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Embedded

Analog-to-Digital Converter (ADC)

The Dialog DA9063 PMIC provides a 10-bit general purpose analog-to-digital converter (ADC) with track and hold circuitry and an analog input multiplexer that allows the conversion of up to nine different inputs.

The ADC measures the following inputs:

- Channel 0: VSYS_RES - measurement of the system VDD (2.5 - 5.5V)
- Channel 1: ADCIN1_RES - high impedance input (0 - 2.5V)
- Channel 2: ADCIN2_RES - high impedance input (0 - 2.5V)
- Channel 3: ADCIN3_RES - high impedance input (0 - 2.5V)
- Channel 4: T_{junc} - measurement of internal temperature sensor
- Channel 5: VBBAT - measurement of the backup battery voltage (0 - 5.0V)
- Channel 8: MON_A8_RES - group 1 internal regulators voltage (0 - 5.0V)
- Channel 9: MON_A9_RES - group 2 internal regulators voltage (0 - 5.0V)
- Channel 10: MON_A10_RES group 3 internal regulators voltage (0 - 5.0V)

Kernel configuration

You can manage the hardware monitor support device driver through the following kernel configuration option:

- **Dialog Semiconductor DA9063** (CONFIG_SENSORS_DA9063)

This option is enabled as built-in on the ConnectCore 6 SBC kernel configuration file (https://github.com/digi-embedded/linux/blob/v4.9/dey-2.4/maint/arch/arm/configs/ccimx6sbc_defconfig).

Kernel driver

The hardware monitor support device driver for Dialog DA9063 is located at drivers/hwmon/da9063-hwmon.c (https://github.com/digi-embedded/linux/blob/v4.9/dey-2.4/maint/drivers/hwmon/da9063-hwmon.c).

Device tree bindings and customization

The PMIC ADC device tree binding is documented at Documentation/devicetree/bindings/hwmon/da9063-hwmon.txt (https://github.com/digi-embedded/linux/blob/v4.9/dey-2.4/maint/Documentation/devicetree/bindings/hwmon/da9063-hwmon.txt).

The device tree node for the hardware monitor support device driver is defined in the ConnectCore 6 device tree.

i.MX6 device tree

```
hwmon {
    compatible = "dlg,da9063-hwmon";
    dlg,tjunc-offset = <(-5)>
}
```

ADC user space usage

You can access the ADC values through the sys file system:

```
root@ccimx6qpsbc:# cd /sys/class/hwmon/hwmon
root@ccimx6qpsbc:# ls
driver       in0_label    in2_input    in3_l
hwmon        in1_input    in2_label    in4_i
in0_input    in1_label    in3_input    in4_l
root@ccimx6qpsbc:# cat in0_label in0_input
VSYS
4968
root@ccimx6qpsbc:# cat in1_label in1_input
ADCIN1
1124
root@ccimx6qpsbc:# cat in2_label in2_input
ADCIN2
2096
root@ccimx6qpsbc:# cat in3_label in3_input
ADCIN3
1632
root@ccimx6qpsbc:# cat in4_label in4_input
VBBAT
425
root@ccimx6qpsbc:# cat temp1_label temp1_inp
TJUNC
50
```

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This topic for another platform?

- ConnectCore 6UL (../cc6ul/yocto-bsp_r_adc_6ul)
- ConnectCore 8X (../cc8x/yocto-bsp_r_adc_8x)
- ConnectCore 6 Plus (../cc6plus/yocto-bsp_r_adc_cc6cc6qp)

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