



# ARV-13XX AD Board

INSTRUCTION MANUAL

(Hardware version A1.2X)

## Model Name

**ARV-1300** (RGB, LVDS)

**ARV-1302** (RGB, TTL)

**ARV-1320** (RGB, DVI, LVDS)

**ARV-1322** (RGB, DVI, TTL)

**ARV-1350** (RGB, DVI, Composite, S-Video, LVDS)

**ARV-1352** (RGB, DVI, Composite, S-Video, TTL)

---

# Table of Contents

---

## **1 Introduction**

- 1.1 Overview
- 1.2 Check List
- 1.3 Contact Information

## **2 Hardware Installation Guide**

- 2.1 Set BIOS Jumpers
- 2.2 Set Panel VDD
- 2.3 Set Backlight VDD
- 2.4 Set Brightness Control
- 2.5 Connect panel cable
- 2.6 Connect backlight power
- 2.7 Connect OSD touch pad
- 2.8 Connect the power adapter to turn on system
- 2.9 Connect signal input cables
- 2.10 Power on your computer
- 2.11 Set OSD (On-Screen Display)
- 2.12 Update firmware BIOS

## **3 Hardware Information**

- 3.1 BIOS Jumpers
- 3.2 Working Voltage Setting for LCD Panel
- 3.3 Working Voltage Setting for Backlight
- 3.4 LVDS Connector
- 3.5 LCD TTL Level Connector
- 3.6 Backlight Connector
- 3.7 OSD Connector
- 3.8 DC Power-In Connector
- 3.9 DB-15 Connector
- 3.10 Slim Type digital DVI Connector
- 3.11 Mini Din for S-Video Signal Input
- 3.12 RCA Jack for Composite connector
- 3.13 Slim Type Video Connector (Reserved Connector)
- 3.14 BIOS Programming Port
- 3.15 External Detection Port

## **4 OSD Setup**

- 5 Product Specifications**
- 6 Customer Support**
- 7 Notice**

## Revision History

Version		Date	Page	Section	Description
Product	Document				
A1.3	2.5	2012/08/21	7,8	2.1	Add Jumpers Drawing
A1.3	2.4	2012/05/11	7,8	2.1	Revise BIOS Switch
A1.3	2.3	2012/03/16	20	3.16	Revise :” External Detection port CN38”
A1.3	2.2	2012/02/14	10	2.13	Change CN38 to optional
A1.2	2.1	2011/11/09	16	3.7	Revise Backlight Connector Description
A1.2	2.0	2011/10/21	7, 8	2.1	Revise BIOS Switch
			All	All	Revise Edition
A1.2	1.9	2011/09/21	12	3	Revise Layout
A1.1	1.8	2011/03/01	8	2	BIOS SWITH description revised
A1.1	1.7	2010/11/18	8	2	BIOS SWITH description revised
A1.1	1.6	2010/11/2	15	3	Add BIOS Programming port
A1.1	1.5	2010/10/28	6, 7	2	BIOS SWITH description revised
A1.1	1.4	2010/10/19	9,15	2,3	Add connector description
A1.1	1.3	2010/09/28	6, 7	2	Add BIOS SWITH
A1.1	1.2	2010/09/28	1	1	Product Line Revised
A1.1	1.1	2009/09/16	9	3	Drawing upgrade
A1	1.0	2009/01/09			First release

**<Remarks>**

---

# 1 Introduction

---

## 1.1 Overview

Thank you for purchasing Spectrah product ARV-13XX A/D converter boards. The ARV-13XX series is designed as a small size driving board for industrial display systems or customized display devices. The ARV-13XX series provides excellent display quality, ease of use, and cost efficient solutions for LCD panel users.

The ARV-13XX series provides complete signal input ports, computer RGB, DVI, and video interfaces, including Composite, S-Video, and YPbPr. ARV-13XX supports a wide range of LCD panels including AUO, Chi-Mei, Sharp, CPT, NEC, Optrex, Mitsubishi, Toshiba, Samsung, and LG. The onboard controller Genesis GM5766 is a high quality A to D and D to D receiver device capable of converting analog or PanelLink digital signals to the required TTL or LVDS signals for various LCD panels. This controller board can drive LCD panels from VGA (640 x 480) up to WSXGA (1680 x1050) resolutions at true color, one or two pixel/clock mode. The ARV-13XX series also provides Genesis unique technology to support excellent panel display quality: ACC (Adaptive Color and Contrast) & ACM-II (Active Color Management), image phase and position adjustment, Auto-configuration, Auto-signal detection, smart OSD adjustment, and perfect scaling function.

Before you start installation, please refer to the Hardware Installation Guide in Section 2 and Hardware Information in Section 3 for details and ensure each switch, connector, and jumper is set properly. We truly believe you will enjoy using the Spectrah ARV-13XX series products. Thank you for making Spectrah AD converter board as your choice.

## 1.2 Check List

Before operating this AD converter board, please make sure that all the items listed below are present in your package:

- One ARV-13XX series AD converter board
- OSD470 (Optional)
- Display cable kits (Optional)
- Inverter (Optional)
- LED driver (Optional)
- Light Sensor (Optional)

## 1.3 Contact Information

Spectrah Dynamics, Inc.

5F-2, No. 188, Sec# 3, Ta-Tung Road, Hsi-Chi, Taipei Hsien 221, Taiwan

Tel: 886-2-86472026

Fax: 886-2-86472201

Website: [www.spectrah.com](http://www.spectrah.com)

Email: [spec\\_support@spectrah.com](mailto:spec_support@spectrah.com)

---

## 2 Hardware Installation Guide

---

**WARNING** - Static electricity can severely damage electronic parts. Take these precautions:

- Before touching any electronic parts, be sure you are properly grounded or that static electricity is discharged from your body. You can do this by touching the metal frame of your computer.
- Do not remove the product from the anti-static container it was shipped in until you are ready to install it. When you remove the product from your display device, place it back in its container.
- When handling a card, hold its edges, and avoid touching its circuitry.

Before you start the installation, please ensure that three required components are available: ARV-13XX series AD converter board, signal input cable, and panel cable (Connect ARV-13XX to LCD panel).

**Note:**

During the installation procedures, if you need pin definition, hardware specifications, or OSD features in detail, please refer to Chapter 3 (Hardware Information) and Chapter 4 (OSD Setup).

## 2.1 Set BIOS Jumpers

There are 5 jumpers to allow user to set appropriate BIOS for various LCD panels. To change output display timing, after resetting jumpers, user should remove power and plug power jack in ARV-13XX again to reset system and get new display timing. The following table depicts the jumper setting and associated display timing. Please refer to Spectrah's panel selection guide or contact Spectrah's customer service center to get correct BIOS setting for your LCD panels.

### Note:

1. SW6 allows users to change the polarity of PWM signal/ or DC voltage through OSD brightness control.
2. ON: Short; OFF: Open
3. LVDS
  - XXXX-LS (NS 8-bit LDI Standard);
  - 6B-XXXX-LS (6+2-Bit LVDS: JEIDA 8-bit LVDS Standard)

F34-1.453 BIOS Jumpers					
Item	SW1-SW2-SW3-SW4-SW5	Panel Timing	Type	Note	Jumpers
0	ON-ON-ON-ON-ON	800480	TTL	800x480	●●●●●●●●
1	OFF-ON-ON-ON-ON	800480-LS	LVDS	800x480	○●●●●●●●
2	ON-OFF-ON-ON-ON	6B-800480-LS	LVDS	800x480	●○●●●●●●
3	OFF-OFF-ON-ON-ON	1024600-LS	LVDS	1024x600	○●●●●●●●
4	ON-ON-OFF-ON-ON	6B-1024600-LS	LVDS	1024x600	●●●○●●●●
5	OFF-ON-OFF-ON-ON	1280768-LS	LVDS	1280x768	○●●○●●●●
6	ON-OFF-OFF-ON-ON	6B-1280768-LS	LVDS	1280x768	●●●○●●●●
7	OFF-OFF-OFF-ON-ON	1280800-LS	LVDS	1280x800	○●●○●●●●
8	ON-ON-ON-OFF-ON	6B-1280800-LS	LVDS	1280x800	●●●○●●●●
9	OFF-ON-ON-OFF-ON	1024600-LS-AU	LVDS	1024x600	○●●●●●●●
10	ON-OFF-ON-OFF-ON	6B-1024600-LS-AU	LVDS	1024x600	●○●●●●●●
11	OFF-OFF-ON-OFF-ON	800480-LS-NLF	LVDS	800x480	○●●●●●●●
12	ON-ON-OFF-OFF-ON	1024600-LS-NLF	LVDS	1024x600	●●●○●●●●
13	OFF-ON-OFF-OFF-ON	800480-LS-AU2	LVDS	800x480	○●●○●●●●



F34-1.423 BIOS Jumpers					
Item	SW1-SW2-SW3-SW4-SW5	Panel Timing	Type	Note	Jumpers
0	ON-ON-ON-ON-ON	1024768-LS	LVDS	1024x768	●●●●●● ●●●●●●
1	OFF-ON-ON-ON-ON	6B-1024768-LS	LVDS	1024x768	○●●●●● ○●●●●●
2	ON-OFF-ON-ON-ON	1024768-CMO-LS	LVDS	1024x768	●○●●●● ●○●●●●
3	OFF-OFF-ON-ON-ON	6B-1024768-CMO-LS	LVDS	1024x768	○○●●●● ○○●●●●
4	ON-ON-OFF-ON-ON	12801024-LS	LVDS	1280x1024	●●●○●● ●●●○●●
5	OFF-ON-OFF-ON-ON	6B-12801024-LS	LVDS	1280x1024	○●○●●● ○●○●●●
6	ON-OFF-OFF-ON-ON	1440900-LS	LVDS	1440x900	●○●○●● ●○●○●●
7	OFF-OFF-OFF-ON-ON	6B-1440900-LS	LVDS	1440x900	○●○●●● ○●○●●●
8	ON-ON-ON-OFF-ON	16801050-LS	LVDS	1680x1050	●●●○●○ ●●●○●○
9	OFF-ON-ON-OFF-ON	6B-16801050-LS	LVDS	1680x1050	○●●○●○ ○●●○●○
10	ON-OFF-ON-OFF-ON	16001200-LS	LVDS	1600x1200	●○●●●○ ●○●●●○
11	OFF-OFF-ON-OFF-ON	1280720-LS	LVDS	1280x720	○●○●●● ○●○●●●
12	ON-ON-OFF-OFF-ON	1366768-LS	LVDS	1366x768	●●●○●○ ●●●○●○
13	OFF-ON-OFF-OFF-ON	6B-1366768-LS	LVDS	1366x768	○●○●●● ○●○●●●
14	ON-OFF-OFF-OFF-ON	1024768-LS-NL	LVDS	1024x768	●○●○●○ ●○●○●○
15	OFF-OFF-OFF-OFF-ON	640480-LS-NL	LVDS	640x480	○●○●●● ○●○●●●
16	ON-ON-ON-ON-OFF	640480-LS	LVDS	640x480	●●●●○ ●●●●○
17	OFF-ON-ON-ON-OFF	6B-640480-LS	LVDS	640x480	○●●●○ ○●●●○
18	ON-OFF-ON-ON-OFF	640480-SP	TTL	640x480	●○●●○ ●○●●○
19	OFF-OFF-ON-ON-OFF	640480-65	TTL	640x480	○●○●○ ○●○●○
20	ON-ON-OFF-ON-OFF	640480	TTL	640x480	●●○●○ ●●○●○
21	OFF-ON-OFF-ON-OFF	640480-SH	TTL	640x480	○●○●○ ○●○●○
22	ON-OFF-OFF-ON-OFF	640480-NL	TTL	640x480	●○●○●○ ●○●○●○
23	OFF-OFF-OFF-ON-OFF	640480-NL2	TTL	640x480	○●○●○ ○●○●○
24	ON-ON-ON-OFF-OFF	800600-NL3	TTL	800x600	●●●○●○ ●●●○●○
25	OFF-ON-ON-OFF-OFF	800600-LS	LVDS	800x600	○●●●○ ○●●●○
26	ON-OFF-ON-OFF-OFF	6B-800600-LS	LVDS	800x600	●○●○●○ ●○●○●○
27	OFF-OFF-ON-OFF-OFF	6B-800600-CMO-LS	LVDS	800x600	○●○●○ ○●○●○
28	ON-ON-OFF-OFF-OFF	6B-800600-TS-LS	LVDS	800x600	●●○●○ ●●○●○
29	OFF-ON-OFF-OFF-OFF	800600	TTL	800x600	○●○●○ ○●○●○
30	ON-OFF-OFF-OFF-OFF	800600-SH	TTL	800x600	●○●○●○ ●○●○●○
31	OFF-OFF-OFF-OFF-OFF	800600-LS-NL	LVDS	800x600	○●○●○ ○●○●○

## 2.2 Set Panel VDD

There are 3 jumpers (JP2, JP3, JP4) to allow user to set appropriate VDD for LCD panels. Please refer to panel specifications in power supply voltage of LCD module before connecting to ARV-13XX series. Otherwise, onboard +12V or + 5V VDD setting in ARV-13XX series may damage your LCD panel with lower power supply voltage like +5V or +3.3V. (Refer to section 3.2 in detail)

JP2	JP3	JP4
+3.3V	+5V	Vin= +12V

## 2.3 Set Backlight VDD

There are 3 jumpers (JP5, JP6, JP7) to allow user to set appropriate VDD for backlight controller like inverter or LED driver board. Please refer to the specifications of backlight controller in power supply voltage before you connect cable to backlight controller module. Inappropriate input voltage may damage backlight. (Refer to section 3.3 in detail)

JP5	JP6	JP7
+3.3V	+5V	Vin= +12V

## 2.4 Set Brightness Control

- Set JP8 & JP9 to select DC Voltage or PWM to control brightness. Please refer to hardware information in Section 3 for details.

## 2.5 Connect panel cable

- Connect CN7 LVDS connector to panel through display cable.
- Connect CN8 TTL connector to panel through display cable.

## 2.6 Connect backlight cable

- Connect CN9 to backlight controller using 7-pin cable (If user has the power module for backlight controller, turn on backlight independently, without the connection to CN9).

## 2.7 Connect OSD touch pad

- Connect OSD-470/ 482 touch pad and cable to CN23.

## 2.8 Connect the power adapter to turn on system

- Connect power cable from power adapter (+12V DC) to CN14 or CN15 power connector (+12V DC is default).
- The LED of OSD-470/ 482 lights red and under normal condition, a small **No Signal** screen appears on the panel in 3 seconds. If not, please check whether power adapter or cable is connected firmly.

## 2.9 Connect signal input cables

- Plug analog VGA cable to CN2
- Plug customized DVI-I cable to CN1 (Optional for ARV-132X/ 135X)
- Plug video cable (NTSC or PAL) into CN11/ CN12/ CN13 (Optional for ARV-135X)

## 2.10 Power on your computer

Power on your system. The LED of OSD-470/ 482 lights green when a supported active computer graphics is connected to ARV-13XX. The LED lights red when system enters standby or there is a loss of active source (Loss of sync in PC Graphics Mode). If the panel display is not normal such as dual screens, smaller screen, especially in the first installation, please select **Auto-Config** option in OSD to reconfigure all the parameter setting and save the update parameters in onboard NVRAM. Users can also enter in OSD setting to get correct image phase, position, and other OSD parameters. For details, please refer to Section 4 for more OSD information.

## **2.11 Set OSD (On-Screen Display)**

Following OSD features in Section 4, user can adjust brightness, contrast, image position, sampling phase, auto-configuration, OSD time-out, etc. and save the parameters in the NVRAM to generate an appropriate panel display yourself.

### **Note:**

In the first setup or using a new VGA card, we suggest user to do **Auto-config** or adjust image **Phase**, **Position**, or **Width** through OSD to set appropriate parameters for LCD panel, especially for the analog RGB input. The factory default setting may not meet the user's requirements due to the difference RGB signal value from VGA controllers. In addition, if the horizontal noise appears on the panel screen, please select **Image** feature to adjust **Phase** to reduce the noise.

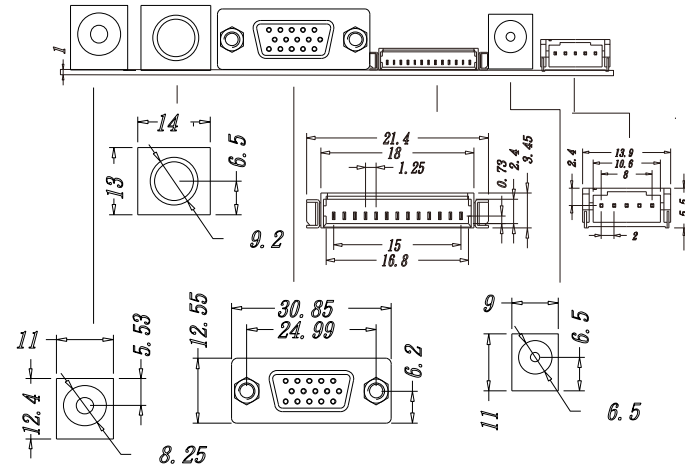
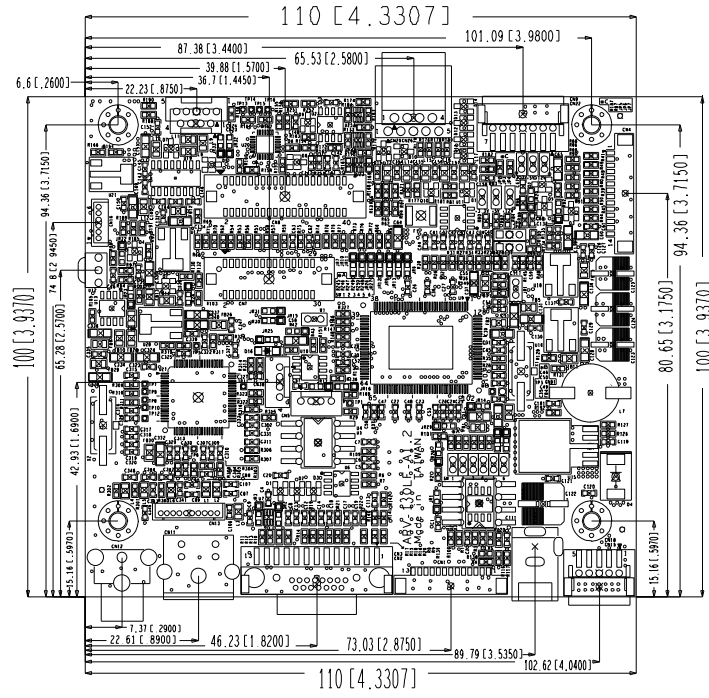
## **2.12 Update firmware BIOS**

CN5 allows user to use Spectrah's cable tool and program to upgrade new firmware BIOS through RS232 interface.

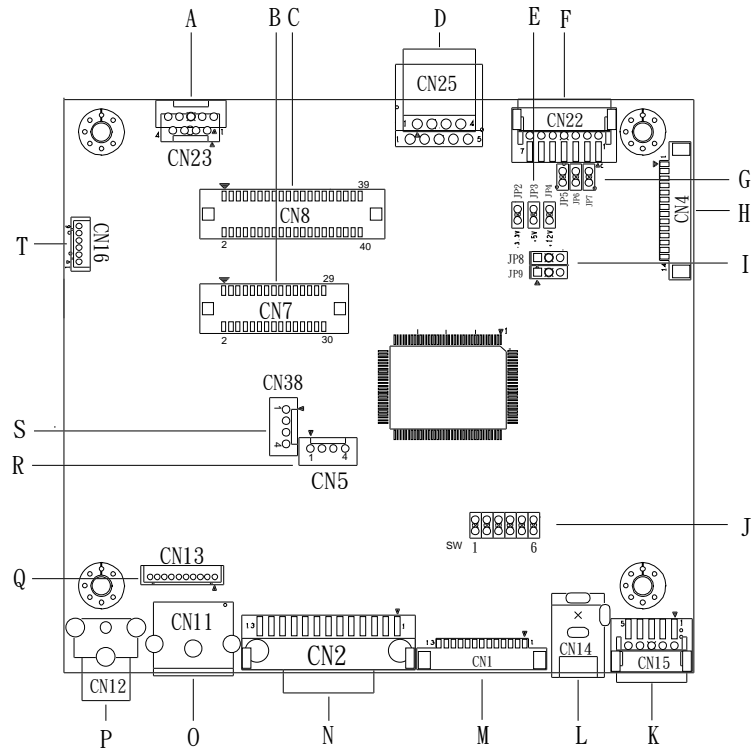
# 3 Hardware Information

Board Dimension: 110(L) x 100(W) mm (inch)

PCB Version: A1.2X



ARV-1300 Rev:A1.2



	ARV-13XX layout No. Definition
<b>A</b>	OSD Connector
<b>B</b>	LVDS Connector
<b>C</b>	TTL Connector
<b>D</b>	N/A
<b>E</b>	Working Voltage Setting Jumpers for LCD Panel
<b>F</b>	Backlight Connector
<b>G</b>	Working Voltage Setting Jumpers for Backlight
<b>H</b>	OSD Connector
<b>I</b>	Brightness Control Jumpers
<b>J</b>	BIOS Switch Jumpers
<b>K</b>	5-Pin Wafer Power Connector
<b>L</b>	DC Jack Power Connector
<b>M</b>	Slim Type DVI Connector
<b>N</b>	DB-15 Connector
<b>O</b>	Mini Din for S-Video Connector
<b>P</b>	RCA Jack for Composite Connector
<b>Q</b>	Slim Type Video Connector (YPbPr)
<b>R</b>	BIOS Programming Port
<b>S</b>	External Detection Port

### 3.1 BIOS Jumpers

There are 5 jumpers to allow user to set appropriate BIOS for LCD panels. Please refer to section 2.1 (BIOS Jumper setting) before turning on ARV-13XX series. To change output display timing, user should remove power and plug power jack in ARV-13XX again to reset system and get new display timing.

### 3.2 Working Voltage Setting for LCD Panel

JP2, JP3, and JP4 allow user to select working voltage in ARV-13XX series for LCD panel module, +3.3V, +5V, +12V. For details in LCD panel VDD setting, please refer to the LCD panel specifications.

Note1: The voltage of JP4 is dependent on the input voltage from the DC power adapter. +12V is the required DC voltage.

JP2	JP3	JP4
+3.3V	+5V	+12V

### 3.3 Working Voltage Setting for Backlight

JP5, JP6, and JP7 allow user to select working voltage in ARV-13XX series for the backlight module of LCD panel, 3.3V, +5V, +12V.

The voltage in pin 1&2 of CN9 is set by JP5, JP6, JP7. For details in the backlight voltage setting, please refer to the LCD panel specifications.

Note1: The voltage of JP7 is dependent on the input voltage from the DC power adapter. +12V is the required DC voltage.

JP5	JP6	JP7
+3.3V	+5V	+12V

### 3.4 Brightness Control Jumpers (JP8, JP9)

There are 2 jumpers (JP8, JP9) to allow user to select brightness control through DC voltage or PWM. Please refer to the specifications of LCD panel, LED driving board, or inverter before you set up both jumpers. Normally, if LED driving board is integrated in LCD panel, it needs PWM signal for dimming control. Most Spectrah's inverters and LED driver boards need DC voltage for brightness control.

	1	2	3	
JP 8	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	DC Voltage (Default)
JP 9	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
	1	2	3	
JP 8	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	PWM
JP 9	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	



### 3.5 LVDS Connector CN7 (DF13-30P) (ARV-13X0 only)

- **Using connector:** Hirose DF13-30P connector compatible
- **Mating connector:** Hirose DF13-30S connector compatible

ARV-13X0 provides one LVDS interface connector for LVDS panels. This connector can support single or dual channel LVDS output. The following table depicts the pin definition of CN7.

Pin	Function	Pin	Function
1	PWM	2	ENA
3	A0M	4	A4M
5	A0P	6	A4P
7	A1M	8	A5M
9	A1P	10	A5P
11	A2M	12	A6M
13	A2P	14	A6P
15	A3M	16	A7M
17	A3P	18	A7P
19	GND	20	GND
21	CLK1M	22	CLK2M
23	CLK1P	24	CLK2P
25	GND	26	GND
27	+12V	28	+12V
29	VDD_LCD	30	VDD_LCD

### 3.6 LCD TTL Level Connector CN8 (DF-13-40P) (ARV-13X2 only)

- **Using connector:** Hirose DF13-40P connector compatible
- **Mating connector:** Hirose DF13-40S connector compatible

The ARV-13X2 provides a 40-pin connector for single channel of TTL type panels. If your panel features dual pixels/clk mode (18-bit x 2, or 24-bit x 2), ARV-13X2 cannot support it. The following table depicts the pin definition of CN8.

Pin	Function	Pin	Function
1	GND	2	EB1
3	ERO	4	EB2
5	ER1	6	EB3
7	ER2	8	EB4
9	ER3	10	EB5
11	ER4	12	EB6
13	ER5	14	EB7
15	ER6	16	GND
17	ER7	18	SCLK
19	GND	20	GND
21	EG0	22	TVS
23	EG1	24	THS
25	EG2	26	GND
27	EG3	28	DEN
29	EG4	30	PWM
31	EG5	32	+12V
33	EG6	34	ENA
35	EG7	36	VDD_LCD
37	GND	38	VDD_LCD
39	EB0	40	N/C

### 3.7 Backlight Connector CN9 (JST S7B-PH)

CN9 allows user to provide DC power from ARV-13XX series directly to backlight controller like inverter or LED driver board. User can also use external power module to power on backlight controller independently. The dimming control through pin-6 is defined by JP8 & JP9 which allow user to select DC voltage or PWM signal to control brightness. For details in backlight controller setting, please refer to the specifications of backlight controller. The following table depicts the pin definition of CN9.

7	6	5	4	3	2	1
VR	PWM/DC	On/Off	GND	GND	VDD_In	VDD_In

### 3.8 OSD Connector CN4 (Molex 53261-14)

CN4 allows user to plug in OSD cable and controller board. The following table depicts the pin definition of CN4.

7	6	5	4	3	2	1
N/C	N/C	Key_L	Enable	Reserve	GND	3.3V

14	13	12	11	10	9	8
LED_G	LED_R	GND	On/Off	GND	Menu	Key_R

### 3.9 DC Power-In Connector CN14, CN15

There are 2 connectors CN14 and CN15 to supply VDD power for ARV-13XX series. User can select either one connector as the major power input port. Connect power cable from power adapter to CN14 or CN15 power connector (+12V DC is default).

#### ■ DC Jack Connector CN14 (Diameter 2.1mm)

Plug the connector of power adapter into CN14 to provide +12V DC current. At least 45 watt DC power source is suggested for normal system operation.

#### ■ 5-Pin Wafer Power Connector CN15 (JST S5B-PH compatible)

Simply plug a 5-pin power connector into CN15 to provide +12V DC and GND for ARV-13XX series.

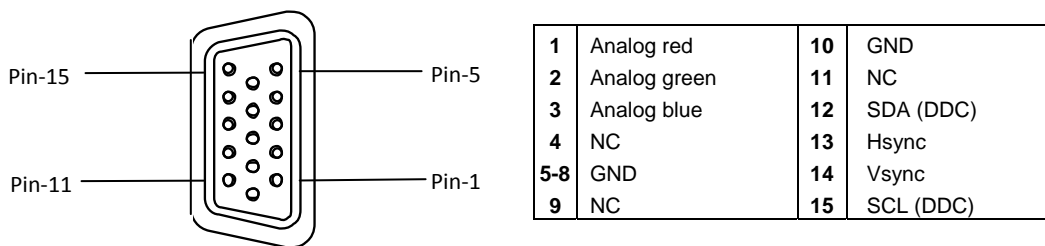
5	4	3	2	1
VDD	VDD	GND	GND	+5V

### Warning!

- The DC voltage in JP4, JP7, and pin1/2 of CN9 is the same as that from CN14/CN15 (+12V DC). Please refer to 3.2 and 3.3 for details.
- Don't connect pin-1 (+5V) of CN15 except special OEM hardware version which require external +5V DC (External +5V DC power connecting to onboard +5V DC from the power regulator may cause power voltage fluctuation.)

### 3.10 DB-15 Connector CN2 (Analog RGB Connector)

CN2 is a standard DB-15 connector for input of RGB analog signals. The following diagram and table depict the pin definition of CN2.



### 3.11 Slim Type Digital DVI Connector CN1

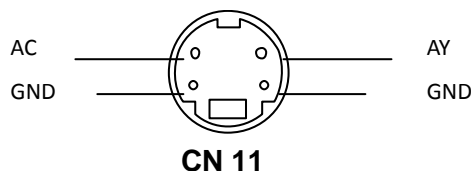
(Molex-53261-13) (Optional for ARV-132X/135X)

CN1 is a 13-pin connector which provides a Panellink signal input interface for display device. The following table depicts the pin definition of CN1.

13	12	11	10	9	8	7	6	5	4	3	2	1
RX2+	RX2-	RX1+	RX1-	RX0+	RX0-	RXC+	RXC-	SCL	SDA	HP	GND	GND

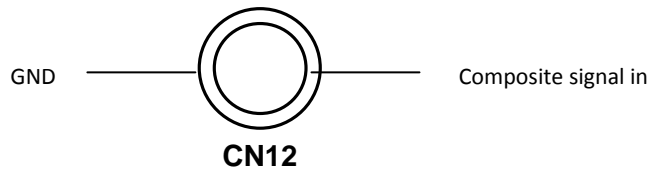
### 3.12 Mini Din S-Video Signal Input CN11 (ARV-135X only)

CN11 allows user to connect to NTSC/PAL video source using S-Video connection cable. The following diagram depicts the pin definition of CN11.



### 3.13 RCA Jack Composite connector CN12 (ARV-135X only)

CN12 allows users to connect to NTSC/PAL video source using composite connection cable. The following diagram depicts the pin definition of CN12.



### 3.14 Slim Type Video Connector CN13 (Molex 53261-10)

CN13 allows user to connect to NTSC/PAL video source using wafer type connector to input composite, S-Video, and component signals together. The following table depicts the pin definition of CN13.

10	9	8	7	6	5	4	3	2	1
Pr	Pb	Y	GND	AC	GND	CMP	GND	AY	GND

### 3.15 BIOS programming port CN5 (JST S4B-PH compatible, 2.0 pitch)

CN5 allows user to use Spectrah's cable tool and program to upgrade new firmware BIOS through RS232 interface. The following table depicts the pin definition of CN5.

1	2	3	4
+5V	DATA	CLK	GND

### 3.16 External Detection port CN38 (Optional)

(JST S4B-PH compatible, 2.0 pitch)

CN38 is an I<sup>2</sup>C interface which allows user to connect external detection card like Spectrah's light sensor card SR2901 or temperature sensor card SR2904. The following table depicts the pin definition of CN38.

1	2	3	4
+3.3V	DATA	CLK	GND

---

## 4 OSD Setup

---



### 4.1 General Description

The ARV-13XX series feature an on-chip OSD (On-Screen Display) controller that creates the OSD user interface menus and overlays them onto the output data stream. User can adjust the display conditions on LCD monitor using the OSD-470/ 482 touch pad. After powering on, the AD controller restores itself to the last known conditions saved in Non-Volatile Random Access Memory (NVRAM). All parameters (Settings) are saved whenever user selects **Save/Exit** icon in each OSD feature page. Not making a selection within a defined time period causes the OSD menu to close. The OSD time-out variable may be user-selected from the Tool menu item. The LEFT (S4) and RIGHT (S3) keypad push buttons are used to scroll through items within the main menu. The selected item is highlighted. The MENU key (S1) is used to open and close the OSD menu. After in OSD menu, S1 key is also defined as CONFIRM key to activate the highlighted item. S2 Key is defined as the ENABLE key for VideoWindowDefine, ACC and ACM features. Power Save button (S5) enables the user to place the system in a low power mode. From the low power mode, pushing S5 button wakes up the microcontroller to perform a LCD power-up sequence.

## 4.2 Feature Description

### 4.2.1 Input Interface Setting



There are 5 input interfaces in ARV-13XX series to accept computer RGB analog and digital signals and also video signals through S-Video, Composite, and YPbPr ports.

- **Analog Input**
- **Digital Input (ARV-132X/ 135X )**
- **S-Video Input (ARV-135X )**
- **Composite (CVBS) Input (ARV-135X )**
- **YPbPr Input (ARV-135X )**

### 4.2.2 Brightness/ Contrast/ Black Level and Hue/ Saturation Adjustment



- **Brightness** - Press S4 and S3 keys to adjust the brightness of LCD backlight directly. This feature should work together with the inverter which provides PWM (Pulse Width Modulation) or Current/ Voltage control feature. The PWM/ or Current control pin of panel inverter should be connected to pin-6 of CN9.

**Light Sensor control** (optional) – When Brightness icon is highlighted, press S2 and hold for 2 seconds to enable light sensor feature. This icon allows user to select Auto Dimming Control if user uses Spectrah's light sensor board SR2901. If user doesn't need Spectrah's light sensor SR2901, please press S2 and hold 2 seconds to disable light sensor feature and return to the original Brightness screen. Otherwise, the brightness control appears unstable and user will see flash on the panel screen.

- **Contrast** - Press S4 and S3 keys to adjust contrast setting.
- **Black Level** - Press S4 and S3 keys to adjust black level.

- **Hue** - Press S4 and S3 keys to adjust video hue level (for video signal only).
- **Saturation** - Press S4 and S3 to adjust video saturation (for video signal only).

#### 4.2.3 Audio Volume Adjustment (N/A)

Press S4 and S3 to adjust audio volume (N/A).



#### 4.2.4 Color Adjustment



- **Auto Color Setup** - Press S1 to do Auto Color Setup.
- **Standard Color Setup** - Press S1 to set standard color defined in MS Windows.
- **RGB Color Temperature Setting and Color Adjustment** - Press S4 and S3 keys to select color temperature or adjust RGB color depth.



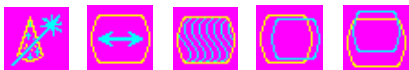
- **DefineVideoWindow** - Press S2 to enable this function and then S1 to select four types of windows screen: Full Screen, 16:9, 16:10, and Left Half Screen.
- **ACC (Adaptive Color and Contrast)** - Most video content is tailored for display on CRTs or in movie theatres. However, CRT monitors have a wider dynamic range than LCD TVs. Therefore, Genesis scaler chip is designed to enhance the dynamics range when video is displayed using LCD TV type screen. Adaptive Color and Contrast (ACC) enhances the contrast of the image to account for.  
Press S2 to enable this function and then S1 to select appropriate ACC setting and YCLink to enhance the contrast and color of the images in video display. This function is terminated when DefineVideoWindow feature is disabled.



- **ACM-II (Active Color Management)** - Active Color Management provides video style control of global color parameters like Hue, Saturation, Contrast, and local color changes such as Normal, Cinema, Vivid etc. It can be applied within a highlight window or over the full display area. Press S2 to enable this function and then S1 to select Normal, Cinema, Vivid, Nature, Sport or 6 Axis.



#### 4.2.5 Image Setting

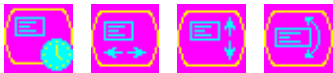


- **Auto-Config** - Press S1 key to automatically configure an optimal display setting.
- **Image Width** - Press S4 and S3 keys to adjust image width.
- **Phase Adjustment** - Press S4 and S3 keys to adjust the signal phase in the analog to digital converter.
- **H-Position** - Press S4 and S3 keys to move the screen left or right by moving the analog capture window.
- **V-Position** - Press S4 and S3 keys to move the screen up or down by moving the analog capture window.

## 4.2.6 Tools



### 4.2.6.1 OSD Control



- **Timeout** - Press S4 and S3 keys to decrease or increase the amount of time that elapses before the menu disappears.
- **OSD H-Position** - Press S4 and S3 keys to adjust the horizontal position of the OSD main menu.
- **OSD V-Position** - Press S4 and S3 keys to adjust the vertical position of the OSD main menu.
- **OSD Direction** - Press S1 to enable OSD direction functions and then S3 and S4 to set required OSD menu direction.
  - ◆ OSD\_Normal
  - ◆ OSD\_Mirroring-H
  - ◆ OSD\_Rotation-270
  - ◆ OSD\_Rotation-90
  - ◆ OSD\_Mirroring-H-V

### 4.2.6.2 Factory Reset

- Press S1 key to reset all user settings and previous setting stored in NVRAM will be lost. This feature help users return back to original default setting in NVRAM, especially when users change onboard firmware ROM and then panel display become blank or noisy.

### 4.2.6.3 Color Reset

- Press S1 to reset all user settings in colors and previous setting stored in NVRAM will be lost. This feature helps users return back to original default position setting in NVRAM.

#### **4.2.6.4 Position Reset**

- Press S1 to reset all user settings in position and previous setting stored in NVRAM will be lost. This feature helps users return back to original default color setting in NVRAM.

#### **4.2.6.5 Sharpness**

- Press S1 and then S4 and S3 to adjust Sharpness.

#### **4.2.6.6. Overlap 640/720**

- Press S1 to set Overlap 640x480@60 and 720x400@70 modes.

#### **Warning!**

If there is no input signal detected by the system, a warning message, **No Signal** is displayed by the OSD until the supported input source is detected by the system.

---

## 5 Product Specifications

---

### **ADC Controller**

Genesis GM5766

Adaptive color and contrast enhancement (Genesis ACC & ACM-II features)

8-bit triple-channel ADC/PLL

Scaling engine

OSD controller

Hue, Saturation, Brightness, Contrast, Color Temperature adjustment

### **Video decoder**

Techwell TW9906 video decoder

High-performance adaptive comb filter

Multi-standard color decoder NTSC / PAL / SECAM

### **Input Port**

DB-15 analog VGA interface (All series)

Slim-Type Digital DVI (ARV-132X/135X only)

Mini Din S-Video Connector (ARV-135X only)

RCA Jack Composite Connector (ARV-135X only)

Slim-Type S-Video YC signal interface (ARV-135X only)

Slim-Type Composite signal interface (ARV-135X only)

Slim-Type Components for YPbPr signal (ARV-135X only)

### **Image Processing Features**

Auto-detection (Input format detection)

Auto-configuration (Input positioning & clock phase)

### **On Screen Display (OSD)**

Auto setup

Brightness / Contrast adjustment

ACC/ ACM-II Color Enhancement & Contrast Adjustment

Image V-Position/ H-Position adjustment

Auto Color Reset/ Standard color Setup

Hue / Saturation/ Color Temperature Adjustment

### **Power-In Support**

LCD Panel: +3.3V, +5V, +12V

Backlight Controller: +3.3V, +5V, +12V

### **Panel Support**

TFT VGA 640 x 480

TFT SVGA 800 x 600

TFT XGA 1024 x 768

TFT SXGA 1280 x 1024

TFT WXGA 1440 x 900

TFT SXGA+ 1400x1050

TFT WSXGA 1680 x 1050

Single 18-bit or Dual 48-bit/36-bit LVDS panels

Single 24-bit TTL panels

### **Panel Connection**

One 40-pin TTL connector (ARV-13X2 only)

One 30-pin LVDS connector

### **Image Scaling**

Scale up/down a lower/higher resolution images to fit higher/lower resolution panels

### **VESA Standard**

Supports VESA DDC2B and a subset of VESA DPMS standards

On board EDID ROM compliant with VESA DDC2B 1.X (Optional)

### **Power Consumption**

3.7 Watt (ARV-13XX board only without connection to LCD panel) (+12V DC input)

### **Power Requirement**

Note: The complete power requirement is dependent on what LCD panel connected to ARV-13XX series. Around 60 Watt power adapter is recommended to supply +12V DC power for ARV-13XX series and LCD panels under 22" size. For more detail in power requirement, please contact Spectrah Customer Service Center for more information.

**Board Dimension**

110 (L) x 100 (W) mm

**Weight**

60g

**Operating Temperature & Humidity**

-30°C to 80°C; ~ 90%RH

**Storage Temperature & Humidity**

-40°C to 95°C; ~ 95%RH

## Mode Table

VGA	SVGA	XGA
640 x 480 @ 60HZ	800 x 600 @ 60HZ	1024 x 768 @ 60HZ
640 x 480 @ 70HZ	800 x 600 @ 70HZ	1024 x 768 @ 70HZ
640 x 480 @ 72HZ	800 x 600 @ 72HZ	1024 x 768 @ 72HZ
640 x 480 @ 75HZ	800 x 600 @ 75HZ	1024 x 768 @ 75HZ
640 x 480 @ 85HZ	800 x 600 @ 85HZ	1024 x 768 @ 85HZ

SXGA	WXGA	WSXGA+
1280 x 1024 @ 60HZ	1366 x 768 @ 60HZ	1680 x 1050 @ 60HZ
1280 x 1024 @ 70HZ	1366 x 768 @ 70HZ	1680 x 1050 @ 70HZ
1280 x 1024 @ 72HZ	1366 x 768 @ 75HZ	1680 x 1050 @ 72HZ
1280 x 1024 @ 75HZ	1366 x 768 @ 85HZ	1680 x 1050 @ 75HZ
1280 x 1024 @ 85HZ	1280 x 720 @ 60HZ	
	1280 x 720 @ 70HZ	
	1280 x 720 @ 75HZ	
	1280 x 720 @ 85HZ	
	1280 x 768 @ 60HZ	
	1280 x 768 @ 70HZ	
	1280 x 768 @ 75HZ	
	1280 x 768 @ 85HZ	
	1280 x 800 @ 60HZ	
	1280 x 800 @ 70HZ	
	1280 x 800 @ 75HZ	
	1440 x 900 @ 60HZ	
	1440 x 900 @ 70HZ	
	1440 x 900 @ 75HZ	
	1400 x 1050 @ 60HZ	
	1400 x 1050 @ 75HZ	

Video	
NTSC/480I/525I	- 720 x 240 x 60I
PAL 525I	- 720 x 240 x 50I

---

## 6 Customer Support

---

### Spectrah Sites

You can download the latest drivers and product specifications from the Spectrah Web site. Our address is: **[www.spectrah.com](http://www.spectrah.com)**

**If you have any problems**, we recommend that you follow the procedure below for the quickest results.

- **Contact your dealer:** This is usually the quickest and most effective method of technical assistance. Your dealer is local and may be familiar with your complete system. In the case of hardware warranty assistance, the product must be returned to the dealer, who will return it to Spectrah.
- **Fax Support:** Call our dial-up Spectrah fax service at **886-2-86472201**.
- **Email Us:** Send your problems to Spectrah customer service center. The email address is : **spec\_support@spectrah.com**

### Information We Need

Please give a complete description of the problem and please include:

- Spectrah board serial number, model number, PCB version number.
- Product model name, ROM/driver version, and relative configuration setting.
- Computer brand name, system BIOS manufacturer, and version number or release date, bus type, processor speed, and amount of memory.
- LCD panel brand and model name.
- Brand and model of any other cards and devices installed on your system.

### Program Specific Problems

If a problem appears with a specific program, please give us the following information:

- Display settings (color palette, display resolution, and so on) applied when the problem occurs.
- Program name and version. Name of any add-on packages you are using.
- If possible, take note of the file and segment address that caused the problem.
- Detailed steps known to cause the bug, so that we can reproduce it.



---

## 7 Notice

---

No part of this manual, including the products and software described in it, may be reproduced, transmitted, transcribed, stored in a retrieval system, or translated into any language in any form or by any means, except documentation kept by the purchaser for backup purpose, without the express written permission of Spectrah Dynamics, Inc.

Products and corporate names appearing in this manual may or may not be registered trademark or copyrights of their respective companies and are used only for identification or explanation, without intent to infringe.

Specifications and information contained in this manual are furnished for informational use only, and are subject to change at any time without notice and should not be construed as a commitment by Spectrah Dynamics.

Copyright © 2012 **Spectrah Dynamics Inc.**, all rights reserved.

<p><b>Product Name:</b> Spectrah ARV-13XX Series Controller Board <b>Document Revision:</b> 2.5 <b>Release Date:</b> Aug-21-2012</p>
--