

The VPBE V4L2 driver design

Functional partitioning

Consists of the following:

1. V4L2 display driver

Implements creation of video2 and video3 device nodes and provides v4l2 device interface to manage VID0 and VID1 layers.

2. Display controller

Loads up VENC, OSD and external encoders such as ths8200. It provides a set of API calls to V4L2 drivers to set the output/standards in the VENC or external sub devices. It also provides a device object to access the services from OSD subdevice using sub device ops. The connection of external encoders to VENC LCD controller port is done at init time based on default output and standard selection or at run time when application change the output through V4L2 IOCTLs.

When connected to an external encoder, vpbe controller is also responsible for setting up the interface between VENC and external encoders based on board specific settings (specified in board-xxx-evm.c). This allows interfacing external encoders such as ths8200. The `setup_if_config()` is implemented for this as well as `configure_venc()` (part of the next patch) API to set timings in VENC for a specific display resolution. As of this patch series, the interconnection and enabling and setting of the external encoders is not present, and would be a part of the next patch series.

3. VENC subdevice module

Responsible for setting outputs provided through internal DACs and also setting timings at LCD controller port when external encoders are connected at the port or LCD panel timings required. When external encoder/LCD panel is connected, the timings for a specific standard/preset is retrieved from the board specific table and the values are used to set the timings in venc using non-standard timing mode.

Support LCD Panel displays using the VENC. For example to support a Logic PD display, it requires setting up the LCD controller port with a set of timings for the resolution supported and setting the dot clock. So we could add the available outputs as a board specific entry (i.e add the "LogicPD" output name to board-xxx-evm.c). A table of timings for various LCDs supported can be maintained in the board specific setup file to support various LCD displays. As of this patch a basic driver is present, and this support for external encoders and displays forms a part of the next patch series.

4. OSD module

OSD module implements all OSD layer management and hardware specific features. The VPBE module interacts with the OSD for enabling and disabling appropriate features of the OSD.

Current status

A fully functional working version of the V4L2 driver is available. This driver has been tested with NTSC and PAL standards and buffer streaming.