

# DSI device tree configuration

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## 1 Article purpose

This article explains how to configure the *DSI*<sup>[1]</sup> **when the peripheral is assigned to the Linux® OS.**

The configuration is performed using the **device tree mechanism**<sup>[2]</sup>.

The [Device tree](#) provides a hardware description of the DSI<sup>[1]</sup> used by the STM32 *DSI Linux driver*.

## 2 DT bindings documentation

The DSI is represented by the STM32 DSI device tree bindings<sup>[3]</sup>.

## 3 DT configuration

This hardware description is a combination of the **STM32 microprocessor** device tree files (*.dtsi* extension) and **board** device tree files (*.dts* extension). See the [Device tree](#) for an explanation of the device tree file split.

**STM32CubeMX** can be used to generate the board device tree. Refer to [How to configure the DT using STM32CubeMX](#) for more details.

### 3.1 DT configuration (STM32 level)

The DSI device tree node is declared in *stm32mp157c.dtsi*<sup>[4]</sup>. The declaration (shown below) defines the hardware registers base address, the clocks and the reset.

```
dsi: dsi@5a000000 {
    compatible = "st,stm32-dsi";
    reg = <0x5a000000 0x800>;
    clocks = <&rcc DSI_K>, <&clk_hse>, <&rcc DSI_PX>;
    clock-names = "pclk", "ref", "px_clk";
    resets = <&rcc DSI_R>;
    reset-names = "apb";
    status = "disabled";
};
```



This device tree part is related to STM32 microprocessors. It must be kept as is, without being modified by the end-user.

## 3.2 DT configuration (board level)

The DSI device tree related to a particular board may have the following nodes, depending on the board hardware:

- **dsi** node: containing the in/out port descriptions and a **panel** sub-node.
- **ltdc** node: containing the in/out port description related to the dsi node.
- **panel\_backlight** node: related to the panel node.

A full example of the [STM32MP157 Evaluation board](#) device tree is available in `stm32mp157c-ev1.dts` <sup>[5]</sup>.

```
&dsi {
    #address-cells = <1>;
    #size-cells = <0>;
    status = "okay";

    ports {
        #address-cells = <1>;
        #size-cells = <0>;

        port@0 {
            reg = <0>;
            dsi_in: endpoint {
                remote-endpoint = <&lt;tdc_ep0_out>;
            };
        };

        port@1 {
            reg = <1>;
            dsi_out: endpoint {
                remote-endpoint = <&panel_in>;
            };
        };
    };

    panel@0 {
        compatible = "raydium,rm68200";
        reg = <0>;
        reset-gpios = <&gpiof 15 GPIO_ACTIVE_LOW>;
        backlight = <&panel_backlight>;
        status = "okay";

        port {
            panel_in: endpoint {
                remote-endpoint = <&dsi_out>;
            };
        };
    };
};

&lt;tdc {
    status = "okay";

    port {
        #address-cells = <1>;
        #size-cells = <0>;
```

```
        ltdc_ep0_out: endpoint@0 {
            reg = <0>;
            remote-endpoint = <&dsi_in>;
        };
};

...

panel_backlight: panel-backlight {
    compatible = "gpio-backlight";
    gpios = <&gpiod 13 GPIO_ACTIVE_LOW>;
    default-on;
    status = "okay";
};
};
```

## 4 How to configure the DT using STM32CubeMX

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The [STM32CubeMX](#) tool can be used to configure the STM32MPU device and get the corresponding [platform configuration device tree](#) files.

The STM32CubeMX may not support all the properties described in the above [DT bindings documentation](#) paragraph. If so, the tool inserts **user sections** in the generated device tree. These sections can then be edited to add some properties and they are preserved from one generation to another. Refer to [STM32CubeMX](#) user manual for further information.

## 5 References

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Please refer to the following links for additional information:

1. ↑ [1.0 1.1 DSI internal peripheral](#)
2. ↑ [Device tree](#)
3. ↑ [st,stm32-ltdc.txt Linux kernel bindings \(including dsi\)](#)
4. ↑ [Linux kernel STM32MP157C device tree \(stm32mp157c.dtsi\)](#)
5. ↑ [Linux kernel STM32MP157 Evaluation board device tree \(stm32mp157c-ev1.dts\)](#)