

:: Display Kit ::

NON



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1 Introduction

Congratulations on your purchase of the Zoom™ Display Kit. The Display Kit includes an LCD, touchscreen, backlight, and cable. Zoom Display Kits are ready-to-use and can be immediately connected to most Zoom Development Kits. Logic's embedded solutions fast forward product development and helps you stay focused on your high-value core technologies.

1.1 Zoom Display Kit Features

Common Features

- +16-bit Color LCD
- +TFT or AD-TFT interface
- +Transmissive LCD
- +Touch panel
- +LED backlight
- +Bezel
- +Ribbon cable
- +Stylus

Individual Specifications

Each Display Kit has unique specifications and features. Full feature lists can be found under the "Product Information" heading on each Display Kit's web page:
<http://www.logicpd.com/eps/displaykits/>.

Compatibility with Development Kits

Not every Display Kit is compatible with every Logic System on Module (SOM) Development Kit. A list of supported SOMs is available on each Display Kit's web page. Please contact Logic with any questions or other display requirements.

2 Getting Started

2.1 Unpack the System

The Zoom Display Kit includes the following items:

- +Display assembly
- +Bottom stand
- +60-pin ribbon cable
- +Stylus
- +Thumb screws:
 - +Two for 3.5" and 5.7" displays
 - +Three for 10.4" and 12.1" displays

Figure 2.1 – Kit Contents



3 QuickStart

3.1 Assemble the Zoom Display Kit

Unpack the thumb screws and securely attach them to the bottom stand and display assembly as shown below.

Figure 3.1 – 3.5” and 5.7” Display Kit Assembly

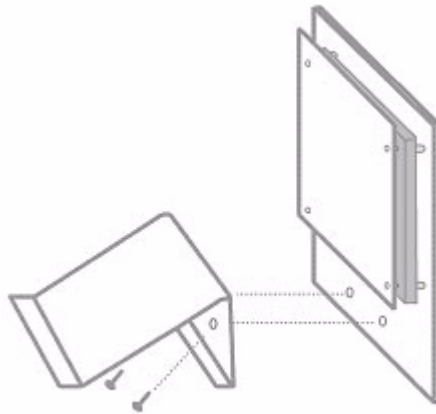
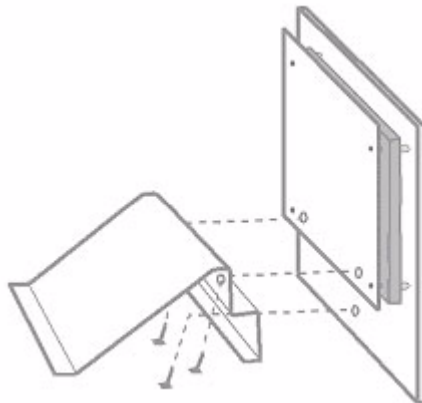


Figure 3.2 – 10.4” and 12.1” Display Kit Assembly



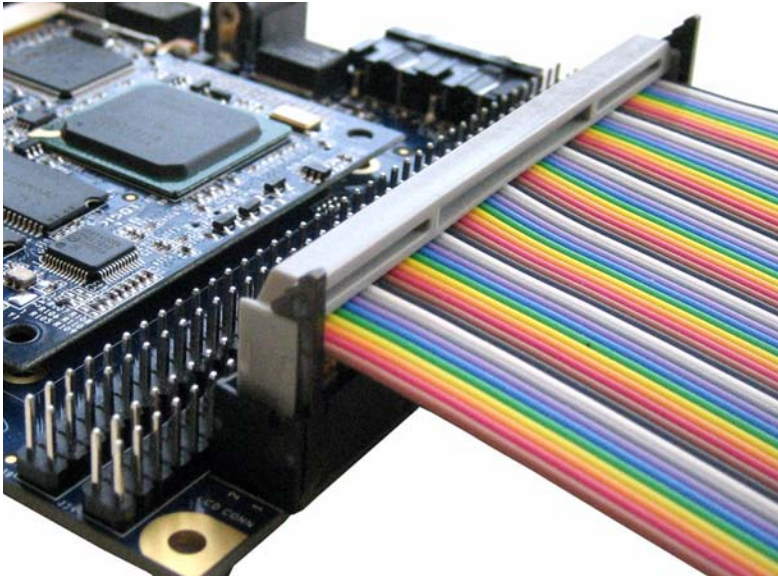
3.2 Cable Connection to the Development Kit

The included ribbon cable connects to most Development Kit baseboards through a 60-pin LCD connector. Specific use of this cable and the location of the baseboard connector differ between Development Kits as explained in the following sections.

3.2.1 Zoom SDK Baseboard Cable Connection

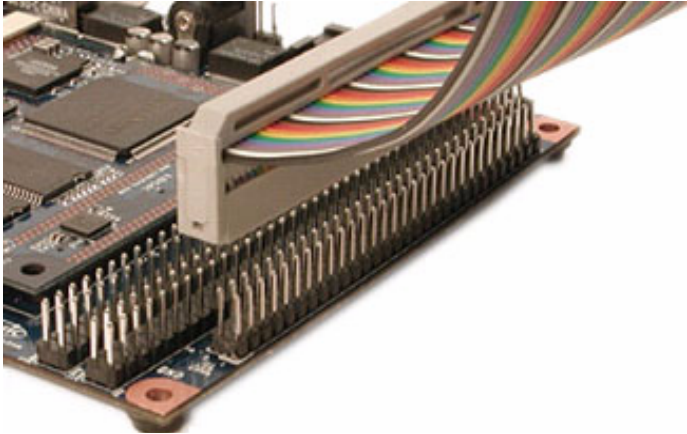
This step only applies to the Zoom ColdFire SDK, Marvell, NXP, and Renesas baseboards. Firmly press the ribbon cable into the 60-pin LCD connector labeled J11 on the silkscreen of the SDK baseboard. The keyed connector can only be inserted in one direction.

Figure 3.3 – SDK Baseboard Ribbon Cable Connection



When connecting the ribbon cable to a baseboard without a keyed connector, you can be sure that the ribbon cable is lined up properly when you align the triangle marked on your ribbon cable with Pin 1 on your baseboard.

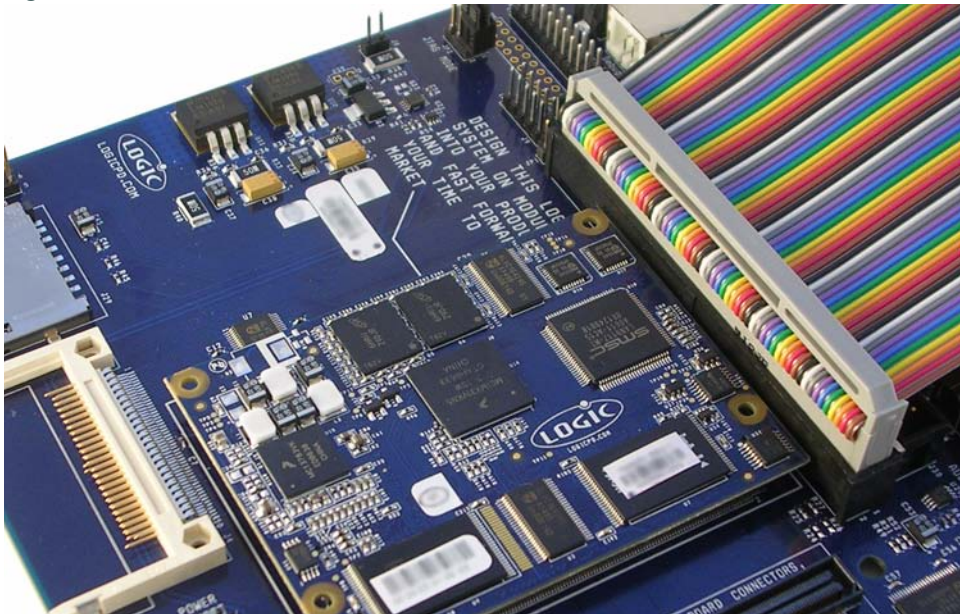
Figure 3.4 – SDK Baseboard without Keyed Connector)



3.2.2 Cable Connection to LV-Baseboard

Firmly press the ribbon cable into the 60-pin LCD connector labeled J11 on the silkscreen of the LV-Baseboard (the same baseboard used in Zoom Freescale i.MX LITEKITS).

Figure 3.5 – LV-Baseboard LCD Connection

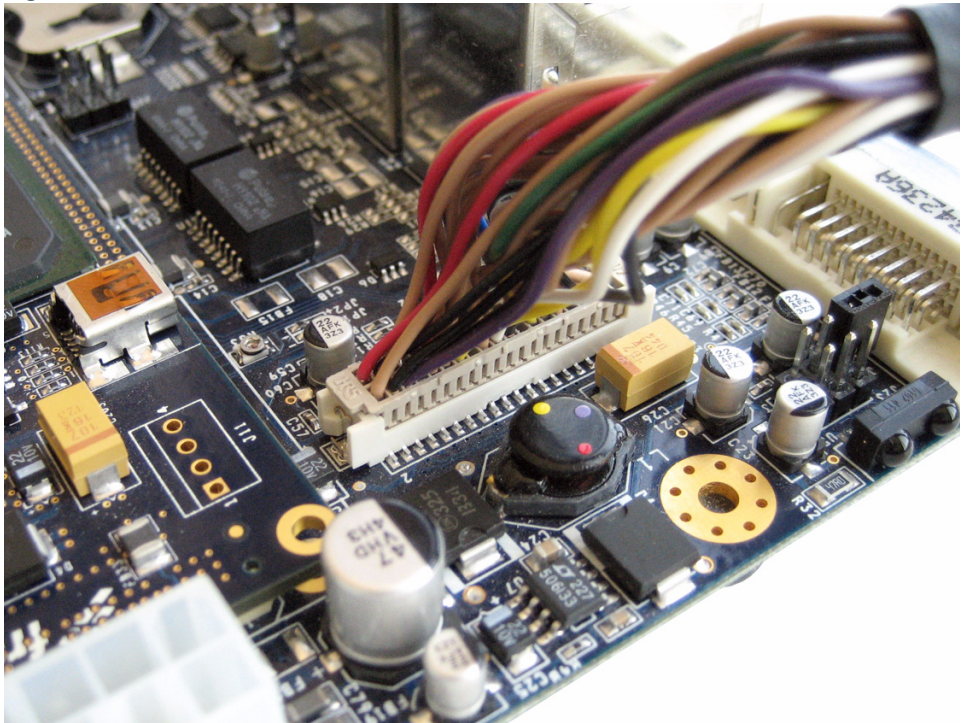


3.2.3 ColdFire EVB Baseboard Cable Connection

The ColdFire EVB Development Kits do not use the included 60-pin ribbon cable. Instead, they require a custom cable with a 60-pin connector on one end and a 40-pin connector on the other. This custom cable must be purchased separately from the Display Kit. Please see the Logic website for more information: <http://www.logicpd.com/eps/displaykits/>.

Firmly press the custom cable into the 40-pin LCD connector labeled J19 on the silkscreen of the Zoom ColdFire EVB baseboard. The keyed connector can only be inserted in one direction.

Figure 3.6 – ColdFire EVB Baseboard Cable Connection



3.2.4 Geode LX LCD Adaptor Board

The Geode LX Development Kits require a custom adaptor board that must be purchased separately from the Display Kit. The adaptor board comes with its own QuickStart Guide explaining proper usage. Please refer to that document for connection instructions. See the Logic website for more information: <http://www.logicpd.com/eps/displaykits/>.

3.3 Cable Connection to the Display Kit

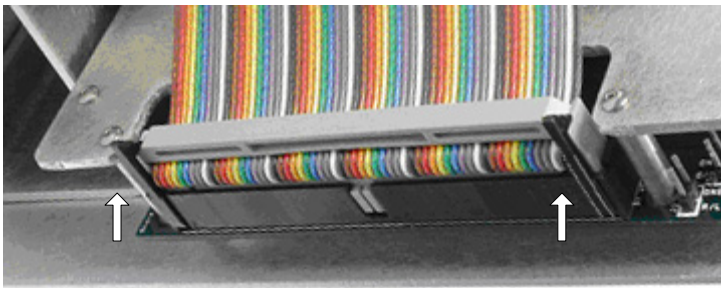
Firmly press the ribbon cable into the 60-pin LCD connector on the Display Kit. The keyed connector can only be inserted in one direction.

Figure 3.7 – Connect Ribbon Cable to the Display Kit



Lock the connector latches in the upright position to secure the ribbon cable, as shown in Figure 3.8 below. To release the cable, unlock the connector latches and remove the ribbon cable.

Figure 3.8 – Lock the Connector Latches in the Upright Position



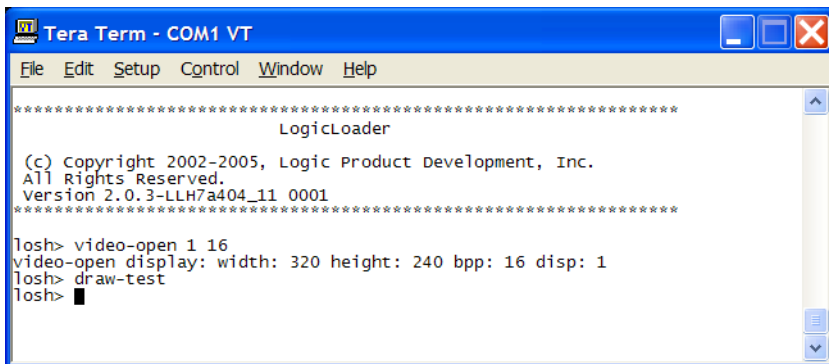
4 Communicating with the Display Kit

Note: This section only applies to Freescale, Marvell, NXP, and Renesas Development Kits that support LogicLoader™. AMD Geode LX Development Kits are x86-based and have a BIOS that may require separate configuration for proper display results. Please reference the specific BIOS documentation for further information.

4.1 Power-up the Development Kit

1. Connect the Development Kit baseboard to a host PC, as explained in the appropriate *Zoom Development Kit QuickStart Guide*.
2. Ensure that the 60-pin ribbon cable or custom cable is properly connected to both the Development Kit and the Display Kit.
3. Apply power to the Development Kit.
4. Open a software terminal emulation tool, such as Tera Term, to access LogicLoader. Use the proper Serial Port Settings as described in the appropriate *Zoom Development Kit QuickStart Guide*.
5. At the `losh` prompt type `"video-open <display> <bpp>"` to initialize your screen. (You may need to first type `"video-open help"` in order to know what your `<display>` and `<bpp>` settings are.)

Figure 4.1 – Using LogicLoader with Tera Term



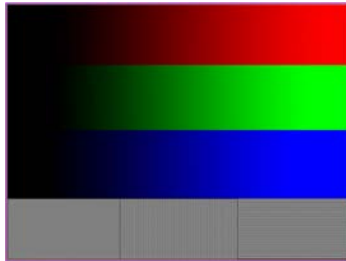
```
Tera Term - COM1 VT
File Edit Setup Control Window Help
*****
LogicLoader
(c) Copyright 2002-2005, Logic Product Development, Inc.
All Rights Reserved.
Version 2.0.3-LLH7a404_11 0001
*****
losh> video-open 1 16
video-open display: width: 320 height: 240 bpp: 16 disp: 1
losh> draw-test
losh> █
```

4.2 Display an Image on the LCD Screen

The 'draw test' command draws a test output on your LCD screen. First open LogicLoader, then type the following 'draw test' command at the 'losh' prompt:

1. LCD-3.5-QVGA-10 display, type the following commands at the prompt:
`<losh> video-open 6 16`
`<losh> draw-test`
2. LCD-3.5-QVGA-20 display, type the following commands at the prompt:
`<losh> video-open 8 16`
`<losh> draw-test`
3. LCD-5.7-QVGA-10 display, type the following commands at the prompt:
`<losh> video-open 1 16`
`<losh> draw-test`
4. LCD-10.4-VGA-10 display, type the following commands at the prompt:
`<losh> video-open 7 16`
`<losh> draw-test`
5. LCD-12.1-SVGA-10 display, type the following commands at the prompt:
`<losh> video-open 2 16`
`<losh> draw-test`

Figure 4.2 – Draw Test Image



(Actual Screen in Color)

If the LogicLoader menu screen or the test output does not appear, check Tera Term serial settings, all cable and board connections, and then reset the Development Kit.

Further Documentation

Please refer to the *LogicLoader User's Manual* and *LogicLoader Command Description Manual* for information on the 'draw test' command and additional LogicLoader usage. Both documents are available on Logic's website:

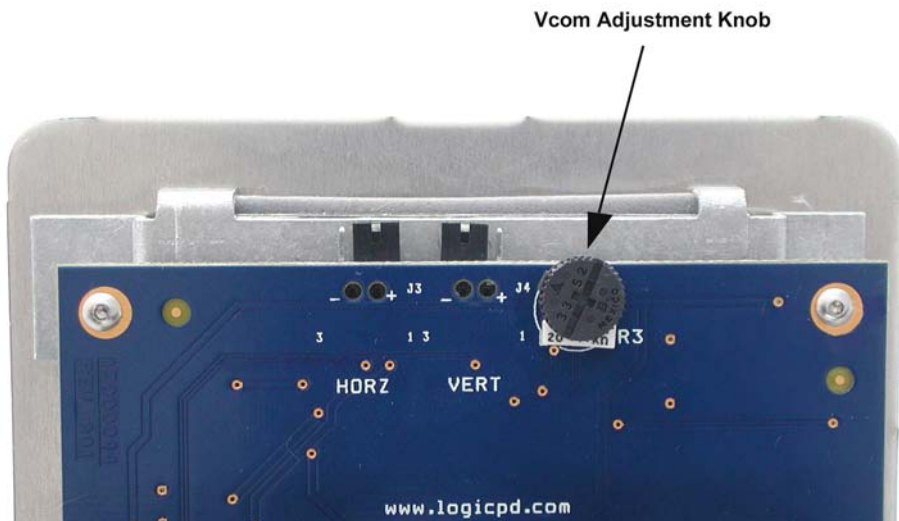
<http://www.logicpd.com/auth/>.

5 Display Kit Adjustments

5.1 LCD-3.5-QVGA-10/20 Vcom Adjustment Knob

The LCD-3.5-QVGA-10/20 Display Kits include an adjustable potentiometer to change the offset for the Vcom signal. If the display is not clear or lines are visible, adjust the Vcom knob to the best position. For further information and the specification for the Sharp LQ035Q7DB02, visit <http://www.sharpsma.com>

Figure 5.1 – Vcom Adjustment Knob

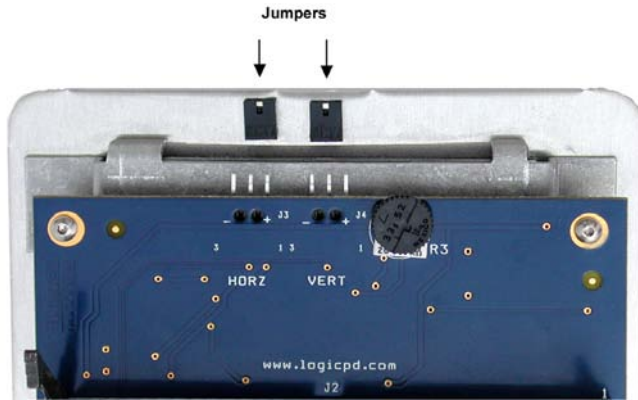


5.2 LCD-3.5-QVGA-10/20 Display Kit Jumper Settings

The jumper settings change the vertical and horizontal scanning directions of the display.

Note: There is no SPR jumper (left most jumper in Figure 5.2) on the LCD-3.5-QVGA-20.

Figure 5.2 – LCD 3.5-QVGA-10 Jumpers



Reference	Name	LCD Signal	Description	Jumper on Pins 1, 2	Jumper on Pins 2, 3	Default
J5	SPR	SPR*	Sampling Start Signal	3.3V	SPL	Jump pins 1, 2
J4	Vertical	U/L	Vertical Scanning Direction	Inverted scanning (x,320) to (x,1)	Normal scanning (x,1) to (x,320)	Jump pins 2, 3
J3	Horizontal	LBR	Horizontal Scanning Direction	Normal scanning (1,Y) to (240,Y) SPL = Input SPR = Output	Inverted scanning (240,Y) to (1,Y) SPL = Output SPR = Input	Jump pins 1, 2

Note 1: LH75401-11, LH79520-10, LH79524-10, LH7A400-10, SH7727-20, and SH7760-10 Processors: these processors do not contain a SPR signal. The SPR should be tied to SPL (Jumper J5; Pins 2, 3) to invert Horizontal Scanning.

Note 2: LH7A404-11 Processor contains a SPR signal. Do not connect the SPR jumper.

5.3 LCD-5.7-QVGA-10 Display Kit Jumper Settings

The jumper settings change the vertical and horizontal scanning directions of the display.

Note: The supported mode in LogicLoader is QVGA.

Reference	Name	LCD Signal	Description	Mode
S-J6	Vertical	LCD_U/D	Vertical Scanning Direction	Normal= jump pins 1, 2 Mirrored= jump pins 2, 3
S-J5	Horizontal	LCD_R/L	Horizontal Scanning Direction	Normal= jump pins 2, 3 Mirrored= jump pins 1, 2
S-J8	VGA/ QVGA	LCD_V/Q	VGA or QVGA Mode Select	QVGA= jump pins 2, 3 VGA= jump pins 1, 2

5.4 LCD-10.4-VGA-10 Display Kit Jumper Settings

The jumper settings change the vertical and horizontal scanning directions of the display.

Figure 5.3 – 10.4" Display Kit Circuit Board



Reference	Name	LCD Signal	Description	Mode
J2	Vertical	LCD_U/D	Vertical Scanning Direction	Normal= jump pins 1, 2 Mirrored= jump pins 2, 3
J5	Horizontal	LCD_R/L	Horizontal Scanning Direction	Normal= jump pins 2, 3 Mirrored= jump pins 1, 2

6 Connector Pinout Description

Table 6.1 – Connector Pinout Description

Pin#	Signal Name ^a	Type	Description	LCD-3.5-QVGA-10 Signals	All Other Displays ^b
1	GND	GND	Ground	GND	GND
2	NC	NC	No Connect	NC	NC
3	5V	PWR	5V - Power supply for LCD	5V	5V
4	3.3V	PWR	3.3V - Power supply for LCD	3.3V	3.3V
5	GND	GND	Ground	GND	GND
6	R0	I	Red 0 (Red LSB) ^c	R0	R0
7	R1	I	Red 1 ^c	R1	R1
8	R2	I	Red 2 ^c	R2	R2
9	R3	I	Red 3 ^c	R3	R3
10	GND	GND	Ground	GND	GND
11	R4	I	Red 4 ^c	R4	R4
12	R5	I	Red 5 (Red MSB) ^c	R5	R5
13	G0	I	Green 0 (Red LSB) ^c	G0	G0
14	G1	I	Green 1 ^c	G1	G1
15	GND	GND	Ground	GND	GND
16	G2	I	Green 2 ^c	G2	G2
17	G3	I	Green 3 ^c	G3	G3
18	G4	I	Green 4 ^c	G4	G4
19	G5	I	Green 5 (Red MSB) ^c	G5	G5
20	GND	GND	Ground	GND	GND
21	B0	I	Blue 0 (Red LSB) ^c	B0	B0
22	B1	I	Blue 1 ^c	B1	B1
23	B2	I	Blue 2 ^c	B2	B2
24	B3	I	Blue 3 ^c	B3	B3
25	GND	GND	Ground	GND	GND
26	B4	I	Blue 4 ^c	B4	B4

Pin#	Signal Name ^a	Type	Description	LCD-3.5-QVGA-10 Signals	All Other Displays ^b
27	B5	I	Blue 5 (Red MSB) ^c	B5	B5
28	LCD_VSYNC	I	Vertical Sync Signal	Not Used	VSYNC
29	LCD_PWM	I	Pulse Width Modulated Signal for use with Backlight (Depends on specific Backlight)	Not Used	Not Used
30	LCD_HSYNC	I	Horizontal Sync Signal	Not Used	HSYNC
31	GND	GND	Ground	GND	GND
32	LCD_CLK	I	Data Sampling Clock Signal	DCLK	DCLK
33	GND	GND	Ground	GND	GND
34	LCD_DON ^d	I	Display On - Typical use for STN 'On/Off' signal	Not Used	Not Used
35	LCD_MDISP	I	STN AC Signal / TFT Enable Signal	Not Used	MDISP
36	LCD_VEEEN ^d	I	Vee (Higher Voltage) Enable power to Backlight (Dependent on Processor/LCD Controller)	Not Used	VEEEN
37	LCD_VDDEN ^d	I	Vdd (LCD Voltage) Enable power to LCD (Dependent on Processor/LCD Controller)	VDDEN	VDDEN
38	GND	GND	Ground	GND	GND
39	GND	GND	Ground	GND	GND
40	LCD_CLK_RETURN	O	"Used with some HRTFT Displays, clock signal sent from the LCD to the Processor/LCD Controller"	Not Used	Not Used
41	GND	GND	Ground	GND	GND
42	GND	GND	Ground	GND	GND
43	LCD_CLS	I	ADTFT - Gate Driver Clock Signal	CLS	Not Used
44	GND	GND	Ground	GND	GND
45	GND	GND	Ground	GND	GND
46	LCD_SPS	I	ADTFT - Gate Driver Start Signal	SPS	Not Used
47	LCD_PSAVE	I	ADTFT - Power Save	PS	Not Used
48	LCD_SPL	I	ADTFT - Line Start Pulse Left	SPL	Not Used
49	LCD_HRLP	I	ADTFT - Line Pulse (Horizontal Sync Pulse)	HRLP	Not Used
50	LCD_MOD	I	ADTFT - Gate Driver Control Signal	MOD	Not Used
51	LCD_REV	I	ADTFT - Reverse control Signal (AC Bias)	REV	Not Used
52	GND	GND	Ground	GND	GND
53	3.3V	PWR	3.3V - Power supply for LCD	3.3V	3.3V
54	5V	PWR	5V - Power supply for LCD	5V	5V

Pin#	Signal Name ^a	Type	Description	LCD-3.5-QVGA-10 Signals	All Other Displays ^b
55	NC	NC	No Connect	NC	NC
56	GND	GND	Ground	GND	GND
57	TOUCH_RIGHT	O	Touch Screen Right Signal (4 wire)	Right	Right
58	TOUCH_BOTTOM	O	Touch Screen Bottom Signal (4 wire)	Bottom	Bottom
59	TOUCH_LEFT	O	Touch Screen Left Signal (4 wire)	Left	Left
60	TOUCH_TOP	O	Touch Screen Top Signal (4 wire)	Top	Top

- Some signals are not used by certain Display Kits. Please check the appropriate column to determine the signals that your Display Kit uses.
- For other display types please see the "Zoom Display Kit Features" Section or visit the Logic website at <http://www.logicpd.com>
- The LCD Data lines (RGB) are set up for an 18-bit TFT Interface. Some processors/LCD controllers do not provide 18 dedicated data lines for this purpose. If this is the case, the data lines must be multiplexed to provide the 18 signals. For example, if only 15 data lines are provided, the MSB of each color should be used for both the MSB signal and LSB signal of that color group. This provides the best color range; Logic's Card Engines have already implemented this option when appropriate. Another option is to tie the LSB low or high.
- Not all power signal enables are used. Some Display Kits have circuits laid out ready to use these signals, but are not populated. Check specific Display Kit schematics to determine if this is the case.

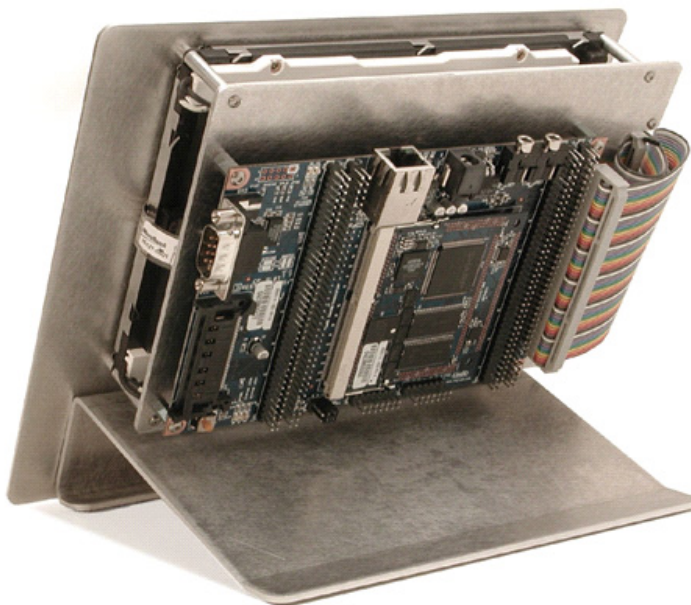
7 Optional Mounting of the Zoom SDK

The Zoom Starter Development Kit can be mounted on the back of the LCD-10.4-VGA-10 and LCD-12.1-SVGA-10 Display Kits. Four mounting holes are included on the back of the display kit for this purpose.

The following components are not included but are needed to mount the Zoom SDK:

- +Four 4-40 standoffs, female to female, minimum 3/8" in length
- +Eight 4-40 screws

Figure 7.1 – Optional Zoom SDK Mounting to Display Kit




8 Product Notices

Evaluation Purposes Only

The Zoom Display Kit being sold by Logic is intended for ENGINEERING DEVELOPMENT OR EVALUATION PURPOSES ONLY and is not considered by Logic to be fit for commercial use. As such, the goods being provided may not be complete in terms of required design, marketing, and/or manufacturing related protective considerations, including product safety measures typically found in the end product incorporating the goods. The user assumes all responsibility and liability for proper and safe handling of the Display Kits.

ESD

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. Logic's warranty does not cover products damaged by ESD.

	<p>Attention: Circuit boards contain electrostatic sensitive devices. Observe precautions for handling. Handle boards by the edge and do not touch integrated circuits directly.</p>
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9 Product Registration

In order to access the latest revision of this manual and other relevant documentation, please register your product online using a recent version of Internet Explorer or Mozilla Firefox. In addition to downloads access, registration provides future notifications when Logic releases documentation and software updates for your product.

Go to the “Create Account” section on the Logic Support website at <http://www.logicpd.com/support/>, and create a user account. You will receive an e-mail with your new username, password, and additional instructions. At this point, log in and complete the product registration form to gain access to product download files.

10 Support

Logic has created a self-service technical support process to make it easier for our customers to find answers to their questions, which enables Logic to provide low cost Development Kits and Display Kits. For additional technical support, please see support packages below.

What support comes with the Zoom Display Kit?

- +Unlimited access to our Technical Discussion Group and FAQs available at <http://www.logicpd.com/support/>

Additional Support Services Available for Purchase

- +Support Packages for Dedicated Technical Support
 - +Visit <http://www.logicpd.com/support/> for complete descriptions, price, and purchase.
 - +Platinum Support Package
 - +Gold Support Package
 - +Silver Support Package
 - +Bronze Support Package
 - +Windows CE Binary BSP Build Support Package
- +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

10.1 Frequently Asked Questions

Visit <http://www.logicpd.com/support/> for a complete list of FAQs for Zoom Display Kits.

10.2 Technical Discussion Group

Visit <http://www.logicpd.com/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.

REVISION HISTORY

REV	EDITOR	REVISION DESCRIPTION	APPROVAL	DATE
A PN 70000019	Andrew Wawra	Release	AJW	02/20/03
B PN 70000019	Andrew Wawra	Added 10.4" and 12.1" support	AJW	05/01/03
C PN 70000019	Himansh Khadilkar	Updated pages 1, 6, & 9	JW	08/26/03
D PN 70000019	James Wicks	Compatibility Chart Update	MAA	01/12/04
E PN 70000019	Lindsey Georges, James Wicks, Eric Harnisch	Added 5.7" support, LCD-3.5-QVGA-20 support in LoLo; Removed SH7750R and added LH79524	MAA	06/18/04
F PN 70000019	Eric Harnisch	Updated Section 7	ELH	08/09/04
G PN 70000019	Jed Anderson	Merged Zoom ColdFire Display QuickStart Guide; Updated Section 3.2; Added Section 4; Updated Section 5.1 for LoLo 2.0.x release; Added MCF5329, PXA270-10, Geode LX, and Geode NX to Chart; Moved Chart to its own Section; Added 3.6" support; Updated Support Section; General editing and formatting	ELH	12/16/05
G2 PN 1008284	Jed Anderson	Removed compatibility chart; Updated Section 1; Removed section for AMD LX Cable and added section for Adaptor Board; Removed AMD Geode NX references; Updated silicon partner names for Marvell and NXP kits; Rearranged Section 3; Updated pictures and headings; Removed information about 3.6" and 6.4" displays; General editing and formatting	EGR	08/28/07

Check <http://www.logicpd.com/> for the latest revision of this manual and additional documentation.



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