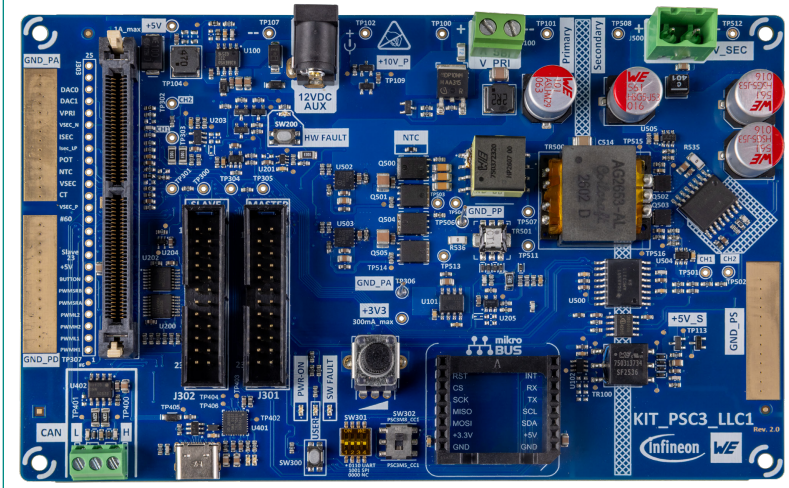
QUICK START GUIDE

PSOC™ Control C3 Low-voltage Development Kit LLC Expansion board

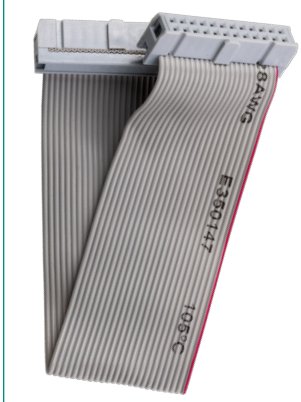
KIT_PSC3_LLC1

Kit contents

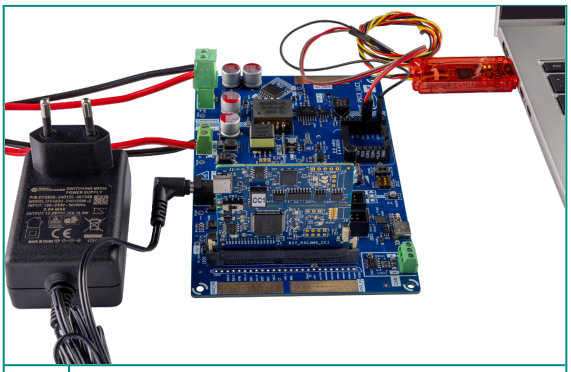
1. KIT_PSC3_LLC1 evaluation board
2. AC-DC auxiliary power adapter (230 VAC to 12 VDC)
3. 24-pin ribbon cable







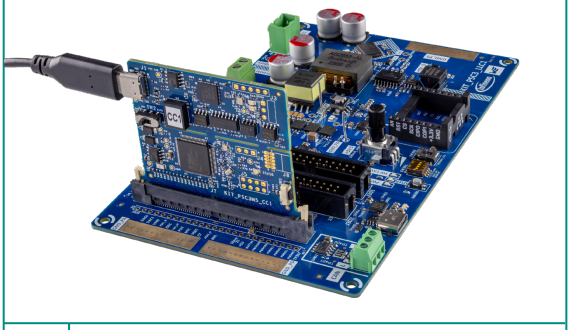
www.infineon.com/KIT_PSC3_LLC1



1 Full hardware setup

How to complete the kit

1. In addition to the content already included in the kit, the user will need the following components to assemble a minimal hardware setup (as shown in Figure 1):
   - DC load (resistive or electronic load, up to 75 W, 10 V, 15 A)
   - DC power supply (50 V, 3 A)
   - Cables for connecting the kit to the LLC DC input and the DC load
   - A PSOC™ Control C3 control card of your choice (KIT_PSC3M5_CC1 or KIT_PSC3M8_CC1) for evaluation or learning purposes
2. Additionally, it is recommended to complement the kit with the ModusToolbox™ Power Suite GUI by purchasing a PMBus dongle (USB0010 or USB008) and connecting it to the PC using the USB cable included in the dongle box.



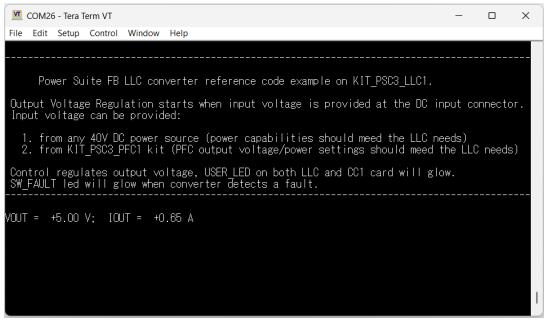
2 USB-C connected to program the control card

Setting up the hardware before starting

1. Complete the kit by connecting at least the minimum required hardware components.
2. Insert the PSOC™ Control C3 control card into the control card slot, as shown in Figure 2.
3. Connect the USB-C cable to the control card, as shown in Figure 2. Program the control card using the **ModusToolbox™ Power Suite code example** available after installing the **ModusToolbox™ Power Suite Pack** from the **Infineon Development Center (IDC).**

Setting up the software and tools

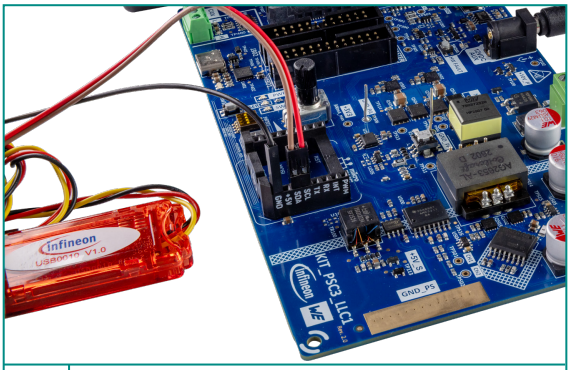
1. Install the **ModusToolbox™ Software** from the www.infineon.com/mtb by clicking Download.
2. Install the **ModusToolbox™ Eclipse IDE** and the **ModusToolbox™ Tools** package.
3. Install **ModusToolbox™ Power Suite Pack** from the **ModusToolbox™** setup tool.
4. Install the latest J-Link drivers if they are not already installed on your system.
5. Create a new application in the Eclipse IDE:
   - Select the appropriate board support package (for example, BSP for KIT_PSC3M5_CC1) for your chosen control card and click **Next.**
   - Under power conversion application, select **Power Suite FB-LLC converter.**
   - Build and program the application onto the control card.



3 **UART message confirms programming is successful**

Verify successful programming and start power conversion

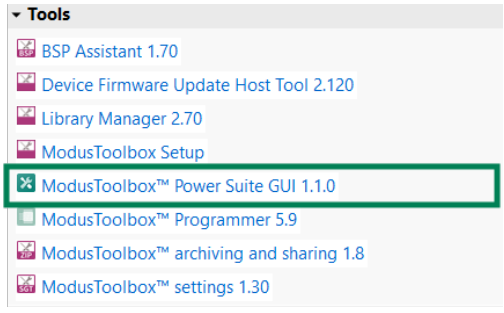
1. To verify the successful programming of the control card, open a UART serial terminal, such as Tera Term and connect to the UART COM port, with the following settings:
   - Baud rate: 115200, Data: 8-bit, Parity: None, Stop bit: 1-bit, Flow control: None
2. Press the reset button (SW1) on the PSOC™ Control C3 control card.
3. If the terminal displays the message shown in Figure 3, the programming process is complete.
4. Once connected and powered on, the kit begins regulating the output voltage, which is set using the onboard potentiometer VR300. Turn the potentiometer clockwise to its maximum position to achieve the target output voltage of 5 V.
5. The user can now load the LLC1 kit by increasing the DC load (resistive or electronic).



4 **USB dongle connected to mikroBUS connector on the kit**

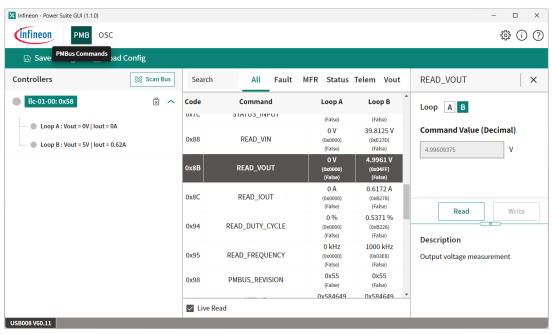
Using the Power Suite GUI

1. The output voltage setpoint can be adjusted using the Power Suite GUI.
2. Connect the USB-0010 dongle to the PC using a USB cable, and then to the kit using three wires (GND, CLK, and SDA), as shown in Figure 4.
3. Press the reset button (SW1) on the PSOC™ Control C3 control card.



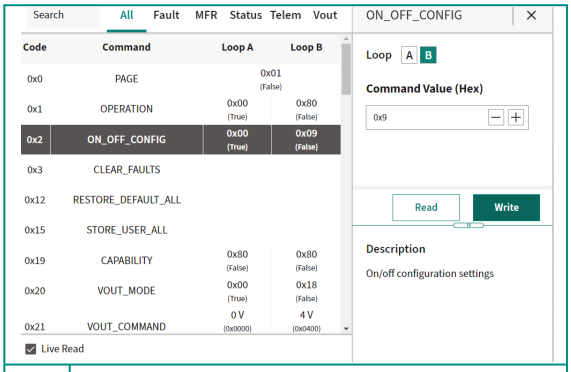
5 **Launch Power Suite GUI**

4. Open the **Eclipse IDE** and launch **Power Suite GUI from the Quick Panel > Tools** section, as shown in Figure 5.
5. Once a valid USB dongle is connected, click **Scan Bus**.



6 **Power Suite GUI: Reading output voltage**

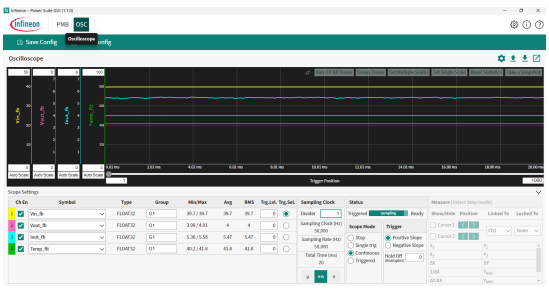
6. Click the PMB button at the top of the interface to display the available PMBus commands, as shown in Figure 6.
7. To read the output voltage, click **READ_VOUT**, select **Loop B**, and then click **Read**, as shown in Figure 6
8. Double-click the **Live Read** checkbox at the bottom to refresh the VOUT/IOUT values.
9. Enter a new value in **VOUT_COMMAND**, such as **4 V**, ensuring that it differs slightly from the default output target voltage



7 **GUI: Switching the application to PMBus control**

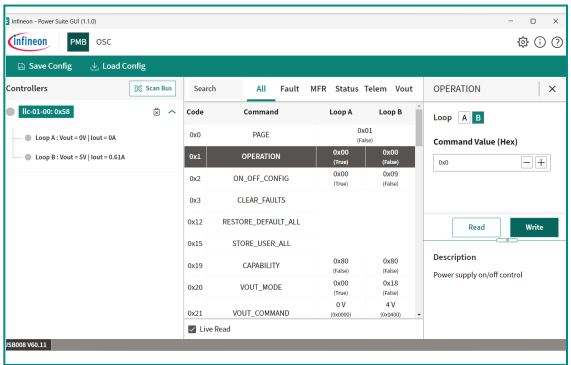
10. To transition the application from the default configuration to PMBus control through GUI (Figure 7):
    - Write **0x9** to the **ON_OFF_CONFIG** command.
    - After the command is successfully executed, the application switches to PMBus control mode.
    - The LLC output will regulate to 4 V, corresponding to the current VOUT_COMMAND setting.

    Note: Update the **VOUT_COMMAND** value as required to achieve the desired output voltage.



8 **Power Suite GUI: Oscilloscope feature**

11. Click the OSC button at the top of the interface to access the oscilloscope feature in the Power Suite GUI, as shown in Figure 8.
    The oscilloscope view enables real-time monitoring of the kit's input parameters, output parameters, and feedback signals, providing valuable insight into system performance.



9 **Power Suite GUI: Turn on/off the LLC**

12. Turn the LLC converter on or off using the OPERATION command (Figure 9)
    - Set OPERATION = 0x80 to turn on the LLC converter
    - Set OPERATION = 0x00 to turn off the LLC converter

Next steps

- The **ModusToolbox™ Power Suite** provides support for this kit, including associated code examples.
- For the KIT_PSC3_LLC1 board details and evaluation pinout details, see the user guide on the kit website.
- For further information regarding the board, the PMBUS communication, and code examples, visit the kit website.

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