CSYS Labs, Inc.

Touch Vision™

TVM2464LTC with LED Backlight

Via software you can draw graphics, adjust the display contrast, control the LED back-light, enable the sound transducer for button feedback or turn it on and off as an alarm. You can also modify the cursor style, select several switch areas as a single button or create phantom buttons in any of the 3 X 10 matrix switch areas of the touch panel. Automatic placement of buttons including labels can also be easily accomplished. All of this capability allows you the luxury of time to concentrate on developing important operational portions of your program while avoiding compromises to the user I/O functions.

A New Concept in LCD Technology

The TVM2464LTC combines the best of several “state of the art” technologies into one compact module. Containing a graphics LCD, touch panel, sound transducer, high intensity LED back-light and a 16 bit high performance controller, the TVM2464LTC is truly a complete “ready to go” equipment interface. This integrated solution to the I/O problem frees up main CPU board space, simplifies front panel design and assembly, shortens product development time and reduces equipment size and cost while enhancing product appearance and operation.

The TVM2464LTC integrates touch panel and graphics LCD technology along with a backlight made up of 168 high efficiency surface mounted yellow green LEDs. The yellow green color of the LEDs was chosen to maximize the display's contrast and thus enhance readability of even the smallest characters being used in your screens.

Easy to Program

An advanced instruction set, which contains a variety of commands for both graphics and text operations makes writing application programs easy and fun. Instructions such as "draw box", "draw vector" and "place button" reduce software overhead through automated operations which eliminate the need for many low level display routines.

Connecting your CPU to the TVM2464LTC is easily accomplished using a parallel interface to your 8 bit buss or bi-directional printer port.

Integrated command and data buffers free your main CPU to continue processing while the TVM2464LTC executes as a true peripheral, returning status information including busy and error flags. Status signals exist to indicate that key closures have occurred during main CPU operations and to signal the condition of the input and output buffers.

The TVM2464LTC has two built in text fonts (the bit patterns used to construct text) and can simultaneously accommodate three down-loaded soft fonts. If other fonts are required, they can be easily loaded "on the fly" just prior to use. Using this approach, an unlimited number of fonts can be used to create any screen.

Built Tough

Liquid Crystal displays are primarily constructed of glass, so we built the TVM2464LTC with protection of the display in mind. Silicone and Poron gaskets plus a protective metal bezel create a shock absorbing environment for the LCD. The touch panel is fabricated from tough polyester with a hard coated touch surface that is easily cleaned using isopropyl alcohol and is highly resistant to most solvents, acids, bases and even your strongest coffee. Using an optically clear adhesive, a protective glass plate is bonded to the touch panel shielding the LCD from direct contact.

Slots are provided in the controller board in order to facilitate the mounting of the TVM2464LTC to your equipment enclosure.

Signal connectors on the TVM2464LTC are standard .050 inch ribbon cable type shrouded headers. The LED power (12 Volts) is provided via a keyed two pin connector located on the LED backlight board and, the backlight can be controlled via a software instruction.

Beneficial Cost Factors

The TVM2464LTC, being a high quality mechanical and electrical system, presents an impressive features vs. cost ratio. Since the TVM2464LTC is so easy to program, time to market as well as both hardware and software development costs are reduced. Being a single component, the costs for TVM2464LTC procurement and storage are minimal.

Designer’s Kit

The designer’s kit includes a TVM2464LTC, PC interface card, cable, manuals, software library, and example programs (including source code) to run on your PC. With the designer’s kit you’ll be creating graphics, down-loading soft fonts, and placing buttons in a very short time. A soft font compiler is also included with which you can create your own text fonts or a large graphic such as a company logo.

Specifications

Mechanical: Unless noted, all dimensions are in inches

Width x Height x Depth	6.35 x 2.90 x 1.90 162 x 74 x 49mm
Bezel opening	4.27 x 1.44, 109 x 37mm
Active viewing area	4.00 x 1.20, 102 x 31mm
Mounting slot size	.130 diameter (6-32)
Weight	10 oz.
Storage Temperature	-20 to +60 °C
Operating Temperature	0 to +40 °C
Display	240 x 64 graphics LCD
Touch Panel	3 x 10 scanned matrix
Back-light	Yellow green LEDs
Connector A (CPU)	20 pin 3M type 3592
Connector B (TP matrix)	14 pin 3M type 3598

Electrical:

Controller voltage	4.5 to 5.5	Volts
Controller current	50	mA
Backlight voltage	11.5 to 15.5	Volts
Backlight current * (nominal at 12 volts)	350	mA
Maximum input low level	0.8	Volts
Minimum input high level	2.0	Volts
Maximum output low level	0.4	Volts
Minimum output high level	3.0	Volts

* The backlight current is adjustable via a potentiometer on the LED board.

Notes:

Dimensions and electrical specifications are typical values. For complete specifications consult the TVM2464 designer's manual or contact C Sys Labs.

Backlight current greater than 500 mA will result in excessive heat generation with little gain in contrast. It is recommended that forced air cooling be employed when using backlight currents in excess of 400 mA.

Instruction Set Summary

Font Selection

- Select Font
- Down Load Font
- Set Font Attributes

Cursor Positioning

- SetXY
- ReadXY
- Cursor Up
- Cursor Down
- Cursor Left
- Cursor Right
- SetX
- SetY
- Set Cursor Attributes

Text Configuration

- Set Text Window
- Set Pitch
- Set Height

Text Input

- Input String

Graphics Input

- Draw Box
- Draw Block
- Draw Horizontal
- Draw Vertical
- Draw Vector
- Set Pixel

Button Input

- Place Button
- Load Button Buffer
- Get Button Size
- Place Phantom Button
- Delete Button
- Delete All Buttons
- Read KeyCode
- Set Button Attribute

Display Control

- Blank Display
- Clear Display
- Refresh
- Set Auto Refresh
- Dump Display RAM
- Load Display RAM
- Move Block Vertically
- Move Block Horizontally

System Instructions

- Soft Reset
- Set Contrast
- Set EL
- NOP
- Set Beeper
- Read Key Matrix

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