

Power Manager Integration

Wi-Fi Connectivity Engineering

Exported on 06/06/2025

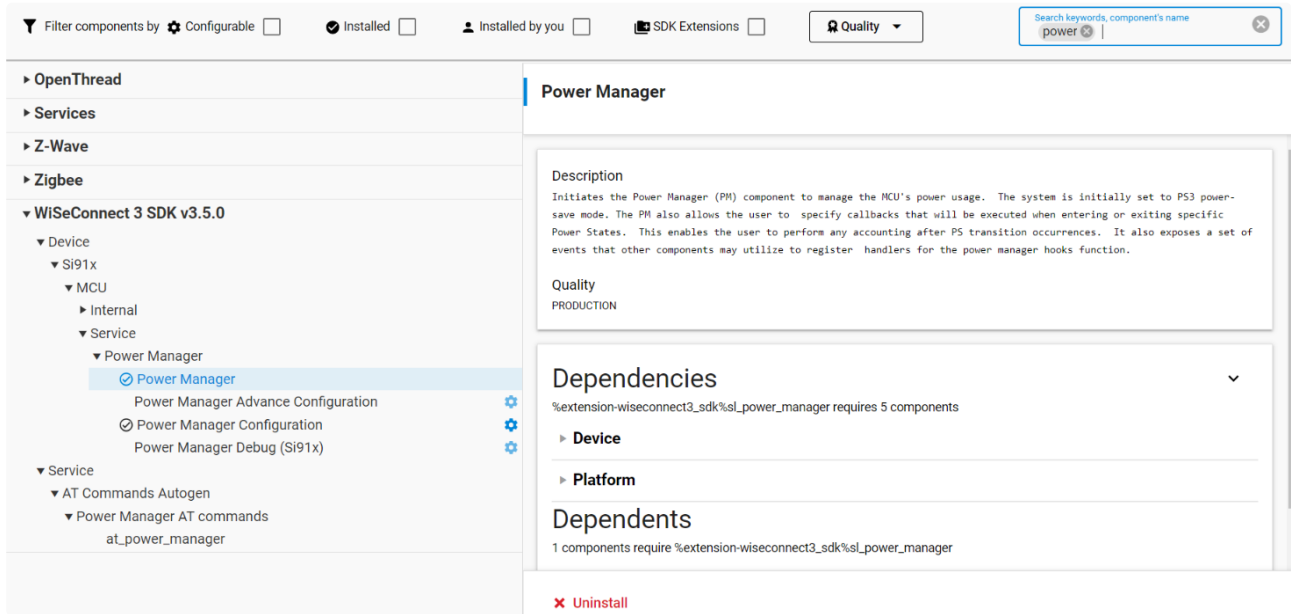
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1 Install Power Manager Component

Install Power Manager Component present under Software Components → Wiseconnect 3 SDK → Device → Si91x → MCU → Service → Power Manager.



This component fetches the power manager dependencies and contributes the event handler template.

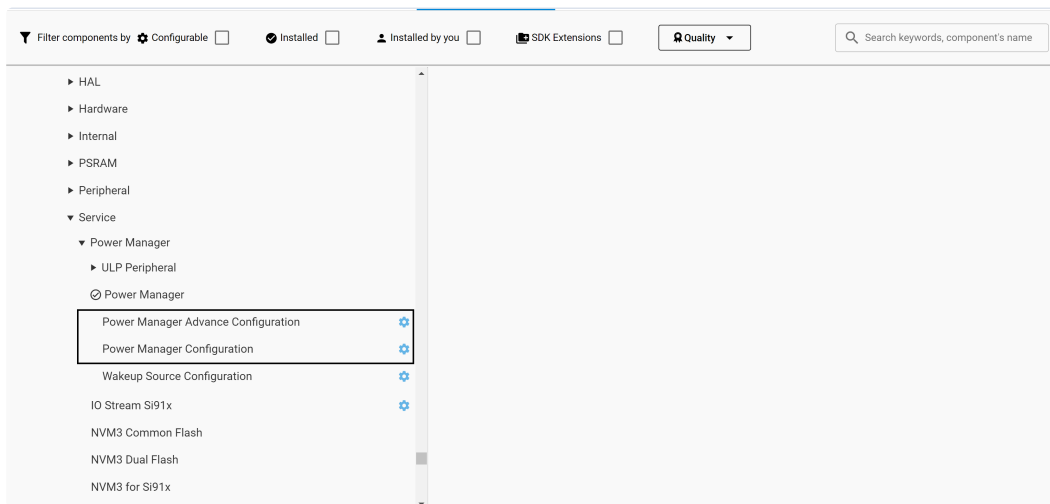
Event handler updates are triggered during state transitions, such as NVIC interrupts or context switches.

Power Manager service is initialized with the installation of this component, user intervention is not required for initializing the Power Manager service.

Note:- The Power Manager Configuration and Wakeup Source Configuration components are automatically installed along with the Power Manager component.

2 Power Manager Configuration Component

There are two components present under Software Components → Wiseconnect 3 SDK → Device → Si91x → MCU → Service → Power Manager



1 Power Manager Configuration Components

These components provide control over peripheral enable/disable and RAM retention.

These components contribute to the event handler with the parameter selected in UC and call the required APIs in the event handler template.

Peripheral and RAM retention is configured with the installation of this component, user intervention is not required.

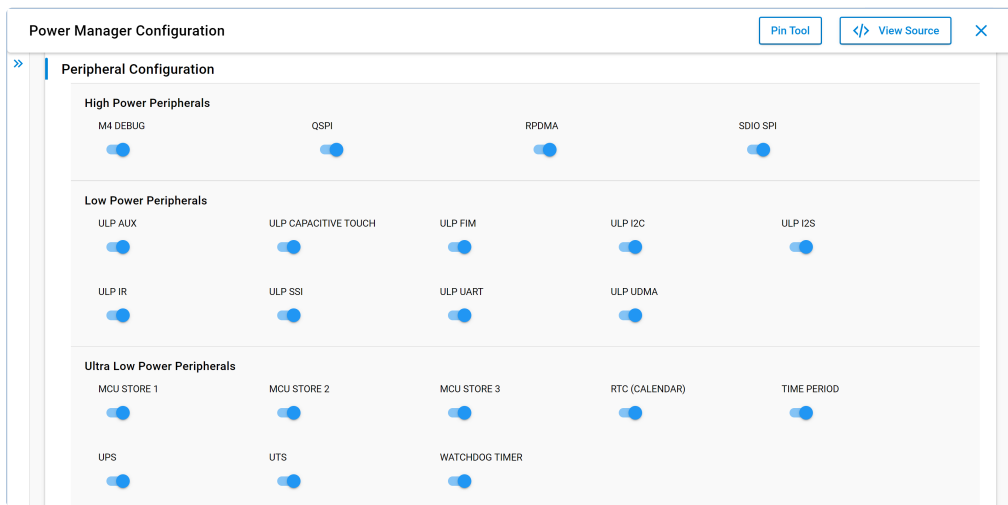
2.1 Power Manager Configuration

This component is a basic configuration component in which the user can select which peripherals need to be powered on/off according to the domain of the peripheral.

Peripheral Configuration includes:

- High Power Peripherals (PS4/PS3)
- Low Power Peripherals (PS2)
- Ultra Low Power Peripherals (All power states)

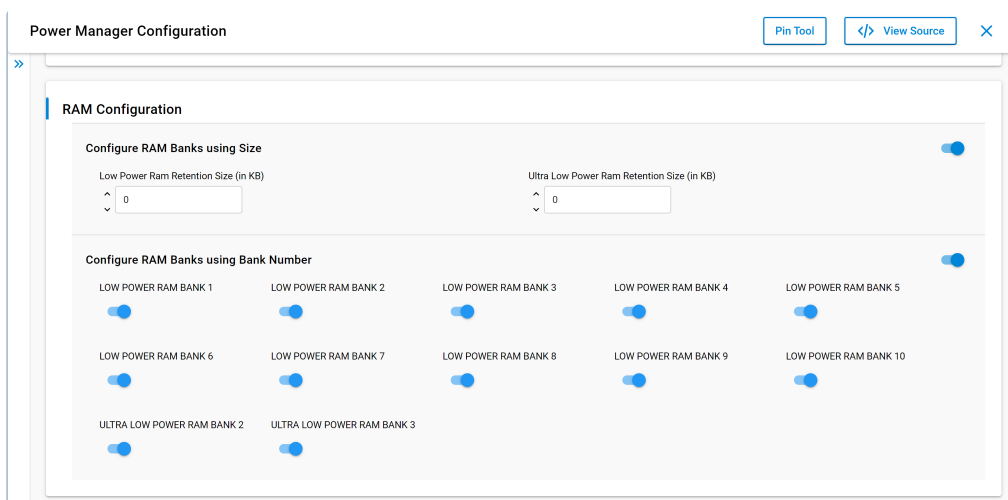
Note: If QSPI is turned off from High Power Peripheral then mcu cannot communicate with TA.



2 Power Manager Configuration: Peripheral Configuration

This component also provides configuration for RAM retention. Two options are provided to configure the RAM Banks i.e. using size or using bank number.

The user needs to select any one option. If both options are selected then the power manager service configures RAM using the bank number.

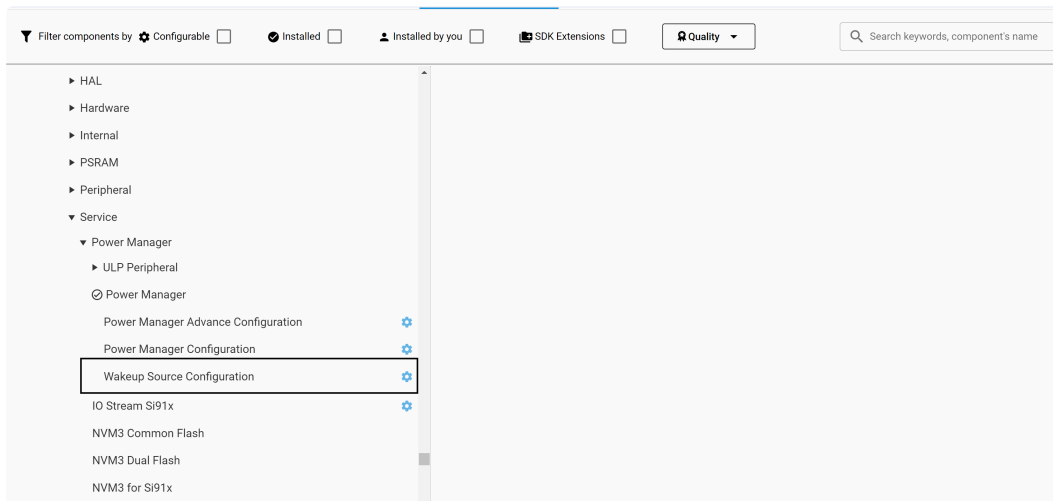


3 Power Manager Configuration: RAM Configuration

3 Wakeup Source Configuration Component

Wakeup Source Configuration component is present under Software Components → Wiseconnect 3 SDK → Device → Si91x → MCU → Service → Power Manager

Note: To use the wakeup source configuration, it is mandatory to install components using the above method for the required peripherals.



4 Wakeup Source Configuration Component

This component provides the initialization and configuration for the NPSS wakeup sources used in PS4 sleep/PS3 sleep/PS2 sleep.

By default, the Alarm Wakeup source is configured with the 5-second alarm trigger

3.1 Calendar Wakeup

Second based wake-up source can be enabled using the toggle

Alarm based wake-up source can be enabled and configured in terms of seconds and milliseconds.

The screenshot shows the 'PM Wakeup Source Configuration' window. On the left, a sidebar lists 'Calendar Wakeup', 'GPIO Wakeup', 'Deep Sleep Timer Wakeup', and 'Wireless Wakeup'. The 'Calendar Wakeup' option is selected. The main panel displays the configuration for 'Calendar Wakeup', which is currently enabled (toggle is blue). It includes two sub-toggles: 'Enable Second Wakeup Source' (disabled) and 'Enable Alarm Wakeup Source' (enabled). An 'Alarm Time (in milliseconds)' input field is set to 5000. Below this, the 'GPIO Wakeup' and 'Deep Sleep Timer Wakeup' options are listed with their respective toggle switches, both of which are currently disabled.

3.2 GPIO Wakeup

There are 4 NPSS GPIO available which can act as a wake-up source. Enabling the GPIO Wakeup allows the user to select the desired GPIO pin as a wakeup source.

The screenshot shows the 'PM Wakeup Source Configuration' window with the 'GPIO Wakeup' option selected in the sidebar. The main panel shows 'GPIO Wakeup' is enabled (toggle is blue). Below it, there are four rows for enabling individual NPSS GPIOs: 'Enable NPSS GPIO 0', 'Enable NPSS GPIO 1', 'Enable NPSS GPIO 2', and 'Enable NPSS GPIO 3'. All four of these sub-toggles are currently disabled. At the bottom of the main panel, the 'Deep Sleep Timer Wakeup' and 'Wireless Wakeup' options are listed with their toggle switches, both of which are currently disabled.

3.3 Deep Sleep Timer

Deep Sleep Timer can be enabled using the toggle and the sleep time is also configurable.

PM Wakeup Source Configuration

Pin Tool

</> View Source

X

>>

Calendar Wakeup

GPIO Wakeup

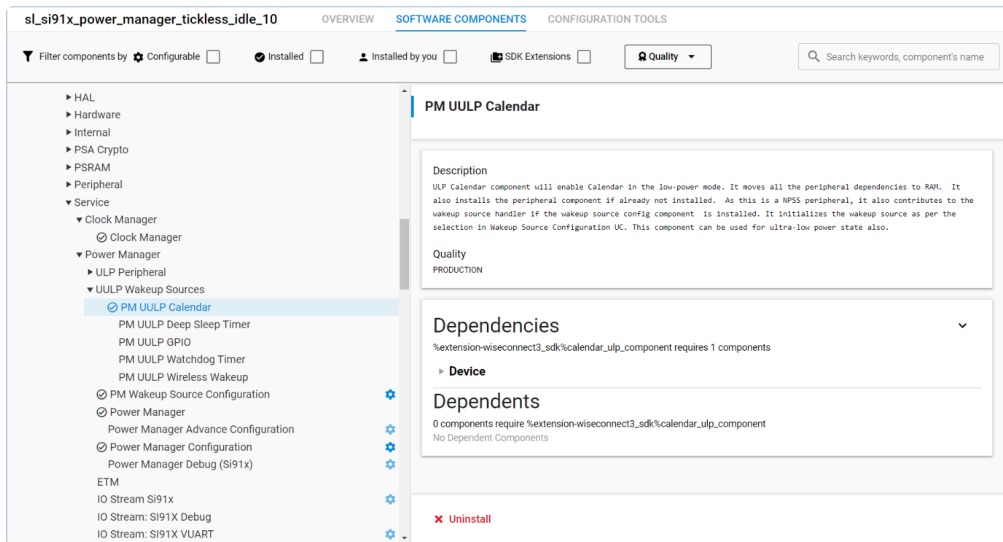
Deep Sleep Timer Wakeup

Sleep Time (in microseconds)

10000

4 Install the NPSS peripheral component for the selected wake-up source

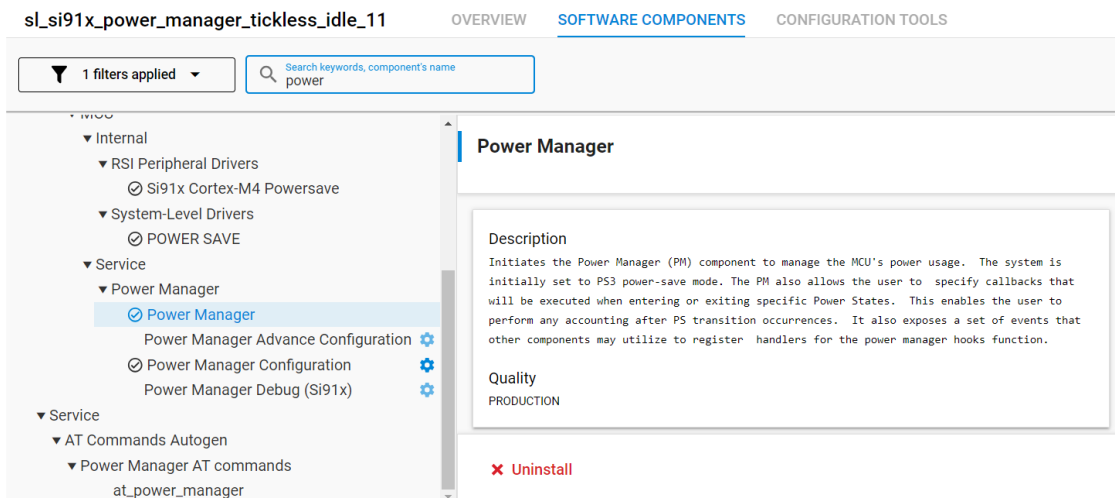
Install the components that are selected as a wakeup source.



5 Low Power Component Installation

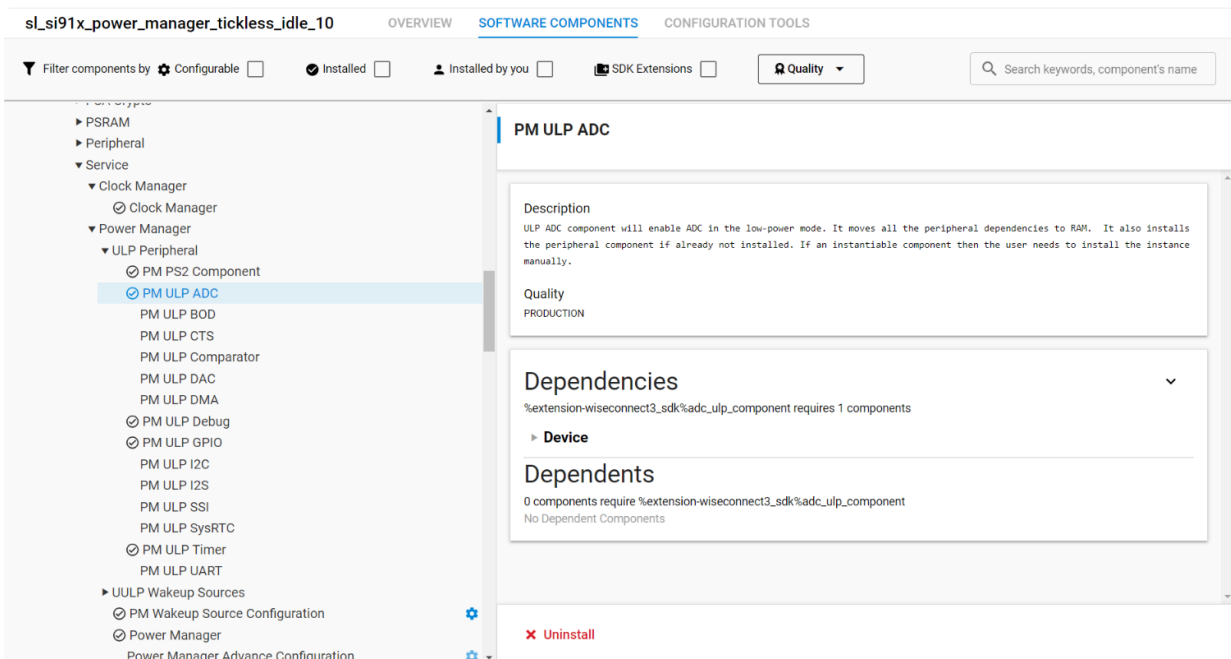
5.1 Install Power Manager Component

Install Power Manager Component present under Software Components → Wiseconnect 3 SDK → Device → Si91x → MCU → Service → Power Manager.



5.2 Navigate to the ULP Peripheral Section in the Software Components

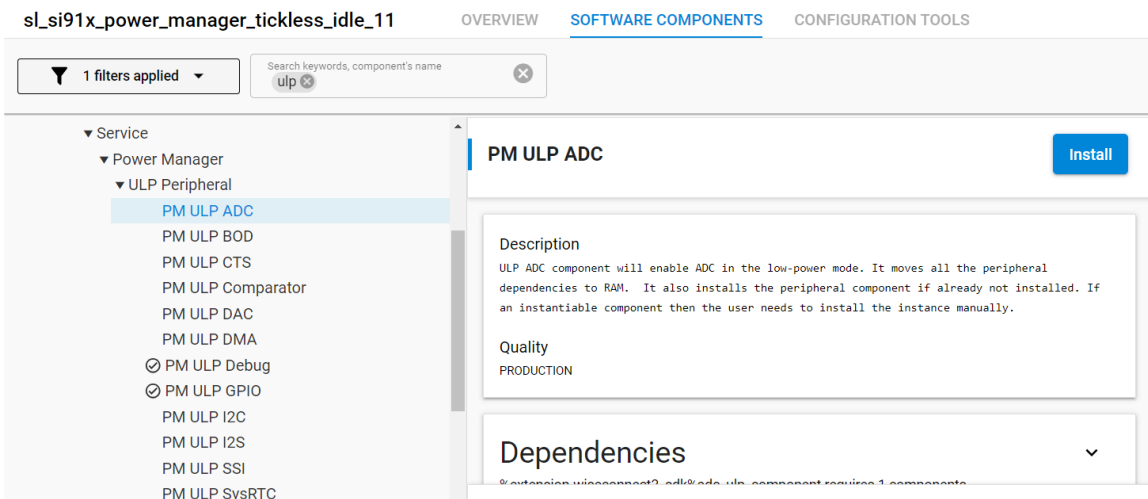
The ULP peripheral component list is present under Software Components → Wiseconnect 3 SDK → Device → Si91x → MCU → Service → Power Manager → ULP Peripheral



5.3 Install the required ULP Peripheral Component

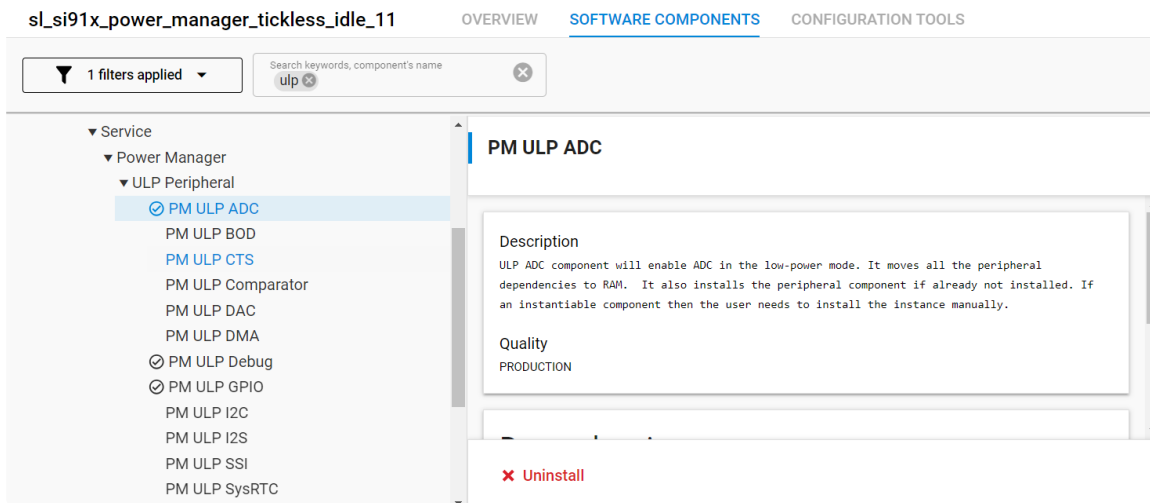
Choose the desired component and install it.

After installation, the basic required components and the dependencies of the peripheral are added to the RAM, i.e., excluded from the (.text) section and included in the (.data) section.



5.4 Uninstalling the ULP Peripheral Component

If any peripheral is no longer required, it can be uninstalled from the same path.



Here the linker file will be reverted to the stage how it was before installing the component.

6 Example

Steps for PS2 state change

- Install Power Manager Component
- Install required low-power peripheral component (if required)
- Include Power Manager header file
- Call the below power manager API

```
#include "sl_si91x_power_manager.h"

void application_function(void)
{
    sl_si91x_power_manager_add_ps_requirement(SL_SI91X_POWER_MANGER_PS2);
}
```