TransChip

TC574X Dynamic OSD API

Revision Log

Revision	Description	Date
1.0	Initial version	12 January 2005
1.1	Updates.	6 March 2005

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1. Introduction

TransChip's TC5740 and TC5747 modules are equipped with an API enabling OSD functions such as the overlaying of icons and frames on images captured by the sensor. A database containing a selection of icons and frames is included. Users can also design their own icons and frames and add them to the database.

The OSD API has recently been expanded to include additional functionality, namely changing the on-screen display from horizontal to vertical (and vice versa) during runtime. This is done by switching between horizontal and vertical LCD scanning. The end user benefits from a constant OSD and the display change from horizontal to vertical (or vice versa) is transparent.

This document explains how to implement the new OSD API functions and provides two examples. For more information about the OSD API or about the other API functions provided with the TC5740/5747, please see the TC574x Programmer's Reference.

2. Changing the OSD Scanning Direction

The Dynamic OSD API allows users to change the on-screen display from horizontal to vertical during runtime. This change is required when switching from vertical to horizontal LCD scanning.

2.1 Requirements

In order to switch between horizontal and vertical OSD during runtime, you will need the following:

- Install TransChip SDK and firmware version 3.34 or higher, as relevant for your module.
- Add icons and frames to the OSD database for use after switching OSD modes. For example, if your OSD is normally horizontal, you'll need additional icons designed for a vertical OSD.

2.2 Changes to the SDK

The following changes were made to the SDK in order to enable the dynamic OSD feature:

- OSD functions for both horizontal and vertical modes are now located in `TCosd.c`. The files `TCosd_h.c` and `TCosd_v.c` were removed from the library.
- For the OSD database init parameters, either `TCosdVDB.h` or `TCosdHDB.h` can be used.
- The following files were updated: `custDef.h`, `TC574xApi.h`, `TchstCom.c`, `TCosd.c`, `TCosd.h` and `TCosdVDB.h`.
- The API function `TCosdSystemSet()` was added:

```
int TCosdSystemSet (TCsystem ucTCosdSystem)
```

// Sets global enum `TCsystem` to one of the following:

```
typedef enum
{
TCIF_HORIZONTAL_OSD_SYSTEM,
TCIF_VERTICAL_OSD_SYSTEM
}TCsystem;
```

// Once the `TCSystem` enum is set, all OSD API functions called are applied according to the selected mode.

2.3 Main Steps

To change the on-screen display from vertical to horizontal:

1. **Disable and reset the OSD** by calling the API functions `TCosdDisableAll()`, and `TCosdReset()`.
2. **Set the desired OSD mode** (horizontal or vertical) using `TCosdSystemSet()`, which takes the enums `TCIF_HORIZONTAL_OSD_SYSTEM` or `TCIF_VERTICAL_OSD_SYSTEM`.
3. **Modify the relevant OSD database parameters** such as the size and position of header and footer regions and bars so as to comply with the selected OSD mode. Call the functions `TCosdModifyDBregion()` and `TCosdModifyDBbars()`.
4. **Initialize the OSD** by calling `TCosdInit()`.
5. **Enable display elements** such as icons, bars, timestamps and frames by calling the API functions `TCosdEnableIcon()`, `TCosdEnablebar()`.

3. Example: Switching from Vertical to Horizontal OSD Mode

Suppose a given handset normally scans images vertically. Its preview dimensions are 160 x 120. However, for a particular application, end users require a window size of 120 x 160 displaying a horizontally scanned image with three icons in the footer bar: save, stop and exit. After exiting the application, the LCD must revert to its normal vertical preview mode.

The following code sample illustrates how to switch the OSD mode from vertical to horizontal.

```
void DSC_osdPrepareForHorizontalWxHdecomp(int w,int h,unsigned char HorJpeg)
{
            TcRegionStruct  tR;
            TcIconStruct    tI;
            TcBarStruct     tB;
            TCosdDisableAll();

            TCosdSystemSet(TCIF_HORIZONTAL_OSD_SYSTEM); //Switch to horizontal OSD mode

               tR.pos.x = 0;
               tR.pos.y = 0;
               tR.size.x = w;
               tR.size.y = h;

            TCosdModifyDBregion(RGN_FRAME,&tR); // Modify frame

               if (HorJpeg) {
                  tR.pos.x = (w-h)/2;
                  tR.pos.y = h-16;
                  tR.size.x = h;
                  tR.size.y = 16;
               }
               else     {
                  tR.pos.x = 0;
                  tR.pos.y = h-16;
                  tR.size.x = w;
                  tR.size.y = 16;
               }
```

```
    TCosdModifyDBregion(RGN_FOOTER_BAR,&tR); // Modify footer bar

       tB.pos = tR.pos;
       tB.size = tR.size;
       TCosdModifyDBbars(FOOTER_BAR,&tB);

    TCosdInit(); // Initialize OSD

    TCosdEnableIcon(ICN_STOP_HOR,TRUE); // Enable icons for horizontal display
    TCosdEnableIcon(ICN_SAVE_HOR,TRUE);
    TCosdEnableIcon(ICN_BACK_HOR,TRUE);
    TCosdEnableBar(FOOTER_BAR,TRUE);

}
```

The following figure illustrates the OSD regions set by the code:

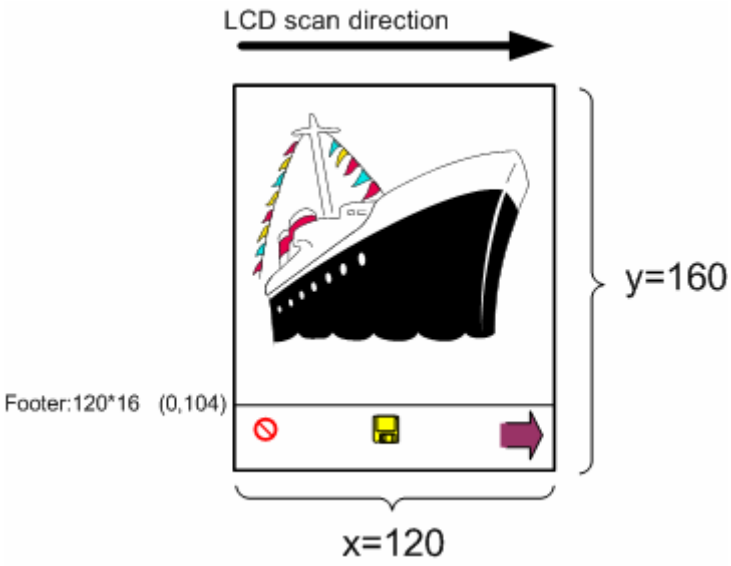

Figure 1: Illustration of Horizontal OSD system

4. Example: Switching from Horizontal to Vertical OSD Mode

Prior to reverting to normal vertical preview mode (160 x 120), the OSD must be set back to vertical.

When setting the OSD mode to vertical, the x and y axes are swapped, `i.e.size.x=vertical_size.y` and `size.y=vertical_size.x`, etc.

The following code sample illustrates how to switch the OSD mode from horizontal to vertical.

```
void DSC_osdBack2Vertical(int w,int h)
{
            TcRegionStruct tR;
            TcIconStruct   tI;
            TcBarStruct    tB;

            TCosdDisableAll();

            TCosdSystemSet(TCIF_VERTICAL_OSD_SYSTEM); // Switch to vertical OSD mode

               tR.pos.x = 0;
               tR.pos.y = 0;
               tR.size.x = h; // The firmware swaps these values when in vertical OSD mode
               tR.size.y = w;

            TCosdModifyDBregion(RGN_FRAME,&tR); // Set the database region

               tR.pos.x = 0;
               tR.pos.y = w-16;
               tR.size.x = h; // The firmware swaps these values when in vertical OSD mode
               tR.size.y = 16;

            TCosdModifyDBregion(RGN_FOOTER_BAR,&tR); // Set footer region

               tB.pos = tR.pos;
               tB.size = tR.size;
               TCosdModifyDBbars(FOOTER_BAR,&tB); // Set footer bar
```

```
TCosdInit();
            TCosdEnableIcon(ICN_OPTIONS,TRUE);  // Enable icons for horizontal display
            TCosdEnableIcon(ICN_BACK,TRUE);
            TCosdEnableBar(FOOTER_BAR,TRUE);

}
```

The following figure illustrates the OSD regions set by the code:

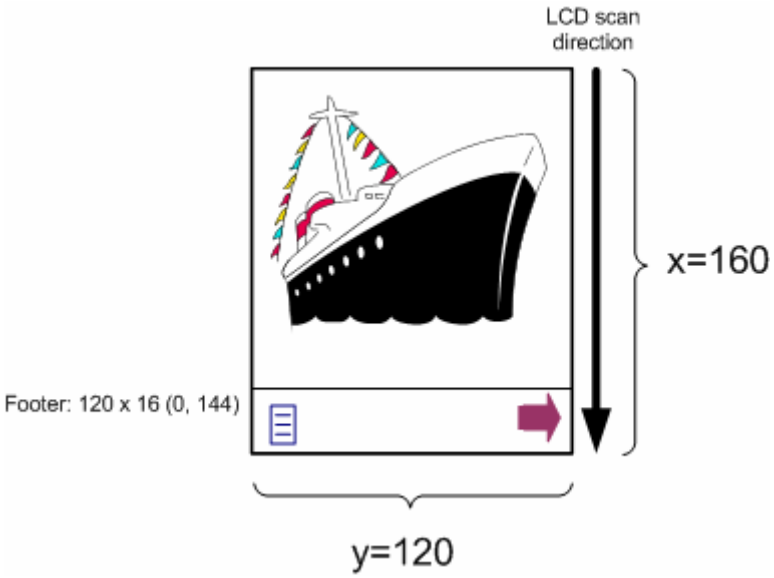

Figure 2:: Illustration of Vertical OSD system