

# TV-OUT Driver for MX31

## *Freescale Semiconductor*

### *Linux BSP*

## 1. Hardware Operation

The detailed hardware operation of TV-Out is detailed in the hardware documentation.

i.MX31_L3_1.42.pdf	Chip specification
FS453-4+FS455-6_HW_v30.pdf	FS453 TV encoder documentation
FS453-4+FS455-6_SW_v30.pdf	FS453 TV encoder documentation
SC16C2552-03.pdf	TV Encoder Card schematics

## 2. Software Operation

Video Modes:

- 640x480 unscaled 60 Hz VGA non-interlaced
- 640x480 scaled to NTSC Television
- 640x480 scaled to PAL Television

## 3. Source Code Structure Configuration

The driver source is maintained in the Linux kernel source tree.

Source file	Purpose
drivers/video/mxc/mxcfb.c	The main frame buffer driver
drivers/video/mxc/mxcfb.h	Associated header file
drivers/video/mxc/fs453.c	Focus FS453/4 television encoder driver
drivers/video/mxc/fs453.h	Associated header file

## 4. Linux Menu Configuration Options

These options are selectable under Device Drivers ---> Graphics support ---> Synchronous Panels

Option	Values	Default value	Description
CONFIG_FB_MXC_TVOUT	y/n/m	n	Enables the driver
CONFIG_FB_MXC_TVOUT_NTSC	y/n	n	Selects NTSC mode

CONFIG_FB_MXC_TVOUT_PAL	y/n	n	Selects PAL mode
CONFIG_FB_MXC_TVOUT_VGA	y/n	n	Selects VGA mode

## 5. Board Configuration Options

Switch or jumper	TV-Out setting	Function
CPU board JP1	Jumper 2-3	Enables 27 MHz system clock from TV-Out card
Base board SW3-4	Set to Off	Tells Redboot to use 27 MHz settings
Base board JP6	Jumper 2-3	Enables I2C1 CLK to TV-Out card
Base board JP7	Jumper 2-3	Enables I2C1 DATA to TV-Out card

## 6. Programming Interface

Same as mxcfb driver module. See chapter 6.

## 7. Usage Example

For each television mode (VGA, NTSC and PAL), do this:

- Configure the driver for the desired television mode. Be sure to select 24bpp.
- Enable the tvout-test-mx31 package under LTIB
- Build and deploy the target image
- Connect a monitor for VGA, or a television or projector for NTSC or PAL
- Boot the target. Check for redboot message: "Clock input is 27MHz"
- Log in as root
- Enter the command " tvout-test-mx31"
- Verify correct picture and stable sync on the screen (shown below)

