

# 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.*

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**DA9217/DA9121 and DA9220/DA9122 EVB Kits**

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## **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.

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## DA9217/DA9121 and DA9220/DA9122 EVB Kits

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### 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<sup>2</sup>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<sup>2</sup>C interface module with USB cable (162-09), which is used for I<sup>2</sup>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.

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### 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<sup>2</sup>C Module should be connected to the evaluation board.

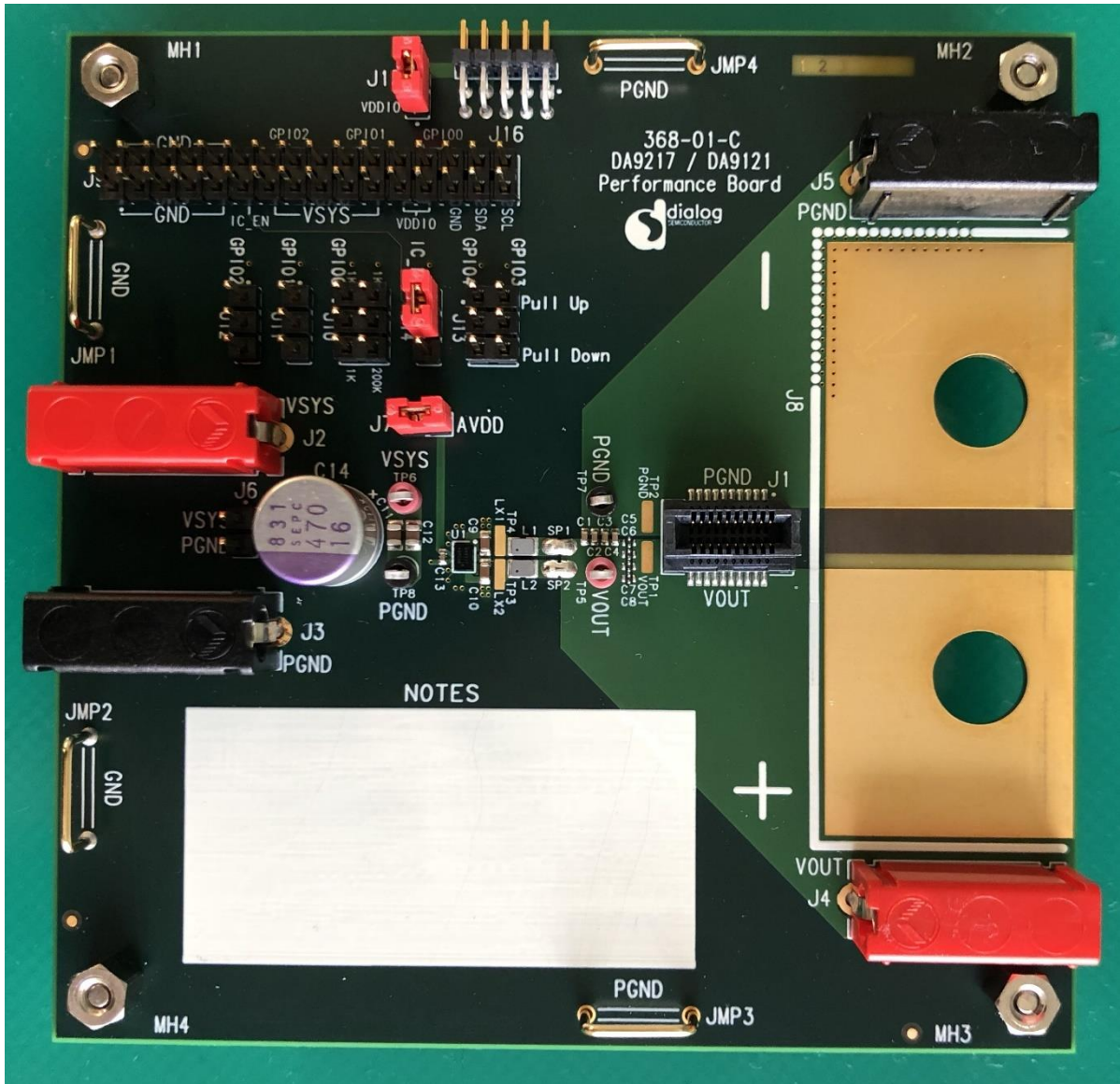


Figure 1: 368-01 DA9217/DA9121 EVB

DA9217/DA9121 and DA9220/DA9122 EVB Kits

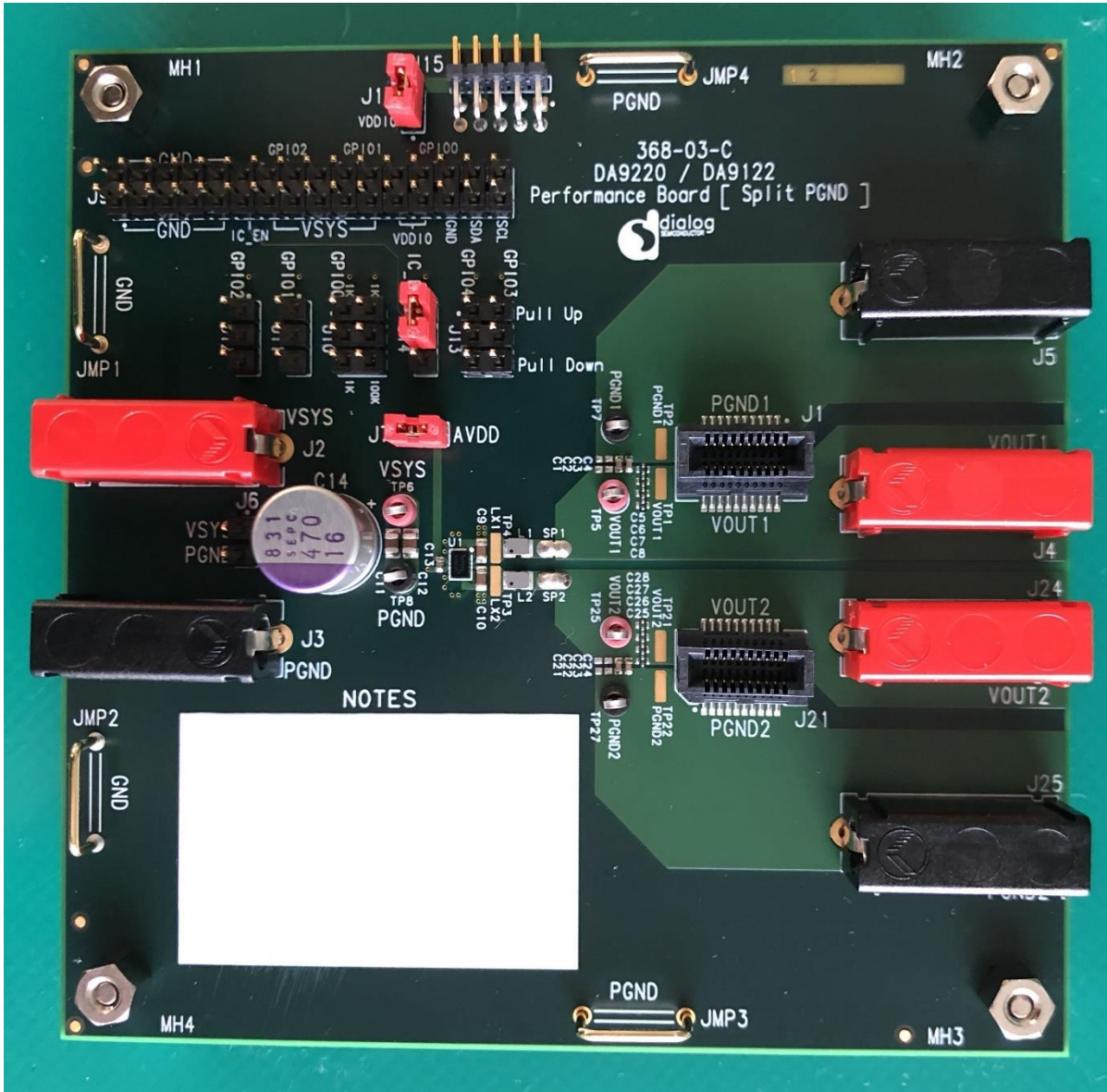


Figure 2: 368-03 DA9220/DA9122 EVB



DA9217/DA9121 and DA9220/DA9122 EVB Kits

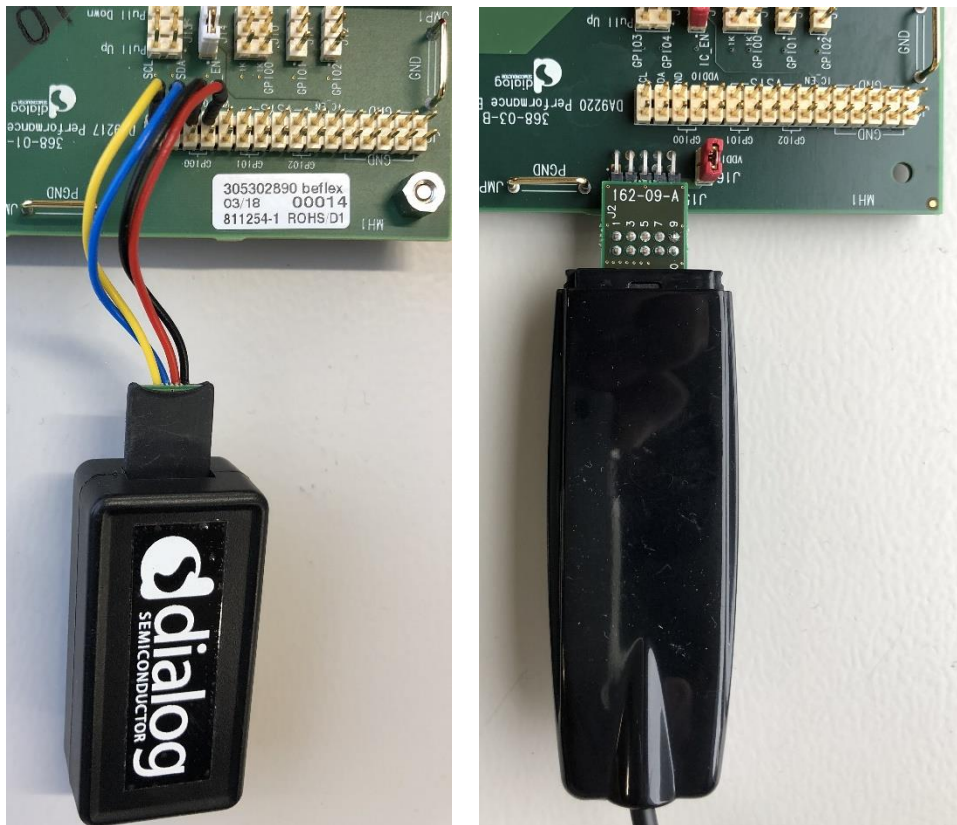


Figure 3: Connection between EVB and USB-I<sup>2</sup>C Module

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4.1 Links Description

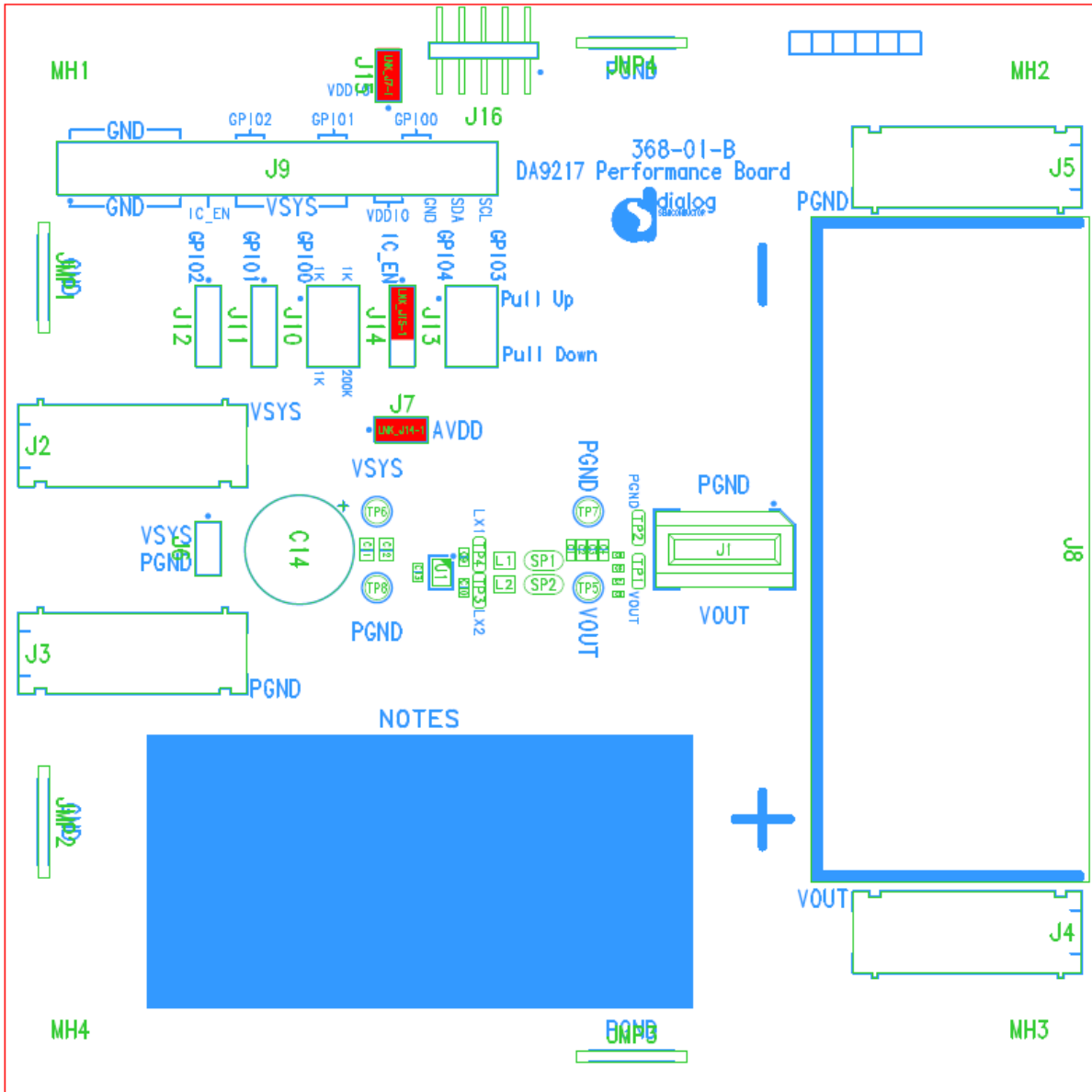


Figure 4: 368-01 EVB Links Location



DA9217/DA9121 and DA9220/DA9122 EVB Kits

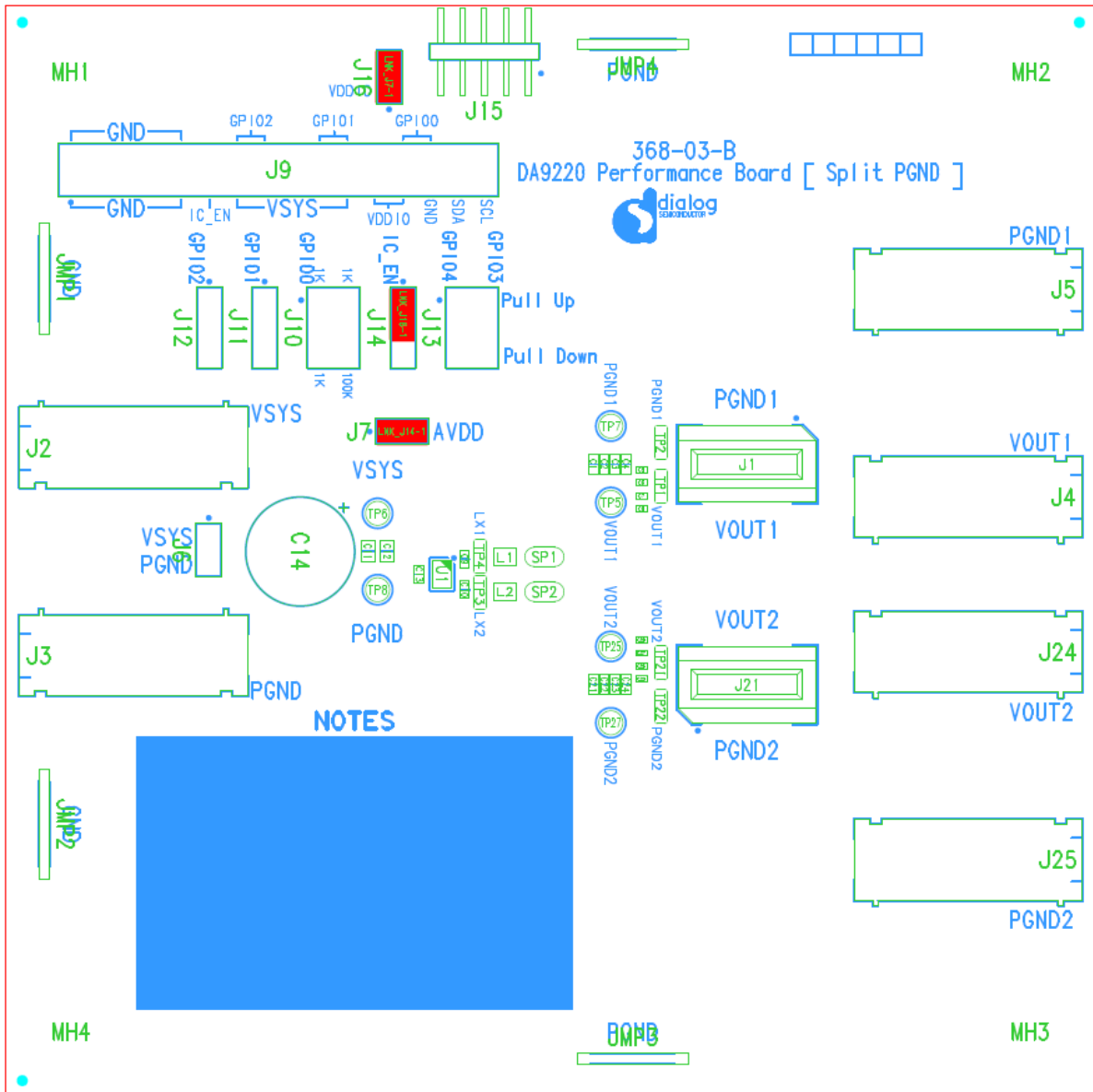


Figure 5: 368-03 EVB Links Location

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**DA9217/DA9121 and DA9220/DA9122 EVB Kits**
**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 <sup>2</sup> C module 3.3 V output (pin 1-2)	-	Connect VDDIO to USB-I <sup>2</sup> 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).

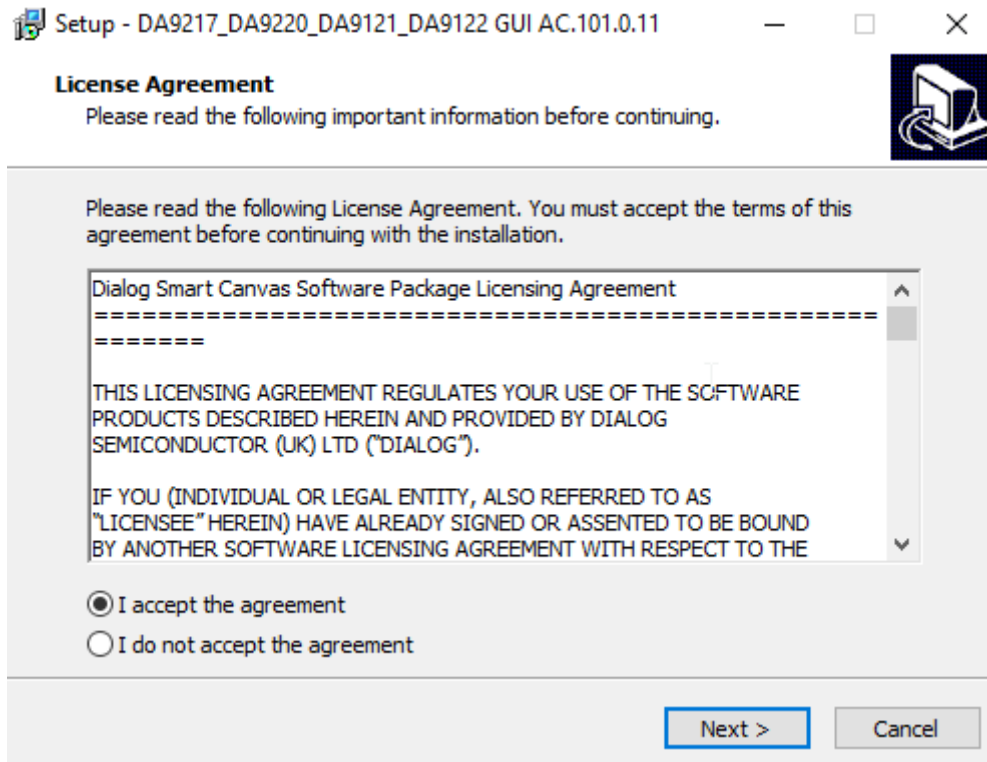


Figure 6: SmartCanvas License Agreement

**NOTE**

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

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

## DA9217/DA9121 and DA9220/DA9122 EVB Kits

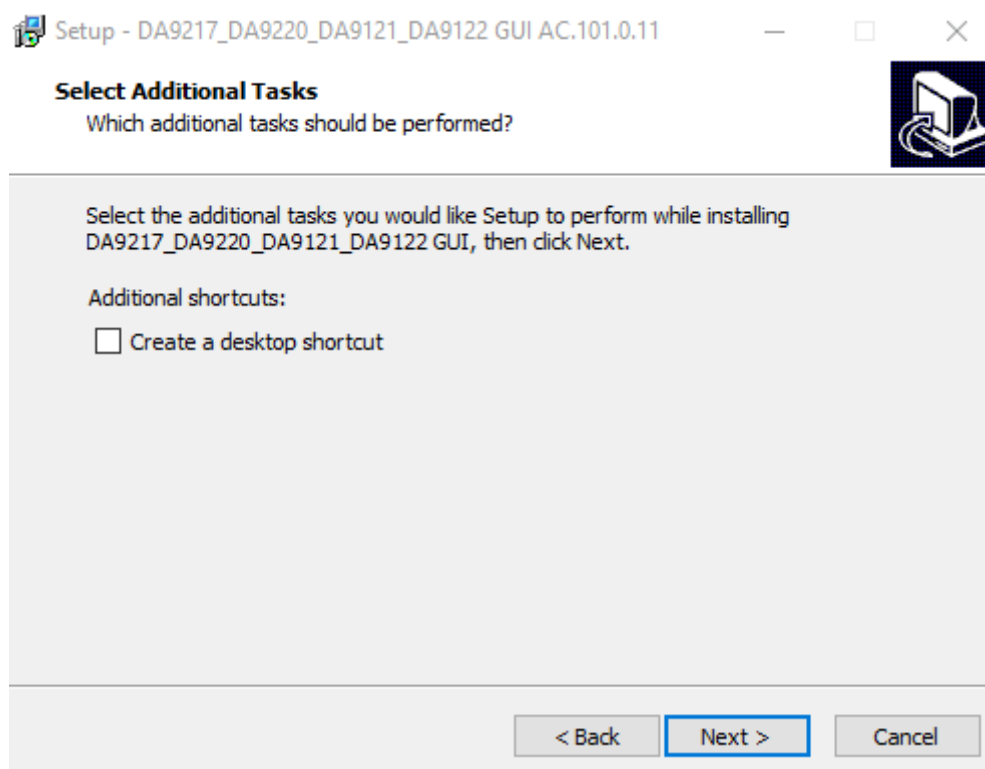


Figure 7: Optional Create a Desktop Shortcut

- Optionally, select to **Create a desktop shortcut** and then click **Next**.

## DA9217/DA9121 and DA9220/DA9122 EVB Kits

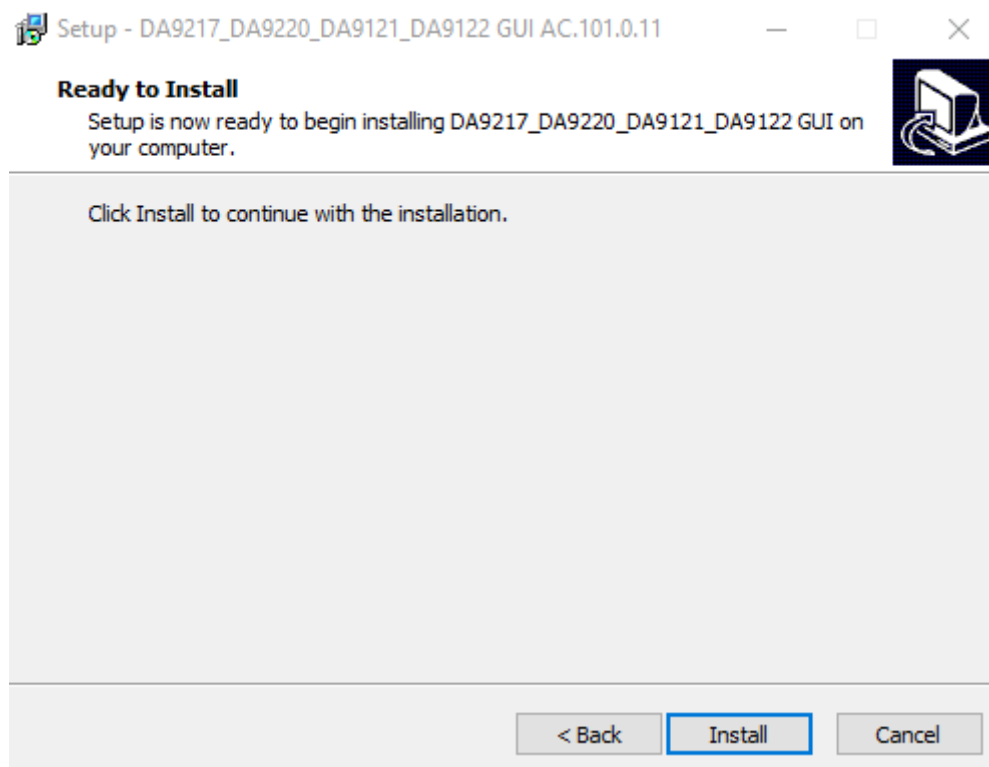


Figure 8: Install SmartCanvas

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.

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## 5.2 USB-IO Driver Installation

Follow the following steps to install the Dialog USB driver:

1. Plug the USB cable of USB-I<sup>2</sup>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](#).

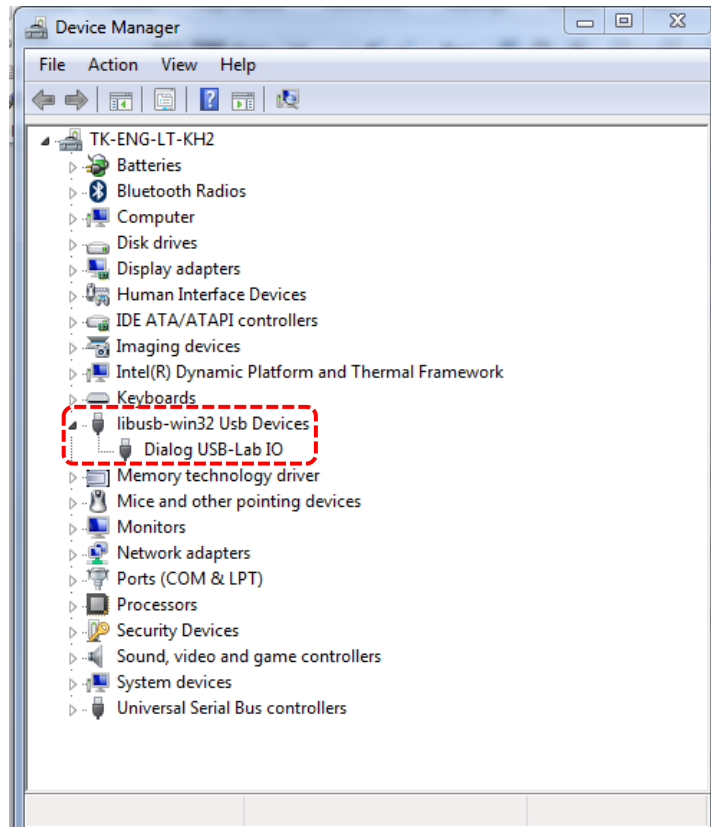


Figure 9: Windows Device Manager



## DA9217/DA9121 and DA9220/DA9122 EVB Kits

## 6 SmartCanvas GUI

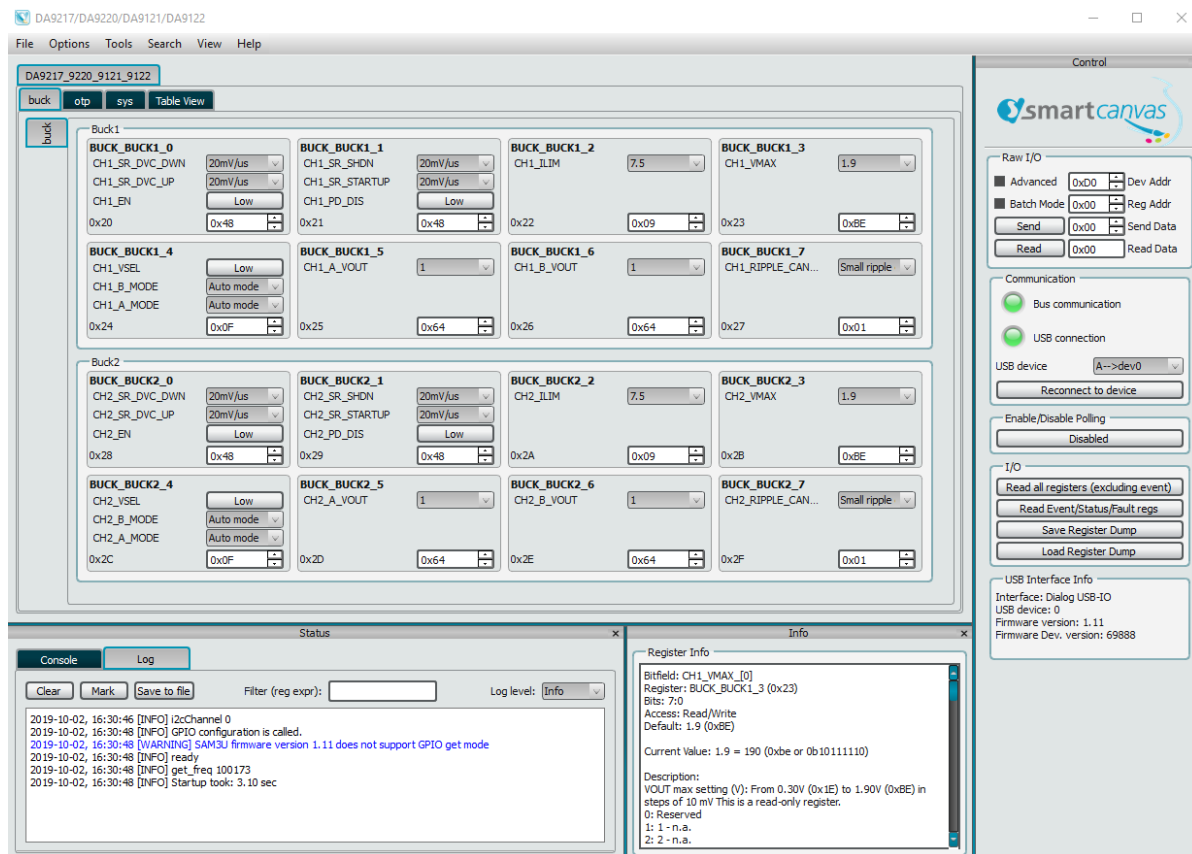


Figure 10: SmartCanvas GUI

Click **Reconnect to device** to connect to the device via the I<sup>2</sup>C interface.

The default I<sup>2</sup>C address of the GUI is 0xD0 (8-bit mapping, 1101 000xb).

To change the I<sup>2</sup>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<sup>2</sup>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.

## DA9217/DA9121 and DA9220/DA9122 EVB Kits

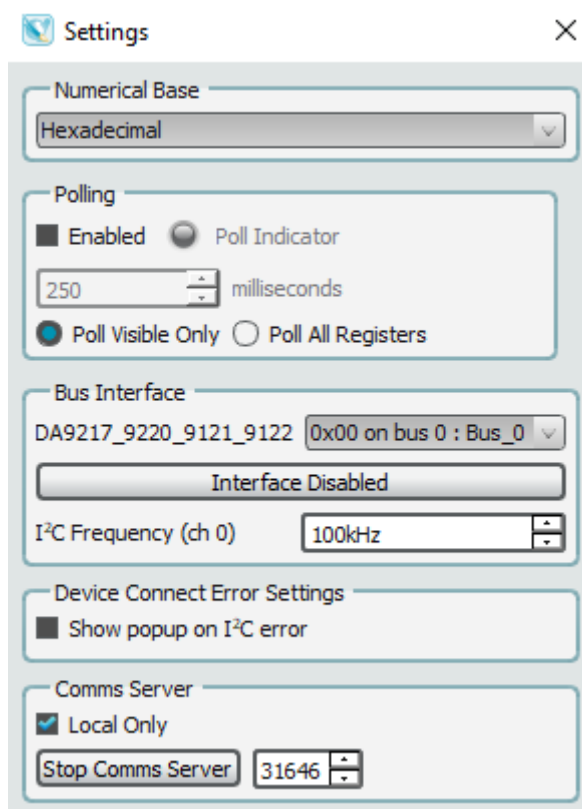


Figure 11: SmartCanvas GUI Settings Window

## 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.

DA9217/DA9121 and DA9220/DA9122 EVB Kits

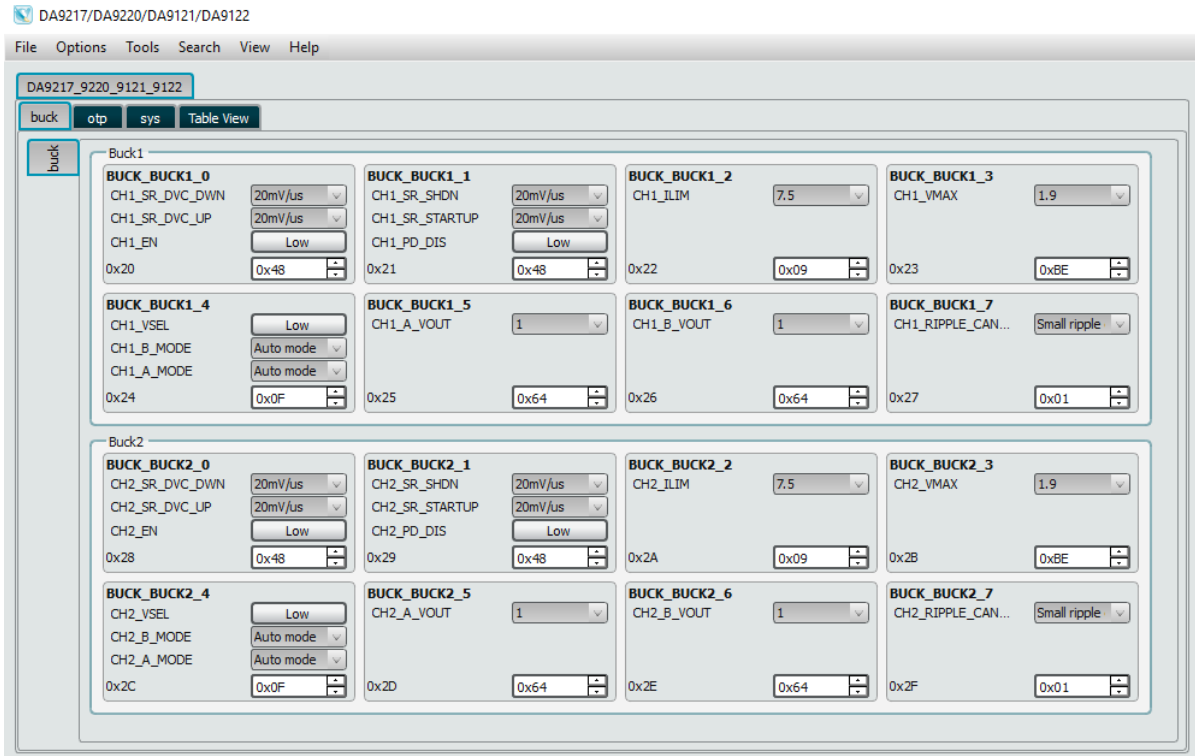


Figure 12: SmartCanvas GUI buck Tab

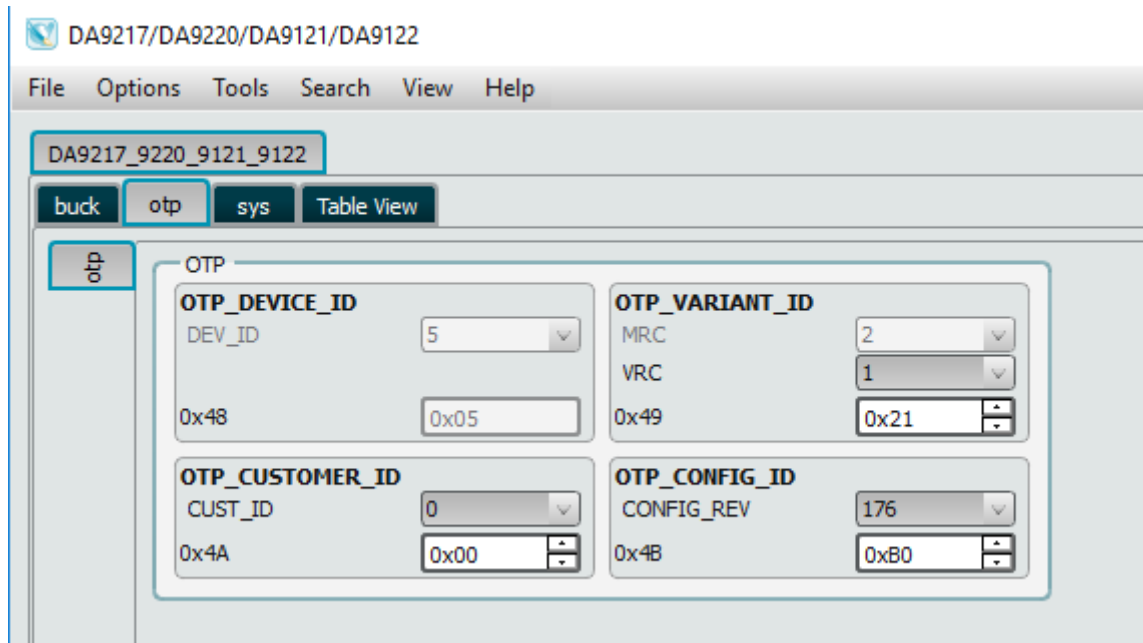


Figure 13: SmartCanvas GUI otp Tab

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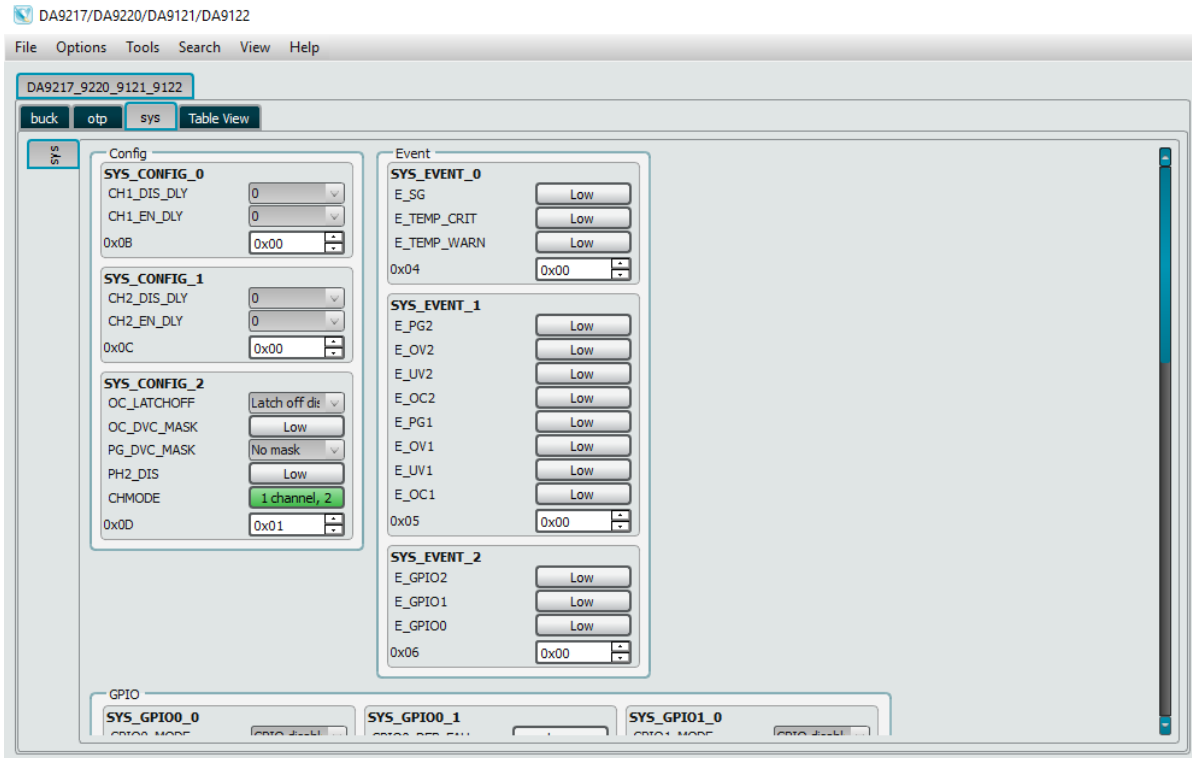


Figure 14: SmartCanvas GUI sys Tab

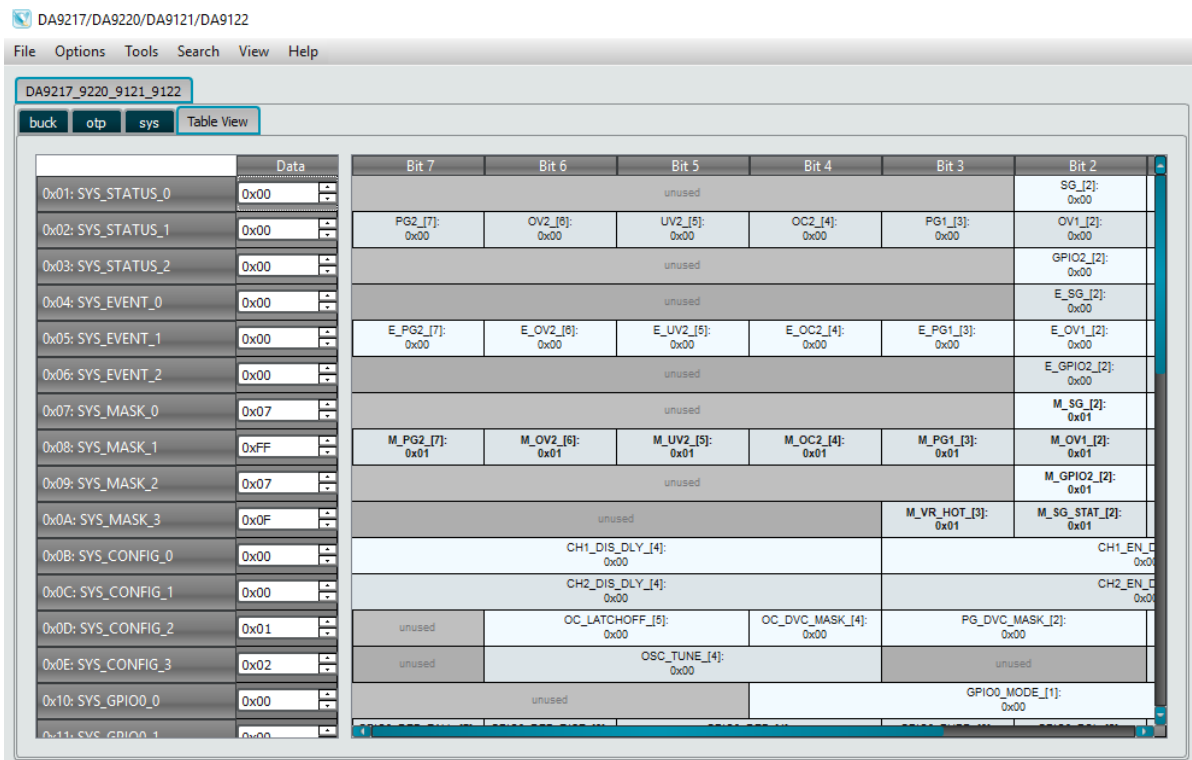


Figure 15: SmartCanvas GUI Table View Tab

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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.

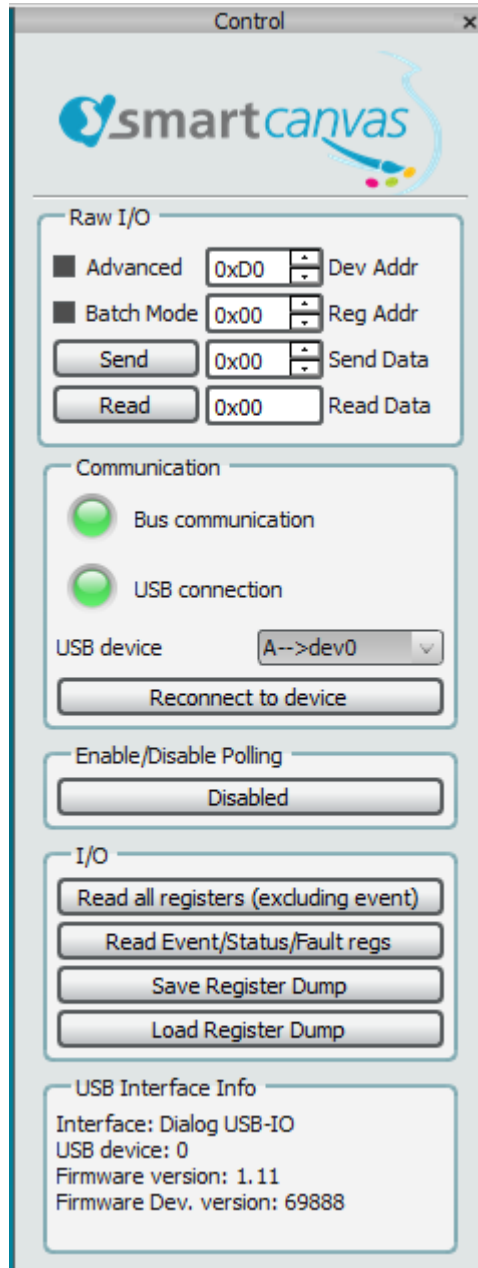


Figure 16: SmartCanvas GUI Control Window

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6.2.1 Raw I/O

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

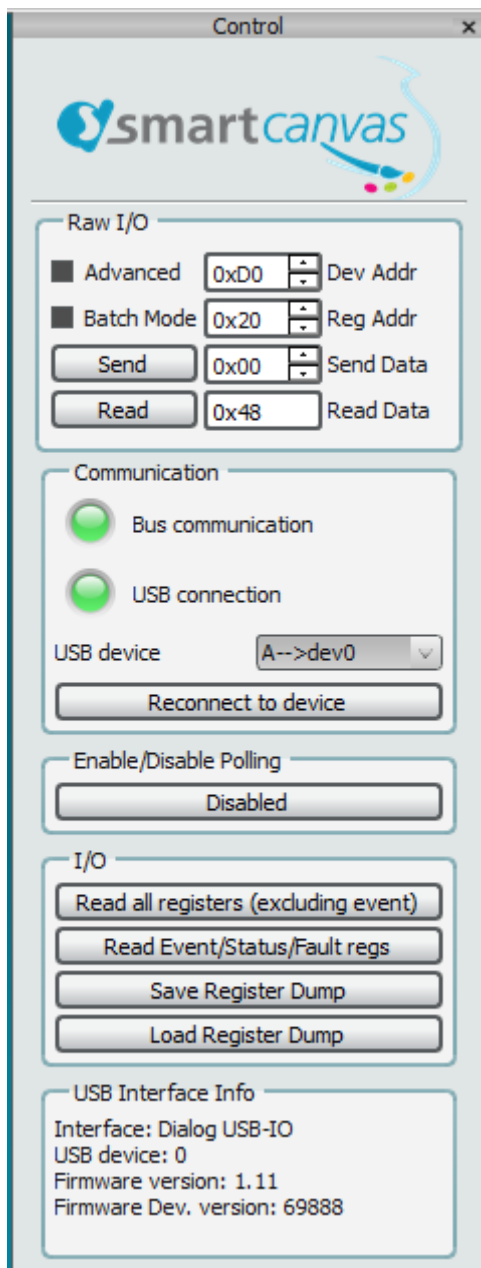


Figure 17: Read addr 0x20 Example



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.



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**NOTE**

Ensure that the I<sup>2</sup>C address in **Dev Addr** is set correctly.

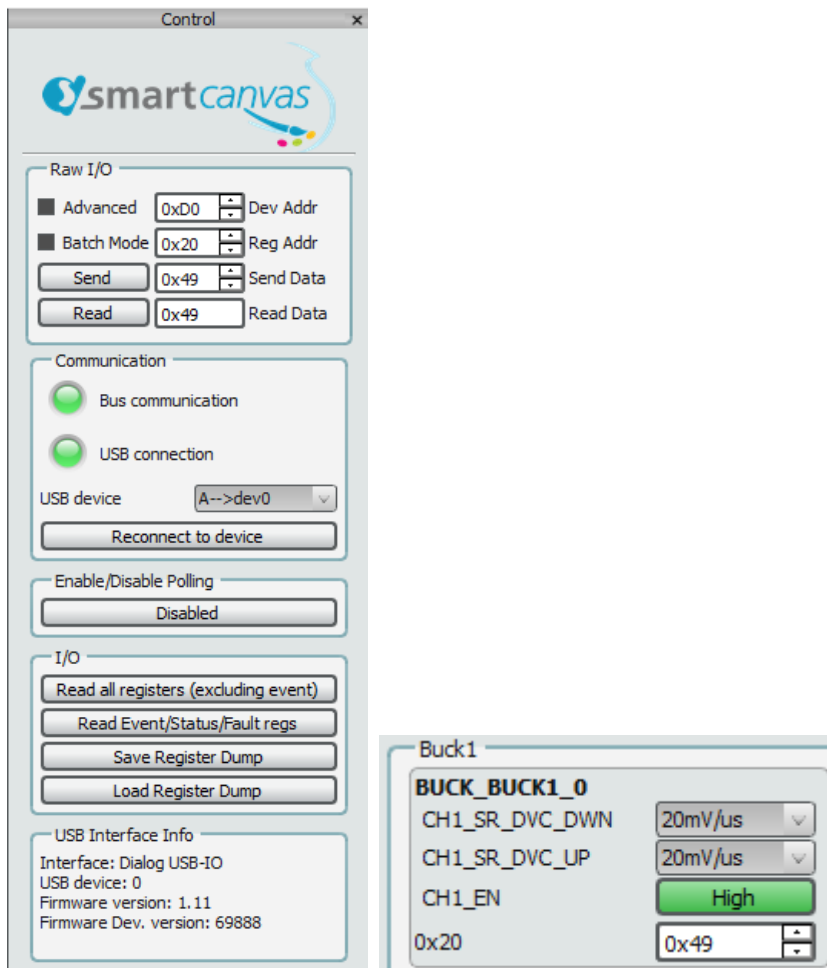


Figure 19: GUI SmartCanvas Raw I/O Window and BUCK\_BUCK1\_0 Register in the buck Tab

**6.2.2 Enable/Disable Polling**

When **Enable/Disable Polling** is set to **Enabled**, the GUI repeatedly reads access via I<sup>2</sup>C 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.

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**DA9217/DA9121 and DA9220/DA9122 EVB Kits****Status Definitions**

<b>Status</b>	<b>Definition</b>
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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