.

## 5.3 Technical Discussion Group

Visit [www.logicpd.com/product-support](http://www.logicpd.com/product-support) to join our Technical Discussion Group (TDG) and share valuable information with other designers. Please note that the TDG site requires its own account creation that is separate from the account for the main Logic website.

## 5.4 Warranty Statement

Refer to the “Development Kit Important Notice” document enclosed with the Zoom OMAP-L138 eXperimenter Kit for warranty information.

## 5.5 Additional Support Services Available from Logic

### **Support Packages for Dedicated Technical Support**

Visit [www.logicpd.com/product-support](http://www.logicpd.com/product-support) for complete descriptions, prices, and purchase options.

### **Product Development Services**

Logic offers product development and manufacturing services from initial product concept and design to volume production and fulfillment.

- +Industrial Design
- +Mechanical Engineering
- +Electrical Engineering
- +Systems & Software Engineering
- +PCB Design & Layout
- +FPGA/DSP Design
- +Manufacturing Services

# Revision History

| REV             | EDITOR | REVISION DESCRIPTION                         | APPROVAL | DATE     |
|-----------------|--------|--|----------|----------|
| 1               | JCA    | +Internal release                            | JCA      | 06/24/09 |
| 2<br>PN 1013886 | JCA    | +Beta release                                | JCA      | 08/14/09 |
| 3<br>PN 1014622 | JCA    | +Table 2.11: Corrected UART2 switch settings | JCA      | 11/12/09 |

Please check [www.logicpd.com](http://www.logicpd.com) for the latest revision of this manual and other documentation.

OMAP and Code Composer Studio are registered trademarks of Texas Instruments Incorporated.

This page intentionally left blank.





## embedded product solutions

411 N. Washington Ave. Suite 400 Minneapolis, MN 55401

T : 612.672.9495 F : 612.672.9489 I : [www.logicpd.com](http://www.logicpd.com)

Logic Product Development makes no warranty for the use of its products. The Company assumes no responsibility for any errors which may appear in this document, reserves the right to change devices or specifications detailed herein at any time without notice, and does not make any commitment to update the information contained herein. The names of the sample source code files and the platform dependent environment variables may be subject to change without notice. Some steps and figures may vary between different versions of tools. No licenses to patents or other intellectual property of Logic are granted by the company in connection with the sale of Logic products, expressly or by implication.

All rights reserved. Logic Product Development. Intel, Renesas, and Sharp are registered trademarks. Pentium is a registered trademark of Intel. Windows is a registered trademark of Microsoft Corporation. Zoom and LogicLoader are trademarks of Logic Product Development. Terms and product names in this document may be trademarks of others.

# Looking for pricing, stock, or lifecycle information?

Click below to explore more details on WIN SOURCE:

-  [View TMDXL138LOGICEXP](#) on WIN SOURCE
-  [Texas Instruments](#) Information

## Optimize Your Supply Chain with WIN SOURCE Solutions

-  Global Sourcing Solution
-  Obsolete Management
-  Cost Control Management
-  Shortage Management
-  Alternative Solution
-  Excess Inventory Management