DISPLAY CONTROL APPLICATION 160x128

USER GUIDE

Rev. 1.1.0

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1. DCA 160X128 USER GUIDE

This guide describes use of the Display Control Application 160x128 software for evaluation of TC51854 LCD Controller Board.

1.1. DCA 160X128 SETTINGS

Settings tab contains Communication, Backlight, Contrast, Change Baud Rate and Controller Response sections.

Figure 1-1 Settings Screen
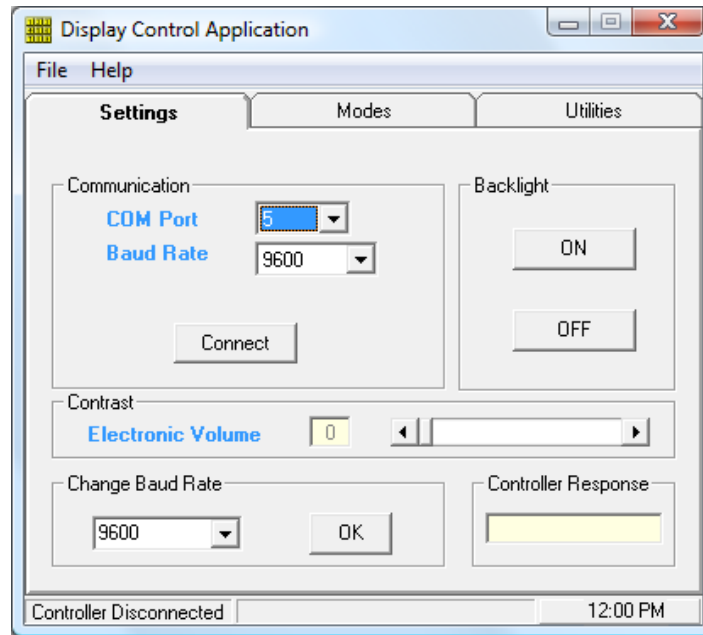
To establish communication with LCD controller:
1. Select COM port.
2. Select Baud Rate.
3. Click Connect.

Program will verify a physical connection with LCD controller. If the selected COM port is busy, the Critical Error message will appear.

Statement 1-1 Critical Error

If the selected COM port is busy (open), try to connect to a different COM port. If no connection is detected, the Demo Mode message will appear.

Statement 1-2 Demo Mode

Backlight section allows turning ON and OFF backlight.

Contrast controls liquid crystal drive voltage V3 issued from the built-in LCD power supply voltage regulating circuit and adjusts the LCD density (contrast). Change Electronic Volume va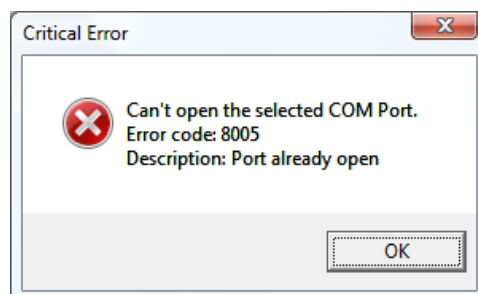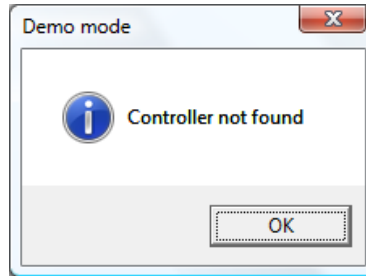lue by moving horizontal slider to the appropriate position. The V3 value is stored and will default to the stored value.

The program loads with a default 9600bps Baud Rate. The Change Baud Rate section allows establishing communication with the controller at a different Baud Rate. Select required Baud Rate from a drop down menu and click OK. The Attention message will appear on the screen. Remove jumper from J7 header and click OK. The baud rate is stored and will default to the stored value. The software will automatically establish communication with the controller.

Statement 1-3 Attention
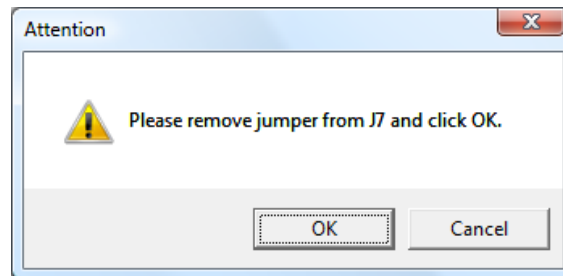
Controller Response section displays the controller response and is updated every time touch on the touch screen is detected or when controller is ready for a next command. The controller will respond with an exclamation mark "!" (0x21) when it's ready for the next command.

1.2. DCA 160X128 MODES

Modes tab contains Text, Graphic and Coordinates groups.

Figure 1-2 Text Screen
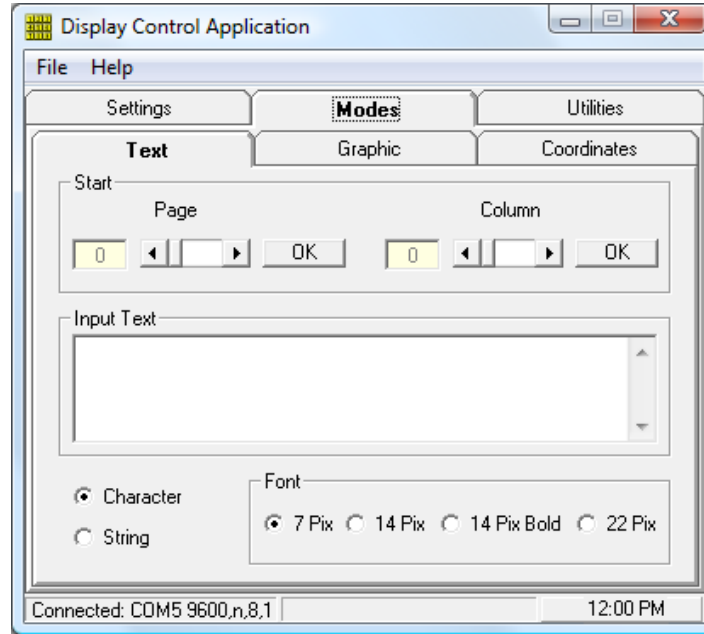
Text tab allows sending single character or text string to the LCD and selecting font sizes: 7 pixels (H), 14 pixels (H), 14 pixels (H) Bold and 22 pixels (H). Different font sizes can be freely mixed on the screen.

Start section allows selecting Start Page and Start Column values. Select Page and Column addresses by moving horizontal sliders to the appropriate positions. Pressing OK next to the Page will send a Start Page address. Pressing OK next to the Column will send a Start Column address.

Figure 1-3 Graphic Screen
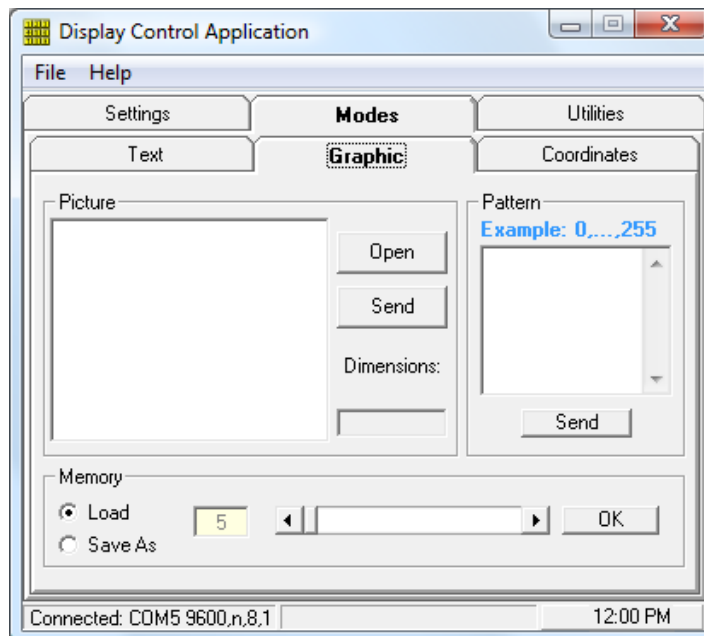
Picture section allows displaying 160x128 pixels bmp pictures and sending them to the screen. Press Open File to open an image file from your PC. The selected picture will show up in the provided window. Pressing Send will send the picture to the controller. Pressing Send while the touch screen is enabled will disable the touch screen. To enable the touch screen, appropriate command is required.

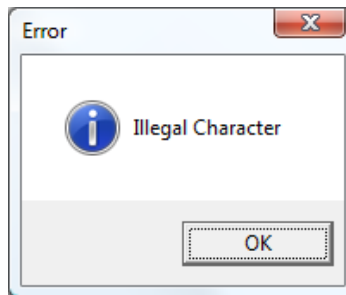Pattern section allows sending graphic patterns to LCD. Input any number from 0 to 255 in the provided window, use comma as a delimiter (Example: 1,5). If inappropriate character was entered, the Error message will appear. Pressing Send will send data to the controller.

Statement 1-4 Error

Memory section allows loading and saving images to and from Flash memory. To Load image from Flash, select Load and specify Screen # by moving horizontal slider to the appropriate position. Pressing OK will send the appropriate command to the controller.

To Save an image to Flash select Save As and specify Screen # by moving horizontal slider to the appropriate position. To prevent an accidental overwriting of the existing screen, the program requires a confirmation every time OK is pressed.
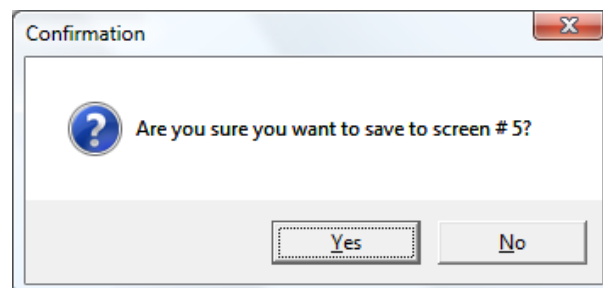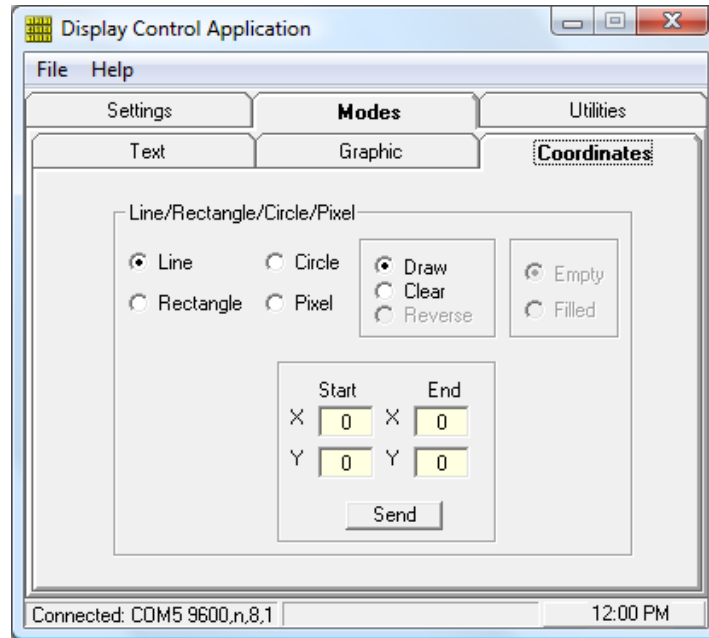
Statement 1-5 Confirmation

Figure 1-4 Coordinates Screen

Coordinates tab allows turning ON/OFF any pixel on the screen and drawing lines, rectangles and circles.

To draw a line: select Line, Draw, enter Start and End coordinates and click Send.
To clear a line: select Line, Clear, enter Start and End coordinates and click Send.

Selecting Rectangle will activate Empty and Filled buttons.
To draw an empty rectangle: select Rectangle, Draw, Empty, enter Start (upper left corner of the rectangle) and End (lower right corner of the rectangle) coordinates and click Send.
To clear an empty rectangle: select Rectangle, Clear, Empty, enter Start (upper left corner of the rectangle) and End (lower right corner of the rectangle) coordinates and click Send.
To draw a filled rectangle: select Rectangle, Draw, Filled, enter Start (upper left corner of the rectangle) and End (lower right corner of the rectangle) coordinates and click Send.
To clear a filled rectangle: select Rectangle, Clear, Filled, enter Start (upper left corner of the rectangle) and End (lower right corner of the rectangle) coordinates and click Send.
To reverse pixels of the specified rectangle: select Rectangle, Reverse, enter Start (upper left corner of the rectangle) and End (lower right corner of the rectangle) coordinates and click Send.
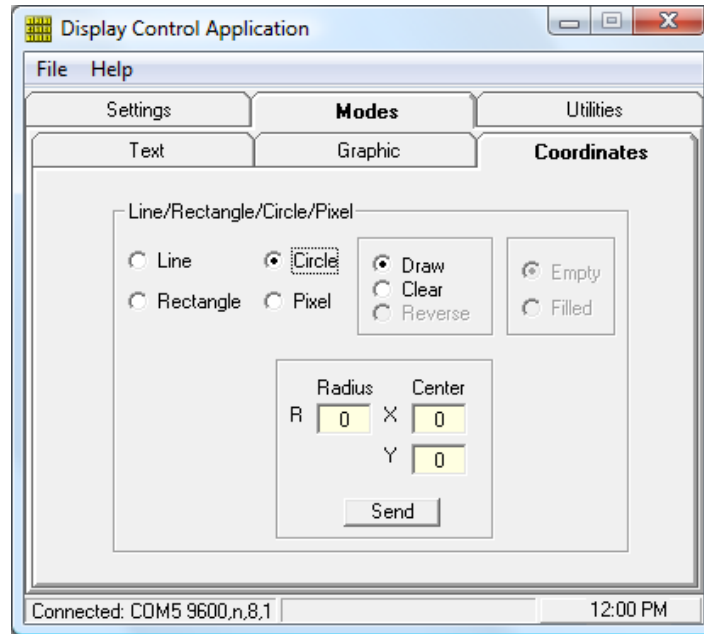
Selecting Circle will change the Coordinates tab appearance.

Figure 1-5 Coordinates Circle

To draw a circle: select Circle, Draw, enter Radius and Center (of the circle) coordinate and click Send.
To clear a circle: select Circle, Clear, enter Radius and Center (of the circle) coordinate and click Send.

To work with pixels: select Pixel, enter XY coordinates and press Send. XY values will be sent to the controller.
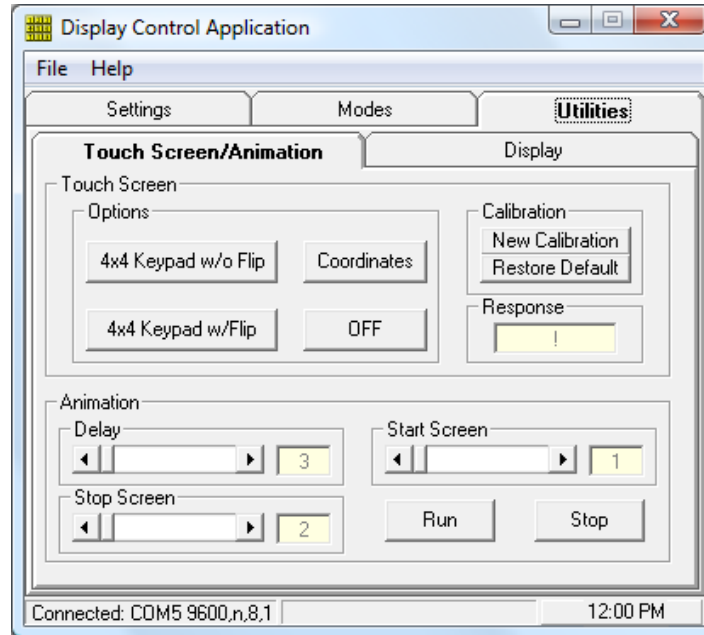
Figure 1-6 Coordinates Pixel
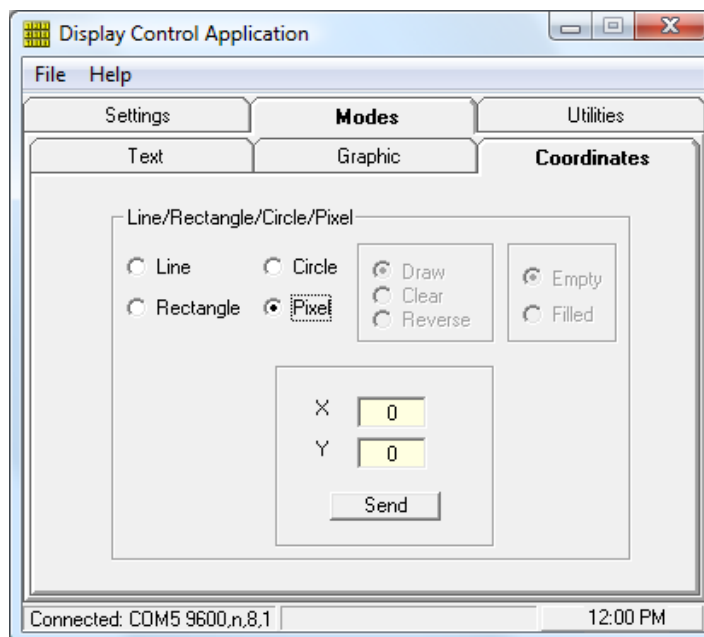
1.3. DCA 160X128 UTILITIES

Utilities tab contains Touch Screen/Animation and Display sections.

Figure 1-7 Touch Screen/Animation Screen

Touch Screen section allows selecting of the required touch screen response. By selecting 4x4 Keypad w/o Flip, the controller will send decimal value for each of 16 keypad boxes, see 4x4 Keypad Example.

By selecting 4x4 Keypad w/Flip, the controller will produce the same results as 4x4 w/o Flip, in addition it will reverse color of a keypad box.

Example 1-1 4x4 Keypad

By selecting Coordinates, the controller will respond by sending XY coordinates of a touch location.

Pressing OFF will turn OFF the touch screen.

The calibration routine is provided to compensate for the normal touch screen variation. Touch Screen Calibration section allows calibrating the touch screen or restoring Factory Default calibration.

Controller Response section displays the controller's response and is updated every time touch on the touch screen is detected or when controller is ready for a next

command. The controller will respond with an exclamation mark "!" (0x21) when it's ready for the next command.

Animation section allows selecting Delay, Start Screen and Stop Screen. Stop Screen value must be greater than Start Screen value, otherwise Animation command will be ignored by the controller. Delay is a time gap between alternations of screens. By clicking Run, the program will send an appropriate command with a specified Delay, Start Screen and Stop Screen values. Any command sent to the controller while animation is running will stop the animation and clear the screen.

Figure 1-8 Display Screen
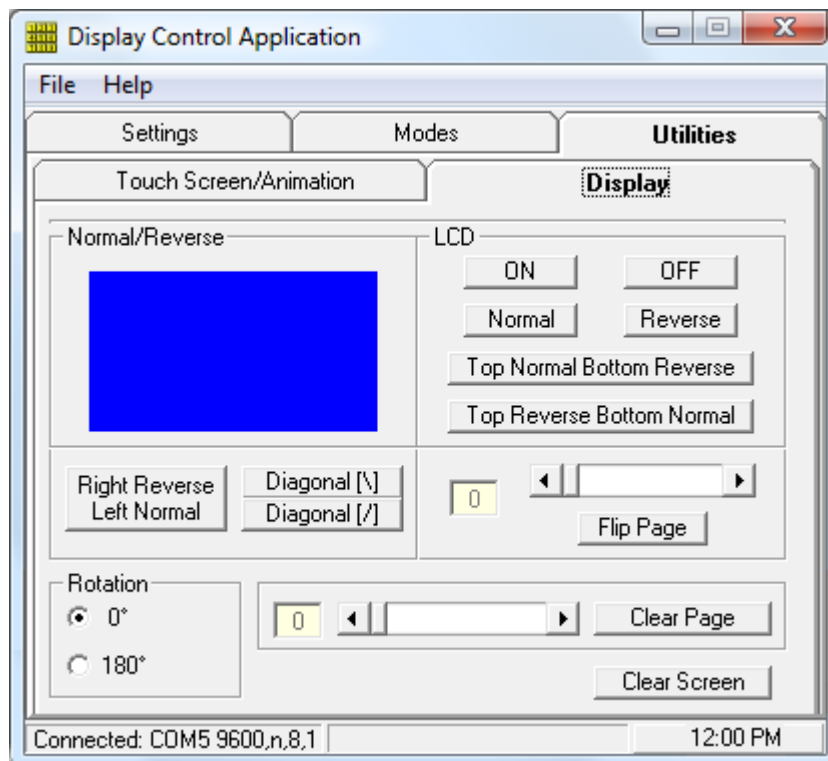
The Display section allows Normal/Reverse modes of the LCD. These modes are executed by LCD drive and allow the display ON/OFF state to be reversed without having to rewrite the contents of the display data RAM. In this case contents of the display data RAM are maintained. All other commands will rewrite the display data RAM.

The Top (8 pages) Normal Bottom (8 pages) Reverse will reverse lower half of the display while Top Reverse Bottom Normal will do the opposite. Right (80 columns) Reverse Left (80 columns) Normal, Diagonal [/], Diagonal [\] commands will reverse the display colors accordingly.

To put an LCD to a power-save mode use Display OFF button. The LCD RAM will maintain the existing data. To return back to normal state use Display ON button.

Clear Screen will clear the LCD screen.

Flip Page will reverse color of the selected page. To specify page, move horizontal slider to the appropriate position and click Flip Page. Clear Page will clear the contents of the specified page only.

Rotation 0° / 180° will rotate the screen to 0° or 180° accordingly.