



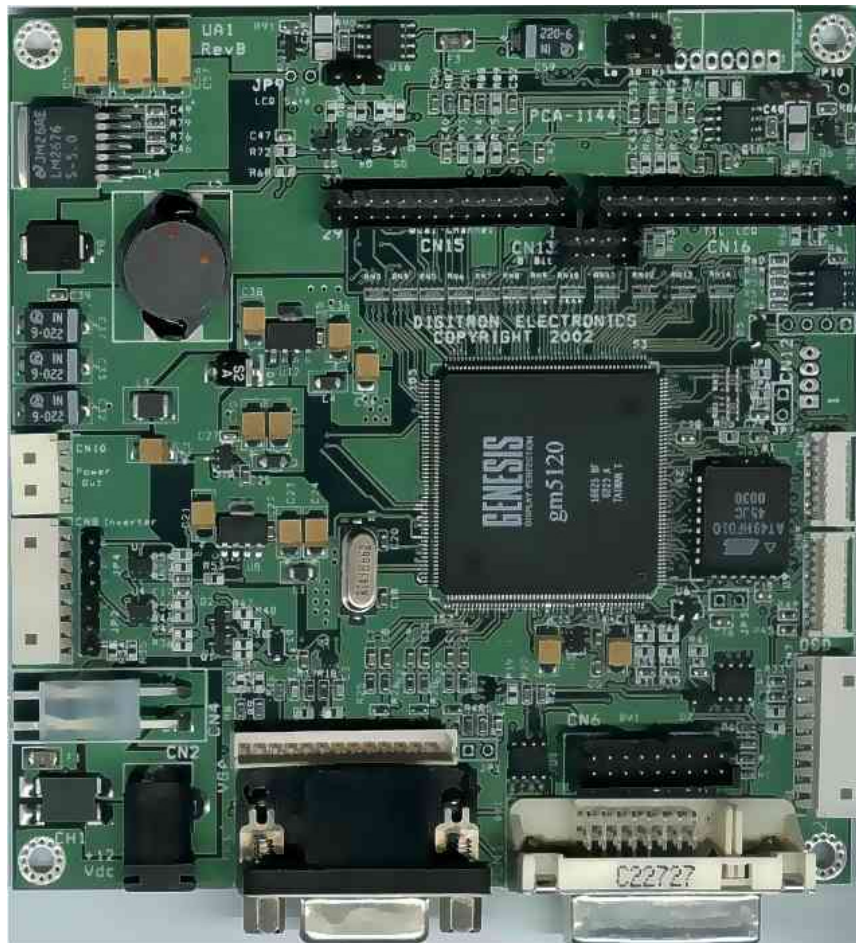
TFT LCD Controller
ANALOG/DIGITAL INTERFACE

Base Model: UA1

OEM

Installation & Users Manual

June 1, 2003



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TFT LCD ANALOG/DIGITAL INTERFACE CONTROLLER

UA1 Series

Populated with one of the following processors depending on board configuration ordered.

Genesis 2110 - Analog XGA and below

Genesis 2120 - Analog SXGA and below

Genesis 5110 - Analog & DVI XGA and below

Genesis 5120 - Analog & DVI SXGA and below

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DESCRIPTION & FEATURES

Description

The UA1 Series LCD Controller is a feature rich, cost effective board designed to drive most of today's TFT LCD flat panel displays. The UA1 series provides the engineer many options not found on other controllers, and is designed and manufactured in the USA. An array of inverter controls and cabling options allows easy integration into any product. Auto-input synchronization circuitry, complete system-on-a-chip processor and the sixth generation integrated ADC provides outstanding image quality and reliability. These controllers can be configured to support TTL and LVDS panel directly. Optional cables and inverters are also available in kit form for many panels. The UA1 power supply is designed to be robust enough to handle even the largest panels with power to spare and producing less heat. UA1 series supports LCD panels from VGA to SXGA resolution. The model UA1 controllers can support both DVI & Analog inputs, up to SXGA resolutions depending on the configuration ordered.

FEATURES:

- ✍ Long Product Life support
- ✍ Complete system-on-a-chip processor offers the best in reliability
- ✍ Optional Integrated Ultra-Reliable DVI 1.0 compliant receiver
- ✍ Support for TTL 6-bit, 8-bit, Dual Clock, LVDS, Open LDI
- ✍ Robust Power Supply Circuitry
- ✍ HDCP and non-HDCP capable versions available
- ✍ Production firmware embedded in internal ROM
- ✍ Revolutionary language independent icon-based OSD embedded in internal ROM
- ✍ Support for optional external ROM
- ✍ Energy Spectrum management techniques for system EMI reduction
- ✍ Integrated system micro-controller for overall system reliability
- ✍ Real Recovery image manipulation for memory-less support of "out of range" signals
- ✍ Comprehensive suite of internal test patterns for manufacturing test
- ✍ Optional IR Control
- ✍ Low power stand-by mode of operation



BASIC INFORMATION

Integration Preparation:

Ensure you have all parts necessary and that the board is set up for the panel you are supporting.
Check connector reference in following section for proper connection.
Check controller jumpers for proper panel voltage (errors may damage panel and or the controller)

The UA1 series controller is designed for TFT LCD Panels from VGA (640x480) to SXGA (1280x1024) with either TTL, LVDS or OPEN LDI inputs. The following guidelines will help in the installation and preparation of the display project.

- ⚡Preparation: Before proceeding it is important to familiarize yourself with the parts making up a system and the various connectors, mounting holes and general layout of the controller. Guides to connectors and mounting holes are shown in the following sections.
- ⚡LCD Panel: This controller is designed for typical TFT panels with 3.3V, 5V or 12V TTL, LVDS or OPEN LDI interfaces. Due to the variation between manufacturers of signal timing and other panel characteristics, factory setup and confirmation should be considered when ordering your controller and connecting to a panel.
- ⚡UA1 controller: Handle the controller card with care as static charge may damage electronic components.
- ⚡LCD signal cable: In order to provide a clean signal it is recommended that the LCD signal cables are no longer than 33cm (13 inches). Care should be taken when placing the cables to avoid signal interference. Additionally, it may be necessary in some systems to add ferrite cores or shielding to the cables to minimize signal noise.
- ⚡Inverter: An inverter will be required for most displays that are not reflective and/or have an inverter already built in. As panels may have 1 or more backlight tubes and the power requirements for different panel models backlights may vary, it is important to match the inverter in order to obtain optimum performance.
- ⚡Inverter Cables: Different inverter models require different cables and different pin assignments. Make sure correct cables are used to match the inverter. Using wrong cables may damage the inverter and/or the UA1 controller.
- ⚡OSD: The On-Screen Display board or membrane switch is required to make adjustments to the setting of the UA1 controller. These controls are language independent icon-based.
- ⚡OSD Cable: The cables to the OSD should be of suitable quality and length so that impedance does not affect performance. Lengths of up to 1 meter (3 feet) should be acceptable.
- ⚡Status LED: Red indicator stands for no signal & green for signal on.
- ⚡VGA Input Cable: As this may affect the quality of the signal to the controller and regulatory emission test results, a suitably shielded cable should be utilized.
- ⚡Power Input: 12V DC is required and should be a stable regulated supply. Although the controller provides power regulation for the LCD's power, the power to the inverter is passed directly from the main power source. If an unregulated power supply is provided to an inverter, any fluctuations in power may affect operation, performance and lifetime of the inverter and or backlight tubes.
- ⚡Inverter Safety: Note that although only 12V DC is supplied as "power-in," an inverter for the panel backlighting provides significantly higher voltages. We strongly advise appropriate insulation for all circuitry to avoid the possibility of serious shock.
- ⚡EMI: Shielding may be required for passing certain regulatory emission test with certain panels.
- ⚡Ground: The various PCB mounting holes are connected to the ground plane.
- ⚡Servicing: The controller is not user serviceable or repairable. Warranty does not cover user error in connecting up to the controller and is invalidated by unauthorized modification or repairs.
- ⚡Controller Mounting: It is recommended that a clearance of at least 10mm is provided above and 5mm below the controller when mounted.
- ⚡PC Graphics Output: Signal quality is very important. If noise or instability in the PC graphics output is present it may result in visible noise on the display. The preferred vertical refresh rate should be 60Hz. Non-interlaced is required.

CAUTION: Never connect or disconnect parts of the display system when the system is powered up as this may cause serious damage.

NOTES:

- ⚡For specific panel setup a sample of an LCD may be required (this will be returned) and a copy of the full technical specifications for the panel from the manufacturer.
- ⚡Re-layout and custom development services are available.

OSD MENU FUNCTIONS

		Factory Reset			Auto Adjust			Reset Color
		Reset Color			Clocks Adjust			RGB Adjust
		Reset Image			Phase Adjust			Color Temperature
		Reset OSD			Horizontal Position			Natural Color
					Vertical Position			
		Brightness			OSD Time Out			
		Contrast			OSD Lock Out	Cable Not Connected		
					OSD Position			
		Accept and Exit				Mode Error		
		Reject and Exit						
						Change Computer Hz		

NOTE: Only required icons included in each model.

There are several ways to exit the OSD menu system:

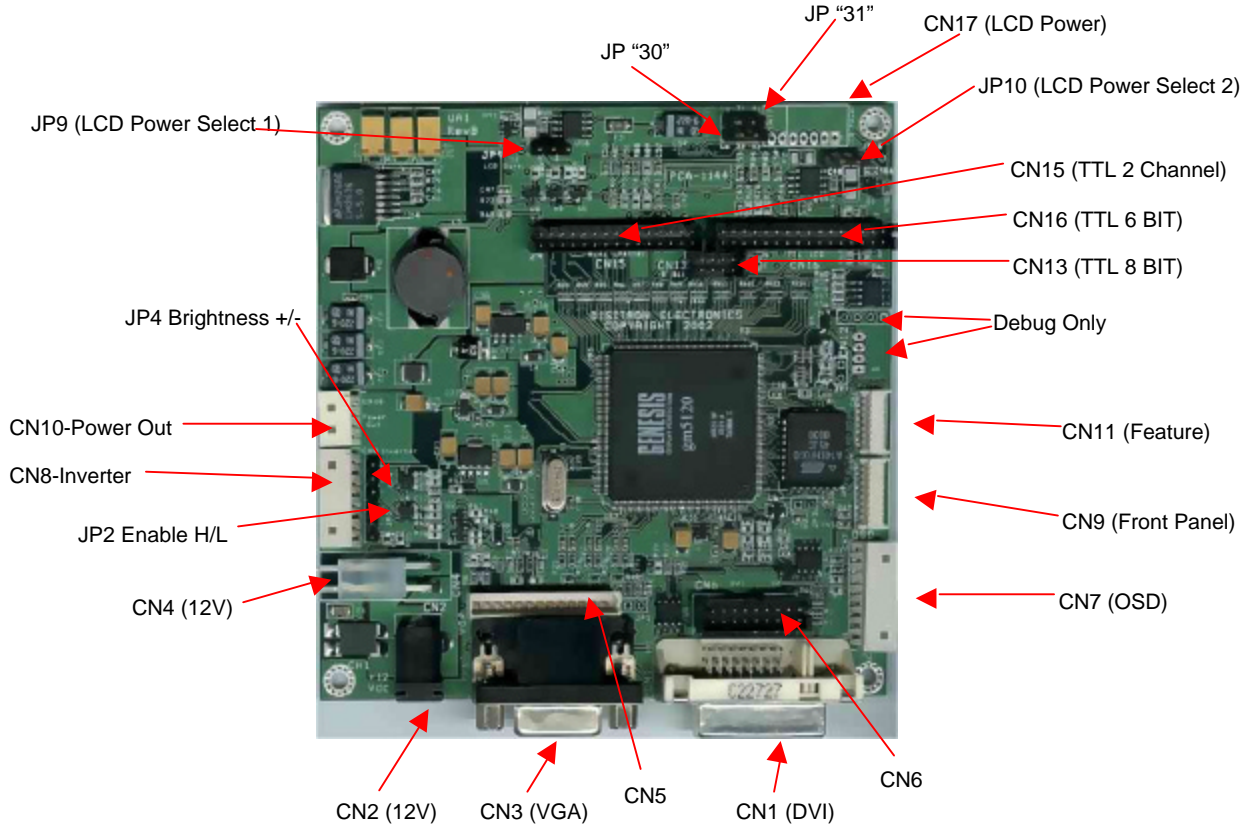
- 1) select the green happy face and hit the EXECUTE key (**saves** changes and exits),
- 2) select the red sad face and hit the EXECUTE key (**discards** changes and exits),
- 3) hold down the EXECUTE key (**saves** changes and exits),
- 4) wait for the OSD to time-out (**saves** changes and exits).



CONNECTOR & JUMPER IDENTIFICATION

Reference	Description	Board Part #	Mating part #
CN1	DVI Input	Molex 87332-1820	Molex 88741-9600 or Milli-Grid to DVI-D
CN2	12VDC Power In 5.5/2.5 Barrel, Positive Center	Kycon KLD-0202-BC	Switchcraft 760
CN3	VGA analog input	HDF15 D-Sub	Standard VGA Cable
CN4	12VDC Optional Power In	Molex 0975-2024	Molex 0952-4024
CN5	VGA analog input alternative (for cable assembly)	Molex 53014-1310	Molex 51004-1300
CN6	DVI Input, Alternate (for cable assembly)	Molex 87332-1820	Molex 88741-9600 or Milli-Grid to DVI-D
CN7	OSD Connector	Molex 53015-0910	Molex 51004-0900
CN8	Inverter Power and Control	Molex 53015-0810	Molex 51004-0800
CN9	Front Panel Connector	Molex 53048-0910	Molex 51021-0900
CN10	Power Output 5 & 12V (touch-screen or amplifier)	Molex 53015-0410	Molex 51004-0400
CN11	Feature Connector (Optional)	Molex 53048-0810	Molex 51021-0800
CN12	Gprobe/Debug	N/A	N/A
CN13	TTL 8 Bit (First Channel, 2 bits)	HRS DF-11-8DP-2DSA	HRS DF11-8DS-2C
CN14	Debug	N/A	N/A
CN15	TTL 8 Bit (Second Channel)	HRS DF-11-30DP-2DSA	HRS DF11-30DS-2C
CN16	TTL 6 Bit (First Channel, 6 bits)	HRS DF-11-32DP-2DSA	HRS DF11-32DS-2C
CN17	Optional LCD Power	Molex 53015-0510	Molex 51004-0500
CN17 alt	Optional LCD Power (Dual Voltage Panel)	Molex 53015-0710	Molex 51004-0700
CN18	LVDS Output	JAE FI-WE31PB-HF	JAE FI-W31S, FI-WE31M
CN18 alt	LVDS Output	JAE FI-WE21PB-HF	JAE FI-W21S, FI-WE21M
JP2	Inverter Enable Select	3 Pin Jumper	
JP3	Controller Reset (Debug Only)	2 Pin Jumper	
JP4	Brightness Select	3 Pin Jumper	
JP9	Primary LCD Power Selector	3 Pin Jumper	
JP10	Secondary LCD Power Selector	3 Pin Jumper	
JP "30"	DF9-30 High/Low	3 Pin Jumper	
JP "31"	DF9-31 High/Low	3 Pin Jumper	

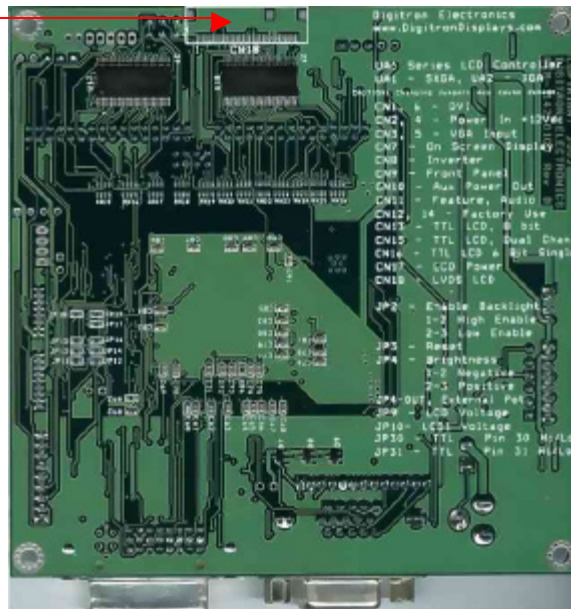
CONTROLLER LAYOUT



CN18 (LVDS)
(Optional)

UA1 Dimensions

Length: 4.30 Inches
 Width: 4.30 Inches
 Mounting Hole Centers
 4.00 Inch Centers



Model UA1 shown
 DVI populated
 SXGA resolution
 Dual LVDS drivers

LEGEND on BACK
 Is a reference for
 controller options

Connector Pin Out Definition

CN1 – DVI Input

PIN	SYMBOL	DESCRIPTION
1	RX2-	TMDS Data 2-
2	RX2+	TMDS Data 2+
3	GND	Ground
6	SCL	DVI DDC Clock
7	SDA	DVI DDC Serial Data
8	VS	Analog Vertical Sync
9	RX1-	TMDS Data 1-
10	RX1+	TMDS Data 1+
11	GND	Ground
14	DDC_5V	+5V Power
15	GND	Ground
16	HP	Hot Plug
17	RX0-	TMDS Data 0-
18	RX0+	TMDS Data 0+
19	GND	Ground
22	GND	Ground
23	RXC+	TMDS Clock +
24	RXC-	TMDS Clock -
C1	Red	Analog-RED
C2	Green	Analog-Green
C3	Blue	Analog-Blue
C4	HS	Analog-Horiz. Sync.

CN2 – 12V Power Supply In

PIN	SYMBOL	DESCRIPTION
1	+12V	+12VDC Power In
2	GND	Ground
3	GND	Ground

CN4 – 12V Power Supply In

PIN	SYMBOL	DESCRIPTION
1	GND	Ground
2	+12V	+12VDC Power In

CN3 – Analog VGA Input

PIN	SYMBOL	DESCRIPTION
1	RED	Analog Red
2	GREEN	Analog Green
3	BLUE	Analog Blue
4	NC	No Connection
5	GND	Ground
6	RGND	Red Return
7	GGND	Green Return
8	BGND	Blue Return
9	+5V	5V in from Video Card
10	GND	Ground
11	NC	No Connection
12	SDA	DDC Serial Data
13	HSYNC	Horizontal Sync
14	VSYNC	Vertical Sync
15	SCL	DDC Data Clock

CN5 – Analog VGA Input Alternate

PIN	SYMBOL	DESCRIPTION
1	RED	Analog Red
2	RGND	Red Return
3	GREEN	Analog Green
4	GGND	Green Return
5	BLUE	Analog Blue
6	BGND	Blue Return
7	GND	Ground
8	GND	Ground
9	HSYNC	Horizontal Sync
10	GND	Ground
11	VSYNC	Vertical Sync
12	SDA	DDC Serial Data
13	SCL	DDC Data Clock

Connector Pin Out Definition

CN6 (CN1) – DVI Input

PIN	SYMBOL	DESCRIPTION
1 (16)	HP	Hot Plug
2	GND	Ground
3 (6)	SCL	DVI DDC Clock
4 (7)	SDA	DVI DDC Serial Data
5 (14)	DDC_5V	+5V Power
6	GND	Ground
7	GND	Ground
8 (23)	RXC+	TMDS Clock +
9 (17)	RX0-	TMDS Data 0-
10 (24)	RXC-	TMDS Clock -
11 (18)	RX0+	TMDS Data 0+
12	GND	Ground
13	GND	Ground
14 (9)	RX1-	TMDS Data 1-
15 (1)	RX2-	TMDS Data 2-
16 (10)	RX1+	TMDS Data 1+
17 (2)	RX2+	TMDS Data 2+
18	GND	Ground

CN7 – OSD Connector

PIN	SYMBOL	DESCRIPTION
1	SW1	Key Switch 1
2	SW2	Key Switch 2
3	SW3	Key Switch 3
4	SW4	Key Switch 4
5	SW5	Key Switch 5
6	GND	Ground
7	GRN	LED Green
8	ORG	LED Red
9	GND	Ground

CN8 – Backlight Inverter Connector

Mating Connector Molex 50114-0900

PIN	SYMBOL	DESCRIPTION
1	+12V	+12VDC 3.5A*
2	+12V	+12VDC 3.5A*
3	GND	Ground
4	BKLT_ADJ	Brightness Adjust (JP4)
5	GND	Ground
6	BLCTRL	Backlight Enable (JP2)
7	GND	Ground
8	+5V	+5VDC 200ma

*Combined current pins 1 & 2

CN9 – Front Panel Connector

Mating Connector Molex 51021-0900

PIN	SYMBOL	DESCRIPTION
1	PS HP	Hard Power ON/OFF
2	GND	Ground
3	SP	Soft Power ON/OFF
4	GRN	LED Green
5	GND	Ground
6	ORG	LED Orange
7	+5V	+5VDC 100ma
8	BKLT_ADJ	Brightness Adjust (Remove JP4)
9	GND	Ground

CN10 – Auxiliary Power Output

Mating Connector Molex 51004-0400

PIN	SYMBOL	DESCRIPTION
1	+5V	+5VDC 1A max (see app note)
2	GND	Ground
3	GND	Ground
4	+12V	+12VDC (see app note)



Connector Pin Out Definition

CN11 – Feature Connector (Reserved for Future Use)

PIN	SYMBOL	DESCRIPTION
1	+12V	+12V dc
2	PWM1	Pulse Width Modulator 1
3	PWM2	Pulse Width Modulator 2
4	GND	Ground
5	KEY5	Key Switch 5
6	KEY6	Key Switch 6
7	KEY7	Key Switch 7
8	GND	Ground

CN12 – Programming Input

PIN	SYMBOL	DESCRIPTION
1	+5V	+5V DC
2	DO	Data Out
3	DI	Data In
4	GND	Ground

CN13 – TTL 8 BIT (2 BIT FIRST CHANNEL)

PIN	SYMBOL	DESCRIPTION
1	ER0 (ER6) *	Even Red 0 (6)
2	ER1 (ER7) *	Even Red 1 (7)
3	EG0 (EG6) *	Even Green 0 (6)
4	EG1 (EG7) *	Even Green 1 (7)
5	EB0 (EB6) *	Even Blue 0 (6)
6	EB1 (EB7) *	Even Blue 1 (7)
7	PWR1	LCD Power 1
8	GND	Ground

* These bits can be remapped for LVDS purposes.

CN15 – TTL 8 Bit Second Channel

PIN	SYMBOL	DESCRIPTION
1	GND	Ground
2	OR0 (OR6) *	Odd Red 0
3	OR1 (OR7) *	Odd Red 1
4	OR2 (OR0) *	Odd Red 2
5	OR3 (OR1)*	Odd Red 3
6	OR4 (OR2)*	Odd Red 4
7	OR5 (OR3) *	Odd Red 5
8	OR6 (OR4) *	Odd Red 6
9	OR7 (OR5) *	Odd Red 7
10	GND	Ground
11	GND	Ground
12	OG0 (OG6) *	Odd Green 0
13	OG1 (OG7) *	Odd Green 1
14	OG2 (OG0) *	Odd Green 2
15	OG3 (OG1) *	Odd Green 3
16	OG4 (OG2) *	Odd Green 4
17	OG5 (OG3) *	Odd Green 5
18	OG6 (OG4) *	Odd Green 6
19	OG7 (OG5) *	Odd Green 7
20	GND	Ground
21	GND	Ground
22	OB0 (OB6) *	Odd Blue 0
23	OB1 (OB7) *	Odd Blue 1
24	OB2 (OB0) *	Odd Blue 2
25	OB3 (OB1) *	Odd Blue 3
26	OB4 (OB2) *	Odd Blue 4
27	OB5 (OB3) *	Odd Blue 5
28	OB6 (OB4) *	Odd Blue 6
29	OB7 (OB5) *	Odd Blue 7
30	GND	Ground



Connector Pin Out Definition

CN16 – TTL 6 BIT First Channel

PIN	SYMBOL	DESCRIPTION
1	GND	Ground
2	CLK	Dot Clock
3	HSYNC	Horizontal Sync
4	VSYNC	Vertical Sync
5	GND	Ground
6	ER2 (ER0) *	Even Red 2
7	ER3 (ER1) *	Even Red 3
8	ER4 (ER2) *	Even Red 4
9	ER5 (ER3) *	Even Red 5
10	ER6 (ER4) *	Even Red 6
11	ER7 (ER5) *	Even Red 7
12	GND	Ground
13	EG2 (EG0) *	Even Green 2
14	EG3 (EG1) *	Even Green 3
15	EG4 (EG2) *	Even Green 4
16	EG5 (EG3) *	Even Green 5
17	EG6 (EG4) *	Even Green 6
18	EG7 (EG5) *	Even Green 7
19	GND	Ground
20	EB2 (EB0) *	Even Blue 2
21	EB3 (EB1) *	Even Blue 3
22	EB4 (EB2) *	Even Blue 4
23	EB5 (EB3) *	Even Blue 5
24	EB6 (EB4) *	Even Blue 6
25	EB7 (EB5) *	Even Blue 7
26	GND	Ground
27	DE	Data Enable
28	PWR1	LCD Power 1
29	PWR1	LCD Power 1
30	PIN 30	LCD Logic Select 30
31	PIN 31	LCD Logic Select 31
32	GND	Ground

CN17 – LCD Panel Power (5 or 7 pin)**

PIN	SYMBOL	DESCRIPTION
1	GND	Ground
2	GND	Ground
3	PWR1	LCD Power 1
4	PWR1	LCD Power 1
5	GND	Ground
6 **	PWR2	LCD Power 2
7 **	PWR2	LCD Power 2

** - These pins may/may not be populated

* These bits can be remapped for LVDS purposes.



Connector Pin Out Definition

CN18 – LVDS Panel Output

PIN	SYMBOL	DESCRIPTION
1	GND	Ground
2	FTX0-	Data
3	FTX0+	Data
4	FTX1-	Data
5	FTX1+	Data
6	FTX2-	Data
7	FTX2+	Data
8	FCK-	Clock
9	FCK+	Clock
10	FTX3-	Data
11	FTX3+	Data
12	STX0-	Data
13	STX0+	Data
14	STX1-	Data
15	STX1+	Data
16	STX2-	Data
17	STX2+	Data
18	SCK-	Clock
19	SCK+	Clock
20	STX3-	Data
21	STX3+	Data
22	GND	Ground
23	GND	Ground
24	GND	Ground
25	GND	Ground
26	GND	Ground
27	PW1	LCD Power 1
28	PW1	LCD Power 1
29	PW1	LCD Power 1
30	PW1	LCD Power 1
31	PW1	LCD Power 1

CN18 ALT – LVDS Panel Output

PIN	SYMBOL	DESCRIPTION
1	GND	Ground
2	FTX0-	Data
3	FTX0+	Data
4	FTX1-	Data
5	FTX1+	Data
6	FTX2-	Data
7	FTX2+	Data
8	FCK-	Clock
9	FCK+	Clock
10	FTX3-	Data
11	FTX3+	Data
12	STX0-	Data
13	STX0+	Data
14	STX1-	Data
15	STX1+	Data
16	STX2-	Data
17	STX2+	Data
18	SCK-	Clock
19	SCK+	Clock
20	STX3-	Data
21	STX3+	Data

Connector Pin Out Definition

JP2 – Inverter Enable Select

PIN	DESCRIPTION
1 - 2	Enable High
2	Common
2 - 3	Enable Low

JP “30” – DF9-30 High/Low Designator

PIN	DESCRIPTION
1	LCD Power
2	Pin 30
3	Ground

JP4 – Brightness Adjust Select

PIN	DESCRIPTION
1 - 2	Brightness Inverted
2	Common
2 - 3	Brightness Standard

JP “31” – DF9-31 High/Low Designator

PIN	DESCRIPTION
1	LCD Power
2	Pin 30
3	Ground

NOTE: Both out for BKL_T_ADJ (See CN9)

JP9 – LCD Primary Power (1)

PIN	DESCRIPTION
1	+3.3 V Safe
2	Common
3	+5 V Safe
4	Common
5	+12 V Fused

NOTE: 2 Position Jumper. Only jumper one Voltage to Common.

JP10 – LCD Secondary Power (2) (not populated)

PIN	DESCRIPTION
1	+3.3 V Safe
2	Common
3	+5 V Safe
4	Common
5	+12 V Fused

NOTE: 2 Position Jumper. Only jumper one Voltage to Common.



Connector Pin Out Definition

DEBUG / TEST

JP3 – Reset Switch (Debug Only)

PIN	DESCRIPTION
1	Reset
2	Ground

JP5-20 – Board Setup Selector Straps

JP	SYMBOL	DESCRIPTION
JP5	BSJ14	Always Installed
JP6	BSJ9	OCM_Start
JP7	BSJ14	External Flash Memory
JP8	BSJ8	H-Port-Enable
JP11	BSJ13	OSC-Select
JP12	BSJ12	RM-A12
JP13	BSJ11	RM-A11
JP14	BSJ10	RM-A10
JP15	BSJ7	H-Proto
JP16	BSJ6	SCL-POL
JP17	BSJ2	RM-A2
JP18	BSJ1	RM-A1
JP19	BSJ0	RM-A0

NOTE: Factory preset do not change

OSD Board Info

CN1 – OSD Connector (on OSD Board)

PIN	DESCRIPTION
1	Key Switch 1
2	Key Switch 2
3	Key Switch 3
4	Key Switch 4
5	NC
6	Ground
7	LED Green
8	LED Orange
9	Ground

OSD Board

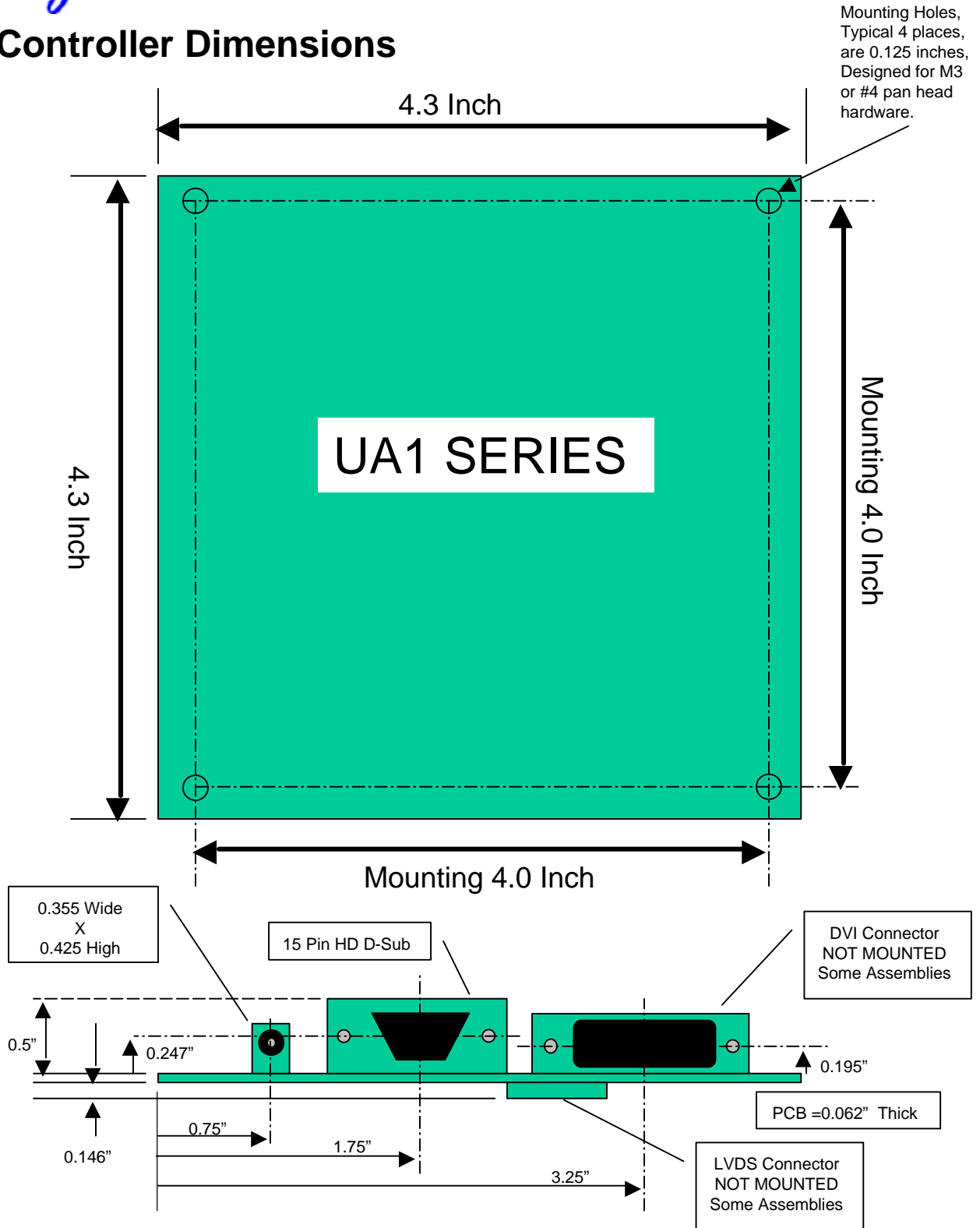
Switch	DESCRIPTION
1	Menu
2	Left
3	Right
4	Exit / On-Off
5	LCD On/Off

Accessories for the UA1 series.

Specifications available upon request.

- Membrane OSD w/ Bi-Color LED integrated
- Remote Control
- Audio Amplifier / Touch Controller
- Special BIOS configuration

Controller Dimensions





IMPORTANT NOTES

IMPORTANT NOTE

This product is for use by system developers and integrators. The manufacturer accepts no liability for damage or injury caused by the use of this product. It is the responsibility of the developer, integrators or other user of this product to:

- Ensure that all necessary and appropriate safety measures are taken
- Obtain suitable regulatory approvals as may be required
- Check power settings to all component parts before connection
- Understand the operation and connectivity requirements of this controller

LIFE SUPPORT POLICY

The UA1 product line should not be used in medical devices with life support functions nor in safety equipment (or similar applications) where component failure might result in loss of life or physical harm without the written approval of an officer of Digitron Electronics.

DISCLAIMER

There is no implied or expressed warranty regarding this material.

WARRANTY

The products are warranted against defects in workmanship and material for a period of one (1) year from the date of purchase provided no modifications are made to it and it is operated under normal conditions and in compliance with the instruction manual.

The warranty does not apply to:

- Product that has been installed incorrectly, this specifically includes but is not limited to cases where electrical short circuit is caused.
- Product that has been altered or repaired except by the manufacturer (or with the manufacturer's consent)
- Product that has been subjected to misuse, accidents, abuse, negligence, or unusual stress whether physical or electrical.
- Ordinary wear and tear.

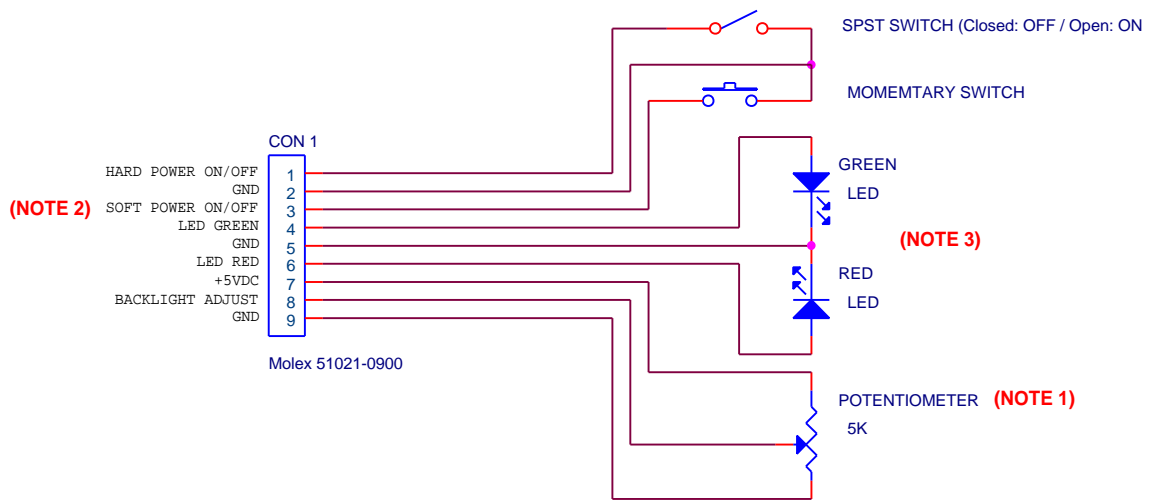
Except for the above express warranties, the manufacturer disclaims all warranties on products furnished hereunder, including all implied warranties of merchantability and fitness for a particular application or purpose. The stated express warranties are in lieu of all obligations or liabilities on the part of the manufacturer for damages, including but not limited to special, indirect consequential damages arising out of or in connection with the use of or performance of the products.

Specifications

Panel compatibility	TFT LCD's from manufacturers such as Samsung, LG, Sharp, Fujitsu, NEC, AU Optronics
LCD Resolution and Vertical Refresh	UA1 – up to SXGA 1280 x 1024, Up to 75 Hz
Input	UA1 – VGA analog, and optional DVI digital
Memory Settings	Settings are stored in non-volatile memory
Language Support	Language independent icon-based OSD
VESA DPMS implementation	Yes
Plug & Play	VESA DDC 1, 2/b compatible
Voltage output for LCD	+3.3VDC, +5VDC, +12VDC, Dual voltage available
Input Voltage	12VDC
Power Load Maximum	5 Amps fused
Controller consumption	3.0 W (no panel) / 0.7 W in standby
Storage temperature	-40 C to +70 C
Operating temperature	0 C to +60 C

APPLICATION NOTE 1

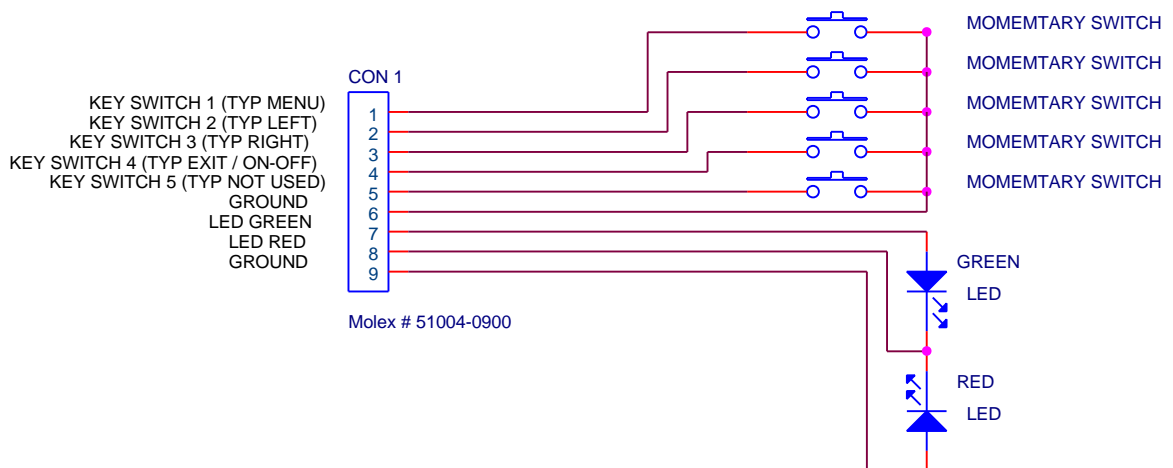
APP NOTE 1: FEATURE CONNECTOR (CN9)



NOTE 1: JP4 MUST BE REMOVED WHEN USING EXTERNAL POTENTIOMETER
 NOTE 2: (SOFT POWER ONLY) IN CASE OF POWER FAILURE, CONTROLLER AUTOMATICALLY RETURNS TO ON STATE
 NOTE 3: NO CURRENT LIMITING RESISTORS REQUIRED

APPLICATION NOTE 2

APP NOTE 2: OSD CONNECTOR (CN7)



NOTE 1: PULL UP RESISTORS LOCATED ON UA1 CONTROLLER

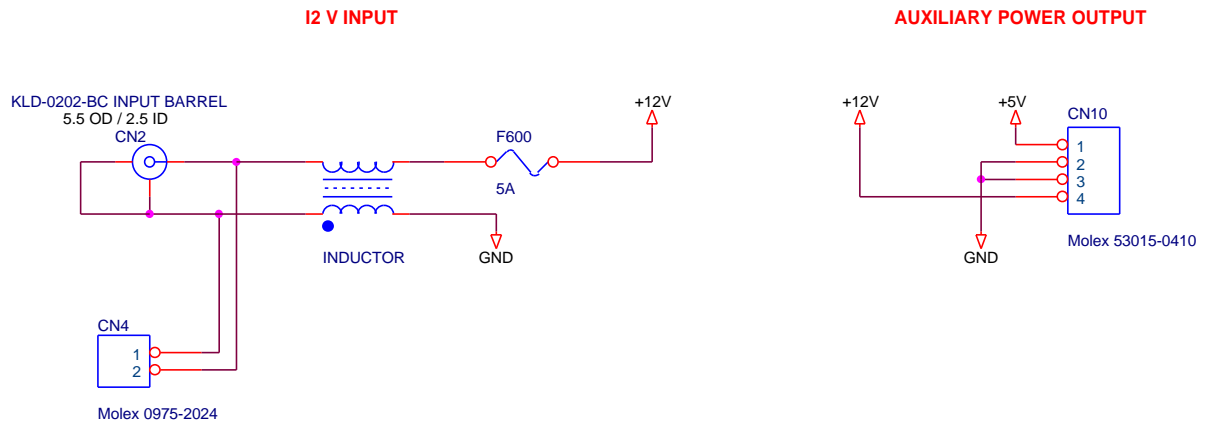
NOTE 2: MOMENTARY SWITCHES AND MEMBRANE SWITCHES LESS THEN 100 OHMS OK

NOTE 3: CURRENT LIMITING RESISTORS FOR LED ARE 300 OHMS 3.3V LOCATED ON UA1 CONTROLLER

NOTE 4: 4 BUTTON OSD STANDARD WITH COMPLETE CONTROLLER KIT SOLUTION

APPLICATION NOTE 3

APP NOTE 3: POWER IN & AUX OUT



NOTE 1: 12V CONTINUALLY ON

NOTE 2: CN10 +12V OUT = CURRENT IN (MAX 5A) - UA1 (0.2A) - INVERTER CURRENT (X) - PANEL CURRENT
 EXAMPLE: 5A - 0.2A (UA1) - 1.5A (INVERTER) - 1A (PANEL) = 2.3A AVAILABLE AT CN4
 NOT TO EXCEED 2 AMP

NOTE 3: CN10 +5V SHUT OFF WHEN HARD POWER ON CN9 (FRONT PANEL CONNECTOR PIN 1) IS ACTIVE