
Controller Board

CBC-2 01

CBC-2 02

Data Sheet

GEMboard™ Display Controller Board

Introduction:

GEMboard™ (CBC-2) is a production display controller board for many popular LCD panels ranging from 5.7" to 10.4" with resolutions up to 640x480 (VGA). GEMboard™ affords greater speed in prototyping, maximizes design flexibility while shortening the time to market. GUI integration has never been easier. The GEMboard™ contains the complete bill of material including support for backlight (LED or CCFL) and touch panels.

Features:

- Amulet AGB75LC04-QU-E 208 PQFP GEM Graphical OS Chip™
- Storage Capacity – 32megabit Serial Flash for storing GUI pages
- 64megabit SDRAM (frame buffer)
- Integrated resistive 4 or 5 wire touch panel decoder, multiple touch panel connections (auxiliary pads/ headers) plus dedicated connectors
- Multiple Serial Interfaces – 3.3v UART, TWI & USB
- 33 pin FPC connector with auxiliary pad for 31pin FPC
- Backlight Support - LED backlight circuit with PWM, optional headers with dedicated connectors. Dedicated CCFL backlight header for inverters w/ PWM control
- Touch Panel calibration feature with dedicated switch and/or software
- Two boards to choose from (-01 and -02) depending on backlight power requirement

Backlight Current

CBC-2 01	Backlight 200mA Output
CBC-2 02	Backlight 75mA Output

Electrical Characteristic

3.1 Recommended Operating Conditions

MIN - MAX 4.75V - 10V	5V Recommended
5V Current	1A

3.2 DC Characteristics

V core Supply Current	22mA @1.2V
V input Low Level	-0.3 to 0.8V
V input High Level	2V to (Vcc + 0.3V)
Pull Up Resistors	70K to 175KOhms
IO Output Current	8mA
Static Current Excluding Power on Reset V core = 1.2V	600uA
Static Current Logic cells consumption, including Power on Reset and all input drivers V core = 1.2V	30uA

Pin #	Signal	Type
1	VLED+	O
2	VLED+	O
3	VLED+	O
4	VLED-	O
5	VLED-	O
6	VLED-	O

Table 1. J1A Connector

Pin #	Signal	Type
1	VLED+	O
2	VLED-	O
3	VLED+	O
4	VLED-	O
5	VLED+	O
6	VLED-	O
7	VLED+	O
8	VLED-	O

Table 2. J1B Connector

Pin Descriptions

Pin Type

I = Input

O = Output

P = Power Supply

Pin #	Signal	Type	Description
1	GND	P	Ground
2	PC	O	Pixel Clock
3	Hsync	O	Hsync Signal
4	Vsync	O	Vsync Signal
5	GND	P	Ground
6	Pixel Data 2	O	R2
7	Pixel Data 3	O	R3
8	Pixel Data 4	O	R4
9	Pixel Data 5	O	R5
10	Pixel Data 6	O	R6
11	Pixel Data 7	O	R6
12	GND		Ground
13	Pixel Data 10	O	G2
14	Pixel Data 11	O	G3
15	Pixel Data 12	O	G4
16	Pixel Data 13	O	G5
17	Pixel Data 14	O	G6
18	Pixel Data 15	O	G7
19	GND	P	Ground
20	Pixel Data 18	O	B2
21	Pixel Data 19	O	B3
22	Pixel Data 20	O	B4
23	Pixel Data 21	O	B5
24	Pixel Data 22	O	B6
25	Pixel Dara 23	O	B7
26	GND	P	Ground
27	OE	O	Output Enable
28	3.3V	P	3.3V
29	3.3V	P	3.3V
30	NC	-	B7
31	SW1	O	3.3V / Ground

Table 3. J2 connector DF9A-31P-1V

Pin #	Signal	Type	Description
1	GND	P	Ground
2	PC	O	Pixel Clock
3	Hsync	O	Hsync Signal
4	Vsync	O	Vsync Signal
5	GND	P	Ground
6	Pixel Data 2	O	R2
7	Pixel Data 3	O	R3
8	Pixel Data 4	O	R4
9	Pixel Data 5	O	R5
10	Pixel Data 6	O	R6
11	Pixel Data 7	O	R6
12	GND		Ground
13	Pixel Data 10	O	G2
14	Pixel Data 11	O	G3
15	Pixel Data 12	O	G4
16	Pixel Data 13	O	G5
17	Pixel Data 14	O	G6
18	Pixel Data 15	O	G7
19	GND	P	Ground
20	Pixel Data 18	O	B2
21	Pixel Data 19	O	B3
22	Pixel Data 20	O	B4
23	Pixel Data 21	O	B5
24	Pixel Data 22	O	B6
25	Pixel Dara 23	O	B7
26	GND	P	Ground
27	OE	O	Output Enable
28	3.3V	P	3.3V
29	3.3V	P	3.3V
30	SW3	O	3.3V / Ground
31	SW7	O	3.3V / Ground
32	SW8	O	3.3V / Ground
33	GND	P	Ground

Table 4. J3 Connector FH12-33S-0.5SH

Pin #	Signal	Type	Description
1	VLED+	O	
2	VLED+	O	
3	VLED-	O	
4	VLED-	O	

Table 5. J4 Header

Pin#	Signal	Type	Description
1	GND	P	Ground
2	5V	P	5V @ 500mA

Table 6. J5 Connector

Pin #	Signal	Type	Description
1	5V	P	Ground
2	PWM0	O	
3	GND	P	Ground
4	NC	-	

Table 7. J6 Header

Pin #	Signal	Type	Description
1	Y-	I	
2	X+	I	
3	Y+	I	
4	X-	I	

Table 8. J8 Header

Pin#	Signal	Type	Description
1	5V	P	Voltage In 5V +/- 10% @ 1A
2	5V	O	Voltage In 5V +/- 10% @ 1A
3	GND	O	Ground
4	GND	O	Ground
5	SCL	O	Serial Clock
6	SDA	O	Serial Data
7	COMMU RXD	O	CommU RXD UART
8	COMMU TXD	O	CommU TXD UART
9	PWM1	O	Programmable Clock 1
10	PWM2	O	Programmable Clock 2
11	PROG M	O	Program Mode Float = Program GND = Run
12	PWM0	O	Programmable Clock 0
13			
14	T_CAL	O	Touch Panel Calibration Float = Normal GND= Cal
15	PROGU RXD	O	ProgU RXD UART
16	PROGU TXD	O	ProgU TXD UART
17	SPI C3	O	SPI Chip Select
18			
19	SPI C2	O	SPI Chip Select
20		O	
21	MOSI	O	SPI Data OUT
22	SCLK	O	SPI Clock
23	RESET	O	System Reset by driving this pin low
24	MISO	O	SPI Data IN

Table 9. J9 Con, 24pin, header, 2mm , Hirose DF-11-24DP-2DSA

Pin#	Description
1	N/C
2	TX (Amulet GUI module transmits data on Pin 2 while the PC receives data on Pin 2)
3	RX (Amulet GUI module receives data on Pin 3 while the PC transmits data on Pin 3)
4	Pin 4 to 6 - Jumpered
5	Ground
6	Pin 4 to 6 - Jumpered
7	Pin 7 to 8 - Jumpered
8	Pin 7 to 8 - Jumpered
9	N/C

Table 10. J10 Connector

Pin #	Signal	Type	Description
1	X-	I	
2	Y+	I	
3	X+	I	
4	Y-	I	

Table 11. J11 Connector

Pin #	Signal	Type	Description
1	VBUS	I	
2	DDM		
3	DDP		
4			
5	GND	P	Ground

Table 12. J12 Connector

Pin #	Signal	Type	Description
1	Y-	I	
2	X-	I	
3	Y+	I	
4	X+	I	

Table 13. J13 Connector

Pin #	Signal	Type	Description
1	Y-	I	
2	X+	I	
3	Y+	I	
4	X-	I	

Table 15. J14 Connector

Pin#	Signal	Type	Description
1	LED+	O	
2	LED-	O	

Table 15. J15 and J16 Connector

Pin #	Signal	Type	Description
1	X+	I	
2	X+	I	
3	Y+	I	
4	Y+	I	
5	X-	I	
6	X-	I	
7	Y-	I	
8	Y-	I	

Table 16. JP10 Connector

JS #	Signal	Type	Description
JS1 1	COMMU TXD		
JS1 2	TXD Transceiver		
JS1 3	PROGU TXD		
JS2 1	COMMU RXD		
JS2 2	RXD Transceiver		
JS2 3	PROGU RXD		

Table 17. JS1 / JS2

SW #	Signal	Type	Description
SW3	R / L	O	3.3V / Ground J3
SW6 1	PROG M	I	
SW6 2	TPC	I	
SW7	U /D	O	3.3V / Ground J3
SW8		O	3.3V /Ground / Open J3
SW9		O	Ground / Open J1
SW11		O	3.3V / Ground J2

Table 18. Switches

Backlight current / Max Voltage adjust

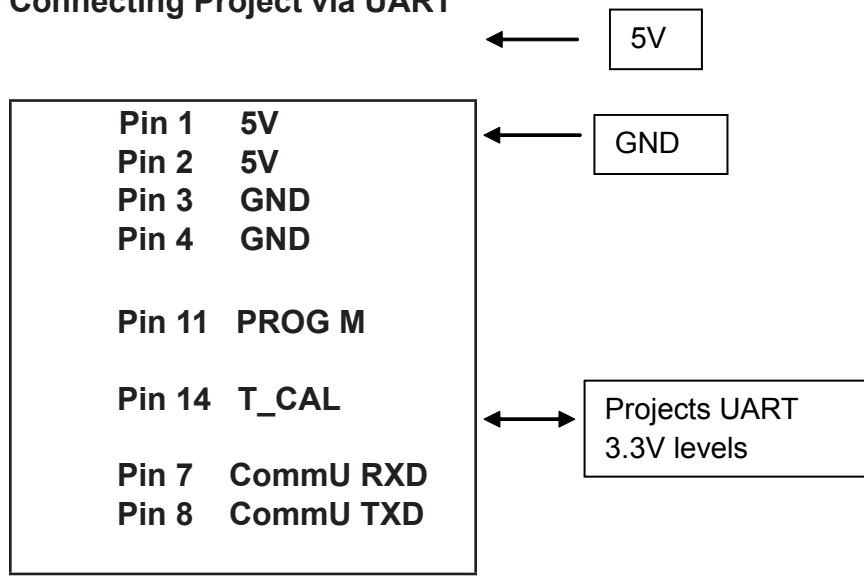
$$(1.5 \times V_{out} / 1.23 - 1) \times 10K = R23 \quad \text{Max Voltage Out}$$

$$0.200 / I_{LED} = R20 - R22 \quad \text{LED Current}$$

Warning supplying to much current to the LED backlight will shorten the life of the LEDs.

J9 typical Connection

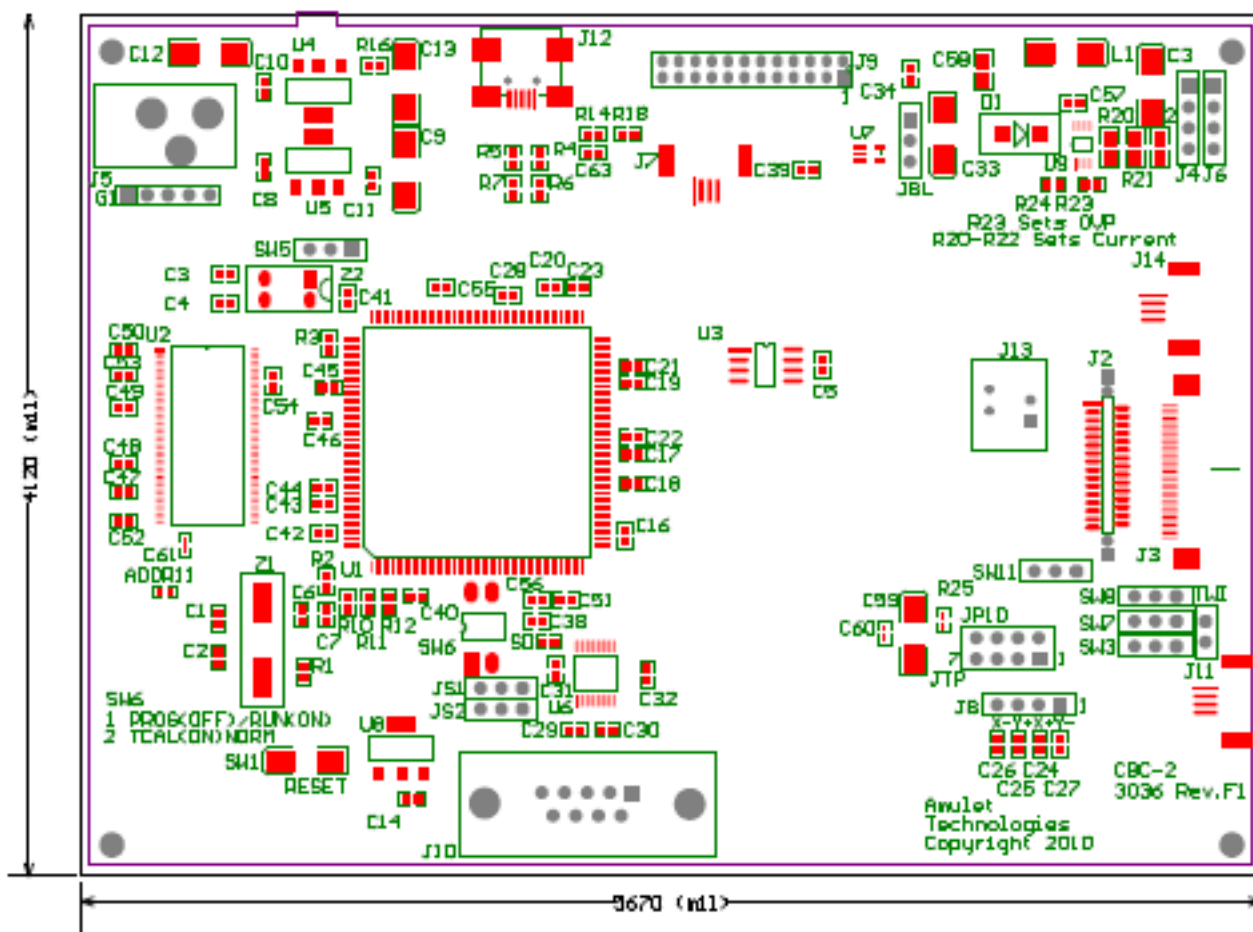
Connecting Project via UART



J9

Note: Cut jumper SD by U6 Jumper “D” side to C38 “8” side GND to to take the RS232 Transceiver out of circuit.

5. Dimensions



Mounting Holes 3mm 136.6mm by 96.4mm



Tel (408) 374-4956
Fax (408) 374-4941
<http://www.AmuletTechnologies.com>
Sales@AmuletTechnologies.com
Support@AmuletTechnologies.com
1475 S. Bascom Ave., Suite 111
Campbell, CA 95008 USA

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