RENESAS

User Manual

DA9217/DA9121 and DA9220/DA9122 EVB Kits

UM-PM-041

Abstract

This document is a user manual for DA9217/DA9121 and DA9220/DA9122 EVB and GUI (SmartCanvas™ software). It provides the basic information for configuring the EVB, installing and using the GUI software.

Contents

Figures

Tables

1   Terms and Definitions

EVB   Evaluation board
GUI   Graphical user interface
PMIC   Power management integrated circuit

2   References

[1]   DA9217, Datasheet, Dialog Semiconductor.
[2]   DA9220, Datasheet, Dialog Semiconductor.
[3]   DA9121, Datasheet, Dialog Semiconductor.
[4]   DA9122, Datasheet, Dialog Semiconductor.

3 Introduction

Dialog Semiconductor's DA9217/DA9121 and DA9220/DA9122 devices are power management ICs with integrated power FETs, see datasheets [1][2][3][4]. The DA9217/DA9121 is configured as a single-channel dual-phase buck converter, while the DA9220/DA9122 is configured as a two channel, one-phase buck converter.

The input voltage range of 2.5 V to 5.5 V makes DA9217/DA9121 and DA9220/DA9122 suitable for a wide variety of low-voltage systems, including, but not limited to, all Li-Ion battery supplied applications. The output voltage is configurable in the range of 0.3 V to 1.57 V.

Key functions for power applications, such as soft-start, selectable output voltage, flexible power-up and power-down sequences are provided on chip and are programmable via the I^{2}C interface with non-volatile memory defaults.

The evaluation kit includes:

● Dialog EVB 368-01, which is designed for DA9217/DA9121 evaluation

● Dialog EVB 368-03, which is designed for DA9220/DA9122 evaluation

● USB-I^{2}C interface module with USB cable (162-09), which is used for I^{2}C communication between the device and PC

● GUI software: Dialog Semiconductor's SmartCanvas

The software can be used to configure the device through write and read operations to all control registers and provides monitoring of the device status.

3.1 PC Requirements

The PC requirements are:

● Windows 7 operating system

● USB1.1 or USB2.0 interface

For any questions or further clarification please refer to your local Dialog support team.

4   Evaluation Board Hardware

The DA9217/DA9121 and DA9220/DA9122 evaluation boards enable the measurement and evaluation of the DA9217/DA9121 and DA9220/DA9122 respectively, see Figure 1 and Figure 2.

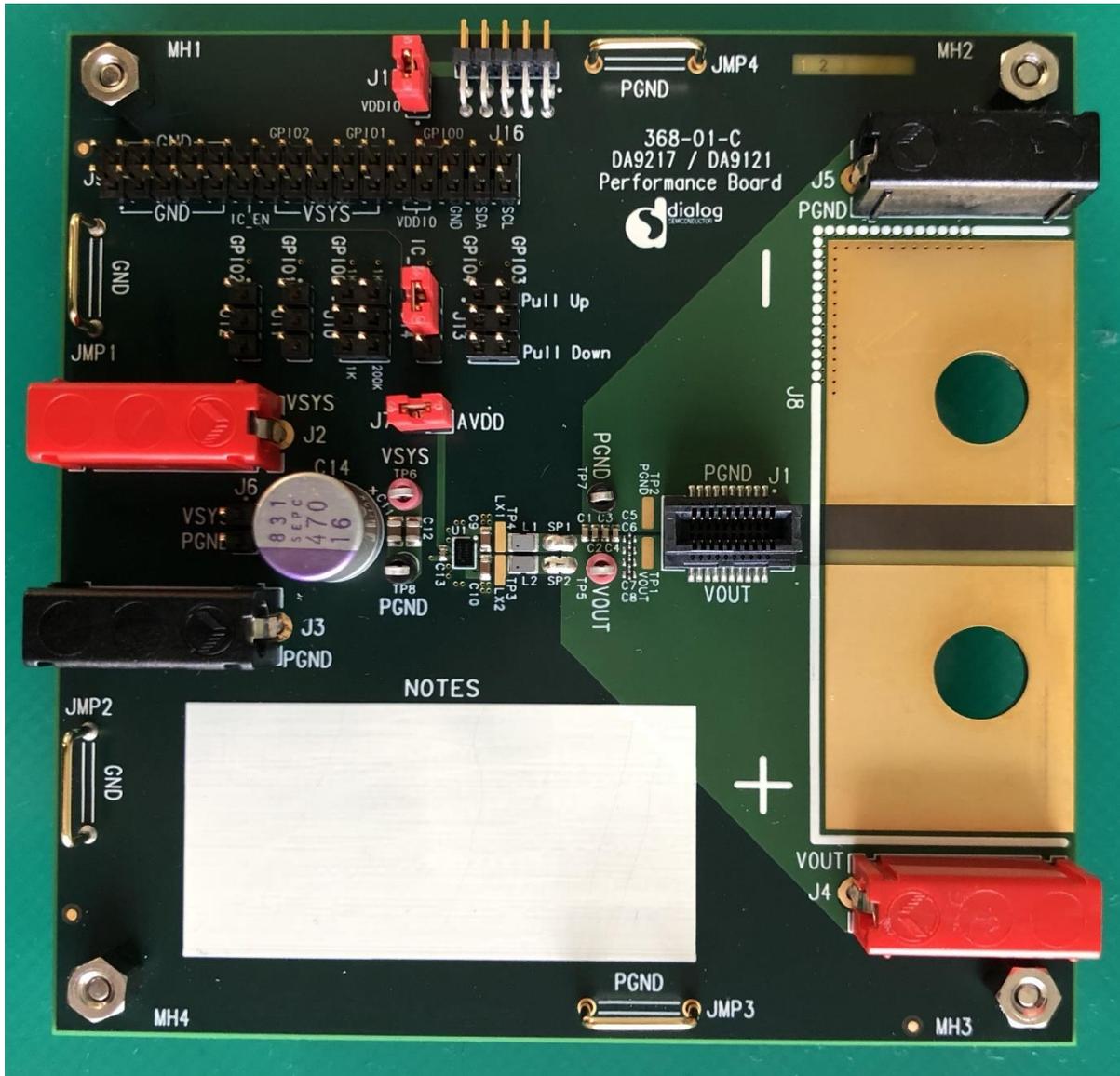Figure 3 shows how the USB-I^{2}C Module should be connected to the evaluation board.

Figure 1: 368-01 DA9217/DA9121 EVB
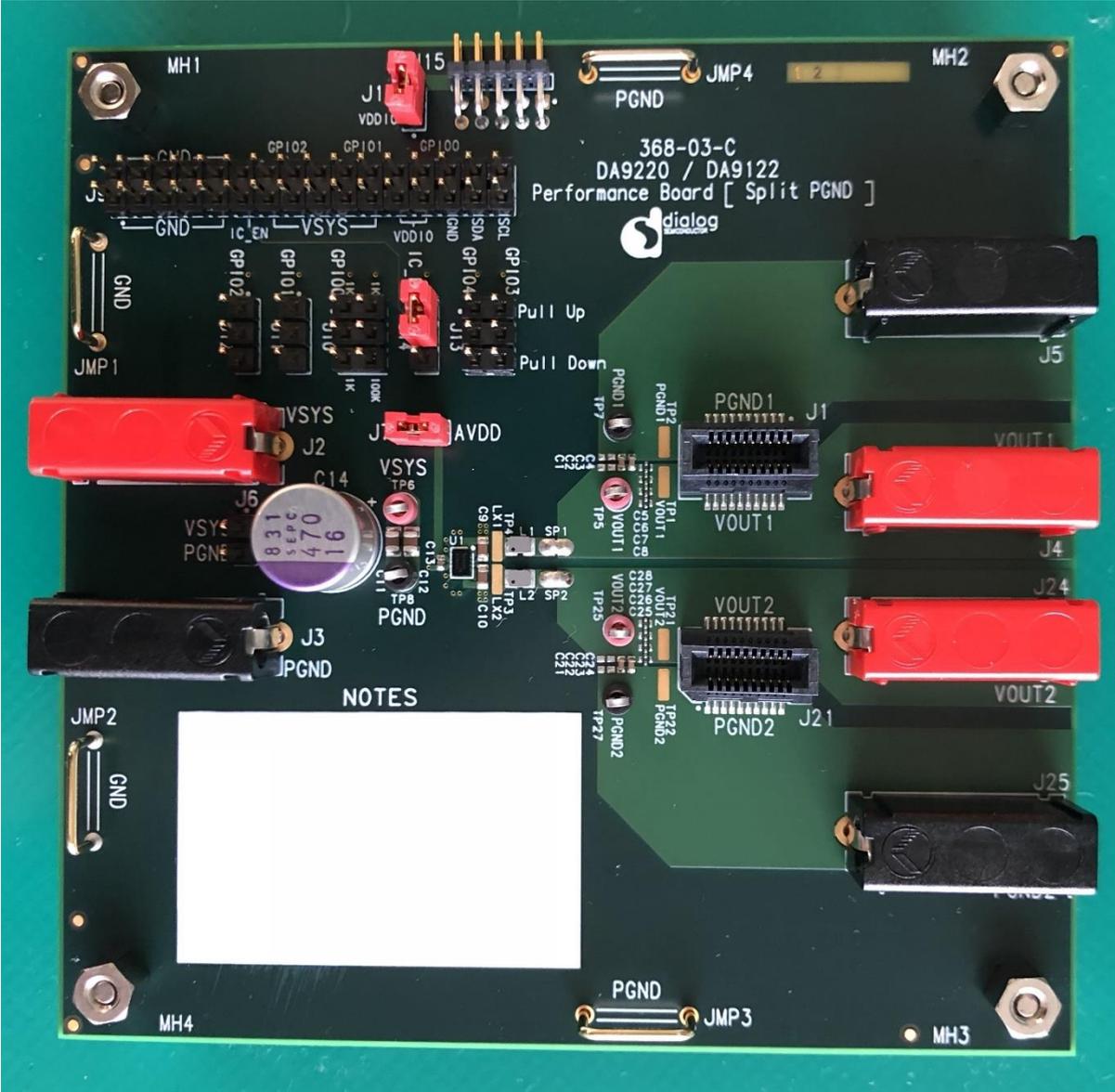
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DA9217/DA9121 and DA9220/DA9122 EVB Kits

Figure 2: 368-03 DA9220/DA9122 EVB
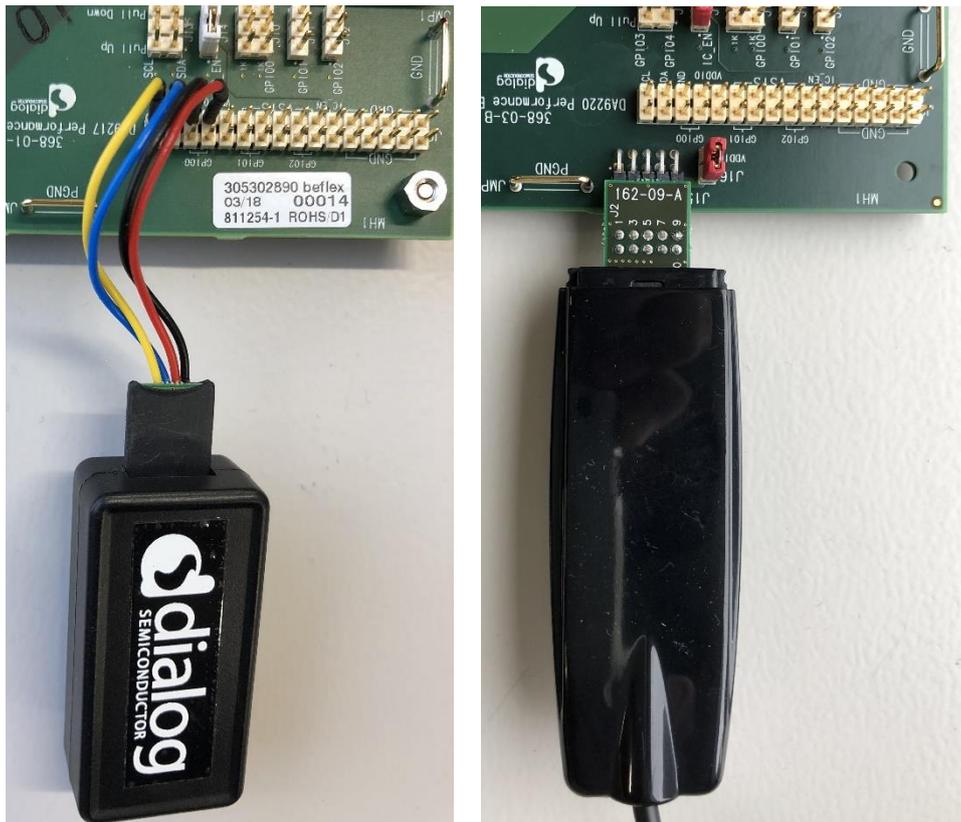
Figure 3: Connection between EVB and USB-I²C Module

4.1 Links Description
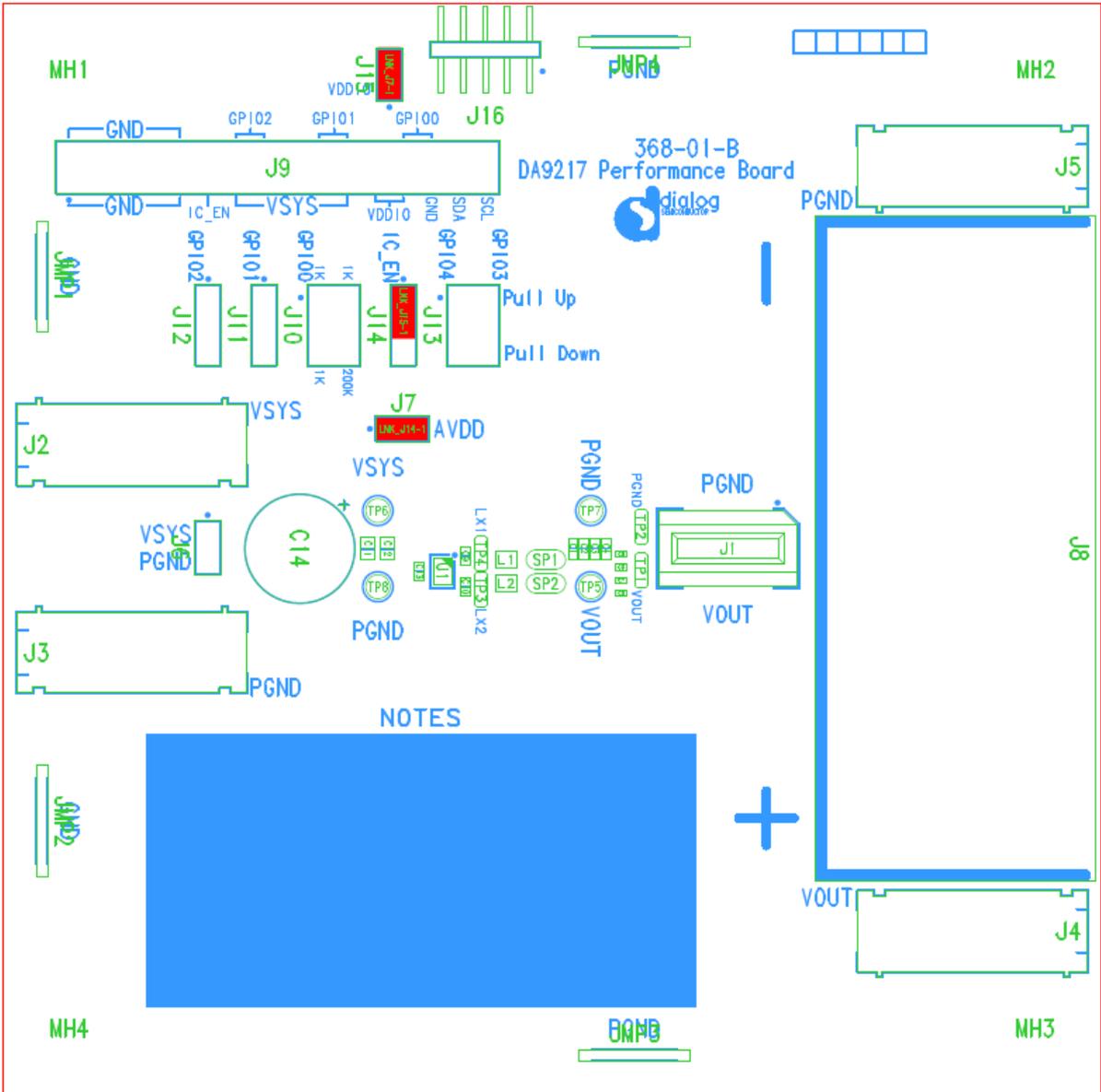
Figure 4: 368-01 EVB Links Location

DA9217/DA9121 and DA9220/DA9122 EVB Kits
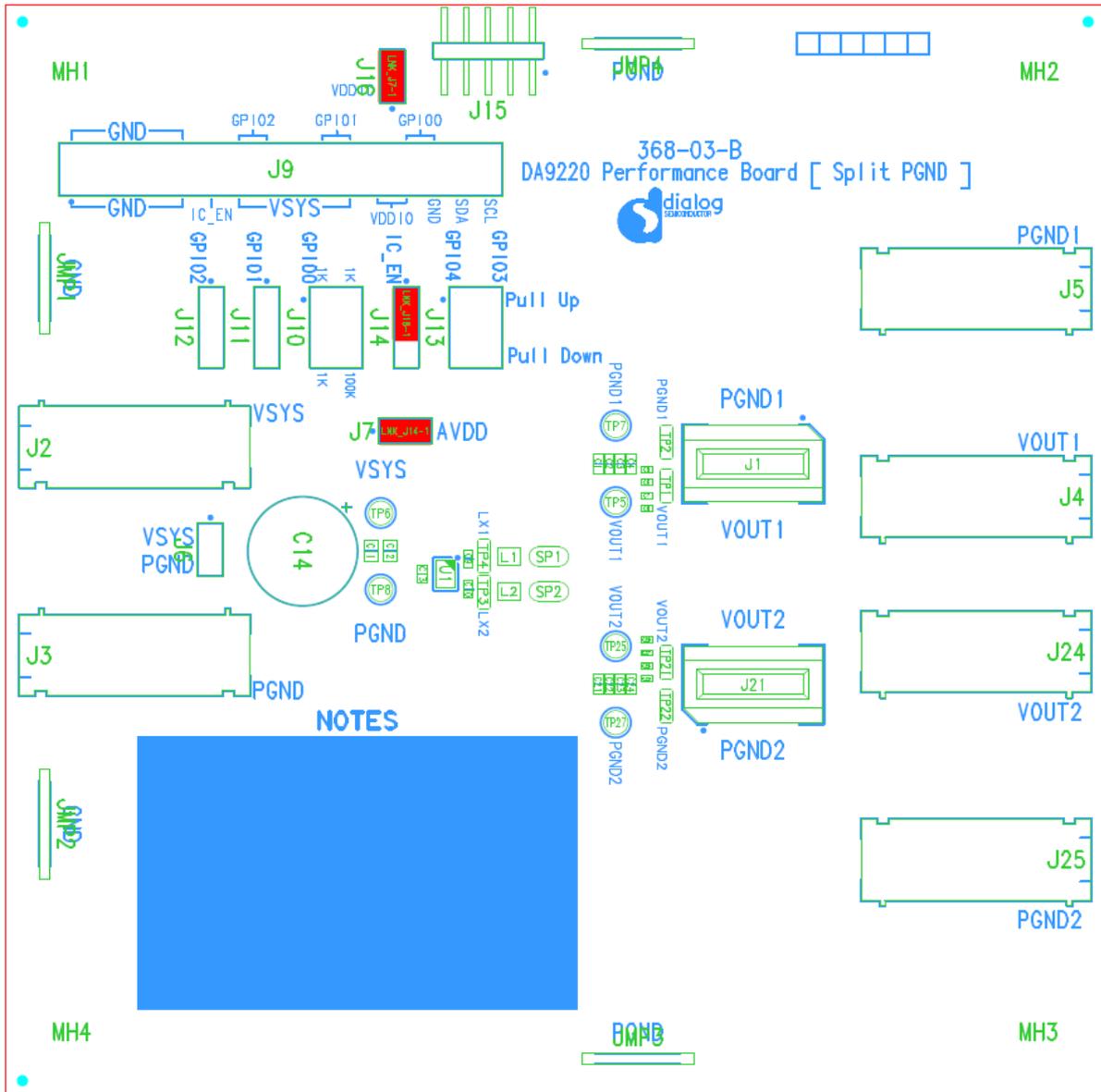
Figure 5: 368-03 EVB Links Location

Table 1: 368-01 EVB and 368-03 EVB Links Description

Link	Position 1	Position 2	Function
J7 Link 7	Connect to VSYS (pin 1-2)	-	Connect AVDD to VSYS
J10 Link 10	Connect to VDDIO (pin 1-3)	Connect to VSYS (pin 2-4)	Pull up GPIO0 to VDDIO or VSYS
J10 Link 10	Connect to GND (pin 3-5)	Connect to GND (pin 4-6)	Pull down GPIO0 to GND
J11 Link 11	Connect to VDDIO (pin 1-2)	-	Pull up GPIO1 to VDDIO
J11 Link 11	Connect to GND (pin 2-3)	-	Pull down GPIO1 to GND
J12 Link 12	Connect to VDDIO (pin 1-2)	-	Pull up GPIO2 to VDDIO
J12 Link 12	Connect to GND (pin 2-3)	-	Pull down GPIO2 to GND
J13 Link 13	Connect to VDDIO (pin 1-3)	Connect to VDDIO (pin 2-4)	Pull up SDA and SCL to VDDIO
J13 Link 13	Connect to GND (pin 3-5)	Connect to GND (pin 4-6)	Pull down SDA and SCL to GND
J14 Link 14	Connect to VDDIO (pin 1-2)	-	Pull up IC_EN to VDDIO
J14 Link 14	Connect to GND (pin 2-3)	-	Pull down IC_EN to GND
J15 Link 15 (on 368-01) J16 Link 16 (on 368-03)	Connect to USB-I^{2}C module 3.3 V output (pin 1-2)	-	Connect VDDIO to USB-I^{2}C module 3.3 V output

5 Software Installation

5.1 SmartCanvas GUI Software Installation

Use the following steps to install the SmartCanvas GUI:

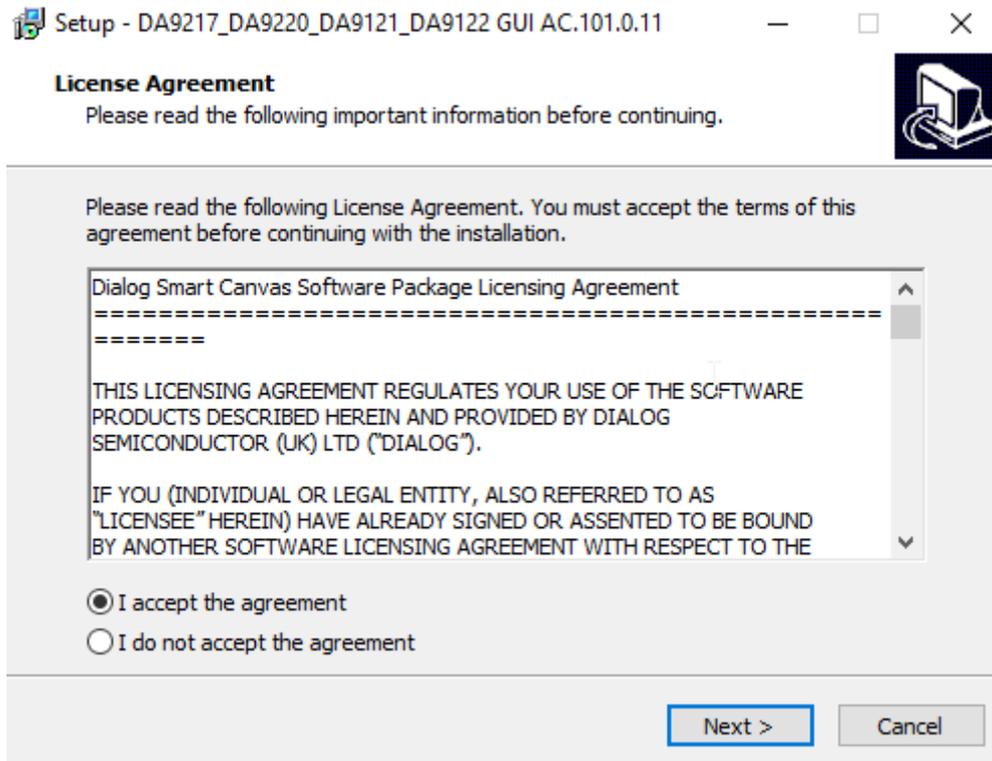1. Run the SmartCanvas software file `setup_DA9217_DA9220_DA9121_DA9122_GUI.exe` (Application).

Figure 6: SmartCanvas License Agreement

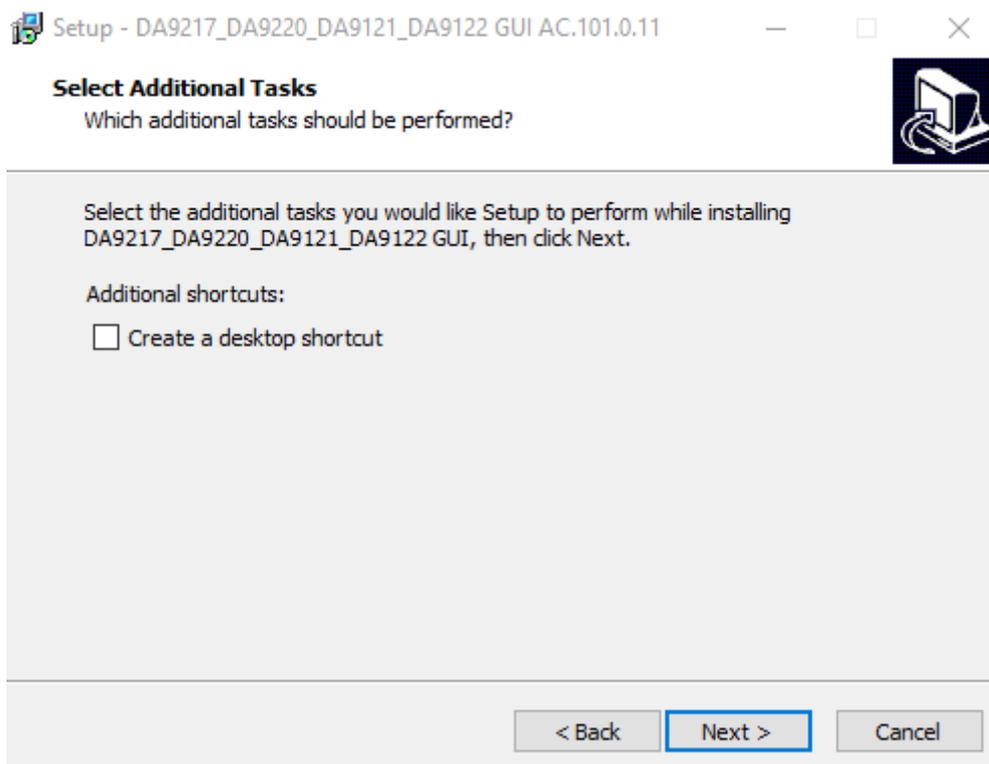| NOTE |
| --- |
| Administrator credentials are required for installation on a new Windows machine. |

2. Select **I accept the agreement** and click **Next**.

Figure 7: Optional Create a Desktop Shortcut

3. Optionally, select to **Create a desktop shortcut** and then click **Next**.
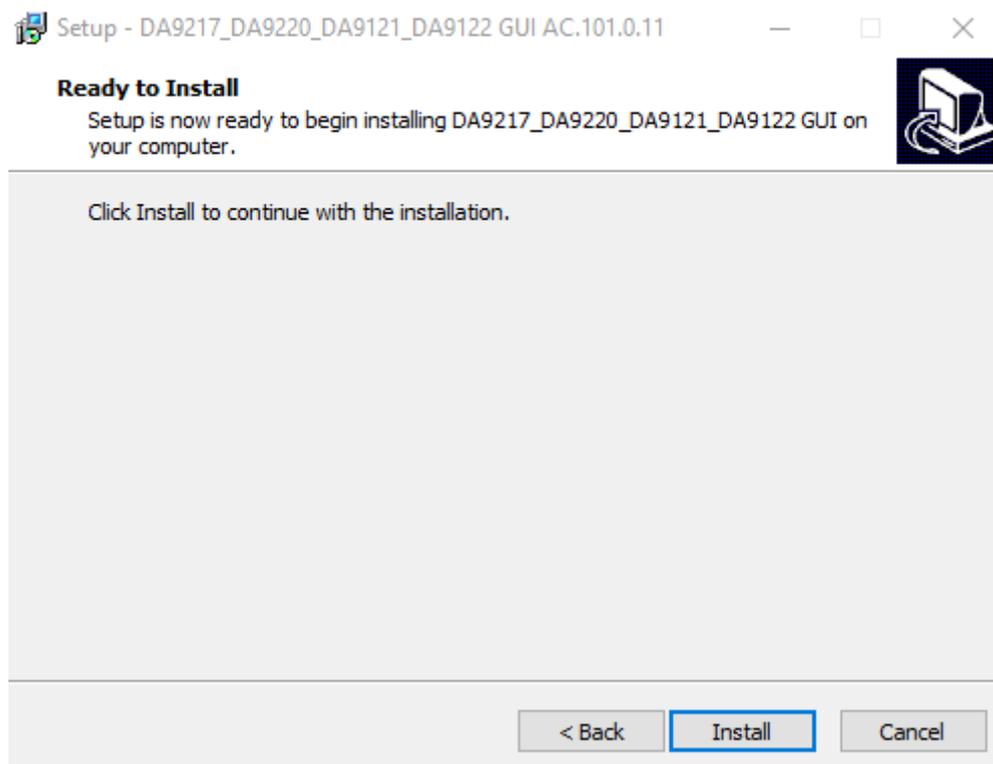
Figure 8: Install SmartCanvas

4. Click **Install**, which creates the directory:
   `C:\Dialog Semiconductor\Power Management\DA9217_DA9220_DA9121_DA9122 GUI`.

5. Once the installation is completed, the SmartCanvas GUI for DA9217/DA9121 and DA9220/DA9122 can be launched from the directory created in step 4 or from the optional shortcut.

5.2 USB-IO Driver Installation

Follow the following steps to install the Dialog USB driver:

1. Plug the USB cable of USB-I^{2}C Module into a free USB port of your PC and wait for a few minutes to complete the driver software installation.
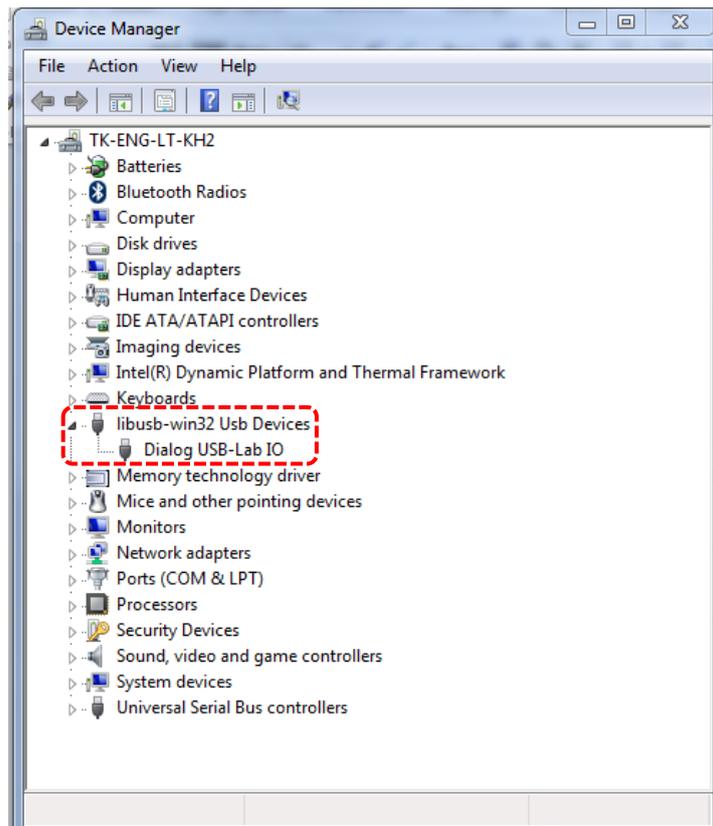2. Check that the Dialog USB driver has been properly installed using the **Windows Device Manager**, see Figure 9.

Figure 9: Windows Device Manager
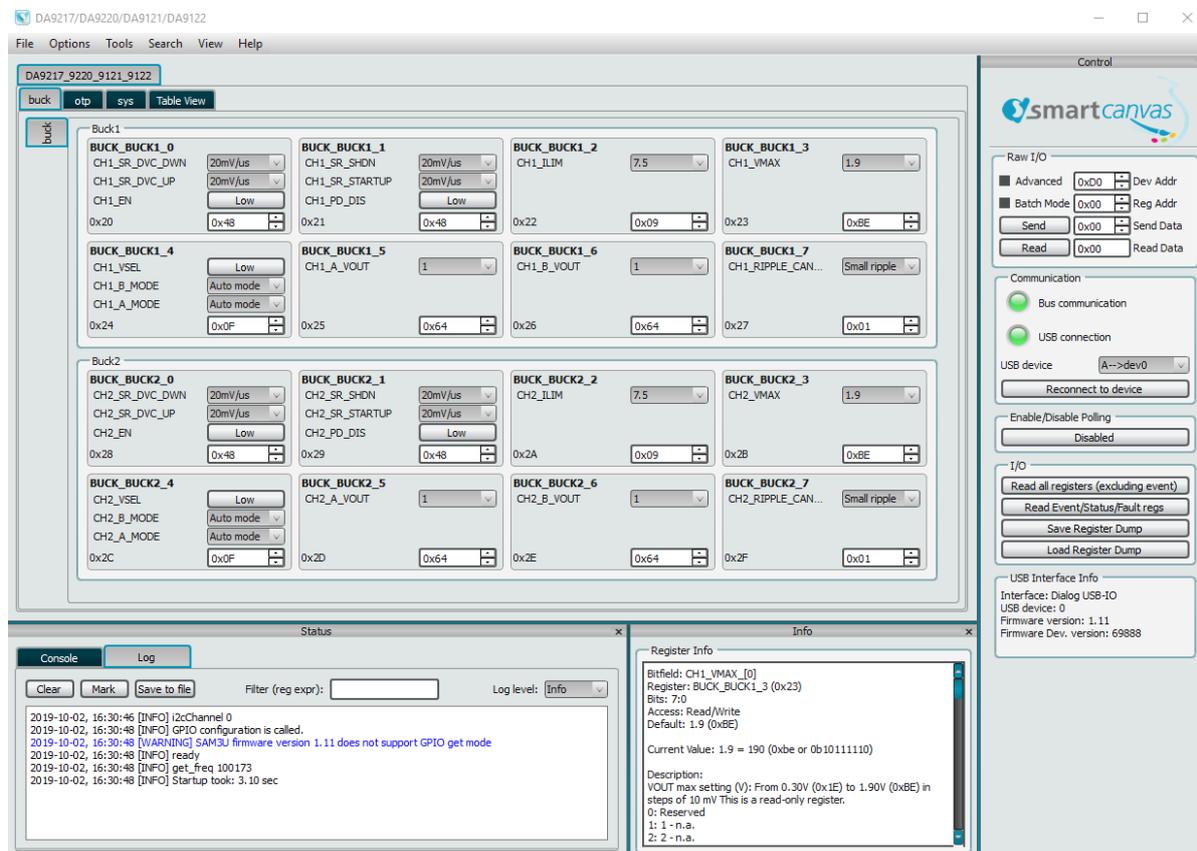
6 SmartCanvas GUI

Figure 10: SmartCanvas GUI

Click **Reconnect to device** to connect to the device via the I^{2}C interface.

The default I^{2}C address of the GUI is 0xD0 (8-bit mapping, 1101 000xb).

To change the I^{2}C address of the GUI:

1. Select **Options > Settings** to displays the **Settings** window, see Figure 11.
2. Change the **Bus Interface** to the intended I^{2}C address (in 8-bit).
3. Click **Enable Interface** to start the communication.

Once communication is established, the **Bus communication** and **USB connection** lights turn green to indicate normal operation.
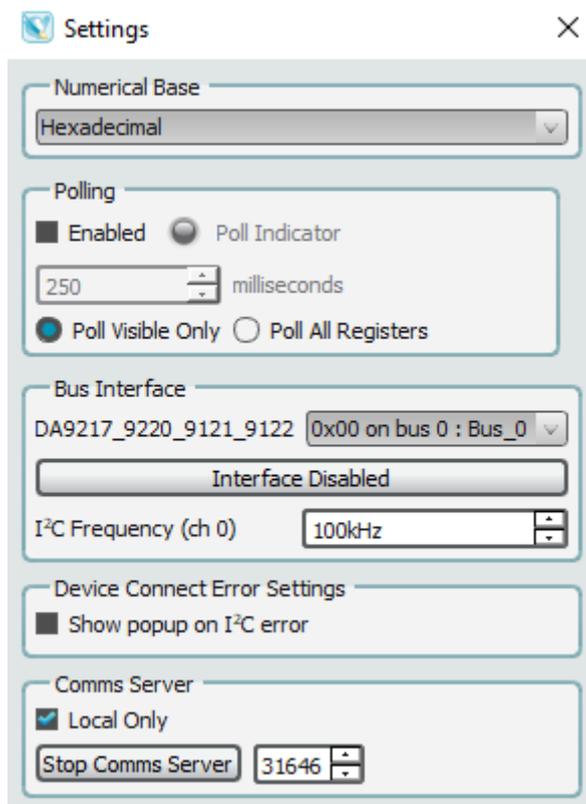
Figure 11: SmartCanvas GUI Settings Window

6.1   SmartCanvas Tabs

There are four tabs in the DA9217/DA9220/DA9121/DA9122 SmartCanvas GUI. They are:

- **buck** - address range from 0x20 to 0x2F which contains CH1 and CH2 settings.
- **otp** - address range from 0x48 to 0x4B which contains information of the chip ID and OTP variant.
- **sys** - address range from 0x01 to 0x15 which contains event and status registers, and GPIOs settings.
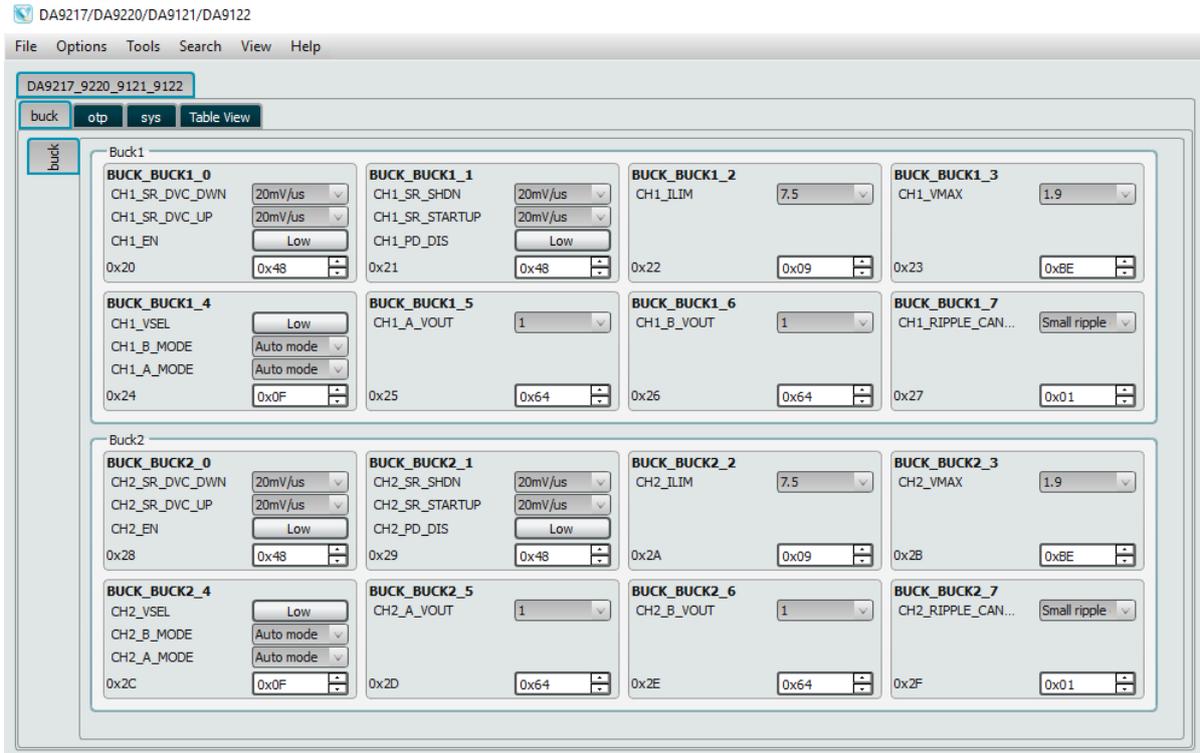- **Table View** - table of registers data.

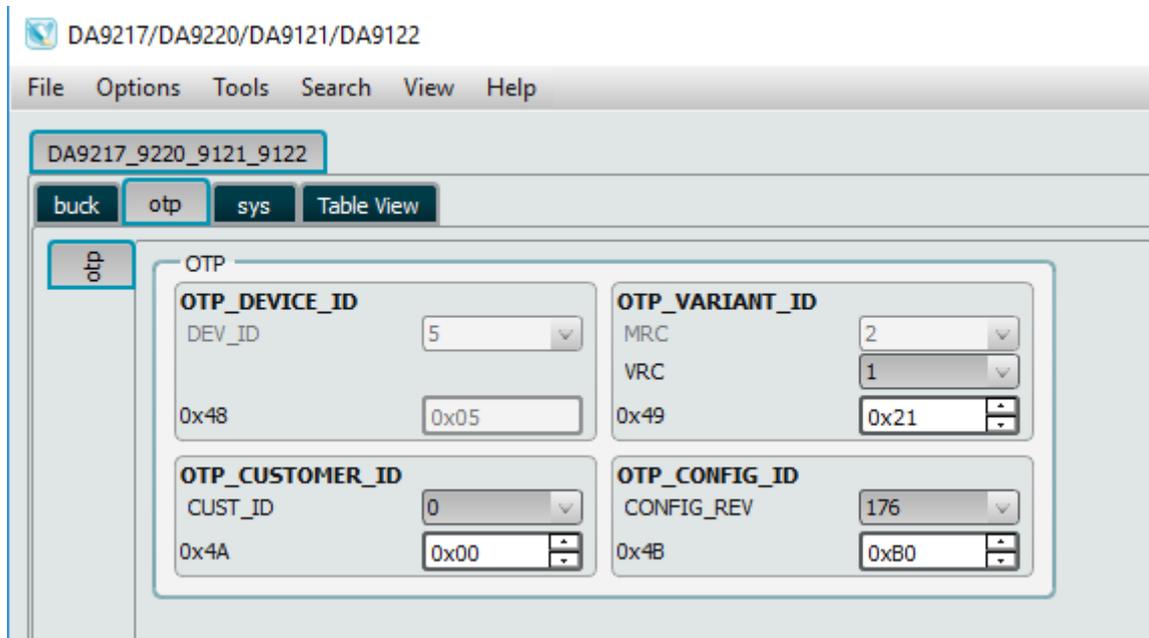**Figure 12: SmartCanvas GUI buck Tab**

Figure 13: SmartCanvas GUI otp Tab

DA9217/DA9121 and DA9220/DA9122 EVB Kits
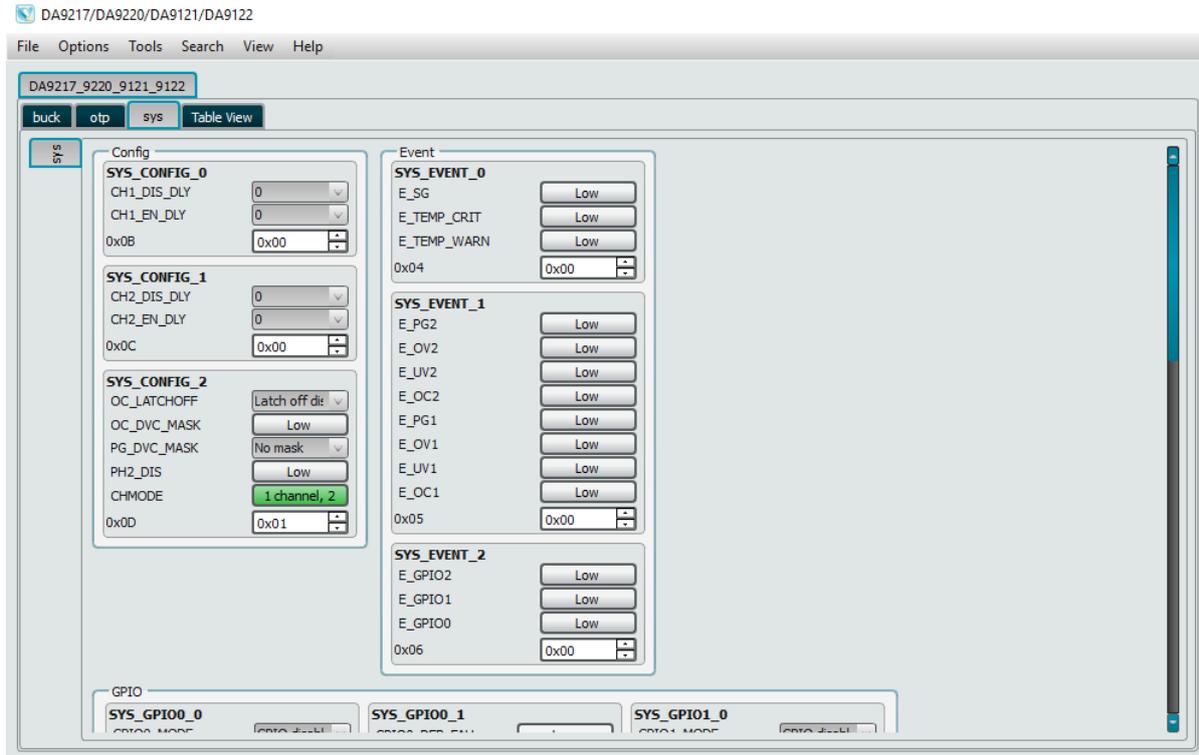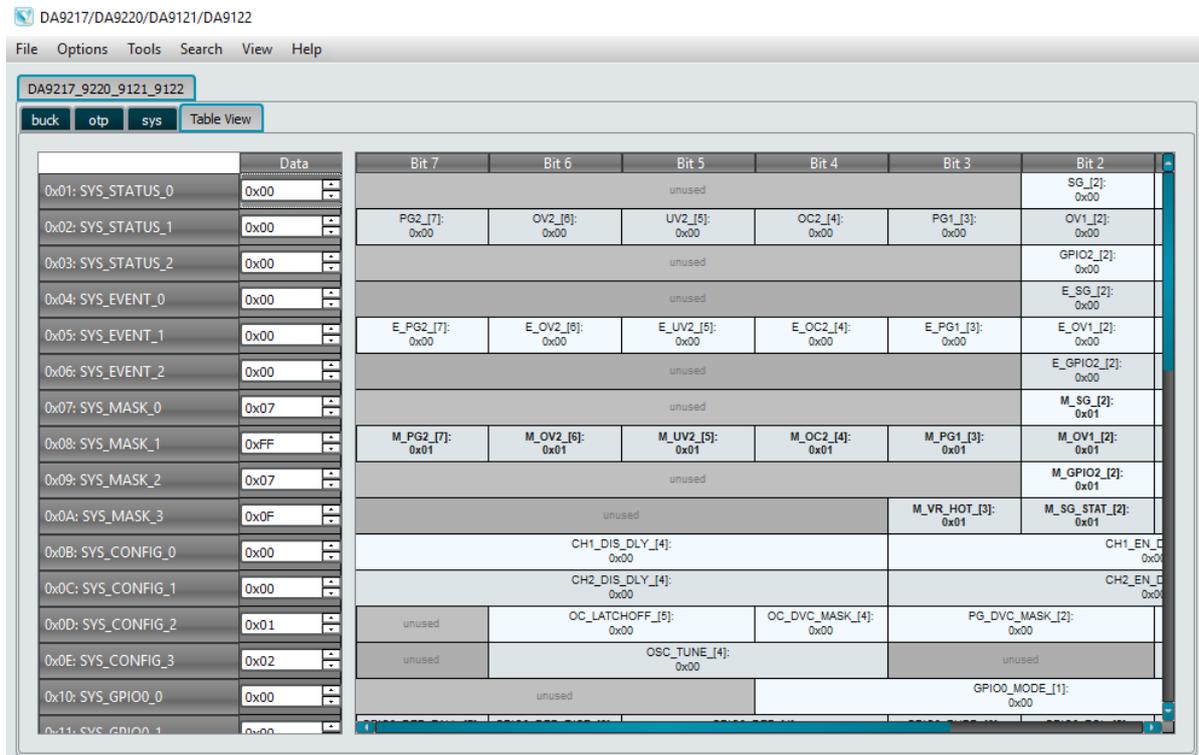

Figure 14: SmartCanvas GUI sys Tab

Figure 15: SmartCanvas GUI Table View Tab

6.2 Control Window

The **Control** window is used to connect to the device, to update the registers, and to save and/or load a Register Dump file.
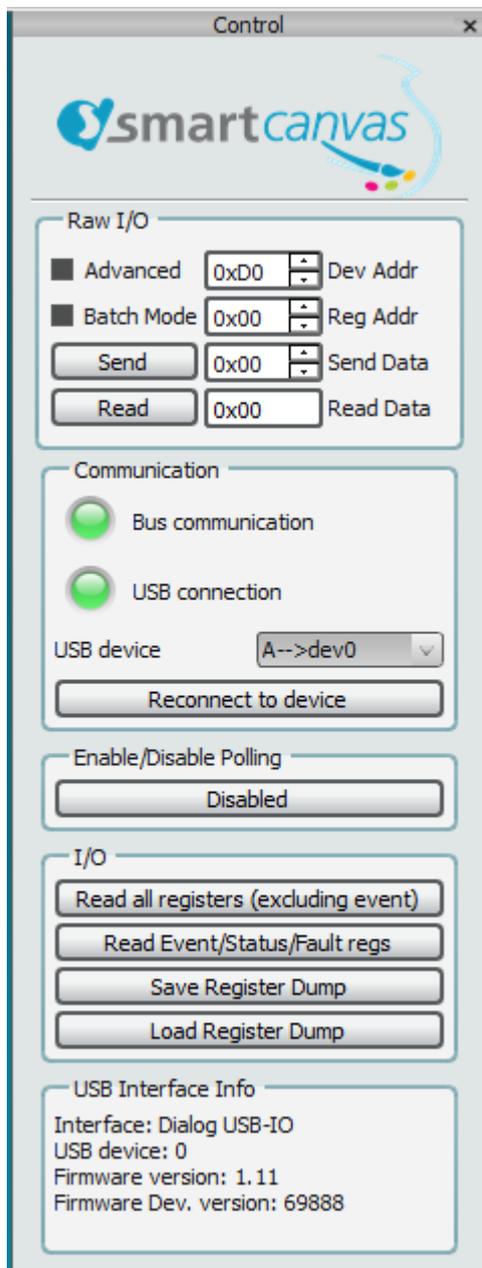

Figure 16: SmartCanvas GUI Control Window

6.2.1 Raw I/O

Data of each register address can be directly read by using the **Raw I/O** function.

Figure 17: Read addr 0x20 Example

Figure 18: Read addr 0x08 Example

It is also possible to write data directly to each register address by using the **Raw I/O** function.

Figure 19 shows an example of writing 0x49 to Addr 0x20 register and then reading register data in Addr 0x20.

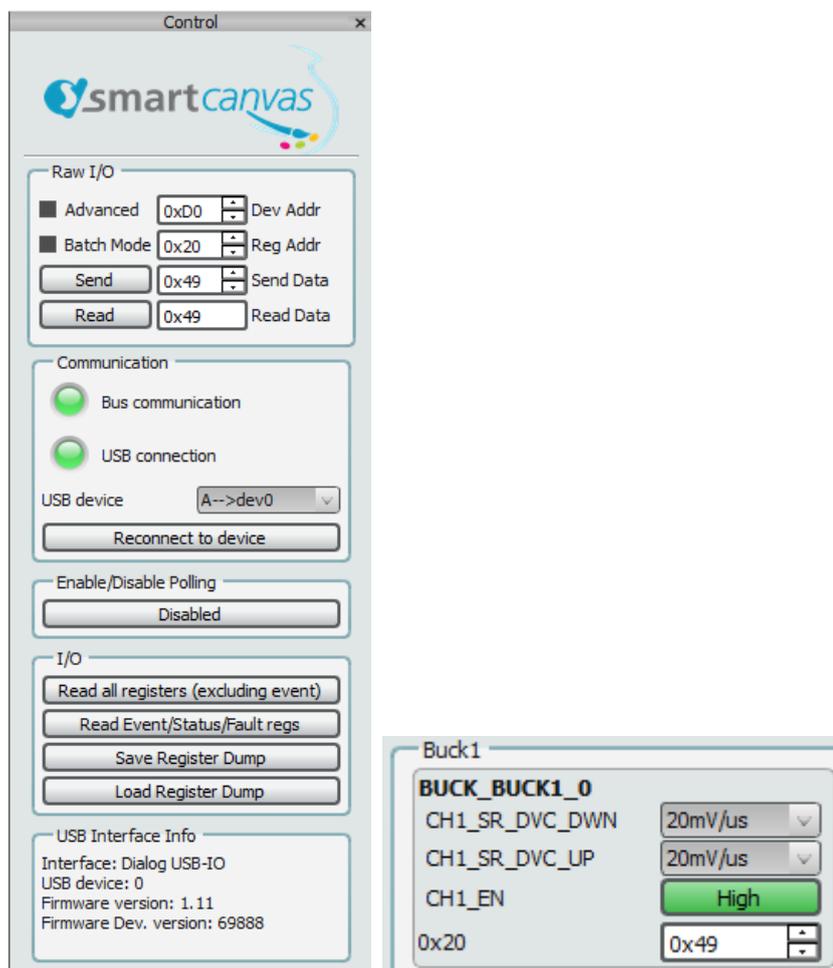| NOTE |
|------|
| Ensure that the I²C address in **Dev Addr** is set correctly. |

Figure 19: GUI SmartCanvas Raw I/O Window and BUCK_BUCK1_0 Register in the buck Tab

6.2.2   Enable/Disable Polling

When **Enable/Disable Polling** is set to **Enabled**, the GUI repeatedly reads access via I²C and updates all registers data.

Select **Disabled** to disable the polling operation.

6.2.3   Registers Update

The **Read all registers** and **Read Event/Status/Fault regs** buttons can be used to update the registers data.

6.2.4   Save and Load Register Dump

Users can save the device registers data in .txt and/or .csv format by using **Save Register Dump** and load data in .txt and/or .csv format to the device registers by using **Load Register Dump**.

Revision History

Revision	Date	Description
0.1	25-May-2018	Initial version (draft).
1.0	18-Oct-2019	Released version.
1.1	16-Feb-2022	Rebranded to Renesas.

Status Definitions

Status	Definition
DRAFT	The content of this document is under review and subject to formal approval, which may result in modifications or additions.
APPROVED or unmarked	The content of this document has been approved for publication.

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