

V2.0

***LCD CONTROLLER BOARD
SPECIFICATION***

MODEL: CX-145 V2.0

Issue date: 2013.05.08

The information in the specification is subject to change without notice.

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REVISION HISTORY

VER.	DATE	BOARD ID	PAGE	DESCRIPTION	AUTHOR
V2.0	2013.05.08	CX-145	ALL	First issue	Linda

1. GENERAL DESCRIPTION

CX-145 is a multi-purpose LCD controller board which support HDMI VGA+AV various of video signal input and dual channel 8bit LVDS output interface. LVDS output signal can up to 1920X1200@60Hz.

CX-145 with Audio function, The power of the audio output is $2 \times 8\Omega \times 3W$. Support HDMI audio output.

CX-145 have pre-load 23 types of firmware with different resolution . You just need to set to correct firmware when you connect to different LCD panel. It can drive most of LVDS LCD panel in the market without re-load firmware .

CX-145 can use internal pin connector to instead of standard connector . Such as : DC jack , HDMI ,VGA AV , Audio connector . This will be easy for you to instead of this board into your products .

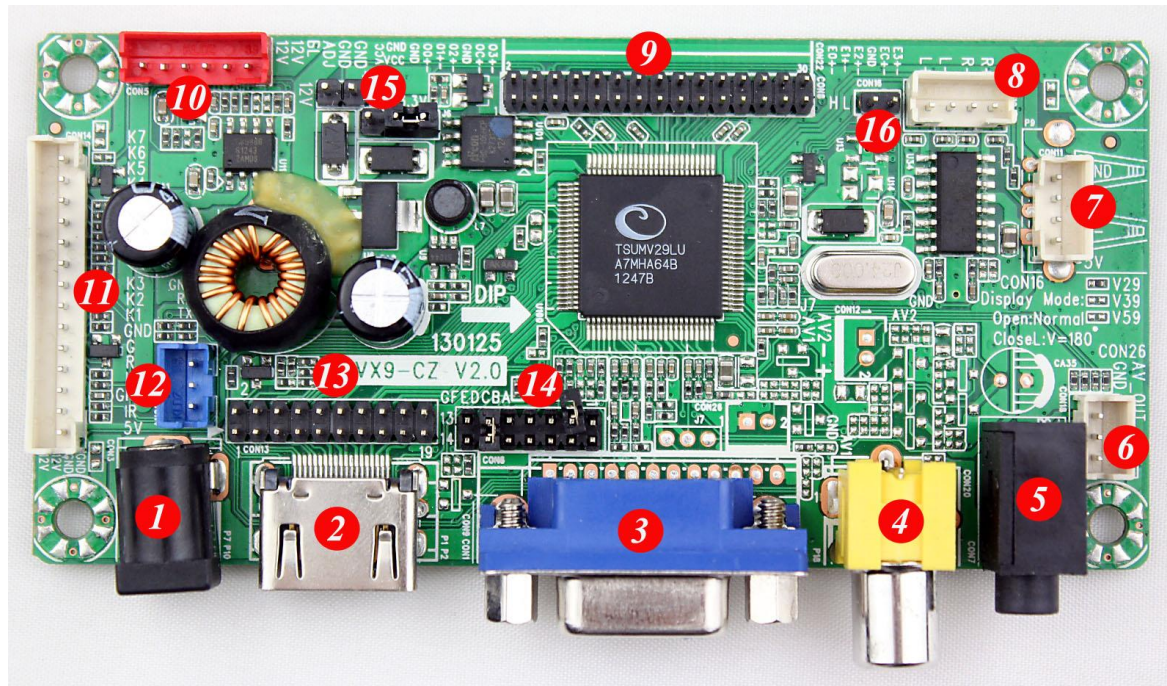
2. FEATURES

CHIPSET	TSUMV29LU(Mstar)		
Support LCD Panel	Interface	Single/Dual LVDS	
	Resolution	Up to 1920X1200@60Hz	
Power	For board	12V DC power supply	
	To LCD panel	3.3V,5V,12V	
	Management	Low power consumption mode	
	Standby	<2 W	
OSD Language	Simple Chinese、 English is default. Other language support customized.		
KEY Function	7 keys	Power , Menu, Vol-,Vol+,CH-,CH+,Input	
	5 keys	Power,Menu,Up,Down,Exit/Enter	
Video input	HDMI	480i,480p,576i,576p,720p 1080i,1080p	
	VGA	Analog RGB(0.7Vp-p) V-H SYNC Separator(TTL)	
	AV(CVBS)	Video System	PAL/NTSC/SECAM
		Video level	1.0 Vp-p ±5%
Audio input	0.2 – 1.5 Vrms		
Audio output	2X3W (8Ω) THD+N<10%		
Extend function	IR control, USB firmware update		

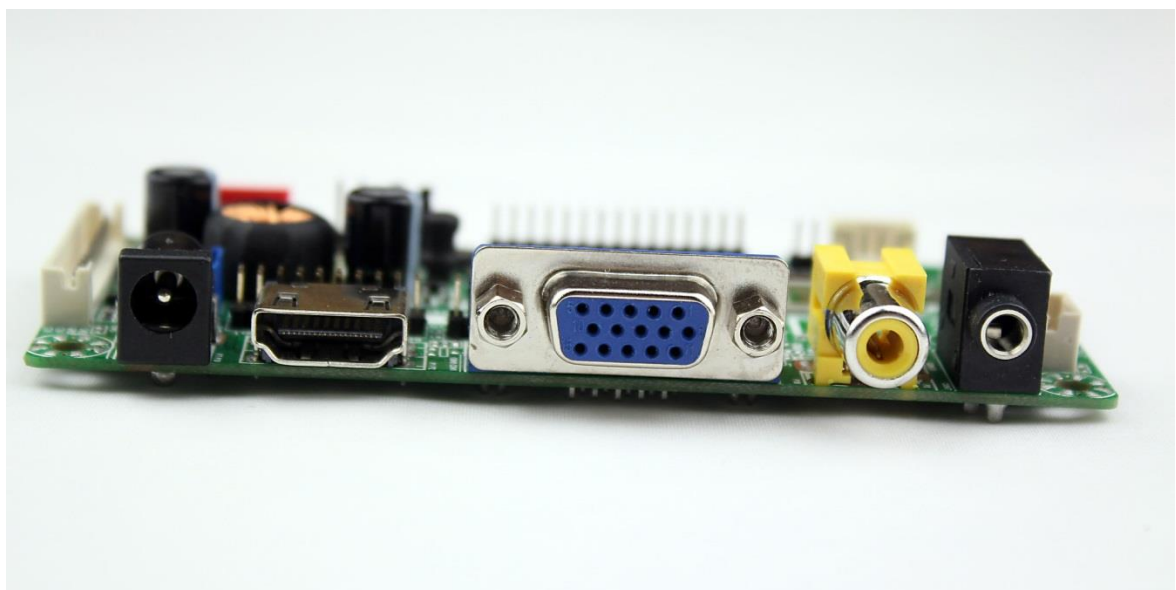
3. FUNCTION LAYOUT

The picture is for a reference only, the actual item is the standard.

Front View of the CX-145:



Side view of the CX-145:



Interface function description :

No.	Description	No.	Description
1	DC Power Input(+12V)	2	HDMI Signal Input
3	VGA Signal Input	4	AV Signal Input
5	PC Audio Input	6	External Audio Input
7	External USB Port	8	Speaker Output
9	LVDS Signal Output	10	FPD Brightness Connector
11	Keypad Interface	12	ISP Debug Interface
13	External HDMI Input	14	Firmware Selection Header
15	Flat Panel Voltage Selection Header	16	Display mode selection header

4. Interface Pinout definition :

No.1 : (Φ2.1 DC jack) DC power input connector : DC +12V

Note : This connector can change to 4Pin/ PH2.0mm connector.The pinout as follows:

Pin NO.	Description	Description
1	12V	+12V Working Voltage
2	12V	
3	GND	Ground
4	GND	

No.2 :(HDMI 1.4、HDCP1.2 or DVI 1.0) HDMI signal input connector

No.3 : (DB15) VGA signal input connector

Note : This connector can change to 12Pin/ PH2.0mm connector. The pinout as follows:

Pin NO.	Description	Description
1	VGA_SCL	SCL signal of VGA
2	VGA_SDA	SDA signal of VGA
3	GND	Ground
4	BLUE	Blue color signal
5	GND	Ground
6	GREEN	Green color signal
7	GND	Ground
8	RED	Red color signal
9	GND	Ground
10	VGA_HS	Horizontal Sync signal
11	VGA_VS	Vertical Sync signal
12	GND	Ground

No.4 : AV signal input connector

Note : This connector can change to 2Pin/ PH2.0mm connector.The pinout as follows:

Pin NO.	Description	Description
1	AV1	AV Signal input
2	GND	Ground

No.5 : PC audio input connector**No.6 (3PIN/2.0 mm Pitch) External audio signal input**

Pin NO.	Description	Description
1	PC_R	Right Channel Audio Input
2	GND	Ground
3	PC_L	Left Channel Audio Input

No.7 (4PIN/2.0 mm Pitch) External USB firmware update connector

Pin NO.	Description	Description
1	5V	+5V DC Power Supply for USB
2	D-	USB Data-
3	D+	USB Data+
4	GND	Ground

Note : This connector can change to standard USB port !

No.8 (4PIN/2.0 mm Pitch) Speaker connector

Pin NO.	Description	Description
1	RO	Right Channel Audio Output
2	GND	Ground
3	GND	Ground
4	LO	Left Channel Audio Output

No.12 (3PIN/2.0 mm Pitch) ISP debug interface

Pin NO.	Description	Description
1	GND	Ground
2	RX	RX data
3	TX	TX data

No.9 (15*2 PIN/2.0 mm Pitch) LVDS Signal Output Interface

Pin NO.	Definition	Description
1	VCC	Power Supply for LCD/LED panel
2	VCC	
3	VCC	
4	GND	Ground
5	GND	
6	GND	
7	RX00-	Negative LVDS Channel O0 (odd)
8	RX00+	Positive LVDS Channel O0 (odd)
9	RX01-	Negative LVDS Channel O1 (odd)
10	RX01+	Positive LVDS Channel O1 (odd)
11	RX02-	Negative LVDS Channel O2 (odd)
12	RX02+	Positive LVDS Channel O2 (odd)
13	GND	GND
14	GND	GND
15	RXOC-	Negative Sampling Clock(odd)
16	RXOC+	Positive Sampling Clock(odd)
17	RX03-	Negative LVDS Channel O3 (odd)
18	RX03+	Positive LVDS Channel O3 (odd)
19	RXE0-	Negative LVDS Channel E0 (even)
20	RXE0+	Positive LVDS Channel E0 (even)
21	RXE1-	Negative LVDS Channel E1 (even)
22	RXE1+	Positive LVDS Channel E1 (even)
23	RXE2-	Negative LVDS Channel E2 (even)
24	RXE2+	Positive LVDS Channel E2 (even)
25	GND	GND
26	GND	GND
27	RXEC-	Negative Sampling Clock(even)
28	RXEC+	Positive Sampling Clock(even)
29	RXE3-	Negative LVDS Channel E3 (even)
30	RXE3+	Positive LVDS Channel E3 (even)

No.10 (6PIN/2.0 mm Pitch) FPD Brightness Connector

Pin NO.	Definition	Description
1	+12V	+12V Power Supply For External Inverter
2	+12V	
3	BL-ON	Back-Light ON/OFF Control
4	ADJ	Backlight Brightness Control
5	GND	Ground
6	GND	

No.11 (14PIN/2.0mm Pitch) Key board & IR receiver & LED indicator

Pin NO.	Definition	Description
1	5V	+5V DC Power Supply
2	IR	IR receiver
3	GND	Ground
4	K0	Key 0
5	R	Red color LED
6	G	Green color LED
7	GND	Ground
8	K1	Key 1
9	K2	Key 2
10	K3	Key 3
11	K4	Key 4
12	K5	Key 5
13	K6	Key 6
14	K7	Key 7

No.13 (10*2 PIN/2.0 mm Pitch) External HDMI interface

Pin NO.	Definition	Description
1	GND	Ground
2	HPD	Hot Plug Detect
3	5V	+5V Power
4	GND	Ground
5	SDA	SDA
6	SCL	SCL
7	CEC	CEC
8	RXC-	TMDS Clock-
9	RXC+	TMDS Clock+
10	GND	Ground
11	RX0-	TMDS Data0-
12	RX0+	TMDS Data0+
13	GND	Ground
14	RX1-	TMDS Data1-
15	RX1+	TMDS Data1+
16	GND	Ground
17	RX2-	TMDS Data2-
18	RX2+	TMDS Data2+
19	GND	Ground
20	GND	Ground

No.14 (14PIN/2.0mm Pitch) Firmware Selection Header

Pin NO.	Definition	Description
1	A	See Appendix I
2	B	
3	C	
4	D	
5	E	
6	F	
7	G	

No.15 (2Pin&3Pin PH2.0 mm Pitch) Flat Panel Voltage Selection Header**J12: 12V power supply for LCD panel**

Pin NO.	Definition	Description
1	LCD_VCC	Send Voltage to LCD panel
2	+12V	+12V Power Supply

J6 : +3.3V & 5V power supply for LCD panel

Pin NO.	Definition	Description
1	5V	+5V power supply
2	LCD_VCC	Send Voltage to LCD panel
3	3.3V	+3.3V power supply

Note : J12 and J6 are use to select the working voltage for LCD LVDS signal . For example , If the LVDS signal of your LCD panel work with 3.3V , You have to connect LCD_VCC to 3.3V . It means you can use the jumper to make a connection between pin 2&pin 3 of J6 connector . If you select the wrong voltage for your LCD panel , It will not working or be damaged . **Please pay more attention on this setting !**

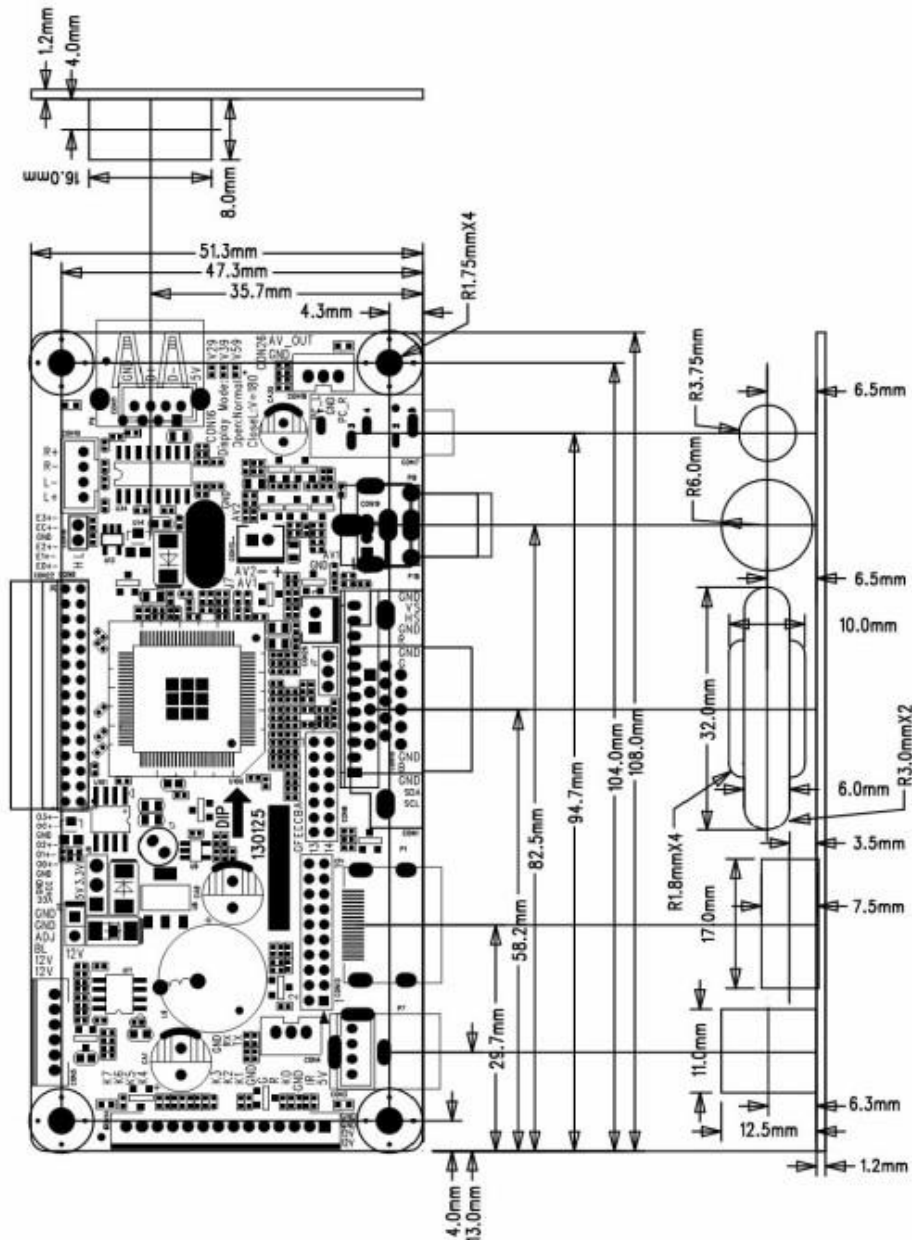
No.16 (2Pin PH2.0 mm Pitch) Display mode selection header

Pin NO.	Definition	Description
1	H	Open: Normal display mode Close: Display Rotate 180 degree
2	L	

Note : This feature is disable when main chip is TSUMV29LU .

5. PCB Mechanical Dimension :

- **Dimension : 108mm(L)*51.3mm(W)*18mm(H)**
- **The height of PCB + highest component = 18mm**
- **Screw Holes Size: $\Phi 3.5\text{mm}$**



6. CONFIGURATION & GENERAL PRECAUTIONS

- **Relative Humidity: ≤80%**
- **Storage Temperature: -20~+80℃**
- **Operation Temperature: 0~+40℃**
- **Keep away from static places and water Must not be pressed and distorted**
- **Do not disassemble the module**
- **Protect it away from contacting with metal or other electric substance**

Appendix I : Firmware Selection Instruction :

No.	Resolution	A	B	C	D	E	F	G	
1	1920X1080-8-1	■	■	□	□	□	□	□	■ ■ Connect □ □ NC
2	1920X1080-6-2	■	□	■	□	□	□	□	
3	1680X1050-8-1	■	□	□	■	□	□	□	
4	1440X900-8-1	■	□	□	□	■	□	□	
5	1280X1024-8-1	■	□	□	□	□	■	□	
6	1366X768-8-1	□	■	□	□	□	□	□	
7	1366X768-6-2	□	□	■	□	□	□	□	
8	1024X768-8-1	□	□	□	■	□	□	□	
9	1024X768-6-2	□	□	□	□	■	□	□	
10	800X600-8-1	□	□	□	□	□	■	□	
11	1024X600-6-2	■	□	□	□	□	□	□	
12	1920X1200-6-2	■	■	□	□	□	□	■	
13	1920X1080-8-2	■	□	■	□	□	□	■	
14	1680X1050-6-2	■	□	□	■	□	□	■	
15	1600X1200-8-1	■	□	□	□	■	□	■	
16	1600X900-8-1	■	□	□	□	□	■	■	
17	1600X900-6-2	□	■	□	□	□	□	■	
18	1440X900-6-2	□	□	■	□	□	□	■	
19	1400X1050-6-2	□	□	□	■	□	□	■	
20	1280X1024-8-2	□	□	□	□	■	□	■	
21	1280X800-6-2	□	□	□	□	□	■	■	
22	1024X768-8-2	■	□	□	□	□	□	■	
23	1024X768-6X2-1	□	□	□	□	□	□	■	

■ : Connected ; □ : Not Connected ;

Note :

1. CX-145 have pre-load 23 types of different firmware on the board .
You can make a combination of seven jumper (A,B,C,D,E,F,G) to get firmware with different resolution .
2. 1920X1080-8-1 : Resolution- Bit depth-LVDS Map .