

## **ES-3115 G/R/C/S/V - XA**

15" Open-Frame LCD Monitor with  
Anti-glare Glass/ Resistive / Capacitive / 3mm SAW /  
6 mm Vandal Proof SAW Touchscreens

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## **FCC Class A**

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy. If not installed and used in accordance with this user's manual, it may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

# Packing List

Before installing your equipment, make sure that the following materials have been received:

- ES-3115G-XA or ES-3115R-XA or ES-3115C-XA or ES-3115S-XA or ES-3115V-XA
- Accessory box, including:
  - CD for ES-3115G/R/C/S/V-XA Driver
  - 12V DC Power adapter
  - 2-wire Power cord for adapter
  - 1.8 m VGA cable
  - 1.8 m RS-232 cable for

If any of these items are missing or damaged, contact your distributor or sales representative immediately.

## Additional Information and Assistance

1. Visit the Advantech web sites at [www.advantech.com](http://www.advantech.com) or [www.advantech.com.tw](http://www.advantech.com.tw) where you can find the latest information about the product.
2. Contact your distributor, sales representative, or Advantech's customer service center for technical support if you need additional assistance. Please have the following information ready before you call:
  - Product name and serial number
  - Description of your peripheral attachments
  - Description of your software (operating system, version, application software, etc.)
  - A complete description of the problem
  - The exact wording of any error messages

## Safety Instructions

1. Read these safety instructions carefully.
2. Keep this User's Manual for later reference.
3. Disconnect this equipment from any AC outlet before cleaning. Use a damp cloth. Do not use liquid or spray detergents for cleaning.
4. For plug-in equipment, the power outlet socket must be located near the equipment and must be easily accessible.
5. Keep this equipment away from humidity.
6. Put this equipment on a reliable surface during installation. Dropping it or letting it fall may cause damage.
7. The openings on the enclosure are for air convection. Protect the equipment from overheating. **DO NOT COVER THE OPENINGS.**
8. Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.
9. Position the power cord so that people cannot step on it. Do not place anything over the power cord.
10. All cautions and warnings on the equipment should be noted.
11. If the equipment is not used for a long time, disconnect it from the power source to avoid damage by transient over voltage.
12. Never pour any liquid into an opening. This may cause fire or electrical shock.
13. Never open the equipment. For safety reasons, the equipment should be opened only by qualified service personnel.
14. If one of the following situations arises, get the equipment checked by service personnel:
  - a. The power cord or plug is damaged.
  - b. Liquid has penetrated into the equipment.
  - c. The equipment has been exposed to moisture.
  - d. The equipment does not work well, or you cannot get it to work according to the user's manual.
  - e. The equipment has been dropped and damaged.
  - f. The equipment has obvious signs of breakage.
15. **DO NOT LEAVE THIS EQUIPMENT IN AN UNCONTROLLED ENVIRONMENT WHERE THE STORAGE TEMPERATURE IS BELOW -20°C (-4°F) OR ABOVE 60°C (140°F). THIS MAY DAMAGE THE EQUIPMENT.**

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# CHAPTER 1

## General Information

This chapter includes:

- Introduction
- Product Features

## 1.1 Introduction

This product, *LCD touch monitor*, is mainly focused on Kiosk market or Human Machine Interface (HMI). It is a core module for Kiosk application. The LCD touch monitor supports direct VGA analog signal inputs, which make it more compatible and adaptable to connect to computers widely used in the current market.

The LCD touch monitor just provides a steel open frame so that Kiosk providers can design their specific IDs to demonstrate their own Kiosk application. Comparing with traditional CRT monitor, LCD monitor takes great advantage on module size and weight; Kiosk providers can therefore make an easier and more flexible design. LCD monitor can also provide high brightness and contrast to achieve better viewing effect. Based on market demand, the size of LCD touch monitor is focused on fifteen inches.

As a Kiosk application product, touch screen is always the best choice as a human machine interface. SAW and Capacitive and Resistive sensor used in touchscreen can make applied force lighter and thus use easier. In addition, the SAW 6mm sensor can also provide impact resistant except the touch function.



## 1.2 Product Features

### General

- **Construction:** steel chassis
- **Dimensions for G/R/C/S/V (W x H x D):** 414 mm x 322.2 mm x 500 mm
- **Weight:** 4.1 kg
- **Mounting:** rear mounting
- **15" TFT active matrix LCD display:** XGA resolution of 1024 x 768 pixels with 262144 colors.
- **Analogy interface:** Accepts RGB input directly. DVI and Audio function can be supported optionally
- **Recommend resolution:** 1024 x 768 @ 75 Hz.
- **Display mode Auto tuning:** automatically execute when a new mode is implemented.
- **OSD controls:** allow on-screen adjustments of Brightness, Contrast, RGB Auto Color Balance, H-Position, V-Position, Clock, Phase.
- **Power Supply:** DC input 12V/4.0A

### Internal functions

- **ADC Core logic chipset:** M-Star MST9111; built-in high speed clock recovery circuit and PLL circuit; supports RGB offset/ RGB gain and gamma correction.

## 1.3 VGA Signal

- **Input signal:**
  - Video:** Analog 0.7Vpp/75ohms
  - Sync.:** Separate sync. LVDS Level
    - Horizontal sync. Positive/Negative
    - Vertical sync. Positive/Negative
- **Synchronization range:**
  - Horizontal:** 30k to 60k Hz (automatically)
  - Vertical:** 56Hz to 75 Hz (automatically)

- **Display mode support:**

Item	Resolution	H Freq.(kHz)	V Freq.(Hz)	Note
1	640x400@70	31.469	70.087	VGA
2	640x480@60	31.469	59.940	VESA
3	640x480@66	35.000	66.667	MAC
4	640x480@72	37.861	72.809	VESA
5	640x480@75	37.500	75.000	VESA
6	720x400@70	31.469	70.087	TEXT
7	800x600@56	35.156	56.250	VESA
8	800x600@60	37.879	60.317	VESA
9	800x600@72	48.077	72.188	VESA
10	800x600@75	46.875	75.000	VESA
11	832x624@75	49.107	75.087	MAC
12	1024x768@60	48.363	60.004	VESA
13	1024x768@70	56.476	70.069	VESA
14	1024x768@75	60.023	75.029	VESA
15	1024x768@75	60.241	75.020	MAC
16	1152x864@70	63.850	70.000	VESA
17	1152x864@75	67.500	75.000	VESA
18	1152x870@75	68.681	74.980	MAC
19	1280x960@60	60.000	60.000	VESA
20	1280x1024@60	63.980	60.000	VESA
21	1280x1024@70	74.882	69.853	VESA
22	1280x1024@75	79.976	75.025	VESA

## **1.4 LCD Specification**

### **1.4.1 LCD Specification**

DF-14H-20P-1.25H (Hirose) or CWY20G-A0D1T (PTWO)

**Pin No. Symbol Description**

Display Type	15" XGA TFT LCD
Active Area (mm)	304.128 X 228.096
Resolution	1024 X 768
Dot Pitch (mm)	0.297 X 0.297
Supply Voltage (Panel)	12 Vdc
Viewing angle (v,h)	80°, 120°
Contrast	400:1
Luminance (cd/m <sup>2</sup> )	250
Color	262144
Backlight MTBF (hr)	25000
LCD MTBF (hr)	50000

## 1.4.2 LCD pin definition

M150XN07 pin definition is shown in the table below.

1	VDD	Power Supply, 3.3V (typical)
2	VDD	Power Supply, 3.3V (typical)
3	VSS	Ground
4	VSS	Ground
5	Rin0-	- LVDS differential data input (R0-R5, G0)
6	Rin0+	+ LVDS differential data input (R0-R5, G0)
7	VSS	Ground
8	Rin1-	- LVDS differential data input (G1-G5, B0-B1)
9	Rin1+	+ LVDS differential data input (G1-G5, B0-B1)
10	VSS	Ground
11	Rin2-	- LVDS differential data input (B2-B5, HS, VS, DE)
12	Rin2+	+ LVDS differential data input (B2-B5, HS, VS, DE)
13	VSS	Ground
14	ClkIN-	- LVDS differential clock input
15	ClkIN+	+ LVDS differential clock input
16	VSS	Ground
17	Rin3-	NC
18	Rin3+	NC
19	VSS	Ground
20	NC	NC Please *floating* and don't connect to ground.

## **1.5 Touchscreen Specification**

### **1.5.1 ES-3115C (Capacity)**

- **Type:** 3M Touch Systems-Microtouch capacity touch screen
- **Resolution:** 1024 x 1024
- **Light Transmission:** 85%
- **Touch Life Cycle:** 225 million
- **Controller:** RS-232 interface
- **Communication speed:** up to 19.2K baud.
- **Power consumption:** +5 V @ 100 mA

### **1.5.2 ES-3115R (Resistive)**

- **Type:** EloTouch resistive touch screen
- **Resolution:** Continuous
- **Light Transmission:** 75%
- **Touch Life Cycle:** 35 million
- **Controller:** RS-232 interface
- **Communication speed:** up to 19.2K baud.
- **Power consumption:** +5 V @ 200 mA

### **1.5.3 ES-3115S (SAW)**

- **Type:** EloTouch Surface Acoustic Wave (SAW)
- **Resolution:** 4096 x 4096
- **Light Transmission:** 91%
- **Touch Life Cycle:** 50 millions
- **Controller:** RS-232 interface
- **Communication speed:** up to 19.2K baud.
- **Power consumption:** +5 V @ 60 mA

### **1.5.4 ES-3115SV (6mm SAW)**

- **Type:** EloTouch Surface Acoustic Wave (6 mm SAW)
- **Resolution:** 4096 x 4096
- **Light Transmission:** 91%
- **Touch Life Cycle:** 50 millions
- **Controller:** RS-232 interface
- **Communication speed:** up to 19.2K baud.
- **Power consumption:** +5 V @ 60 mA

## 1.6 External AC Power Adapter

- **Output:** 12Vdc/4.0A
- **Input:** 100 ~ 240 Vac, 47 ~ 63 Hz, 1.2A
- **Efficiency:** better than 84% under maximum load.
- **MTBF:** 50,000 hr at 25°C

## 1.7 Environment

- **Temperature:** 0°C ~ 45°C (32° ~112°)
- **Relative humidity:** 5 ~ 95 % @ 40° (non-condensing)
- **Shock:** 10G peak acceleration (11 msec duration)
- **Certification:** FCC class A

## **System Setup**

- Introduction
- Preparing for First-time Use
- I/O arrangement
- Installation Procedure
- OSD Control
- Enabling the Touchscreen

## 2.1 Introduction

This chapter describes basic features and procedures for using the Open-frame LCD monitor. Topics covered include the system installation, OSD control, Touchscreen, and so on.

## 2.2 Preparing for First-time Use

Before you start to set up the ES-3115 LCD Monitor, You should have at least the following items ready in your accessory box:

- 12V DC Power adapter
- 2-wire Power cord for adapter
- 1.8m VGA cable
- 1.8m RS-232 cable (Not available for ES-3115G)
- CD for ES-3115R/C/S/V driver and User's Menu

## 2.3 I/O arrangement

The diagram shows the VGA port, RS-232 port and DC Power inlet.

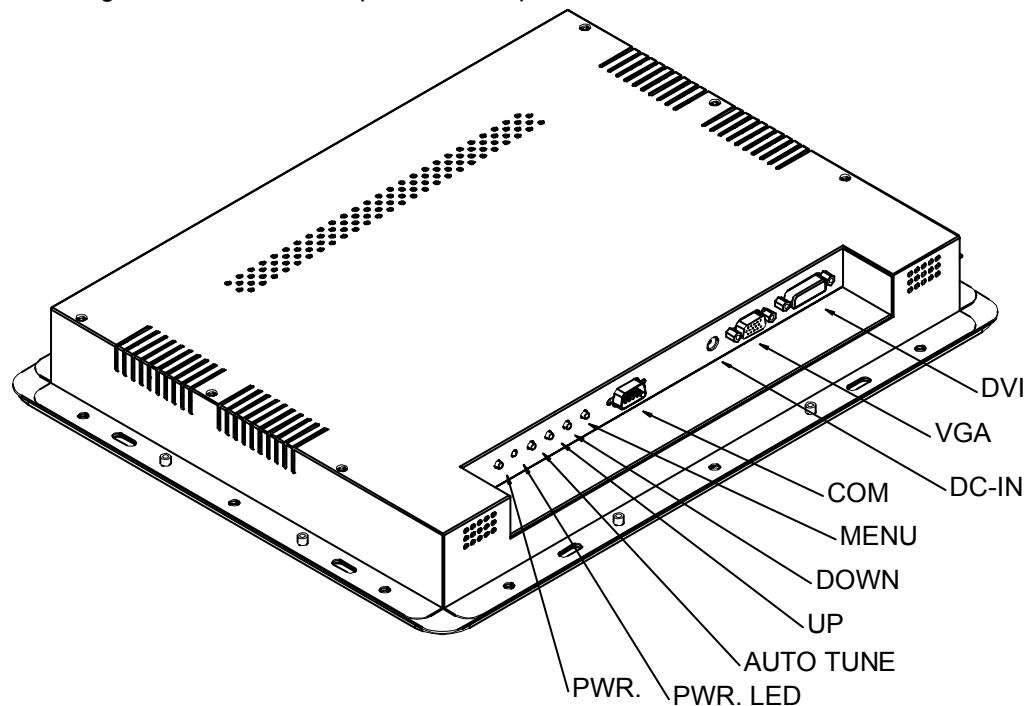


Figure 2-1: Rear view of the ES-3115R/C/S/V



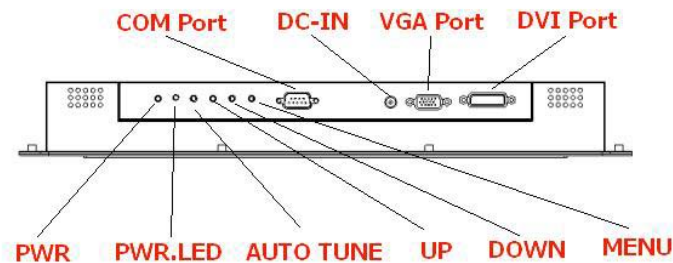
## 2.4 Installation Procedure

The ES-3115 can only be powered by an AC electrical outlet adapter (90 ~ 240 volts). Be sure to always handle the power cord and power adapter by holding the plug ends only.

1. Make sure that the system power is turned off.
2. Connect the VGA cable and RS-232 cable between the ES-3115 and your PC system.
3. Plug the 2-way power cord to the power adapter. Plug the adapter cable to the DC 12V jack of ES-3115.
4. Connect the 2-pin male plug of the power cord to an electrical outlet.
5. Turn on the PC system.

## 2.5 OSD Control

### OSD buttons



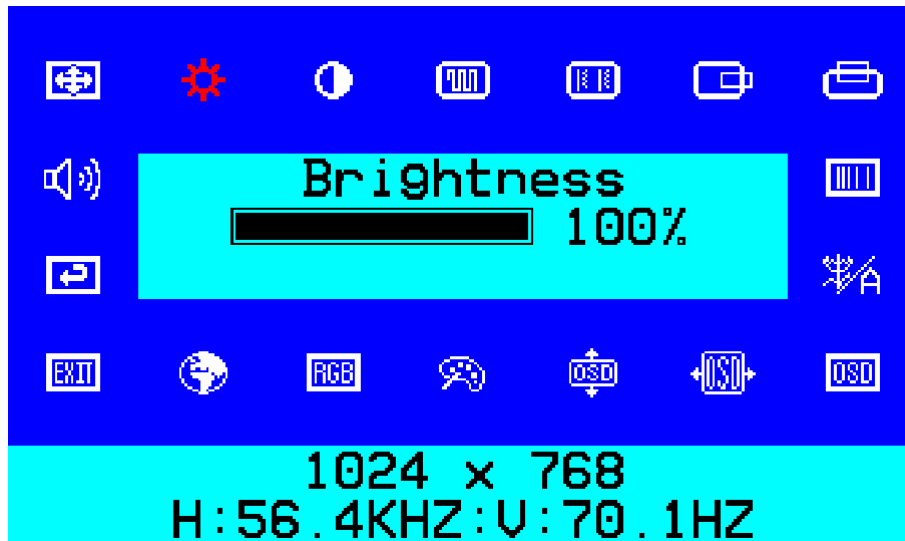
### Adjusting with OSD control

Five different keys are well-defined for operation. They are labeled on the keypad.

1. ① (**Power KEY**) is designated for Power On/Off





2. **[Menu] (Menu KEY)** is designated for Menu/Enter function depending on the selected item. Pressing [Menu] can invoke OSD menu. After that, [Menu] is also an entry key.
3. **[← /↑] (INC KEY)** is designated for selection function in up direction in OSD menu and also to increase the value on selected function.
4. **[→ /↓] (DEC KEY)** is designated for selection function in down direction in OSD menu and also to decrease the value on selected function.
5. **[Auto Tune] (AUTO KEY)** is designated for invoking AUTO ADJUST function at any time once is pressed for H-position, V-position, Pixel Clock and Phase for an optimal image.














## OSD Screen



Press "INC" or "DEC" to locate the item you desire to change, then press "Menu" to make the adjustment, when press "Menu" again to go back to main menu.

## OSD Function List

- |   |             |   |
|---|-------------|---|
|  | Auto Adjust | Automatically adjusts H-position, V-position, Pixel Clock and Phase for an optimal image<br>Press "Menu" to execute |
|  | Brightness  | Adjust the Brightness<br>Press "INC" or "DEC" to adjust the parameter   |
|  | Contrast    | Adjust the difference between the light and dark areas<br>Press" INC" or "DEC" to execute                           |
|  | Clock       | Adjusts the video distortion. It will appear horizontal   |

	Phase	noise on the screen while adjust the Clock. Press" INC" or "DEC" to adjust the parameter Adjusts the video distortion. It will appear vertical noise on the screen while adjust the Phase Press" INC" or "DEC" to adjust the parameter
	Horizontal Position	Move the display picture Press" INC" to the right, press "DEC" to the left
	Vertical Position	Move the display picture Press" INC" to the up, press "DEC" to the down
	Sharpness	Adjusts the sharpness (Available in Scaling-up mode) Press" INC" or "DEC" to adjust the parameter
	Text Mode	Zoom ratio change between VGA and Text mode Press "Menu" to execute
	OSD Transparency	Adjust the OSD transparency Press" INC" to deepen or "DEC" to shallow
	OSD H-Position	Adjust the OSD position Press" INC" to the right, press "DEC" to the left
	OSD V-Position	Adjust the OSD position Press" INC" to the up, press "DEC" to the down
	Switch Color	Adjust color temperature Press" INC" or "DEC" to select a color mode
	Set Color USER	Adjust color temperature for User mode
	OSD Language	Change OSD language Press" INC" or "DEC" to select, and press "Menu" to execute
	Exit	Exit the OSD menu and save the values Press "Menu" to execute
	Memory Recall	Restore the default value (The value according to the factory mode) Press "Menu" to execute

## 2.6 Enable the Capacity Touchscreen driver (ES-3115C-XA)

The capacity touchscreen of ES-3115C-XM is patented technology available from 3M Touch System. Its tough, scratch-resistant and wear-resistant feature is an ideal choice for unattended kiosks and POI applications in public places like train stations, airports, malls, supermarket,

and etc.

ES-3115C-XA provides 1 CD kit which contain capacitive driver. It enables you to use the capacitive touchscreen with applications running in Windows environments. You can run Windows programs and use touch input without any program modification.

1. Make sure the RS-232 cable is properly connected. The Setup program cannot configure the touchscreen without it.
2. Insert the CD Kit into your PC system's CD drive.
3. Change to the \3M Microtouch\ directory. Click the SETUP.EXE installation program. The Setup program begins to execute and load the TouchWare files.
4. Follow the instructions displayed on the screen. Make your selections carefully when answering questions to complete the installation.

## **2.7 Enable the Resistive Touchscreen driver (ES-3115R-XA)**

The resistive touchscreen of ES-3115R-XA is patented technology available from Elotouch System. It is an ideal choice for unattended kiosks and POI applications in public places like train stations, airports, malls, supermarket, and etc.

ES-3115R-XA provides 1 CD kit which contain resistive driver. It enables you to use the resistive touchscreen with applications running in Windows environments. You can run Windows programs and use touch input without any program modification.

1. Make sure the RS-232 cable is properly connected. The Setup program cannot configure the touchscreen without it.
2. Insert the CD Kit into your PC system's CD drive.
3. Change to \EloTouch directory and change to the subdirectory corresponding to the Windows version you are using now. Click the SETUP.EXE installation program. The Setup program begins to execute and load the Elotouch's driver.
4. Follow the instructions displayed on the screen. Make your selections carefully when answering questions to complete the installation.

## **2.8 Enable the SAW Touchscreen driver (ES-3115S-XA)**

The SAW touchscreen of ES-3115S-XA is patented technology available from Elotouch System. Its tough, scratch-resistant and wear-resistant feature is an ideal choice for unattended kiosks and POI applications in public places like train stations, airports, malls, supermarket, and etc.

ES-3115V-XA provides 1 CD kit which contain SAW driver. It enables you to use the resistive touchscreen with applications running in Windows environments. You can run Windows programs and use touch input without any program modification.

1. Make sure the RS-232 cable is properly connected. The Setup program cannot configure the touchscreen without it.
2. Insert the CD Kit into your PC system's CD drive.
3. Change to \EloTouch directory and change to the subdirectory corresponding to the Windows version you are using now. Click the SETUP.EXE installation program. The Setup program begins to execute and load the Elotouch's driver.
4. Follow the instructions displayed on the screen. Make your selections carefully when answering questions to complete the installation.

## **2.9 Enable the 6mm Touchscreen driver (ES-3115V-XA)**

The 6mm touchscreen of ES-3115SV-XA is patented technology available from Elotouch System. Its tough, scratch-resistant and Impact-resistant feature is a ideal choice for unattended kiosks and POI applications in public places like train stations, airports, malls, supermarket, and etc.

ES-3115V-XA provides 1 CD kit which contain capacitive driver. It enables you to use the resistive touchscreen with applications running in Windows environments. You can run Windows programs and use touch input without any program modification.

1. Make sure the RS-232 cable is properly connected. The Setup program cannot configure the touchscreen without it.
2. Insert the CD Kit into your PC system's CD drive.
3. Change to \EloTouch directory and change to the subdirectory corresponding to the Windows version you are using now. Click the SETUP.EXE installation program. The Setup program begins to execute and load the Elotouch's driver.
4. Follow the instructions displayed on the screen. Make your selections

carefully when answering questions to complete the installation.

## **Specification**

- Introduction
- Mechanical Dimension
- Cut-out Dimensions for Rear Mounting
- Mounting Guide
- Exploded Diagram
- Electrical Block Diagram
- ADC Board
- DC to DC Power Board
- DC to AC Inverter
- Touchscreen Control Board

### **3.1 Introduction**

The mechanical design concept of ES-3115 G/ R/C/ S/ V -XA follows easy assembling, easy maintenance principles. Two main metal parts are used to support PCB, LCD panel, and touch screen. Basically, front frame and back frame form a space to contain all parts of LCD touch monitor. The back frame metal plate are used to mount PCB boards and LCD panel, front metal frame is used to mount the Touchscreen.



### 3.2 Mechanical Dimension

#### Mechanical Dimension of ES-3115G/R/C/S/V-XA

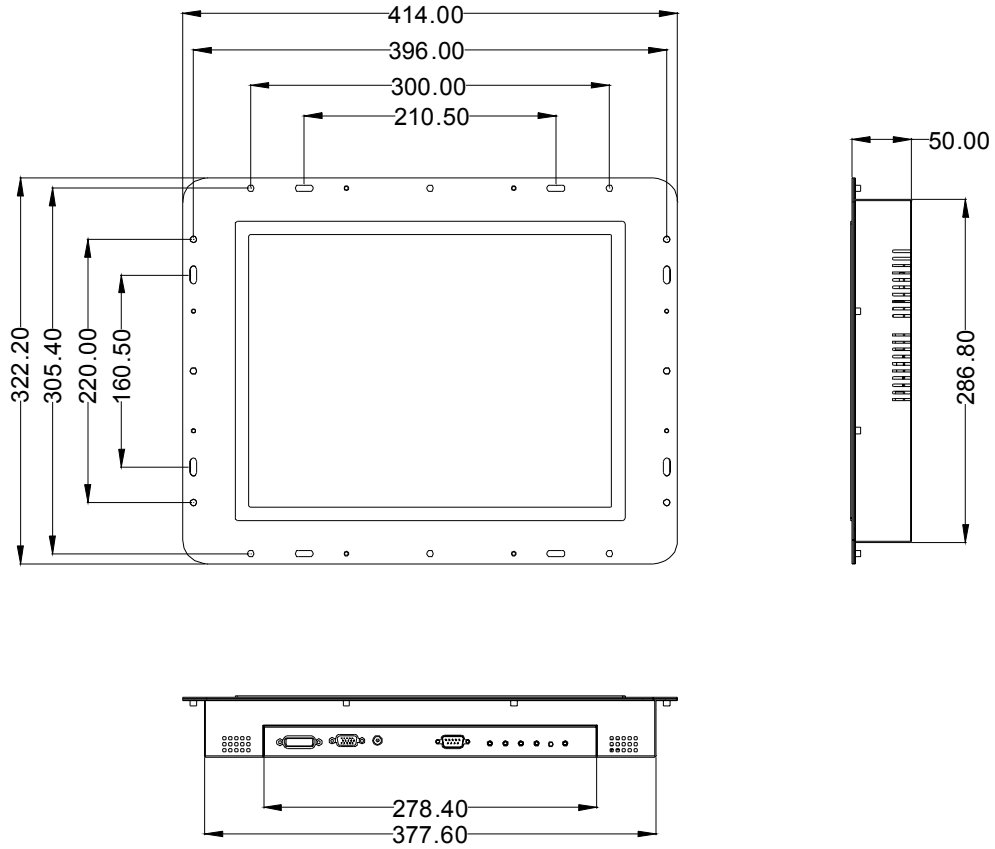


Figure 3-1: Dimensions of the ES-3115G/R/C/S/V-XA

### 3.3 Cut-out Dimension for ES-3115 G/R/C/S/V-XA Rear Mounting

To construct a suitable panel, refer to the following cutout & elongated holes dimension diagram.

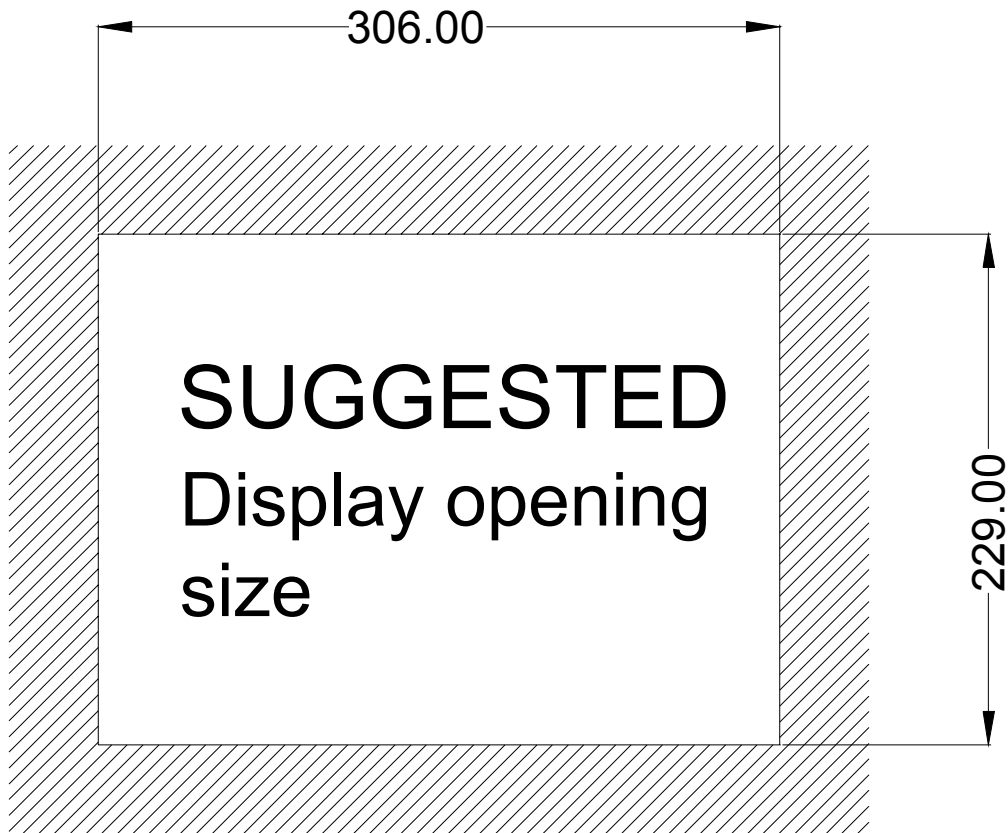


Figure 3-3: ES-3115 G/R/C/S/V-XA dimensions of cut-off.

### 3.4 Mounting guide

To mount the ES-3115G/R/C/S/V-XA into a panel or kiosk:

1. Build 8 screw studs along the four sides of the cut out opening based on the dimension given on the drawing above.
2. There are ten elongated holes located along the four sides of the open frame monitor. Mount the open frame LCD monitor on by aligning the screw studs with the elongated hole.
3. Tighten the screw stud with hex nut and make sure it is stable.

Note: The screw stud should not be less than M4 and 5mm in height.

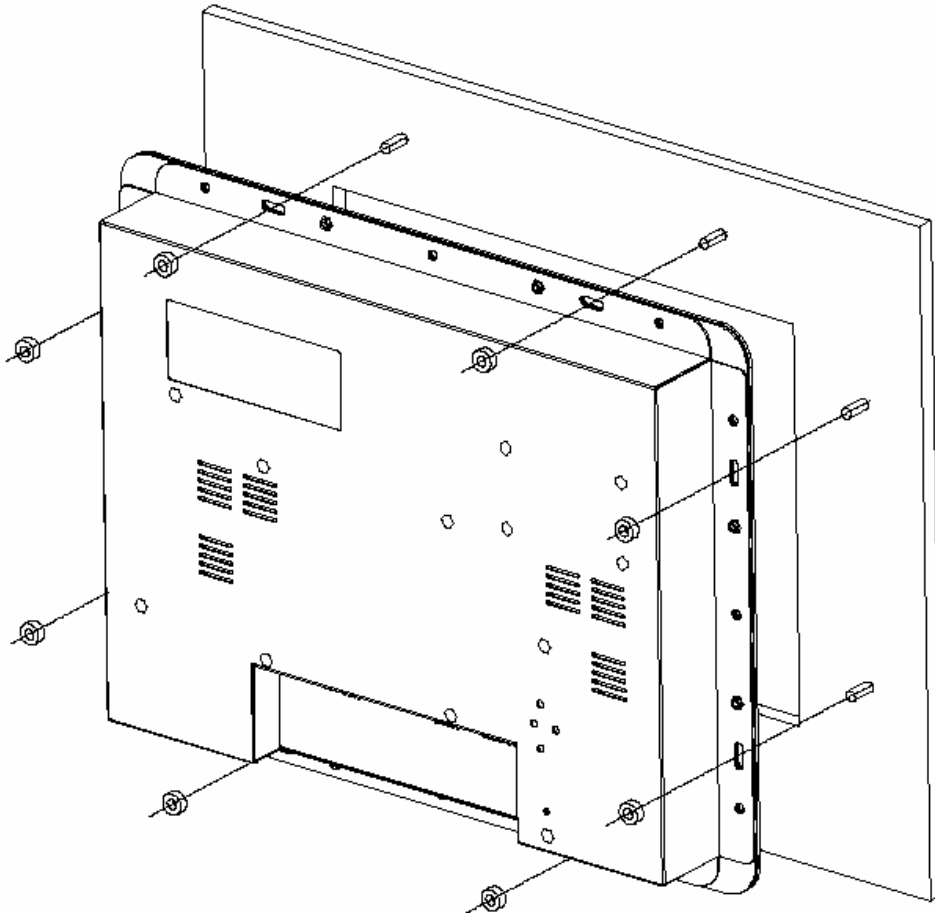


Figure 3-4: Rear mounting of the ES-3115 G/R/C/S/V-XA

## 3.5 Mounting guide

### 3.5.1 Exploded Diagram of ES-3115 G/R/C-XA

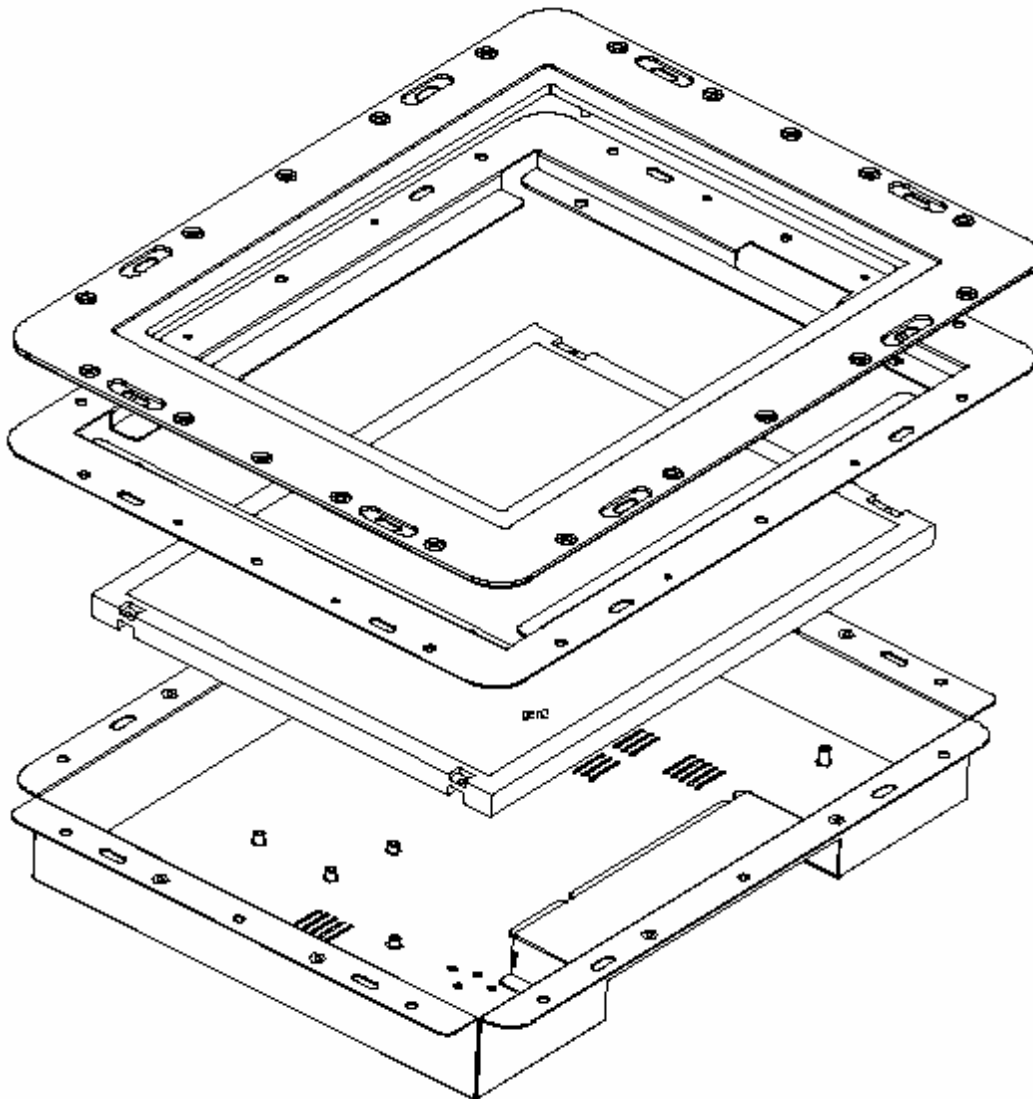


Figure 3-6: Exploded diagram of the ES-3115 G/R/C-XA

### 3.5.2 Exploded Diagram of ES-3115 S/ V –XA

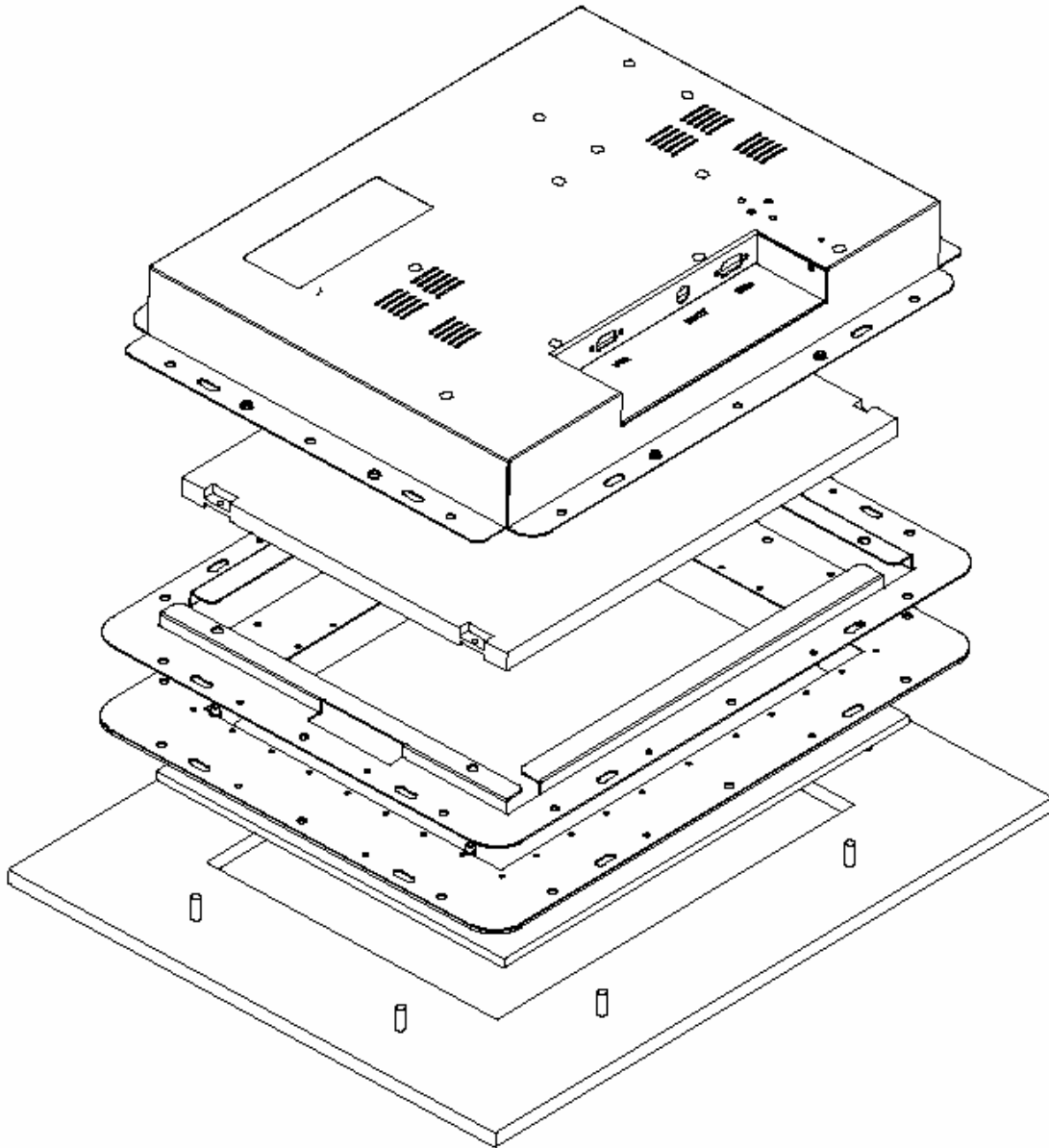


Figure 3-7: Exploded diagram of the ES-3115S/ V –XA

### 3.6 Electrical Block Diagram

According to the product idea, 15" LCD panel and touchscreen are the basic two components in this product. Besides, in order to reduce the depth of LCD touch monitor and solve cooling problem at the same time, a DC input is designed to remove the AC switching power supply. An AC switching power adapter of full range is used to provide DC voltage of the monitor.

The LCD touch monitor is constructed based on steel open frame architecture. It consists of a 15" LCD panel, an DC to AC inverter board to support a set of cold cathode fluorescent light (CCFL), an analog to digital converter board (ADC) to convert analog RGB signals to digital ones, and a touchscreen used as a pointing device. A metal chassis supports the whole module.

#### Block Diagram

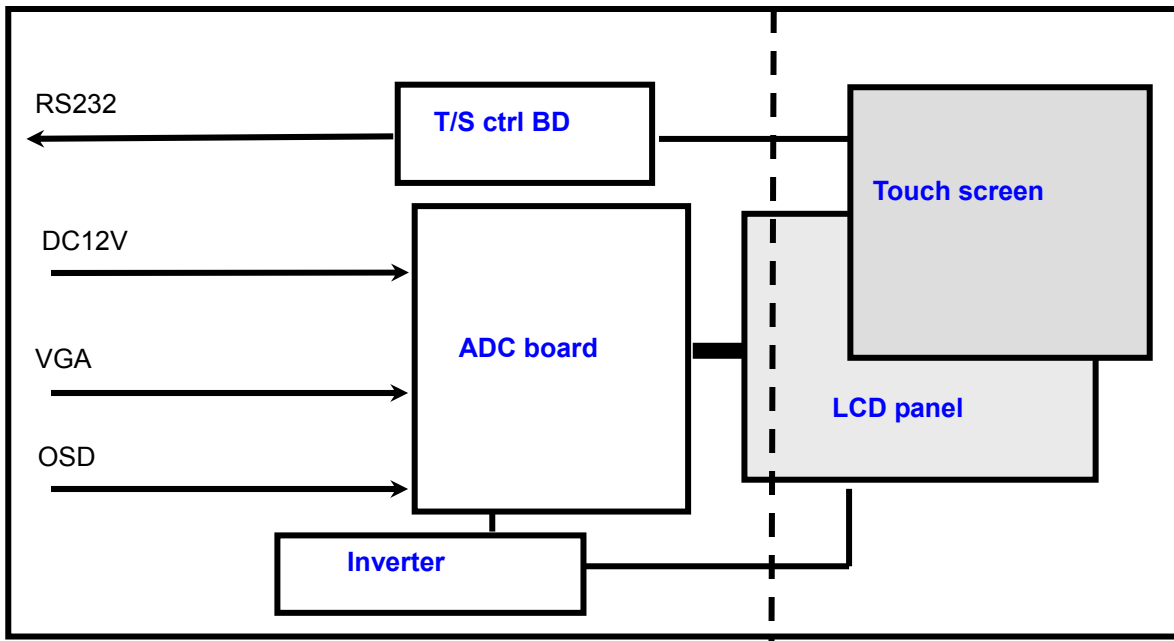


Figure 3-8: Block Diagram

### 3.7 ADC Board

The ADC board is used to convert RGB signal to LCD digital signal and send to LCD panel to display. The ADC board is as below:

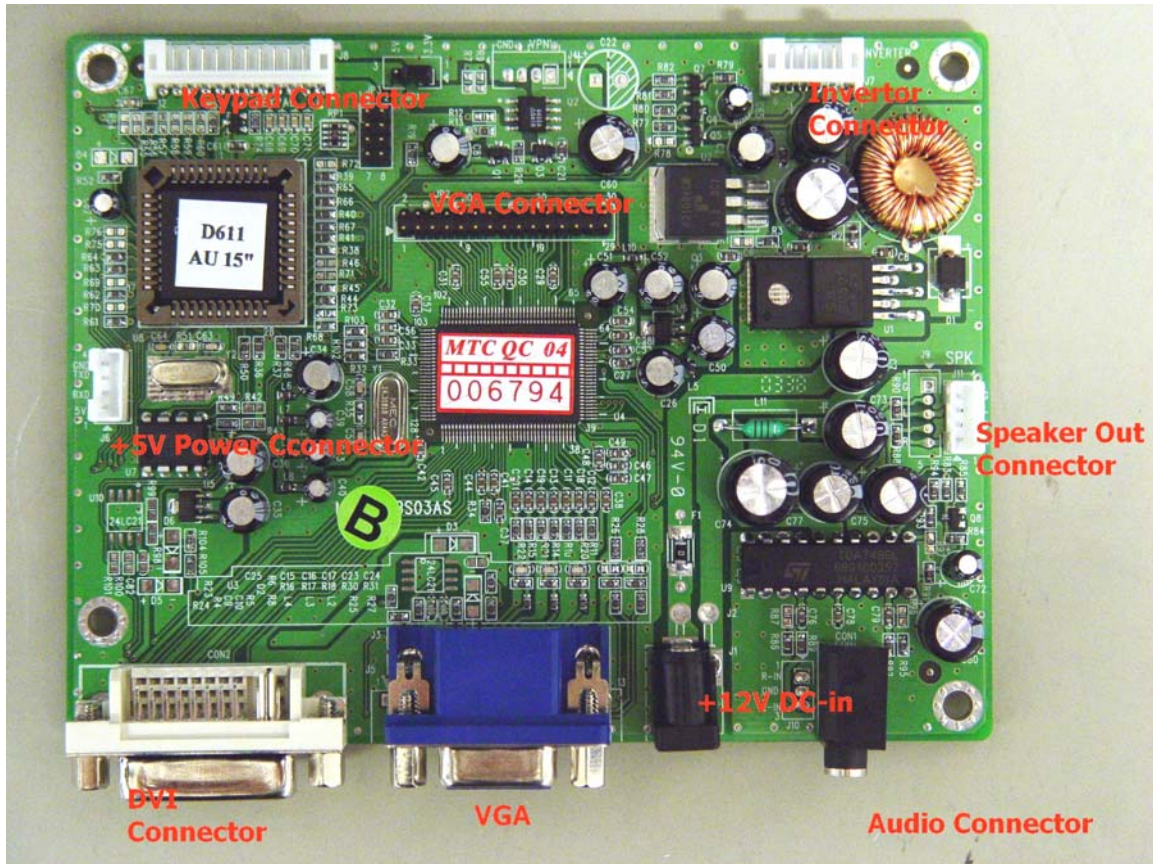


Figure 3-9: Locating connectors on ADC board

### 3.8 DC to AC Inverter

The DC/AC inverter is used to provide the power to LCD backlight. The inverter is as below:

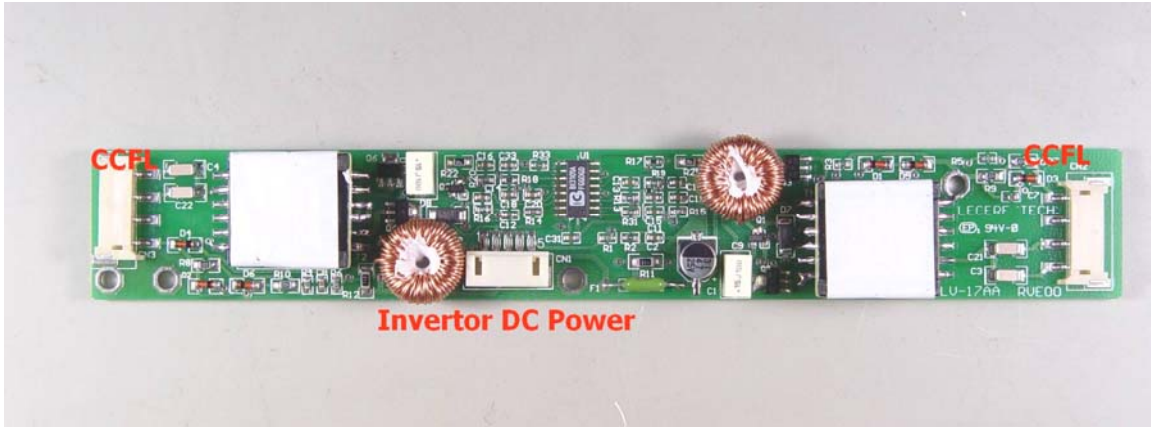


Figure 3-10: Locating connectors on DC/AC inverter



### 3.9 Touch Screen Control Board

Except ES-3115G-XA, all other ES-3115 series provide various touch screen with different technical. For ES-3115C-XA, it use 3M MicroTouch's Capacity Touch Screen sensor and has the control board as below:



Figure 3-11: Locating connector of ES-3115C control board

ES-31153115R-XA used the ELO's resistive touch screen as below:



Figure 3-12: Locating connector of ES-3115R control board

ES-3115S-XA and ES-3115V-XA used the ELO's Surface Wave touch screen as below:

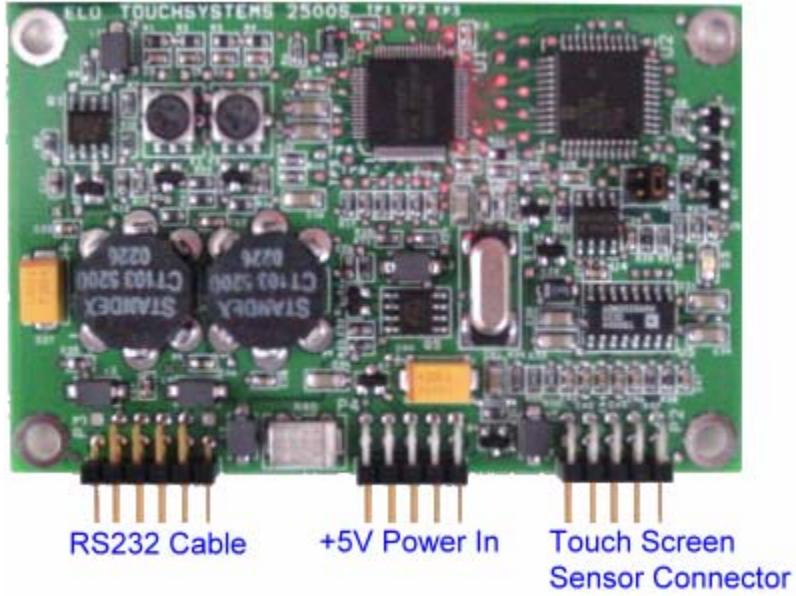


Figure 3-13: Locating connector of ES-3115S and ES-3115V control board