

Mode Setting Helper Functions

The DRM subsystem aims for a strong separation between core code and helper libraries. Core code takes care of general setup and teardown and decoding userspace requests to kernel internal objects. Everything else is handled by a large set of helper libraries, which can be combined freely to pick and choose for each driver what fits, and avoid shared code where special behaviour is needed.

This distinction between core code and helpers is especially strong in the modesetting code, where there's a shared userspace ABI for all drivers. This is in contrast to the render side, where pretty much everything (with very few exceptions) can be considered optional helper code.

There are a few areas these helpers can be grouped into:

- Helpers to implement modesetting. The important ones here are the atomic helpers. Old drivers still often use the legacy CRTC helpers. They both share the same set of common helper vtables. For really simple drivers (anything that would have been a great fit in the deprecated fbdev subsystem) there's also the simple display pipe helpers.
- There's a big pile of helpers for handling outputs. First the generic bridge helpers for handling encoder and transcoder IP blocks. Second the panel helpers for handling panel-related information and logic. Plus then a big set of helpers for the various sink standards (DisplayPort, HDMI, MIPI DSI). Finally there's also generic helpers for handling output probing, and for dealing with EDIDs.
- The last group of helpers concerns itself with the frontend side of a display pipeline: Planes, handling rectangles for visibility checking and scissoring, flip queues and assorted bits.

Modeset Helper Reference for Common Vtables

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\gpu\linux-master) [Documentation] [gpu] drm-kms-helpers.rst, line 39)

Unknown directive type "kernel-doc".

```
.. kernel-doc:: include/drm/drm_modeset_helper_vtables.h
   :doc: overview
```

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\gpu\linux-master) [Documentation] [gpu] drm-kms-helpers.rst, line 42)

Unknown directive type "kernel-doc".

```
.. kernel-doc:: include/drm/drm_modeset_helper_vtables.h
   :internal:
```

Atomic Modeset Helper Functions Reference

Overview

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\gpu\linux-master) [Documentation] [gpu] drm-kms-helpers.rst, line 53)

Unknown directive type "kernel-doc".

```
.. kernel-doc:: drivers/gpu/drm/drm_atomic_helper.c
   :doc: overview
```

Implementing Asynchronous Atomic Commit

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\gpu\linux-master) [Documentation] [gpu] drm-kms-helpers.rst, line 59)

Unknown directive type "kernel-doc".

```
.. kernel-doc:: drivers/gpu/drm/drm_atomic_helper.c
   :doc: implementing nonblocking commit
```

Helper Functions Reference

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\gpu\linux-master) [Documentation] [gpu] drm-kms-helpers.rst, line 65)

Unknown directive type "kernel-doc".

```
.. kernel-doc:: include/drm/drm_atomic_helper.h
   :internal:
```

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\gpu\linux-master) [Documentation] [gpu] drm-kms-helpers.rst, line 68)

Unknown directive type "kernel-doc".

```
.. kernel-doc:: drivers/gpu/drm/drm_atomic_helper.c
   :export:
```

Atomic State Reset and Initialization

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\gpu\linux-master) [Documentation] [gpu] drm-kms-helpers.rst, line 74)

Unknown directive type "kernel-doc".

```
.. kernel-doc:: drivers/gpu/drm/drm_atomic_state_helper.c
   :doc: atomic state reset and initialization
```

Atomic State Helper Reference

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\gpu\linux-master) [Documentation] [gpu] drm-kms-helpers.rst, line 80)

Unknown directive type "kernel-doc".

```
.. kernel-doc:: drivers/gpu/drm/drm_atomic_state_helper.c
   :export:
```

GEM Atomic Helper Reference

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\gpu\linux-master) [Documentation] [gpu] drm-kms-helpers.rst, line 86)

Unknown directive type "kernel-doc".

```
.. kernel-doc:: drivers/gpu/drm/drm_gem_atomic_helper.c
   :doc: overview
```

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\gpu\linux-master) [Documentation] [gpu] drm-kms-helpers.rst, line 89)

Unknown directive type "kernel-doc".

```
.. kernel-doc:: include/drm/drm_gem_atomic_helper.h
   :internal:
```

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\gpu\linux-master) [Documentation] [gpu] drm-kms-helpers.rst, line 92)

Unknown directive type "kernel-doc".

```
.. kernel-doc:: drivers/gpu/drm/drm_gem_atomic_helper.c
   :export:
```

Simple KMS Helper Reference

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\gpu\linux-master [Documentation] [gpu] drm-kms-helpers.rst, line 98)

Unknown directive type "kernel-doc".

```
.. kernel-doc:: drivers/gpu/drm/drm_simple_kms_helper.c
:doc: overview
```

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\gpu\linux-master [Documentation] [gpu] drm-kms-helpers.rst, line 101)

Unknown directive type "kernel-doc".

```
.. kernel-doc:: include/drm/drm_simple_kms_helper.h
:internal:
```

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\gpu\linux-master [Documentation] [gpu] drm-kms-helpers.rst, line 104)

Unknown directive type "kernel-doc".

```
.. kernel-doc:: drivers/gpu/drm/drm_simple_kms_helper.c
:export:
```

fbdev Helper Functions Reference

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\gpu\linux-master [Documentation] [gpu] drm-kms-helpers.rst, line 110)

Unknown directive type "kernel-doc".

```
.. kernel-doc:: drivers/gpu/drm/drm_fb_helper.c
:doc: fbdev helpers
```

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\gpu\linux-master [Documentation] [gpu] drm-kms-helpers.rst, line 113)

Unknown directive type "kernel-doc".

```
.. kernel-doc:: include/drm/drm_fb_helper.h
:internal:
```

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\gpu\linux-master [Documentation] [gpu] drm-kms-helpers.rst, line 116)

Unknown directive type "kernel-doc".

```
.. kernel-doc:: drivers/gpu/drm/drm_fb_helper.c
:export:
```

format Helper Functions Reference

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\gpu\linux-master [Documentation] [gpu] drm-kms-helpers.rst, line 122)

Unknown directive type "kernel-doc".

```
.. kernel-doc:: drivers/gpu/drm/drm_format_helper.c
:export:
```

Framebuffer CMA Helper Functions Reference

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-

master\Documentation\gpu\[linux-master] [Documentation] [gpu]drm-kms-helpers.rst, line 128)

Unknown directive type "kernel-doc".

```
.. kernel-doc:: drivers/gpu/drm/drm_fb_cma_helper.c
   :doc: framebuffer cma helper functions
```

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\gpu\[linux-master] [Documentation] [gpu]drm-kms-helpers.rst, line 131)

Unknown directive type "kernel-doc".

```
.. kernel-doc:: drivers/gpu/drm/drm_fb_cma_helper.c
   :export:
```

Framebuffer GEM Helper Reference

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\gpu\[linux-master] [Documentation] [gpu]drm-kms-helpers.rst, line 137)

Unknown directive type "kernel-doc".

```
.. kernel-doc:: drivers/gpu/drm/drm_gem_framebuffer_helper.c
   :doc: overview
```

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\gpu\[linux-master] [Documentation] [gpu]drm-kms-helpers.rst, line 140)

Unknown directive type "kernel-doc".

```
.. kernel-doc:: drivers/gpu/drm/drm_gem_framebuffer_helper.c
   :export:
```

Bridges

Overview

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\gpu\[linux-master] [Documentation] [gpu]drm-kms-helpers.rst, line 151)

Unknown directive type "kernel-doc".

```
.. kernel-doc:: drivers/gpu/drm/drm_bridge.c
   :doc: overview
```

Display Driver Integration

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\gpu\[linux-master] [Documentation] [gpu]drm-kms-helpers.rst, line 157)

Unknown directive type "kernel-doc".

```
.. kernel-doc:: drivers/gpu/drm/drm_bridge.c
   :doc: display driver integration
```

Special Care with MIPI-DSI bridges

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\gpu\[linux-master] [Documentation] [gpu]drm-kms-helpers.rst, line 163)

Unknown directive type "kernel-doc".

```
.. kernel-doc:: drivers/gpu/drm/drm_bridge.c
   :doc: special care dsi
```

Bridge Operations

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\gpu\linux-master [Documentation] [gpu]drm-kms-helpers.rst, line 169)

Unknown directive type "kernel-doc".

```
.. kernel-doc:: drivers/gpu/drm/drm_bridge.c
   :doc: bridge operations
```

Bridge Connector Helper

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\gpu\linux-master [Documentation] [gpu]drm-kms-helpers.rst, line 175)

Unknown directive type "kernel-doc".

```
.. kernel-doc:: drivers/gpu/drm/drm_bridge_connector.c
   :doc: overview
```

Bridge Helper Reference

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\gpu\linux-master [Documentation] [gpu]drm-kms-helpers.rst, line 182)

Unknown directive type "kernel-doc".

```
.. kernel-doc:: include/drm/drm_bridge.h
   :internal:
```

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\gpu\linux-master [Documentation] [gpu]drm-kms-helpers.rst, line 185)

Unknown directive type "kernel-doc".

```
.. kernel-doc:: drivers/gpu/drm/drm_bridge.c
   :export:
```

Bridge Connector Helper Reference

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\gpu\linux-master [Documentation] [gpu]drm-kms-helpers.rst, line 191)

Unknown directive type "kernel-doc".

```
.. kernel-doc:: drivers/gpu/drm/drm_bridge_connector.c
   :export:
```

Panel-Bridge Helper Reference

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\gpu\linux-master [Documentation] [gpu]drm-kms-helpers.rst, line 197)

Unknown directive type "kernel-doc".

```
.. kernel-doc:: drivers/gpu/drm/bridge/panel.c
   :export:
```

Panel Helper Reference

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\gpu\linux-master [Documentation] [gpu]drm-kms-helpers.rst, line 205)

Unknown directive type "kernel-doc".

```
.. kernel-doc:: drivers/gpu/drm/drm_panel.c
:doc: drm panel
```

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\gpu\linux-master) [Documentation] [gpu] drm-kms-helpers.rst, line 208)

Unknown directive type "kernel-doc".

```
.. kernel-doc:: include/drm/drm_panel.h
:internal:
```

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\gpu\linux-master) [Documentation] [gpu] drm-kms-helpers.rst, line 211)

Unknown directive type "kernel-doc".

```
.. kernel-doc:: drivers/gpu/drm/drm_panel.c
:export:
```

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\gpu\linux-master) [Documentation] [gpu] drm-kms-helpers.rst, line 214)

Unknown directive type "kernel-doc".

```
.. kernel-doc:: drivers/gpu/drm/drm_panel_orientation_quirks.c
:export:
```

Panel Self Refresh Helper Reference

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\gpu\linux-master) [Documentation] [gpu] drm-kms-helpers.rst, line 220)

Unknown directive type "kernel-doc".

```
.. kernel-doc:: drivers/gpu/drm/drm_self_refresh_helper.c
:doc: overview
```

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\gpu\linux-master) [Documentation] [gpu] drm-kms-helpers.rst, line 223)

Unknown directive type "kernel-doc".

```
.. kernel-doc:: drivers/gpu/drm/drm_self_refresh_helper.c
:export:
```

HDCP Helper Functions Reference

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\gpu\linux-master) [Documentation] [gpu] drm-kms-helpers.rst, line 229)

Unknown directive type "kernel-doc".

```
.. kernel-doc:: drivers/gpu/drm/drm_hdcp.c
:export:
```

Display Port Helper Functions Reference

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\gpu\linux-master) [Documentation] [gpu] drm-kms-helpers.rst, line 235)

Unknown directive type "kernel-doc".

```
.. kernel-doc:: drivers/gpu/drm/dp/drm_dp.c
:doc: dp helpers
```

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\gpu\linux-master [Documentation] [gpu] drm-kms-helpers.rst, line 238)

Unknown directive type "kernel-doc".

```
.. kernel-doc:: include/drm/dp/drm_dp_helper.h
:internal:
```

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\gpu\linux-master [Documentation] [gpu] drm-kms-helpers.rst, line 241)

Unknown directive type "kernel-doc".

```
.. kernel-doc:: drivers/gpu/drm/dp/drm_dp.c
:export:
```

Display Port CEC Helper Functions Reference

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\gpu\linux-master [Documentation] [gpu] drm-kms-helpers.rst, line 247)

Unknown directive type "kernel-doc".

```
.. kernel-doc:: drivers/gpu/drm/dp/drm_dp_cec.c
:doc: dp cec helpers
```

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\gpu\linux-master [Documentation] [gpu] drm-kms-helpers.rst, line 250)

Unknown directive type "kernel-doc".

```
.. kernel-doc:: drivers/gpu/drm/dp/drm_dp_cec.c
:export:
```

Display Port Dual Mode Adaptor Helper Functions Reference

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\gpu\linux-master [Documentation] [gpu] drm-kms-helpers.rst, line 256)

Unknown directive type "kernel-doc".

```
.. kernel-doc:: drivers/gpu/drm/dp/drm_dp_dual_mode_helper.c
:doc: dp dual mode helpers
```

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\gpu\linux-master [Documentation] [gpu] drm-kms-helpers.rst, line 259)

Unknown directive type "kernel-doc".

```
.. kernel-doc:: include/drm/dp/drm_dp_dual_mode_helper.h
:internal:
```

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\gpu\linux-master [Documentation] [gpu] drm-kms-helpers.rst, line 262)

Unknown directive type "kernel-doc".

```
.. kernel-doc:: drivers/gpu/drm/dp/drm_dp_dual_mode_helper.c
:export:
```

Display Port MST Helpers

Overview

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\gpu\linux-master) [Documentation] [gpu]drm-kms-helpers.rst, line 271)

Unknown directive type "kernel-doc".

```
.. kernel-doc:: drivers/gpu/drm/dp/drm_dp_mst_topology.c
   :doc: dp mst helper
```

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\gpu\linux-master) [Documentation] [gpu]drm-kms-helpers.rst, line 274)

Unknown directive type "kernel-doc".

```
.. kernel-doc:: drivers/gpu/drm/dp/drm_dp_mst_topology.c
   :doc: Branch device and port refcounting
```

Functions Reference

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\gpu\linux-master) [Documentation] [gpu]drm-kms-helpers.rst, line 280)

Unknown directive type "kernel-doc".

```
.. kernel-doc:: include/drm/dp/drm_dp_mst_helper.h
   :internal:
```

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\gpu\linux-master) [Documentation] [gpu]drm-kms-helpers.rst, line 283)

Unknown directive type "kernel-doc".

```
.. kernel-doc:: drivers/gpu/drm/dp/drm_dp_mst_topology.c
   :export:
```

Topology Lifetime Internals

These functions aren't exported to drivers, but are documented here to help make the MST topology helpers easier to understand

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\gpu\linux-master) [Documentation] [gpu]drm-kms-helpers.rst, line 292)

Unknown directive type "kernel-doc".

```
.. kernel-doc:: drivers/gpu/drm/dp/drm_dp_mst_topology.c
   :functions: drm_dp_mst_topology_try_get_mstb drm_dp_mst_topology_get_mstb
               drm_dp_mst_topology_put_mstb
               drm_dp_mst_topology_try_get_port drm_dp_mst_topology_get_port
               drm_dp_mst_topology_put_port
               drm_dp_mst_get_mstb_malloc drm_dp_mst_put_mstb_malloc
```

MIPI DBI Helper Functions Reference

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\gpu\linux-master) [Documentation] [gpu]drm-kms-helpers.rst, line 302)

Unknown directive type "kernel-doc".

```
.. kernel-doc:: drivers/gpu/drm/drm_mipi_dbi.c
   :doc: overview
```

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-

master\Documentation\gpu\[linux-master] [Documentation] [gpu]drm-kms-helpers.rst, line 305)

Unknown directive type "kernel-doc".

```
.. kernel-doc:: include/drm/drm_mipi_dbi.h
:internal:
```

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\gpu\[linux-master] [Documentation] [gpu]drm-kms-helpers.rst, line 308)

Unknown directive type "kernel-doc".

```
.. kernel-doc:: drivers/gpu/drm/drm_mipi_dbi.c
:export:
```

MIPI DSI Helper Functions Reference

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\gpu\[linux-master] [Documentation] [gpu]drm-kms-helpers.rst, line 314)

Unknown directive type "kernel-doc".

```
.. kernel-doc:: drivers/gpu/drm/drm_mipi_dsi.c
:doc: dsi helpers
```

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\gpu\[linux-master] [Documentation] [gpu]drm-kms-helpers.rst, line 317)

Unknown directive type "kernel-doc".

```
.. kernel-doc:: include/drm/drm_mipi_dsi.h
:internal:
```

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\gpu\[linux-master] [Documentation] [gpu]drm-kms-helpers.rst, line 320)

Unknown directive type "kernel-doc".

```
.. kernel-doc:: drivers/gpu/drm/drm_mipi_dsi.c
:export:
```

Display Stream Compression Helper Functions Reference

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\gpu\[linux-master] [Documentation] [gpu]drm-kms-helpers.rst, line 326)

Unknown directive type "kernel-doc".

```
.. kernel-doc:: drivers/gpu/drm/drm_dsc.c
:doc: dsc helpers
```

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\gpu\[linux-master] [Documentation] [gpu]drm-kms-helpers.rst, line 329)

Unknown directive type "kernel-doc".

```
.. kernel-doc:: include/drm/drm_dsc.h
:internal:
```

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\gpu\[linux-master] [Documentation] [gpu]drm-kms-helpers.rst, line 332)

Unknown directive type "kernel-doc".

```
.. kernel-doc:: drivers/gpu/drm/drm_dsc.c
```

```
:export:
```

Output Probing Helper Functions Reference

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\gpu\linux-master [Documentation] [gpu]drm-kms-helpers.rst, line 338)

Unknown directive type "kernel-doc".

```
.. kernel-doc:: drivers/gpu/drm/drm_probe_helper.c
:doc: output probing helper overview
```

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\gpu\linux-master [Documentation] [gpu]drm-kms-helpers.rst, line 341)

Unknown directive type "kernel-doc".

```
.. kernel-doc:: drivers/gpu/drm/drm_probe_helper.c
:export:
```

EDID Helper Functions Reference

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\gpu\linux-master [Documentation] [gpu]drm-kms-helpers.rst, line 347)

Unknown directive type "kernel-doc".

```
.. kernel-doc:: include/drm/drm_edid.h
:internal:
```

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\gpu\linux-master [Documentation] [gpu]drm-kms-helpers.rst, line 350)

Unknown directive type "kernel-doc".

```
.. kernel-doc:: drivers/gpu/drm/drm_edid.c
:export:
```

SCDC Helper Functions Reference

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\gpu\linux-master [Documentation] [gpu]drm-kms-helpers.rst, line 356)

Unknown directive type "kernel-doc".

```
.. kernel-doc:: drivers/gpu/drm/drm_scdc_helper.c
:doc: scdc helpers
```

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\gpu\linux-master [Documentation] [gpu]drm-kms-helpers.rst, line 359)

Unknown directive type "kernel-doc".

```
.. kernel-doc:: include/drm/drm_scdc_helper.h
:internal:
```

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\gpu\linux-master [Documentation] [gpu]drm-kms-helpers.rst, line 362)

Unknown directive type "kernel-doc".

```
.. kernel-doc:: drivers/gpu/drm/drm_scdc_helper.c
:export:
```

HDMI Infoframes Helper Reference

Strictly speaking this is not a DRM helper library but generally useable by any driver interfacing with HDMI outputs like v4l or also drivers. But it nicely fits into the overall topic of mode setting helper libraries and hence is also included here.

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\gpu\[linux-master] [Documentation] [gpu] drm-kms-helpers.rst, line 373)

Unknown directive type "kernel-doc".

```
.. kernel-doc:: include/linux/hdmi.h
   :internal:
```

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\gpu\[linux-master] [Documentation] [gpu] drm-kms-helpers.rst, line 376)

Unknown directive type "kernel-doc".

```
.. kernel-doc:: drivers/video/hdmi.c
   :export:
```

Rectangle Utilities Reference

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\gpu\[linux-master] [Documentation] [gpu] drm-kms-helpers.rst, line 382)

Unknown directive type "kernel-doc".

```
.. kernel-doc:: include/drm/drm_rect.h
   :doc: rect utils
```

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\gpu\[linux-master] [Documentation] [gpu] drm-kms-helpers.rst, line 385)

Unknown directive type "kernel-doc".

```
.. kernel-doc:: include/drm/drm_rect.h
   :internal:
```

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\gpu\[linux-master] [Documentation] [gpu] drm-kms-helpers.rst, line 388)

Unknown directive type "kernel-doc".

```
.. kernel-doc:: drivers/gpu/drm/drm_rect.c
   :export:
```

Flip-work Helper Reference

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\gpu\[linux-master] [Documentation] [gpu] drm-kms-helpers.rst, line 394)

Unknown directive type "kernel-doc".

```
.. kernel-doc:: include/drm/drm_flip_work.h
   :doc: flip utils
```

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\gpu\[linux-master] [Documentation] [gpu] drm-kms-helpers.rst, line 397)

Unknown directive type "kernel-doc".

```
.. kernel-doc:: include/drm/drm_flip_work.h
   :internal:
```

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\gpu\linux-master [Documentation] [gpu] drm-kms-helpers.rst, line 400)

Unknown directive type "kernel-doc".

```
.. kernel-doc:: drivers/gpu/drm/drm_flip_work.c
:export:
```

Auxiliary Modeset Helpers

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\gpu\linux-master [Documentation] [gpu] drm-kms-helpers.rst, line 406)

Unknown directive type "kernel-doc".

```
.. kernel-doc:: drivers/gpu/drm/drm_modeset_helper.c
:doc: aux kms helpers
```

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\gpu\linux-master [Documentation] [gpu] drm-kms-helpers.rst, line 409)

Unknown directive type "kernel-doc".

```
.. kernel-doc:: drivers/gpu/drm/drm_modeset_helper.c
:export:
```

OF/DT Helpers

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\gpu\linux-master [Documentation] [gpu] drm-kms-helpers.rst, line 415)

Unknown directive type "kernel-doc".

```
.. kernel-doc:: drivers/gpu/drm/drm_of.c
:doc: overview
```

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\gpu\linux-master [Documentation] [gpu] drm-kms-helpers.rst, line 418)

Unknown directive type "kernel-doc".

```
.. kernel-doc:: drivers/gpu/drm/drm_of.c
:export:
```

Legacy Plane Helper Reference

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\gpu\linux-master [Documentation] [gpu] drm-kms-helpers.rst, line 424)

Unknown directive type "kernel-doc".

```
.. kernel-doc:: drivers/gpu/drm/drm_plane_helper.c
:doc: overview
```

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\gpu\linux-master [Documentation] [gpu] drm-kms-helpers.rst, line 427)

Unknown directive type "kernel-doc".

```
.. kernel-doc:: drivers/gpu/drm/drm_plane_helper.c
:export:
```

Legacy CRTC/Modeset Helper Functions Reference

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\gpu\[linux-master] [Documentation] [gpu] drm-kms-helpers.rst, line 433)

Unknown directive type "kernel-doc".

```
.. kernel-doc:: drivers/gpu/drm/drm_crtc_helper.c
   :doc: overview
```

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\gpu\[linux-master] [Documentation] [gpu] drm-kms-helpers.rst, line 436)

Unknown directive type "kernel-doc".

```
.. kernel-doc:: drivers/gpu/drm/drm_crtc_helper.c
   :export:
```

Privacy-screen class

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\gpu\[linux-master] [Documentation] [gpu] drm-kms-helpers.rst, line 442)

Unknown directive type "kernel-doc".

```
.. kernel-doc:: drivers/gpu/drm/drm_privacy_screen.c
   :doc: overview
```

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\gpu\[linux-master] [Documentation] [gpu] drm-kms-helpers.rst, line 445)

Unknown directive type "kernel-doc".

```
.. kernel-doc:: include/drm/drm_privacy_screen_driver.h
   :internal:
```

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\gpu\[linux-master] [Documentation] [gpu] drm-kms-helpers.rst, line 448)

Unknown directive type "kernel-doc".

```
.. kernel-doc:: include/drm/drm_privacy_screen_machine.h
   :internal:
```

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\gpu\[linux-master] [Documentation] [gpu] drm-kms-helpers.rst, line 451)

Unknown directive type "kernel-doc".

```
.. kernel-doc:: drivers/gpu/drm/drm_privacy_screen.c
   :export:
```