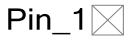
General Purpose I/O Pin (PDL_GPIO) and Fast GPIO Pin (PDL_FGPIO)

1.0



Features

- GPIO
- Fast GPIO

General Description

The General Purpose I/O Pin (PDL_GPIO) component is used to set connectivity in your design. By default, all I/O ports operate as normal GPIO. You can assign any pin to be a Fast GPIO pin, which can read an input level and set an output level from the CPU within one cycle clock of HCLK.

This component uses firmware drivers from the PDL_GPIO module, which is automatically added to your project after a successful build.

When to Use a PDL_GPIO Component

Use the PDL_GPIO component when a design must generate or access an off-device signal through a physical IO pin. These are the most commonly used component in the Component Catalog. For example, they are used to interface with potentiometers, buttons, LEDs, etc.

Quick Start

1. Drag a PDL_GPIO or PDL_FGPIO component from the Component Catalog FMx/Ports and Pins/ folder onto your schematic. The placed instance takes the name Pin_1.
2. There is no need to open the Configure dialog. This component doesn't provide any parameters.
3. Select pin placement in the Design Wide Resources Pin Editor.
4. Build the project to verify the correctness of your design. This will add the required PDL modules to the Workspace Explorer and generate configuration data for the Pin_1 instance.
5. The following example initializes a GPIO for output and shows how to toggle the state of an output pin:

```
Pin_1_GpioInitIn(1u);/* Make the pin readable */
Pin_1_GpioInitOut(1u);/* Enable output */
```

```
/* Read, toggle, and write the new state of the pin */
Pin_1_GpioPut( Pin_1_GpioGet() == 1u ? 1u : 0u );
```

6. Build and program the device.

Component Usage

After a successful build, firmware drivers from the GPIO/FGPIO module are added to your project in the pdl/drivers/gpio folder. Pass the generated data structures to the associated PDL functions in your application initialization code to configure the peripheral.

Generated Data

Once the component is initialized, the application code should use the peripheral functions provided in the referenced PDL files. Refer to the PDL for the list of provided API functions. To access this document, right-click on the component symbol on the schematic and choose "**Open API Documentation**…" in the drop-down menu.

Preprocessor Macros

The PDL_GPIO component generates the following preprocessor macros. The PDL_FGPIO component generates the same macros. Note that each macro is prefixed with the instance name of the component (e.g. "Pin_1").

Macro	Description
Pin_1_*F*GpioInitIn(v)	Initializes the pin in Input mode, depending on the v value pin will be initialized in Pull-up or Pull-down mode. *F* – used for FGPIO component.
Pin_1_*F*GpioInitOut(v)	Initializes the pin in Output mode, depending on the v value pin will be in Low or High state after initialization. *F* – used for FGPIO component.
Pin_1_*F*GpioGet()	This macro returns the Pin_1 state. *F* – used for FGPIO component.
Pin_1_*F*GpioPut(v)	This macro changes the pin state to low or high depending on the v value. *F* – used for FGPIO component.
Pin_1_FGpioEnableOutput()	Before using the FGPIO output You must call this macro to set a pin to be a Fast GPIO. This macro is generated only for FGPIO component.
Pin_1_FGpioDisableOutput()	After calling this macro pin becomes a simple GPIO pin. This macro is generated only for FGPIO component.

Code Examples and Application Notes

There are numerous code examples that include schematics and example code available online at the Cypress Code Examples web page.

Cypress also provides a number of application notes describing how FMx devices can be integrated into your design. You can access the Cypress Application Notes search web page at www.cypress.com/appnotes.

Resources

The PDL_GPIO and PDL_FGPIO components uses the GPIO (General Purpose Input-Output) peripheral block.

References

- FM0+ Family of 32-bit ARM® Cortex®-M0+ Microcontrollers Peripheral Manuals
- Cypress FM0+ Family of 32-bit ARM® Cortex®-M0+ Microcontrollers

Component Changes

This section lists the major changes in the component from the previous version.

Version	Description of Changes	Reason for Changes / Impact
1.0.a	Minor datasheet edits.	
1.0	Initial Version	