



HAIDAR TECHNOLOGY, LLC.
The Next Generation Of Intelligent Embedded GUI Systems

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SEG-CW43-LNT
Serial Enabled Graphic Controller and WQVGA 4.3" TFT
Color display

REV 1.00

Revision 1.00

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1. Overview:

The SEG-Cx and the attached touch color display provide a complete Graphical User interface for embedded systems. It is based on our intelligent and easy to use graphic engine SEGE (Serial Enabled Graphic Engine). SEGE uses the same techniques used in objective oriented programming (OOP) to create the embedded GUI without any additional code for the LCD or the touch panel. A powerful set of objects and a window based software “LCDMaster” are used to make this task extremely easy, fast and simple. LCDMaster is a true WYSIWYG visual GUI builder for color displays. It allows you to design the GUI application visually from your PC screen using simple Drag-and-Drop tools with absolutely no coding for the GUI design.

The predefined object set which includes Screen, Bargraph, Button, Textbox, Picturebox, Numberbox, Image, Slider, Needle and Shape are the GUI building blocks. Similar to OOP, each object has properties, methods and events. Each object has also a touch zone which can be enabled or disabled at design time. When the user touches one of those zones, a touch event will be generated to notify the host controller and to execute user defined macro without the host supervision.

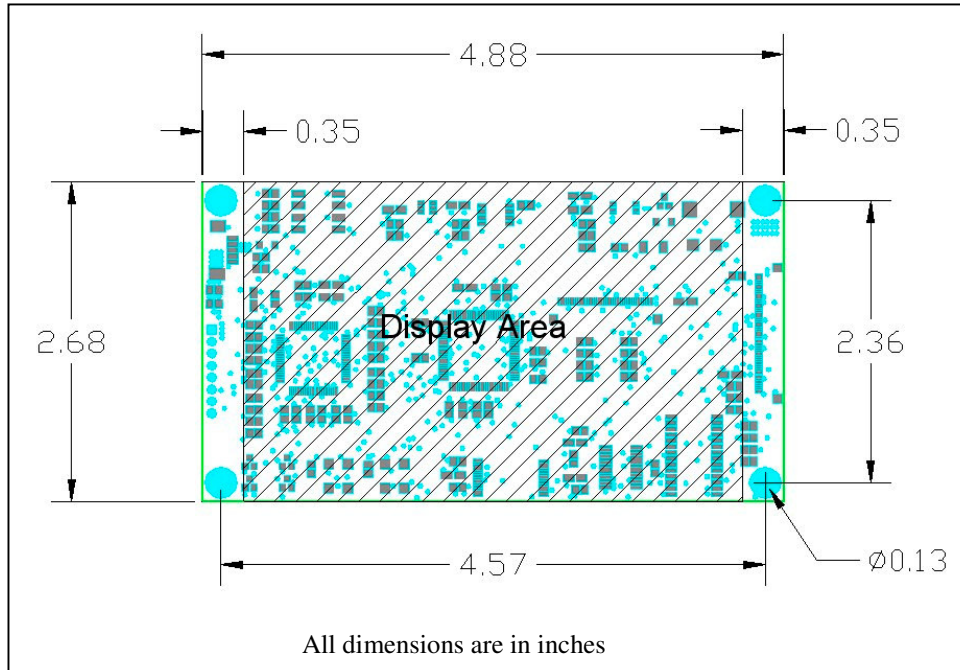
Using SEG-Cx is simply the quickest way to create stunning GUI without any graphical programming!

2. Features:

- WQVGA (480X272) 4.3” color TFT with 4 wires touch screen
- Powerful 32-bit processor running at 80MHZ on board
- Powerful graphic controller with 256KB RAM on board
- Powerful resistive touch screen and 4X4 keypad controller on board
- 8Mbyte EEPROM for bitmaps, fonts and GUI storage
- 8 Digital Input
- 8 Digital Output
- Efficient DC/DC converter for LED backlight with digital brightness control
- CMOS (3.3V) RS232 and RS485 up to 115.2kb/sec serial interface
- Battery backed Real Time Clock (Optional)
- 4 PWM outputs
- 4 Analog inputs
- Wide operating temperature (-20°C to +70°C)
- Low Power
- Low Cost
- ROHS Compliant



3. Board dimensional drawing:



4. Dimensions:

| | |
|--------|----------------|
| Width | 2.68" / 68mm |
| Length | 4.57" / 116mm |
| Depth | 0.25" / 6.42mm |

5. Electrical Characteristics:

SEG-Cx requires 3.3V DC. Exceeding the supply voltage over the typical value (3.3V) will cause a permanent damage to the board and to the attached LCD and void your warranty.

Current draw is as follows:

| Configuration | Typical Current (A) at 3.3V | Max Current (A) at 3.3V |
|---------------|---|-------------------------|
| SEG-CW43-LNT | 0.28A / LED backlight is ON 0.13A / LED backlight is OFF | 0.5A at 3.3V |

6. Environmental:

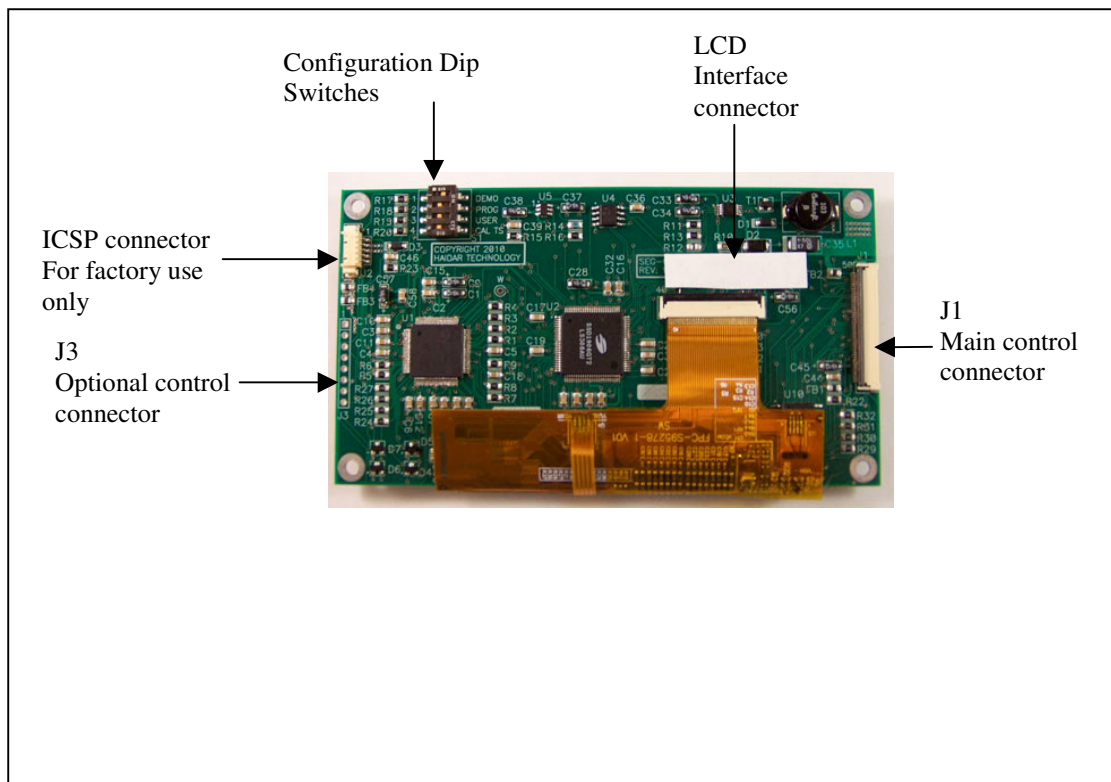
The standard SEG-Cx board is rated for commercial temperature operation of 0 to 70°C. The Industrial Temperature -40 to 85°C version is available as a special order.

7. Electrical Specifications:

| Parameter | Symbol | Min. | Typ. | Max. | Units |
|--|--------|--------|------|--------|-------|
| Input Supply Voltage | VDD | - | 3.3 | 3.7 | V |
| High Level Input Voltage (VDD = 3.3V) | VIH | 0.7VDD | - | VDD | V |
| Low Level Input Voltage (VDD = 3.3V) | VIL | 0 | - | 0.3VDD | V |
| Digital sink/source current | Id | - | - | 25 | MA |
| Analog input voltage | Va | 0 | - | 3.3V | V |
| RS232 TX/RX | | 0.7VDD | - | VDD | V |

Warning: RX and TX use a CMOS level of 3.3V. Connecting them to standard (PC) RS232 with +/- 12V or other will damage the controller and void your warranty.

8. Board Picture:



9. Control Connector J1 and J3:

J1 is Omron XF2M-5015 (50 pin, 0.5mm pitch dual contact FFC connector).

| J1 Pin Name | Pin # | Type | Tolerance | Description |
|-------------|-------|------|-----------|--|
| VIN | 1 | PWR | 3.3V | Supply Voltage input |
| VIN | 2 | PWR | 3.3V | Supply Voltage input |
| VIN | 3 | PWR | 3.3V | Supply Voltage input |
| VIN | 4 | PWR | 3.3V | Supply Voltage input |
| GND | 5 | PWR | 0V | Ground |
| GND | 6 | PWR | 0V | Ground |
| RXLED | 7 | DOUT | 3.3V | RS232/485 Receiver LED. This output pin can be connected to LED through a limiting resistor. The LED is lit when data is received. |
| TXLED | 8 | DOUT | 3.3V | RS232/485 Transmitter LED. This output pin can be connected to LED through a limiting resistor. The LED is lit when data is transmitted. |
| RX | 9 | DIN | 3.3V | RS232/485 Receiver input |
| TX | 10 | DOUT | 3.3V | RS232/485 Transmitter output |
| RS485ENA | 11 | DOUT | 3.3V | Active High. RS485 transmitter enable. |
| Ready | 12 | DOUT | 3.3V | Active Low. This output pin is driven inactive (High) when the controller board is busy. At power-on/reset, the host controller can use this pin to check if SEG-Cx board is ready or not. |
| NotifyHost | 13 | DOUT | 3.3V | Active Low. This output pin is driven active (if enabled in software) to notify the host controller that an object has been touched. |
| Buzzer | 14 | DOUT | 3.3V | Buzzer output |
| HBLED | 15 | DOUT | 3.3V | Heart Beep LED. This output pin can be connected to LED through a limiting resistor. The LED flashes at 10HZ rate to indicate that the board is running normally. |
| DI0 | 16 | DIN | 3.3V | Digital Input 0 |
| DI1 | 17 | DIN | 3.3V | Digital Input 1 |
| DI2 | 18 | DIN | 3.3V | Digital Input 2 |
| DI3 | 19 | DIN | 3.3V | Digital Input 3 |
| DI4 | 20 | DIN | 3.3V | Digital Input 4 |
| DI5 | 21 | DIN | 3.3V | Digital Input 5 |
| DI6 | 22 | DIN | 3.3V | Digital Input 6 |
| DI7 | 23 | DIN | 3.3V | Digital Input 7 |
| DO0 | 24 | DOUT | 3.3V | Digital Output 0 |
| DO1 | 25 | DOUT | 3.3V | Digital Output 1 |
| DO2 | 26 | DOUT | 3.3V | Digital Output 2 |
| DO3 | 27 | DOUT | 3.3V | Digital Output 3 |
| DO4 | 28 | DOUT | 3.3V | Digital Output 4 |
| DO5 | 29 | DOUT | 3.3V | Digital Output 5 |
| DO6 | 30 | DOUT | 3.3V | Digital Output 6 |
| DO7 | 31 | DOUT | 3.3V | Digital Output 7 |
| ROW1 | 32 | DIN | 3.3V | Keypad Row 1 |
| ROW2 | 33 | DIN | 3.3V | Keypad Row 2 |

| | | | | |
|-------|----|------|----------|---|
| ROW3 | 34 | DIN | 3.3V | KeyPad Row 3 |
| ROW4 | 35 | DIN | 3.3V | KeyPad Row 4 |
| COL1 | 36 | DOUT | 3.3V | KeyPad Column 1 |
| COL1 | 37 | DOUT | 3.3V | KeyPad Column 2 |
| COL1 | 38 | DOUT | 3.3V | KeyPad Column 3 |
| COL1 | 39 | DOUT | 3.3V | KeyPad Column 4 |
| AN0 | 40 | AIN | 0 - 3.3V | Analog Input 0 |
| AN1 | 41 | AIN | 0 - 3.3V | Analog Input 1 |
| AN2 | 42 | AIN | 0 - 3.3V | Analog Input 2 |
| AN3 | 43 | AIN | 0 - 3.3V | Analog Input 3 |
| PWM0 | 44 | DOUT | 3.3V | PWM 0 |
| PWM1 | 45 | DOUT | 3.3V | PWM 1 |
| PWM2 | 46 | DOUT | 3.3V | PWM 2 |
| PWM3 | 47 | DOUT | 3.3V | PWM 3 |
| Reset | 48 | DIN | 3.3V | Active Low. This pin can be used to reset the board. Leave open if is not used. |
| GND | 49 | PWR | 0V | Ground |
| GND | 50 | PWR | 0V | Ground |

J3 is 0.1" (2.54mm) 8 pins header.

| J3 Pin Name | Pin # | Type | Tolerance | Description |
|-------------|-------|------|-----------|--|
| VIN | 1 | PWR | 3.3V | Supply Voltage input |
| GND | 2 | PWR | 0V | Ground |
| RX | 3 | DIN | 3.3V | RS232/485 Receiver input |
| TX | 4 | DOUT | 3.3V | RS232/485 Transmitter output |
| RS485ENA | 5 | DOUT | 3.3V | Active High. RS485 transmitter enable. |
| Ready | 6 | DOUT | 3.3V | Active Low. This output pin is driven inactive (High) when the controller board is busy. At power-on/reset, the host controller can use this pin to check if SEG-Cx board is ready or not. |
| NotifyHost | 7 | DOUT | 3.3V | Active Low. This output pin is driven active (if enabled in software) to notify the host controller that an object has been touched. |
| Reset | 8 | DIN | 3.3V | Active Low. This pin can be used to reset the board. Leave open if is not used. |

10. Analog Inputs:

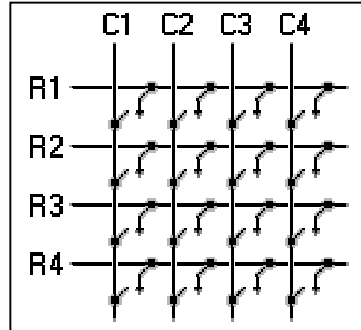
SEG-Cx has four 10-bit analog inputs. The input analog input range is from 0V to 3.3V. Each analog input is diode protected with a 100Ω current limiting resistor. The digital output is an average of 16 samples.

11. PWM Outputs:

SEG-Cx has four 8-bit PWM outputs. The switching frequency is 1KHZ for all channels. This frequency is fixed in software and can not be altered by the user.

12. External Keyboard:

SEG-Cx has a 4X4 matrix keypad controller. Two keys can be pressed simultaneously, and will generally be decoded correctly by the keypad scanning circuitry. The keypad de-Bounce time is set to 50msec.



13. Dip Switches:

SEG-Cx has 4 Dip-Switches which can be used by the user to configure the board. The power must be turned off and then on for the new settings to be active.

| Dip Switch # | OFF Position | ON Position | Default Position |
|--------------|-----------------------|------------------------|------------------|
| 1 | Normal Operation | Demo Mode | ON |
| 2 | Normal Operation | Programming Mode | OFF |
| 3 | Default Configuration | User Configuration | OFF |
| 4 | Normal Operation | Calibrate Touch Screen | OFF |

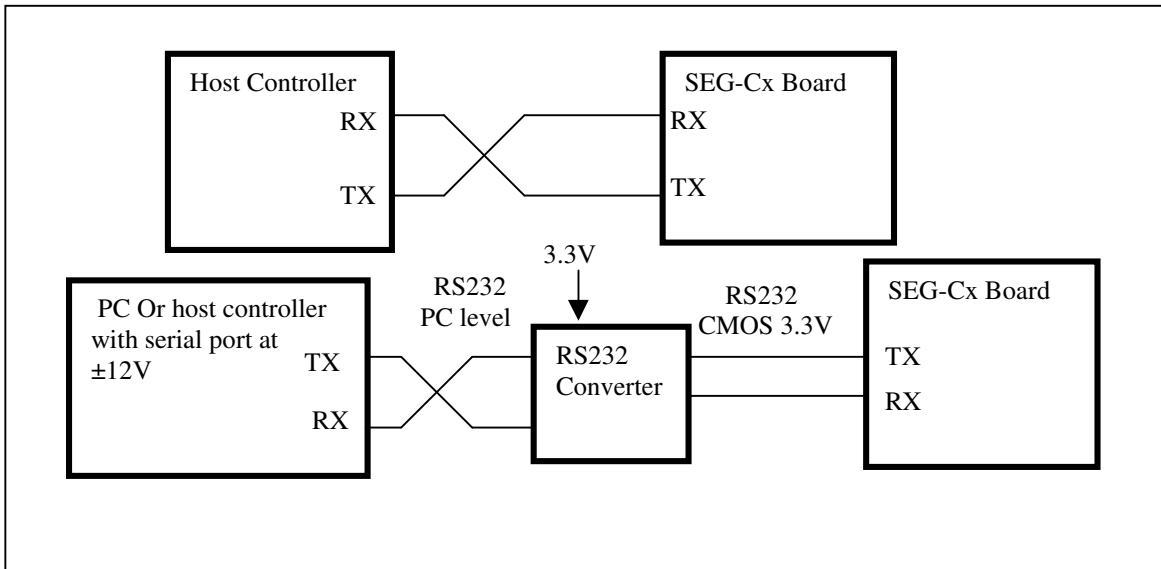
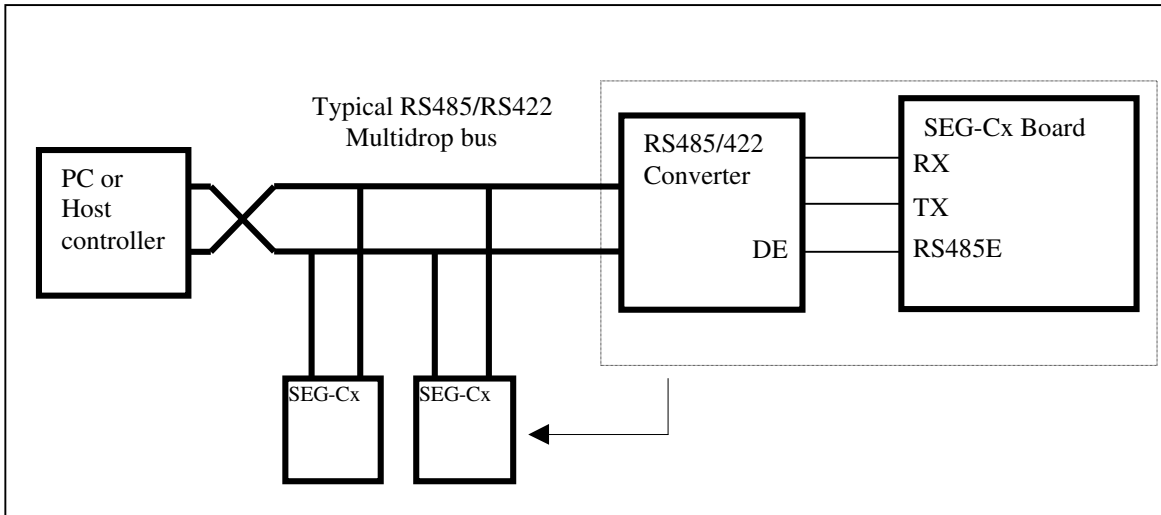
For normal operation, keep dip switch 1, 2 and 4 in OFF position. At power-on or after a reset, the board will read the configuration bytes from the program memory (default) if dip switch 3 is OFF or from the flash memory (user) if dip switch position is ON. See SEGE software manual for more information about the configuration bytes.

14. RS232 and RS485 communication:

SEG-Cx has one serial port, which can be used as RS232, RS422 or RS485. All signals (RX, TX and RS485ENA) are at CMOS level (3.3V). By default, the serial communication is 115.2KB/Sec baud, 8 data bits, no parity with one stop bit. For PC RS232 communication, RS232 driver (like MAX3232) is needed to convert the signal level from 3.3V to $\pm 12V$.

Multipoint RS485/422 communication bus can be also used by the host controller to communicate with multiple SEG-Cx boards. Each board must have a unique address (from 1 to 254) or DeviceID (DVID) which can be set in software. The default DVID is 16.

RS485ENA output is used to enable/disable the RS485/422 transmitter driver.



15. Grounding:

In order for the touch screen to work properly with a panel that has a CCFL backlight, the panel metal frame must be grounded to the board ground. SEG-Cx has one mounting hole connected to ground through a jumper. The panel frame must be connected to this mounting hole directly or through a transient protection diode for ESD. This is not necessary if the panel has LED backlight.

16. Software Command Reference:

The software commands and GUI are described in a separate document, **the SEGE Software Reference manual**.

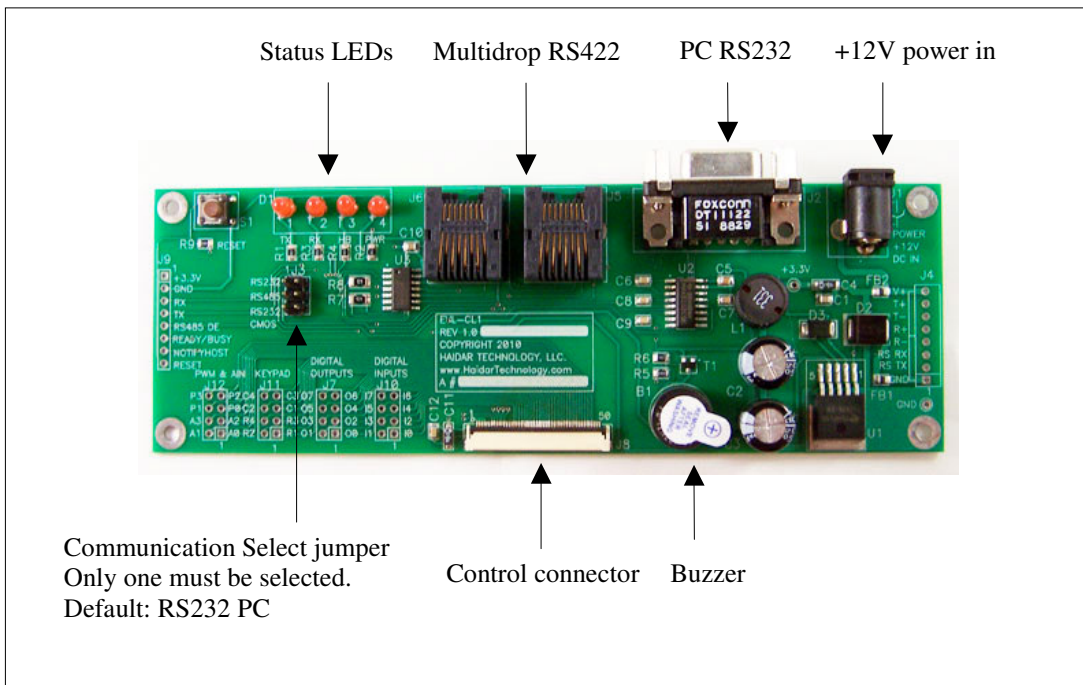
17. Getting Started:

The starter kit “STK-LCW43LNT” includes everything you need to start designing an initiative and great looking graphical user interface fast and easy. It includes:

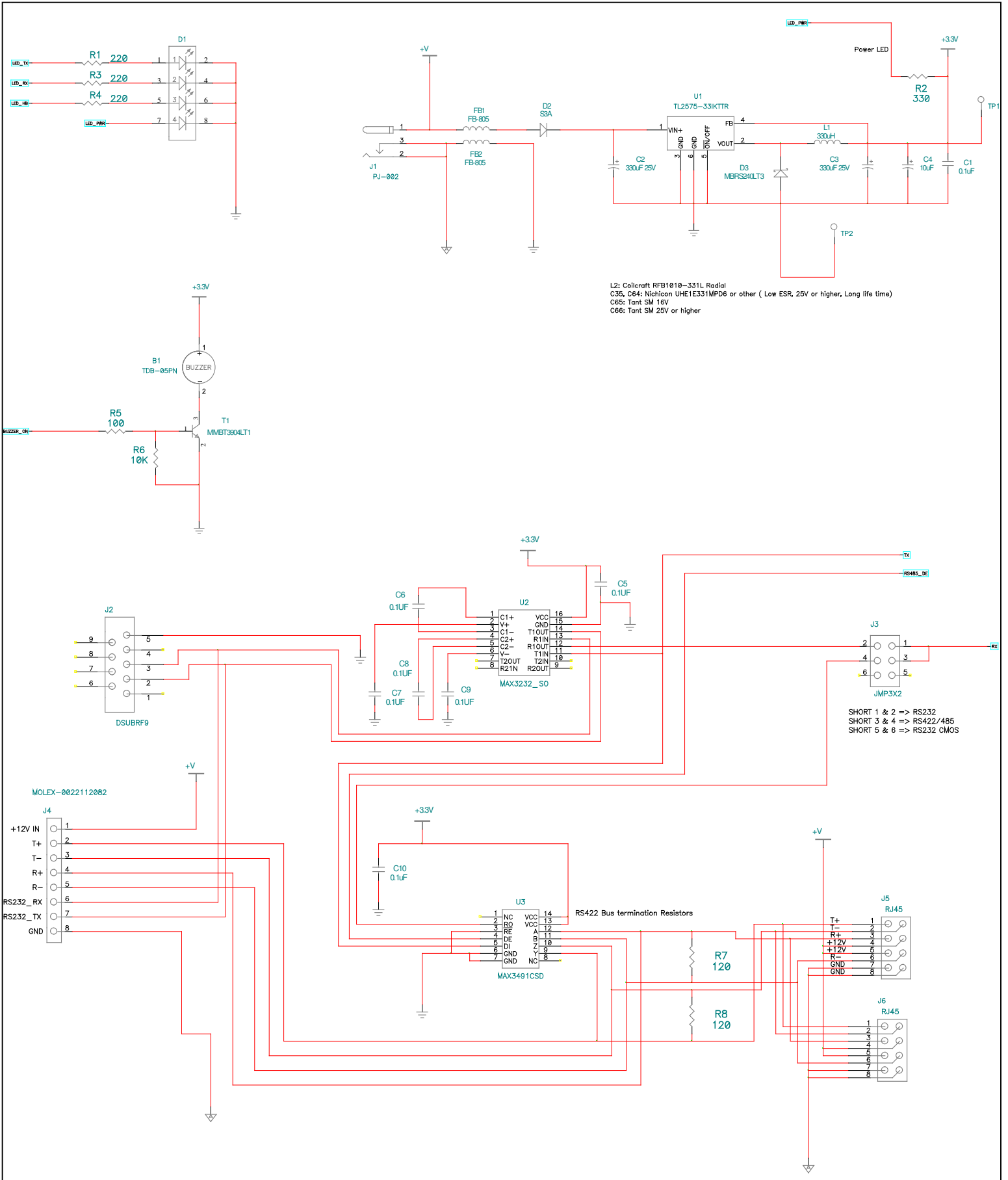
- SEG-CW43-LNT panel
- Full version of LCDMaster software
- EVL-CL1 evaluation board
- 12V power supply
- 50 pin, 0.5mm flat flex cable
- RS232 cable
- Stylus

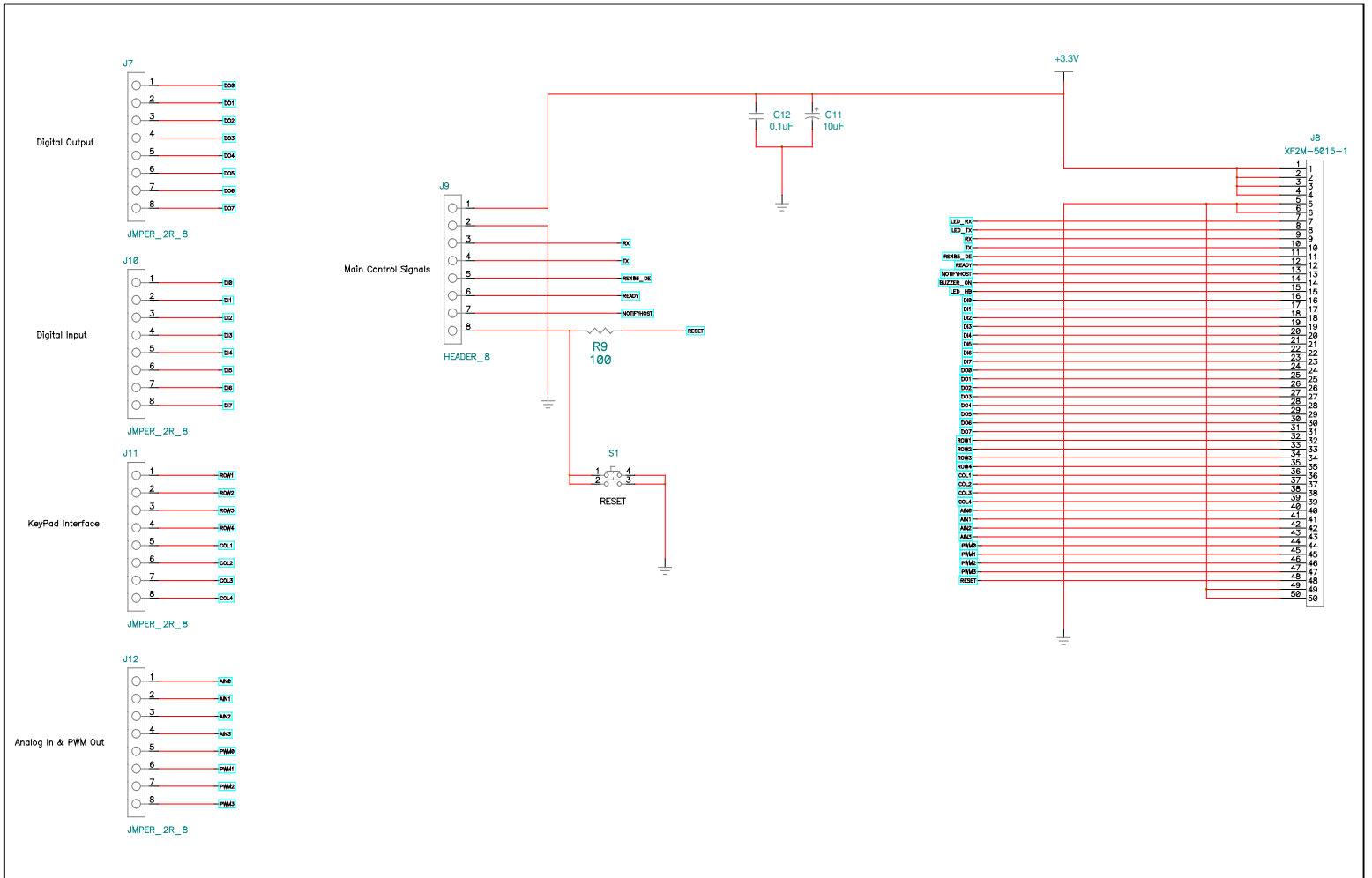


17.1. EVL-CL1 board:

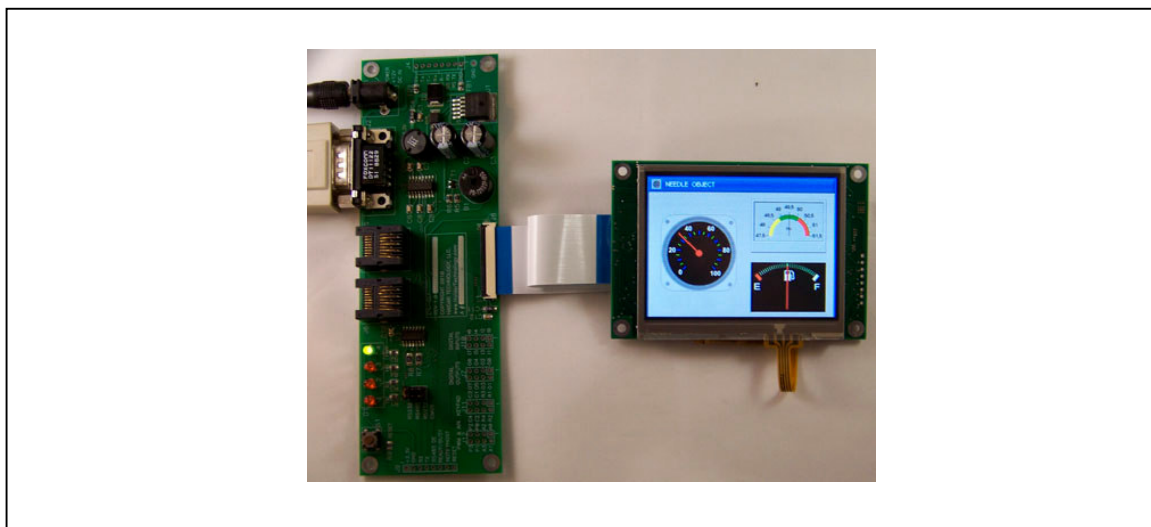


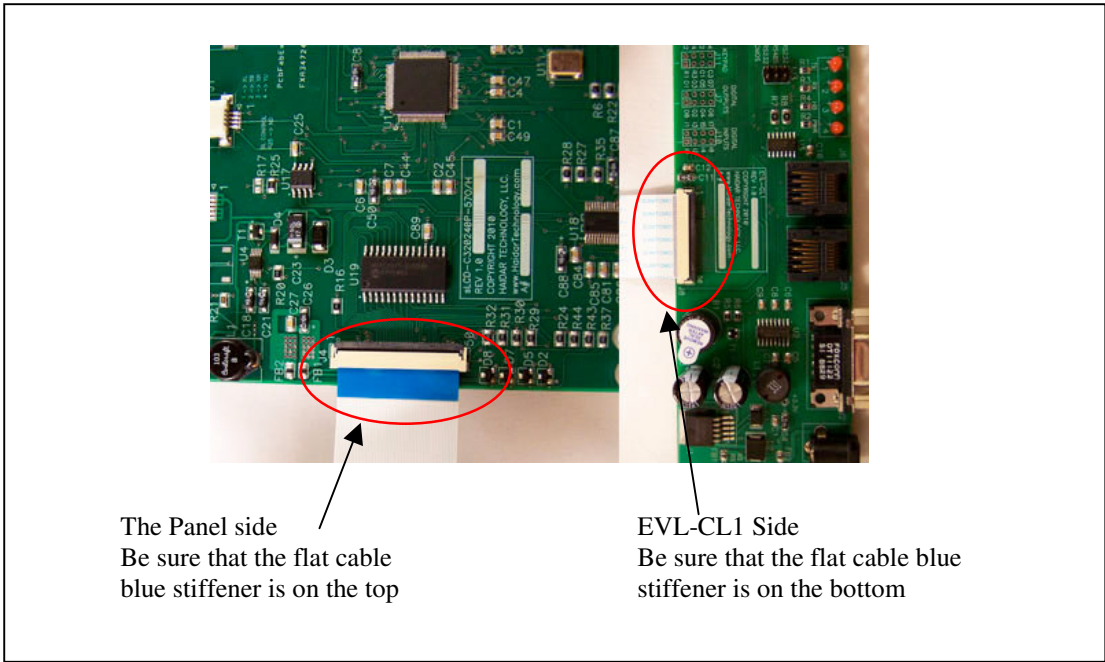
17.2. EVL-CL1 Schematic:





17.3. Connecting SEG-Cx to EVL-CL1:





18. Manual Change History:

| Date | Revision | Change |
|------------|----------|--------------------------------|
| 10/04/2010 | REV1.00 | Initial version of this manual |
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Returns and Repair Policy

No merchandise may be returned for credit, exchange, or service without prior authorization from. To obtain warranty service, contact the factory and request an RMA (Return Merchandise Authorization) number. Enclose a note specifying the nature of the problem, name and phone number of contact person, RMA number, and return address. Authorized returns must be shipped freight prepaid to Haidar Technology LLC. 5837 Karris Square Drive, Dublin, OH 43016 with the RMA number clearly marked on the outside of all cartons. Shipments arriving freight collect or without an RMA number shall be subject to refusal. Haidar reserves the right in its sole and absolute discretion to charge a 15% restocking fee, plus shipping costs, on any products returned with an RMA.

Return freight charges following repair of items under warranty shall be paid by Haidar, shipping by standard ground carrier. In the event repairs are found to be non-warranty, return freight costs shall be paid by the purchaser.