



LCDK185CTL1ARH01 & LCDK185NTL1NCH01

Kit to Interface with LCD185 over HDMI and USB

111 Corning Road, Suite 116 • Cary, NC 27518

Approvals	
Model Number	LCDK185CTL1ARH01 LCDK185NTL1NCH01
Datasheet Revision	1.2
Drawing Revision	B

Customer Approval	
Approved by: _____	Date: _____

Table of Contents

Revision History	5
Document Revision	5
Hardware Revision.....	5
Ordering Information	6
Product Description	7
Compatibility	7
General Specification.....	7
Pictorial.....	8
Carrier PCB – 3D Rendering.....	8
Carrier PCB – Mechanical.....	9
SODIMM – 3D Rendering.....	9
LCD185 Driver PCB – 3D Rendering.....	10
Connectors (Carrier PCB).....	11
Pin Out – S220, USB-C	13
Pin Out – S210, HDMI	13
Pin Out – S205, Power Jack.....	13
Pin Out – S200, S201, 2 pin Power	13
Pin Out – S202, LVDS Config	14
Pin Out – S300, LVDS video & Touch I2C	14
Connectors (LCD185 Driver PCB).....	15

Pin Out – S300, Touch I2C	16
Pin Out – S301, S302, Backlight.....	16
Pin Out – S303, LCD LVDS video	16
Pin Out – S200, LVDS video & Touch I2C	16
Pin Out –S201, 2 pin Power.....	17
EDID	18
10.1" WUXGA	18
Absolute Max Ratings	19
Electrical Characteristics	19
Use Case.....	20
Warnings.....	20
Appendix 1: Mechanical Drawing	21

Revision History

Document Revision

Date	Version #	Description	Created By	Checked By	Approved By
9/28/2022	R1.0	Initial release	DA	KB	JH
2/17/2023	R1.1	Updated mechanical drawing, updated ordering information table, updated PCB pictorials, PCB-L0128R1.1 was PCB-L0128R1.0	LH	DA	JH

Hardware Revision

Date	Version #	Description
09/27/2022	R1.0	Initial Release
2/17/2023	R1.1	Added PCB stacking hardware

Ordering Information

LTS Part #	Parts in Kit	Name (Description)
LCDK185CTL1ARH01	PCB-L0130R1.1	Carrier PCB (10.1" LVDS)
	PCB-L0129R1.0	SODIMM (HDMI to LVDS)
	PCB-L0128R1.1	LCD185 Driver PCB
	LCD185-101CTL1ARNTR1.0	LCD185 (10.1" Edge Lit HBWG w/PCAP 1920 x 1200)
	10339	10 inch, 2-pin power cable
	0150180567	Carrier FFC (Cable FFC 60Pos 0.50mm 6") ¹
	0151661165	LCD FFC (Cable FFC 45Pos 0.50mm 2")
	2ABL024F	Power Supply (12V 2A)
	A14040700UX0339	M3 X 9 mm + 4 mm Hex Standoff
	93640A125	M3 x 6 mm Nylon Socket Head Screw
LCDK185NTL1NCH01	PCB-L0130R1.1	Carrier PCB (10.1" LVDS)
	PCB-L0129R1.0	SODIMM (HDMI to LVDS)
	PCB-L0128R1.1	LCD185 Driver PCB
	LCD185-101NTL1NCNTR1.0	LCD185 (10.1" Edge Lit HBWG 1920 x 1200)
	10339	10 inch, 2-pin power cable
	0150180567	Carrier FFC (Cable FFC 60Pos 0.50mm 6") ¹
	0151661165	LCD FFC (Cable FFC 45Pos 0.50mm 2")
	2ABL024F	Power Supply (12V 2A)
	A14040700UX0339	M3 X 9 mm + 4 mm Hex Standoff
	93640A125	M3 x 6 mm Nylon Socket Head Screw

Note 1: if this cable is ordered or provided separately, tabs near the ends of the cable will need to be cut to fit into connectors on PCB-L0128 and PCB-L0130.

Product Description

LCD185 requires multiple industry standard interfaces (LVDS, I2C, Backlight Driver, and various regulated voltages) which make it well-suited for a cost-efficient and high-performance product integration. However, the required interfaces may not be well supported in all evaluation and product development environments. To ease the initial evaluation and development effort with LCD185, LCDK185 is offered. LCDK185 only requires HDMI for video, USB for touchscreen data, and a single power supply.

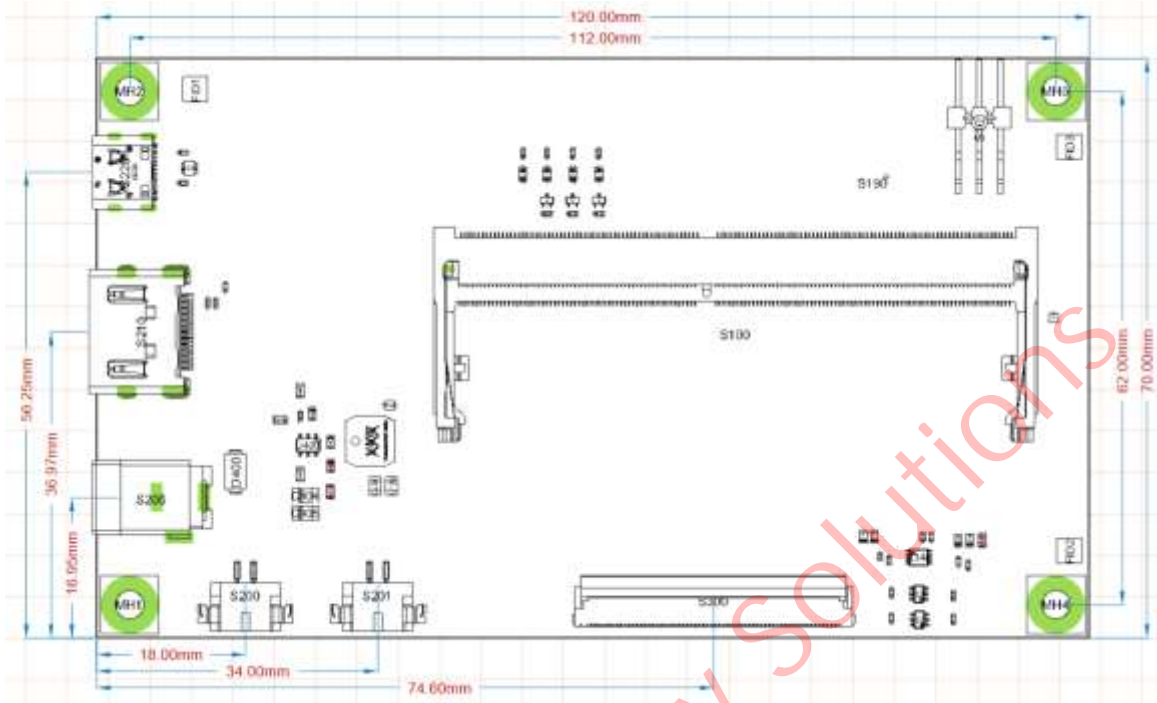
Compatibility

High resolution LVDS panels are most commonly native Landscape orientation. The resolution supported by this module is WUXGA (1920x1200). It is expected the host driving HDMI can satisfy the timing requirements as found in the EDID section below. Most Windows OS systems can output the native timing requirements and furthermore are able to rotate and flip the screen. There are dozens of Linux based platforms that are compatible as well. There is no scaler on PCB-L0129R1.0 to support other input resolutions.

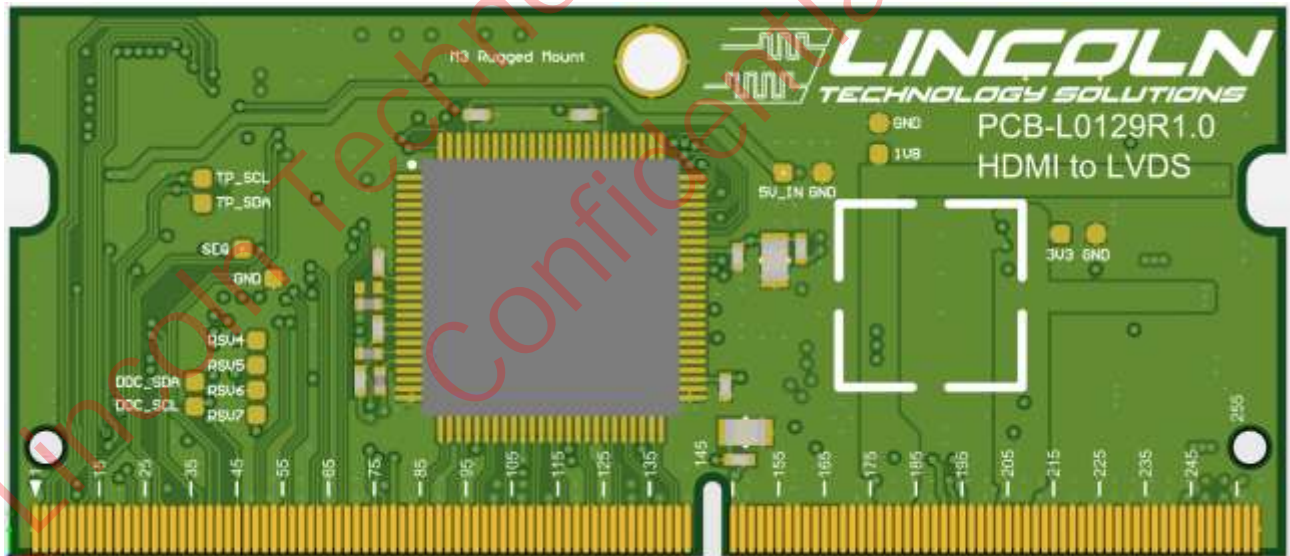
General Specification

Item	Specification	Unit
Outline Dimensions (typ) ¹	228 x 154 (LCD185) 35 (Thickness with PCB stacking hardware)	mm
LCD Size (diagonal)	10.1	inches
Active Area	216.8x135.5	mm
Resolution	1920x1200	pixels
Backlight Type	Edge-lit	-

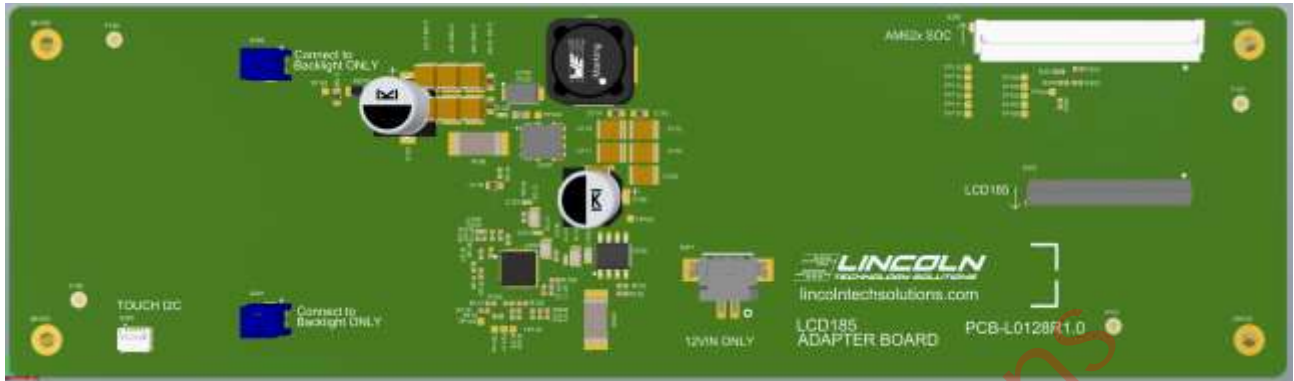
Carrier PCB – Mechanical



SODIMM – 3D Rendering

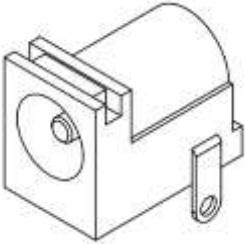
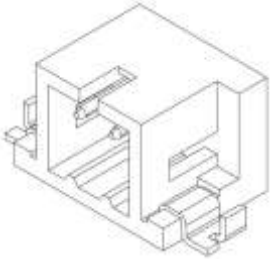
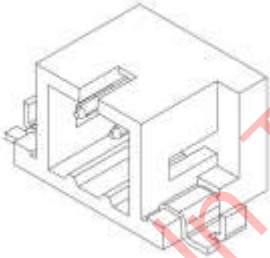
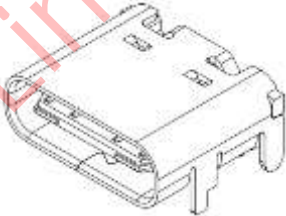


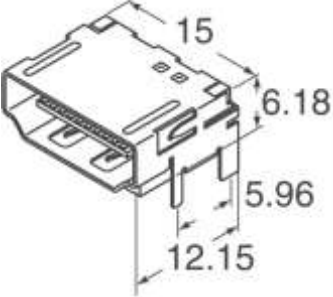
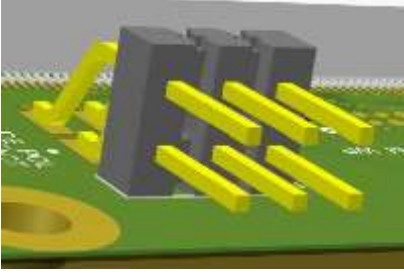

LCD185 Driver PCB – 3D Rendering



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Connectors (Carrier PCB)

Connector Type	MPN	Description
Power Jack S101 	PJ-002AH	Power input (VCC) 2.10mm ID (0.083") 5.50mm OD (0.217") 12V/2A input
2 POS Power Connector S200 	DF3EA-2P-2H(21)	Alternate power input (VCC) 12V/2A input
2 POS Power Connector S201 	DF3EA-2P-2H(21)	Power output 12V output
USB Type C S300 	TYPE-C-31-M-12	Touch output USB-C 16 position

<p>HDMI S302</p> 	<p>0471510001</p>	<p>Graphic input</p> <p>Standard Type A</p> <p>19 position</p>
<p>2x3 POS Header S101</p> 	<p>TSM-103-01-T-DH</p>	<p>3 position jumper header for LVDS configuration.</p>
<p>60 POS FFC S300</p> 	<p>XF2M-6015-1AH</p>	<p>LCD185 Power, LVDS, and touch screen. Connects to LCD185 Driver PCB.</p>

Pin Out – S220, USB-C

The USB-C is a standard connector supporting USB connection between the Carrier PCB and a USB Host (i.e. PC). The Carrier PCB translates the in-cell touchscreen data from I2C to USB-HID at full speed data rates.

Pin Out – S210, HDMI

The HDMI connector is a standardized type A. It is plug and play with standard equipment. The graphical input must be capable of providing WUGXA portrait (1200x1920). There is an onboard EDID that communicates with user equipment specifying timing and display size.

Pin Out – S205, Power Jack

Number	Pin Name	Description
1	VCC	12V power supply
2	GND	Ground
3	GND	Ground

Pin Out – S200, S201, 2 pin Power

Number	Pin Name	Description
1	VCC	12V power supply
2	GND	Ground

Pin Out – S202, LVDS Config

A 0.1" pitch 2x3 header is provided to support 3 jumper positions to modify the LVDS Configuration.

Position 1 is located closest to the PCB edge and mounting hole.

NOTE: For a typical LCDK185 application, no jumper is required.

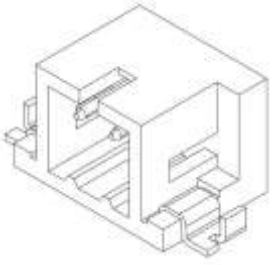
Position	Signal	Description
1	PXL_DUAL	Placing a jumper selects 1 pixel per clock.
2	PXL_CLK_ACT	Placing a jumper selects LVDS clock disabled when DE is low.
3	LVDS_DE_POL	Placing a jumper selects DE as low when data is active.

Pin Out – S300, LVDS video & Touch I2C

A 0.5mm pitch 60 position FFC connector to carry LVDS video, I2C touch signals, and LCD power from the Carrier PCB (PCB-L0130) to S200 on the LCD185 Driver PCB (PCB-L0128) using the provided carrier FFC. Request information on PCB-L0128 if the pinout for this connector is needed.

Connectors (LCD185 Driver PCB)

Connector Type	MPN	Description
Touch I2C (S300) 	5034800600	6 positions 0.5mm pitch Connector to Touch I2C
Backlight (S301, S302) 	S2B-ZR(LF)(SN)	Connector to LCD backlight 2 positions 1.5mm pitch
LCD185 (S303) 	FH34SRJ-45S-0.5SH(50)	45 positions 0.5mm pitch Connector to LCD185
60 POS FFC (S200) 	XF2M-6015-1AH	LCD185 Power, LVDS, and touch screen. Connects to Carrier PCB.

<p>2 POS Power Connector (S201)</p> 	<p>DF3EA-2P-2H(21)</p>	<p>Backlight circuit power input.</p>
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Note: The pinout for these connectors is not provided as these connections are fully supported by the provided cables and FFCs. If the pinout for any of these connectors is not provided as these connections are intended to remain as shipped. Request information on the LCD185 Driver PCB (PCB-L0128) if full pinouts are needed.

Pin Out – S300, Touch I2C

A 0.5mm pitch 6 position FFC connector that supports the LCD185 Touch IC FFC.

Pin Out – S301, S302, Backlight

2-pin 1.5mm pitch connectors that connect the output of the backlight circuit on the LCD185 Driver PCB to the LCD185 cabled backlight connectors.

Pin Out – S303, LCD LVDS video

A 0.5mm pitch 45 position FFC connector that connects LVDS and LCD power from the LCD185 Driver PCB to LCD185 using the provided LCD FFC.

Pin Out – S200, LVDS video & Touch I2C

A 0.5mm pitch 60 position FFC connector to carry LVDS video, I2C touch signals, and LCD power from the Carrier PCB (PCB-L0130) to S200 on the LCD185 Driver PCB (PCB-L0128) using the provided carrier FFC.

Pin Out –S201, 2 pin Power

Power for this connector is intended to be passed through the Carrier PCB. The pinout is provided in case power must be supplied externally.

Number	Pin Name	Description
1	VCC	12V power supply
2	GND	Ground

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EDID

Below is the EDID stored on the SODIMM. This is communicated over the DDC bus to the host. The host must be capable of generating timing based on these parameters. In the absence of EDID communication, it is expected the host is outputting per these timing specs.

10.1" WUXGA

Native Landscape 1920x1200

EDID BYTES:

```

0x 00 01 02 03 04 05 06 07 08 09 0A 0B 0C 0D 0E 0F
-----
00 | 00 FF FF FF FF FF FF 00 32 93 00 05 00 00 00 00
01 | 24 1E 01 04 80 58 32 78 22 EE 91 A3 54 4C 99 26
02 | 0F 50 54 00 00 00 01 01 01 01 01 01 01 01 01
03 | 01 01 01 01 01 01 98 3C 80 A0 70 B0 2B 40 80 14
04 | 34 00 D9 88 00 00 00 1E 00 00 00 10 00 00 00 00
05 | 00 00 00 00 00 00 00 00 00 00 00 00 00 10 00 00
06 | 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 FC
07 | 00 4C 54 53 2D 44 53 49 44 72 69 76 65 72 00 BF
08 | 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
09 | 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0A | 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0B | 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0C | 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0D | 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0E | 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0F | 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

```

Block 1

Preferred Timing Block ▼

Pixel Clock:	155.12	<input type="checkbox"/> Interlaced
H. Active Pixels:	1920	V. Active Lines: 1200
H. Blank:	160	V. Blank: 43
H. Front Porch:	128	V. Front Porch: 3
H. Sync Width:	20	V. Sync Width: 4
H. Image Size:	217	V. Image Size: 136
H. Border:	0	V. Border: 0
H. Clock:	74.58 kHz	V. Clock: 60.00 Hz

CVT 1.2 Wizard

Stereo Viewing Support

No Stereo

<input type="radio"/> FS, R on sync	<input type="radio"/> 2Way, R on even
<input type="radio"/> FS, L on sync	<input type="radio"/> 2Way, L on even
<input type="radio"/> Side-By-Side	<input type="radio"/> 4Way

Sync Signal Definition

<input type="radio"/> Analog	<input type="radio"/> Bipolar Analog
<input type="radio"/> Digital Composite	<input type="radio"/> Digital Separate
<input checked="" type="checkbox"/> V. Sync Polarity	<input checked="" type="checkbox"/> H. Sync Polarity

Absolute Max Ratings

Item	Symbol	Value		Unit
		Min	Max	
Power Supply Voltage	VCC	-0.3	13	V
Operating Temperature	T _{OPR}	-10	50	°C
Storage Temperature	T _{STG}	-20	70	°C

Electrical Characteristics

Total Power is for the SODIMM + Carrier PCB + LCD185 Driver PCB + LCD185 (with backlight).

Item	Symbol	Value			Unit	Note
		Min	Typ	Max		
Supply Voltage	VCC	11.4	12.0	12.6	V	Ta = 25°C
Total Power	P _{TOT}	11.1	12	12.5	W	Ta = 25°C
Backlight Power	P _{BL}	-	5	-	W	Ta = 25°C

Use Case

1. Insert the SODIMM (PCB-L0129) into the Carrier PCB.
2. Use the Carrier FFC to connect S301 on the Carrier PCB to S200 on the LCD185 Driver PCB, both ends contacts down.
3. Connect the two LCD185 cabled backlight connectors to S301 and S302 on the LCD185 Driver PCB.
4. Connect the provided Power Cable from S201 on the Carrier PCB to S201 on the LCD185 Driver PCB.
5. Connect the LCD FFC from the LCD185 connector to S303 on the LCD185 Driver PCB.
6. Connect the small touch FFC on LCD185 to S300 on the LCD185 Driver PCB.
7. Apply power using the Power Supply.
8. To send video data to LCD185, connect an HDMI cable between a video source (e.g. PC) and S210 on the Carrier PCB.
9. To read touchscreen data, connect a USB cable between a PC and S300 on the Carrier PCB.

Warnings

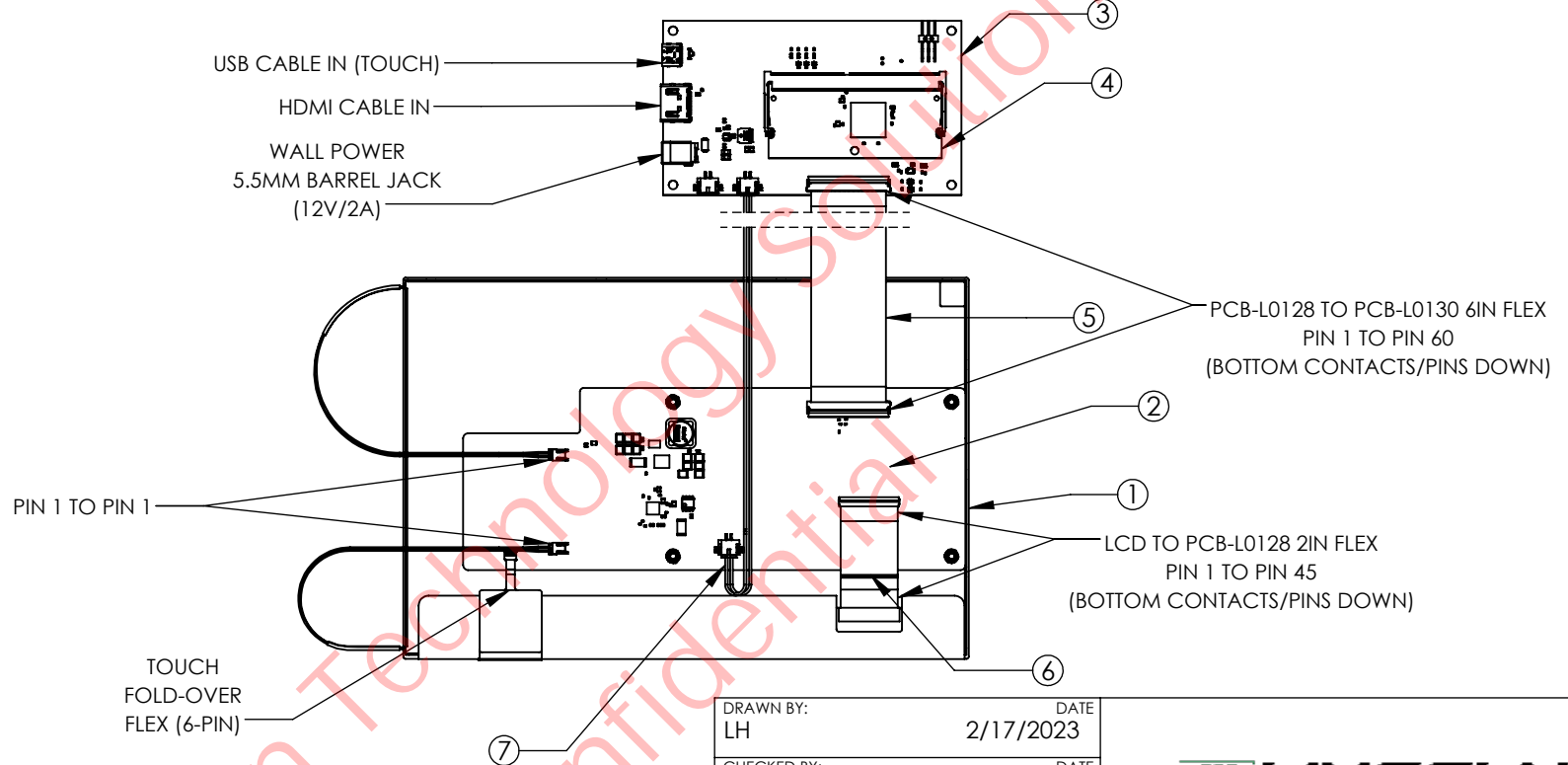
1. Insert the SODIMM into the Carrier PCB and connect LCD185 before applying power to the Carrier PCB.
2. Removing the SODIMM with power connected may cause permanent damage to both the SODIMM and the Carrier PCB.

Appendix 1: Mechanical Drawing

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ITEM NO.	KIT NO.	PART NO.	DESCRIPTION	QTY.
1	LCDK185CTL1ARH01	LCD185-101CTL1ART	LCD185	1
	LCDK185NTL1NCH01	LCD185-101NTL1NCT		
2	ALL	PCB-L0128	LCD185 DRIVER PCB	1
3	ALL	PCB-L0130	LCD185 CARRIER PCB	1
4	ALL	PCB-L0129	SODIMM PCB	1
5	ALL	MFR P/N: 0150180567	6IN FLEX PIN 1 TO PIN 60	1
6	ALL	MFR P/N: 0151661165	2IN FLEX PIN 1 TO PIN 45	1
7	ALL	10339	10IN 2-PIN POWER CABLE	1
8	ALL	MFR P/N: A14040700UX0339	M3 X 9MM + 4MM HEX STAND OFF	4
9	ALL	MFR P/N: 93640A125	M3 X 6MM NYLON SOCKET HEAD SCREW	4
10	ALL	MFR P/N: 2ABL024	12V/2A POWER SUPPLY	1

ZONE	REV.	DESCRIPTION	DATE	APPROVED
	A	INITIAL ISSUE	9/27/2022	JH
	B	ADDED PCB STACKING HARDWARE	2/17/2023	JH



DRAWN BY: LH	DATE 2/17/2023
CHECKED BY: JH	DATE 2/17/2023
MATERIAL: N/A	
FINISH: N/A	
COMMENTS: ALL DIMENSIONS ARE IN MILLIMETERS	

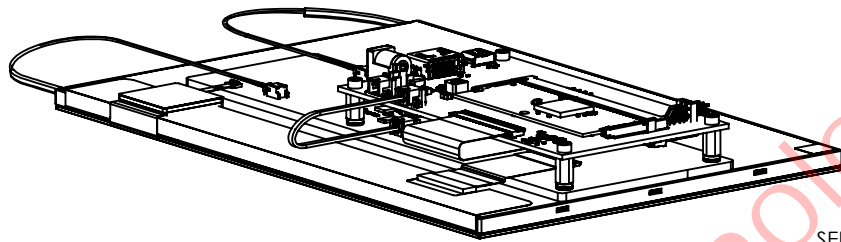


NOTE:
 1. DRAWING IS VALID FOR KIT PART NUMBERS LCDK185CTL1ARH01 AND LCDK185NTL1NCH01.
 2. ITEM 10 IS PROVIDED WITH KIT BUT NOT DEPICTED IN DRAWING.

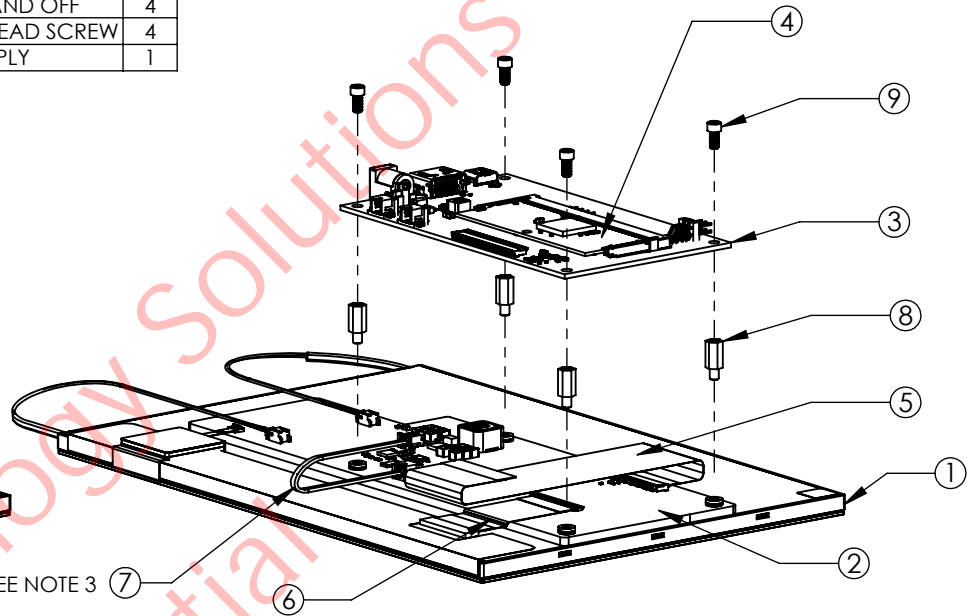
SCALE: 1:3	SHEET 1 OF 2
DO NOT SCALE DRAWING	

DESCRIPTION LCD185 HDMI AND USB INTERFACE KIT		
PART NO. SEE NOTE 1	HW REV. 1.1	DRW REV. B
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF LINCOLN TECHNOLOGY SOLUTIONS (LTS) AND SHALL NOT BE REDISTRIBUTED. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF LTS IS PROHIBITED.		

ITEM NO.	KIT NO.	PART NO.	DESCRIPTION	QTY.
1	LCDK185CTL1ARH01	LCD185-101CTL1ART	LCD185	1
	LCDK185NTL1NCH01	LCD185-101NTL1NCT		
2	ALL	PCB-L0128	LCD185 DRIVER PCB	1
3	ALL	PCB-L0130	LCD185 CARRIER PCB	1
4	ALL	PCB-L0129	SODIMM PCB	1
5	ALL	MFR P/N: 0150180567	6IN FLEX PIN 1 TO PIN 60	1
6	ALL	MFR P/N: 0151661165	2IN FLEX PIN 1 TO PIN 45	1
7	ALL	10339	10IN 2-PIN POWER CABLE	1
8	ALL	MFR P/N: A14040700UX0339	M3 X 9MM + 4MM HEX STAND OFF	4
9	ALL	MFR P/N: 93640A125	M3 X 6MM NYLON SOCKET HEAD SCREW	4
10	ALL	MFR P/N: 2ABL024	12V/2A POWER SUPPLY	1



FULL ASSEMBLY



EXPLODED ASSEMBLY

SEE NOTE 3 ⑦

DRAWN BY: LH DATE: 2/17/2023

CHECKED BY: JH DATE: 2/17/2023

MATERIAL: N/A

FINISH: N/A

COMMENTS: ALL DIMENSIONS ARE IN MILLIMETERS



DESCRIPTION: LCD185 HDMI AND USB INTERFACE KIT

PART NO. SEE NOTE 1	HW REV. 1.1	DRW REV. B
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NOTE:
3. 12V 2-PIN PWR CABLE LENGTH NOT SHOWN TO SCALE.

SCALE: 1:2.5 SHEET 2 OF 2

DO NOT SCALE DRAWING