



AWMF-0188/0210-DK-UG

Development Kit User Guide

	AWMF-0188/0210 Developer Kit User Guide	Document	AWMF-0188-0210-DK-UG
		Issue Date	3/7/23
		Revision	1.2
		Page	1 of 12

Revision	Date	By	Description of Change
1.2	3/7/24	AMS	Updated IF de-embedding file for AWMF-0210. Updated logos
1.1	5/23/22	AMS	Added note for AWMF-0210 bypass mode support
1	1/21/22	AMS	Initial version

	AWMF-0188/0210 Developer Kit User Guide	Document	AWMF-0188-0210-DK-UG
		Issue Date	3/7/23
		Revision	1.2
		Page	2 of 12

1

CONTENTS

2

IMPORTANT READ THIS SECTION FIRST

3

2.1

Power Up

3

2.2

BYPASS Mode Support

3

3

SOFTWARE INSTALLATION

4

3.1

NI-8452 USB-SPI Installation

4

3.2

Hardware Validation

7

3.3

AWMF-0188/0210 Control Software Installation

8

4

AWMF-0188/0210 SOFTWARE OPERATION

9

4.1

Start Up

9

4.2

Main Tab

9

5

POWER UP PROCEDURE

10

5.1

Controller Connections

10

5.2

Power Supply Connections

11

5.3

Additional Recommendations

12

	AWMF-0188/0210 Developer Kit User Guide	Document	AWMF-0188-0210-DK-UG
		Issue Date	3/7/23
		Revision	1.2
		Page	3 of 12

2 IMPORTANT READ THIS SECTION FIRST

2.1 Power Up

Prior to powering up the evaluation board it is critical that you review and carefully follow the procedure outlined in:

5 Power Up Procedure

Failure to follow this procedure can result in damage to the device

2.2 BYPASS Mode Support

As of 2/21/22, TX and RX BYPASS modes for the AWMF-0210 are no longer supported and any references to the associated bypass controls and features should be ignored. BYPASS modes for the AWMF-0188 are fully supported.

	AWMF-0188/0210 Developer Kit User Guide	Document	AWMF-0188-0210-DK-UG
		Issue Date	3/7/23
		Revision	1.2
		Page	4 of 12

3 SOFTWARE INSTALLATION

In order to control the evaluation board, two software installation steps are required. The first step is to install the necessary support software for the National Instruments NI-8452 USB-SPI adaptor as described in 3.1. The second step is to install the Anokiwave software specific to the evaluation board to provide the control user interface, as described in 3.3.

3.1 NI-8452 USB-SPI Installation

This section describes the software installation process for the NI-8452 hardware. The software should be downloaded via the link provided in the AWMF-0188/210-DKxxx-QSG Quick Start Guide. The user should follow the installation steps detailed in Figure 1 to Figure 13.

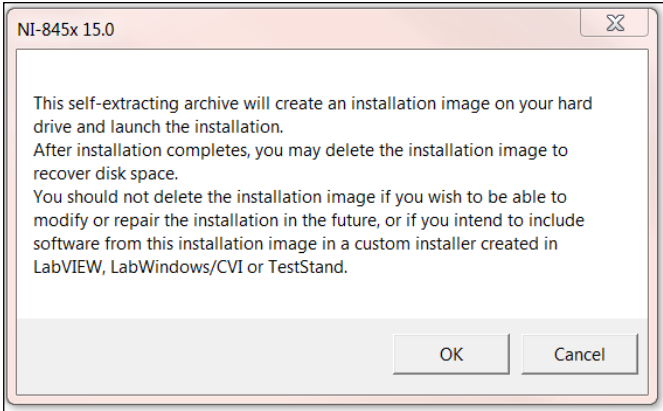


Figure 1:Run the Self-Extracting Archive Utility. Press OK to Continue

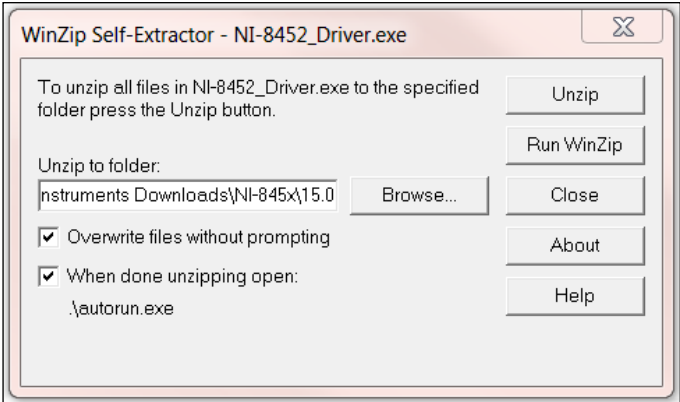


Figure 2:Recommend that the defaults shown above are used. Press Unzip to Continue

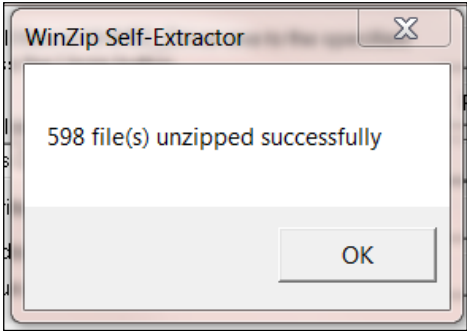


Figure 3:After the self-extraction process has completed the following message should be visible. Press OK to Continue

	AWMF-0188/0210 Developer Kit User Guide	Document	AWMF-0188-0210-DK-UG
		Issue Date	3/7/23
		Revision	1.2
		Page	5 of 12

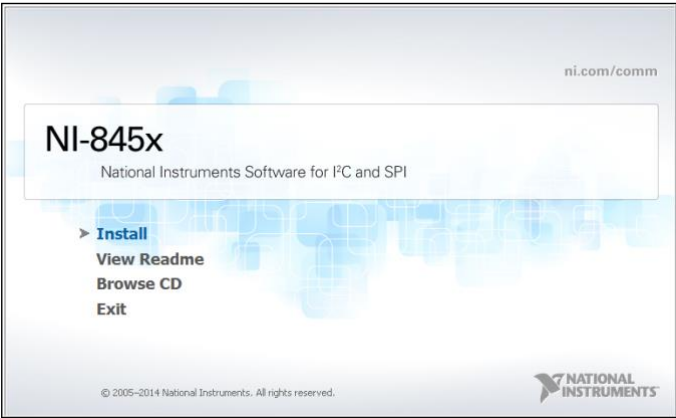


Figure 4: Select Install

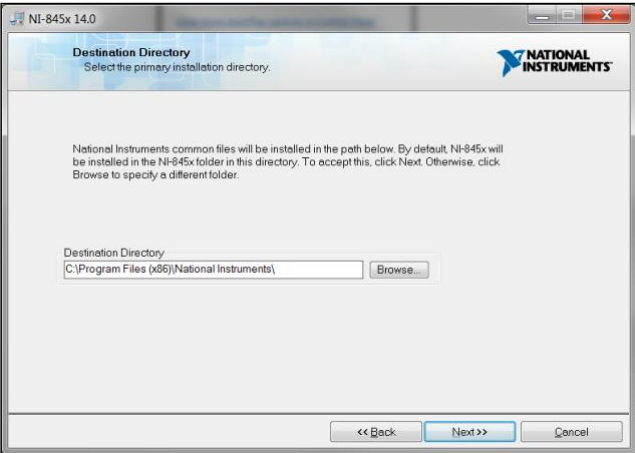


Figure 5: Recommend the default folder is used as shown above. Press Next to Continue

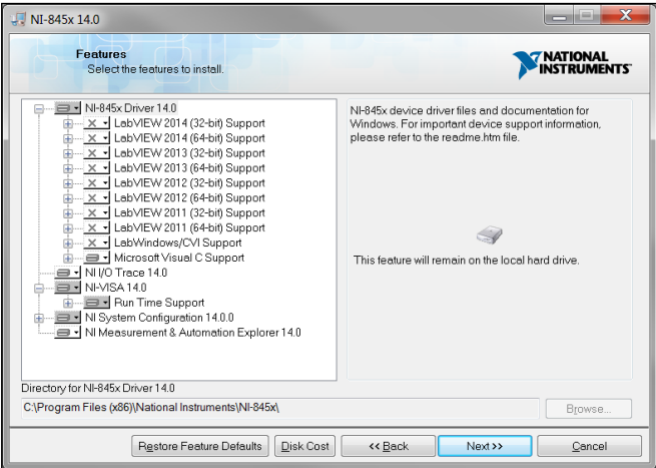


Figure 6: The installer will automatically select the necessary support files for the target system. Press Next to Continue

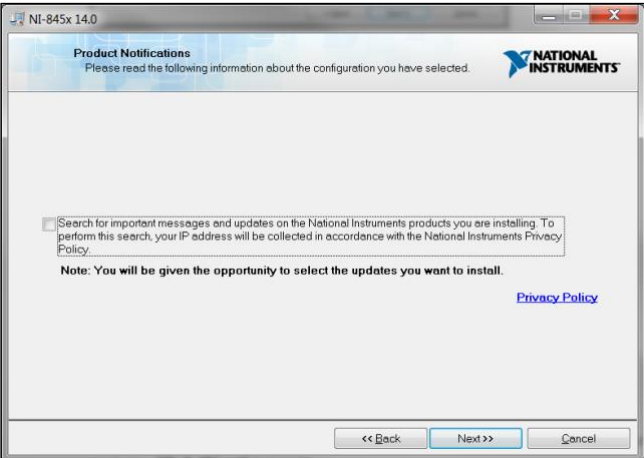


Figure 7: Uncheck the Search for important messages and updates. Press Next to Continue



Figure 8: Select acceptance of the license agreements. Press Next to Continue

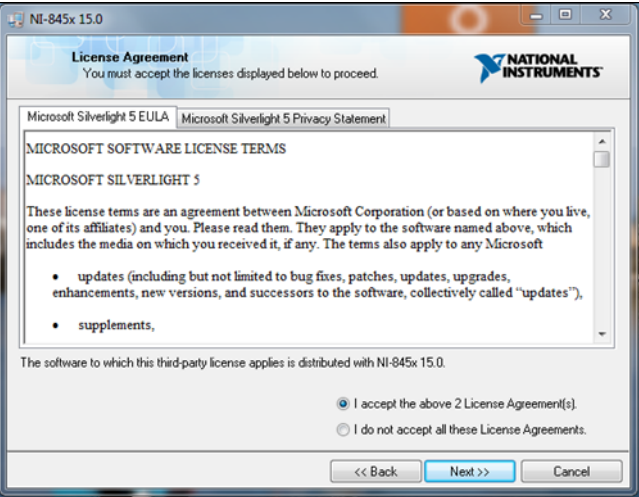


Figure 9: Select acceptance of the license agreements. Press Next to Continue (This dialog may not appear if Silverlight is already installed on the target system)

	AWMF-0188/0210 Developer Kit User Guide	Document	AWMF-0188-0210-DK-UG
		Issue Date	3/7/23
		Revision	1.2
		Page	6 of 12

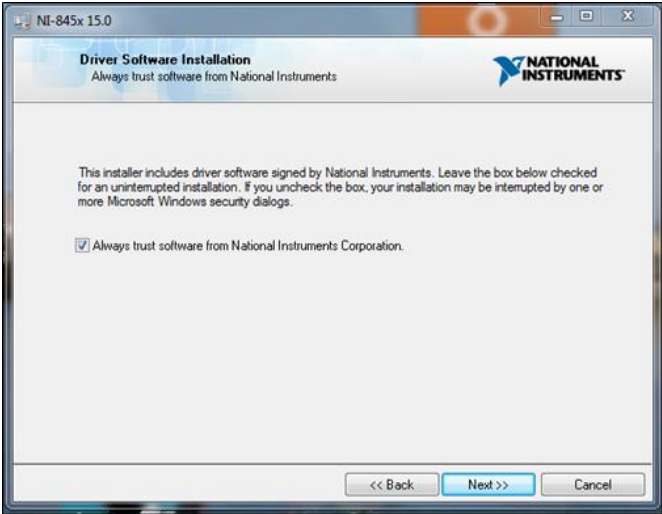


Figure 10: Maintain the check option if uninterrupted installation is required. Press OK to Continue

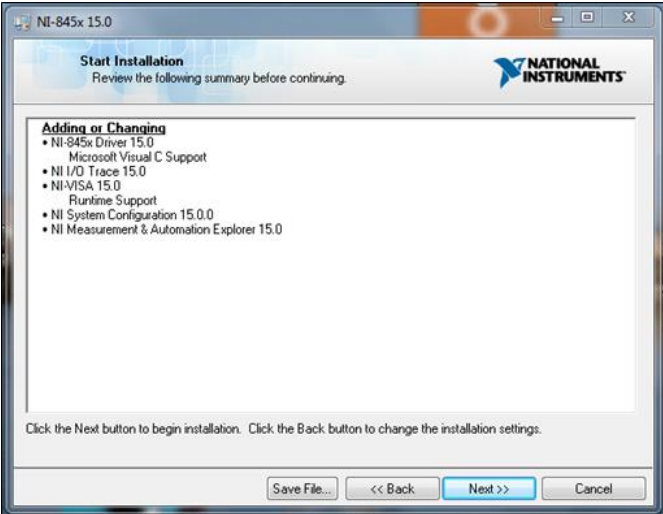


Figure 11: This dialog shows the tools that will be installed. The actual dialog may differ from the above depending upon installation options and the current configuration of the target machine.

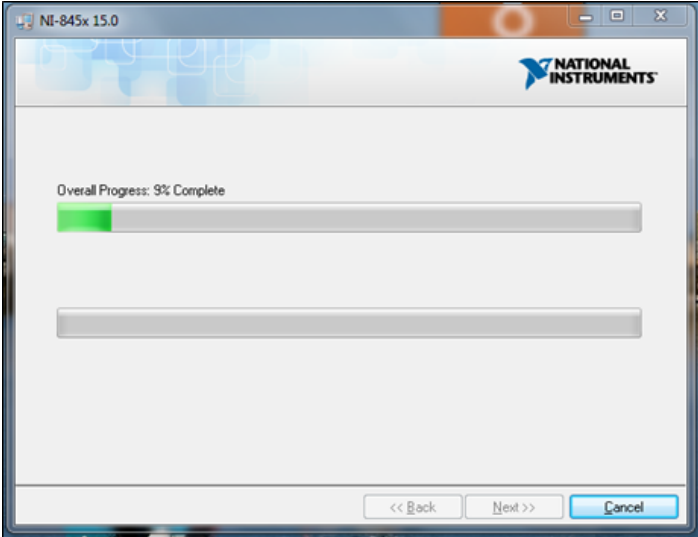


Figure 12: The NI-8452 driver and support files will then be installed. The process may take several minutes.

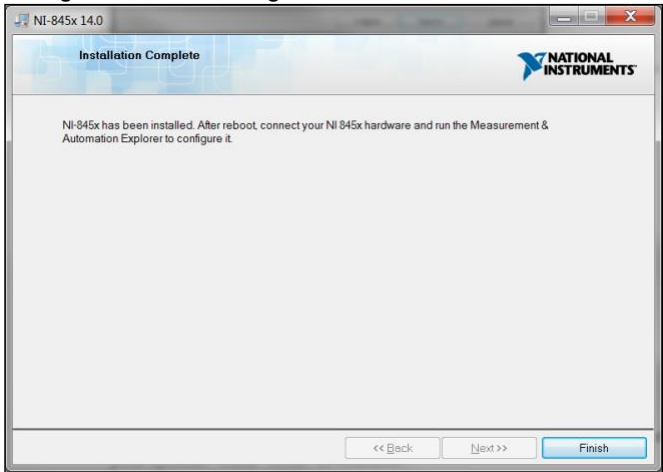


Figure 13: Press Finish to complete the installation process. Upon completion the user may be required to re-start the system.

	AWMF-0188/0210 Developer Kit User Guide	Document	AWMF-0188-0210-DK-UG
		Issue Date	3/7/23
		Revision	1.2
		Page	7 of 12

3.2 Hardware Validation

Once the NI-8452 software installation has successfully completed, the NI-8452 should be plugged into the PC using an available USB port. Successful installation and configuration can be confirmed if the blue LED labelled **USB** is lit, as illustrated in Figure 14.



Figure 14: Connecting the NI-8452 to the PC Should Result in the USB Indicator Being Lit

3.3 AWMF-0188/0210 Control Software Installation

This section describes the steps necessary to install the Anokiwave Developer Kit control software. The software should be downloaded via the link provided in the AWMF-0188-0210-DKxxx-QSG Quick Start Guide. Follow the steps detailed in Figure 15 to Figure 17 to extract the control software to a user defined folder.

Please note that the control software is compatible with both the AWMF-0188 and AWMF-0210 parts. Operation is identical for both parts, but the recommended settings for each part differ slightly.

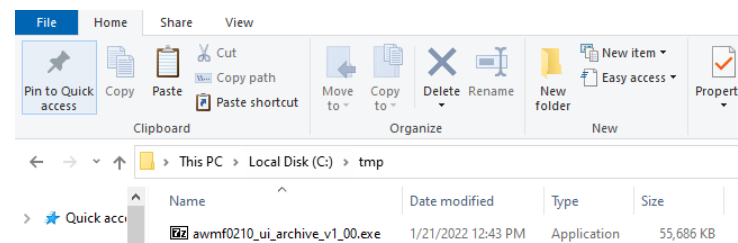


Figure 15: Copy the Self-Extracting Executable to a Temporary Folder

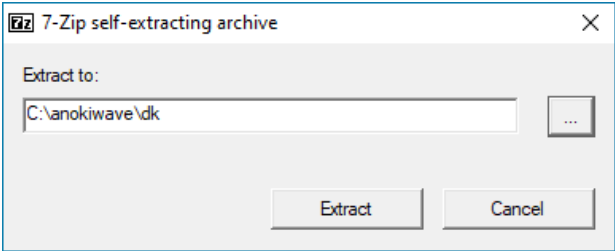


Figure 16: Select Folder to Extract Files (Recommend the default folder above)

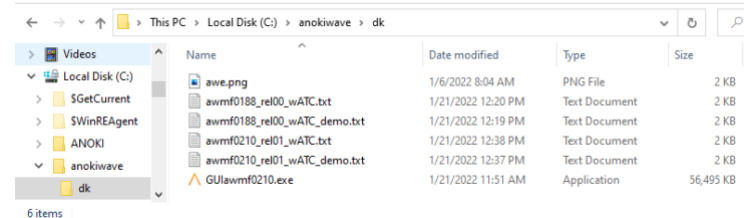


Figure 17: Folder Results After Successful Extraction

	AWMF-0188/0210 Developer Kit User Guide	Document	AWMF-0188-0210-DK-UG
		Issue Date	3/7/23
		Revision	1.2
		Page	9 of 12

4 AWMF-0188/0210 SOFTWARE OPERATION

Note that the control software can be started in 'live' or 'simulation mode'. If live mode is selected, the evaluation board must be connected and powered on before selecting live mode. The hardware connections and power up sequence detailed in Section 5 should be followed prior to starting the control software in live mode. The 'simulation mode' does not require any hardware to be attached to the PC and is intended to help familiarize the user with the various controls and register write/read operations.

4.1 Start Up

Once the software is started, the user is first presented with a dialog box to configure the address of the NI-8452 controller. Selecting the default **usb** setting will result in the control software finding the next available NI-8452 in the system. This option is recommended for systems which involve a single evaluation board. For cases where the user is controlling multiple Anokiwave devices through separate controllers, the user can specify the serial number of the NI-8452 controller to be used. Selecting SIM (simulation mode) will start the control software in a mode that does not require any control hardware attached.

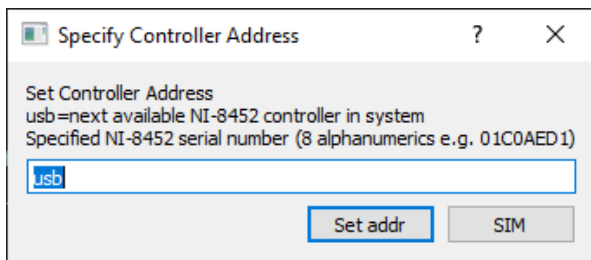


Figure 18: Control Software: Specifying the Hardware Controller Address

4.2 Main Tab

The main tab user interface (UI) screen is shown in Figure 19, just after start up. The status box should report *Device Connected*. Any errors encountered in connecting to the hardware shall be reported to the same status box. The majority of widgets in the UI have tooltips for further information on the respective feature/control.

The T/R Mode (combo-box **00:SBY**) controls the state of the TX_EN and RX_EN lines which allows management of the four basic modes, namely Standby (SBY), Transmit (TX), Receive (RX) and Sleep (SLP) modes. Note that the state of the TX_EN and RX_EN lines change immediately upon a change in the combo box and is highlighted by a message of the form *TR=x* in the status window (where x is a 2-bit integer representing the state of the lines, with RX_EN being the MSB). The **0:Write RADDR** combo-box manages the SPI write options as follows. **0: Write RADDR** writes to the RADDR register. **1:Incremental ON** writes only those registers that have been changed since the previous write (the control software maintains a copy of all the registers to determine which registers need to be updates after changes to settings in the UI). **2:Write ALL main regs** writes all key write registers in the range 0x00-0x41. Note that issuing a RFIC RST (sw_reset) to the device, or power cycling the device will cause the control software to lose register tracking information and a **2:Write ALL main regs** should be selected to completely update the register state tracking.

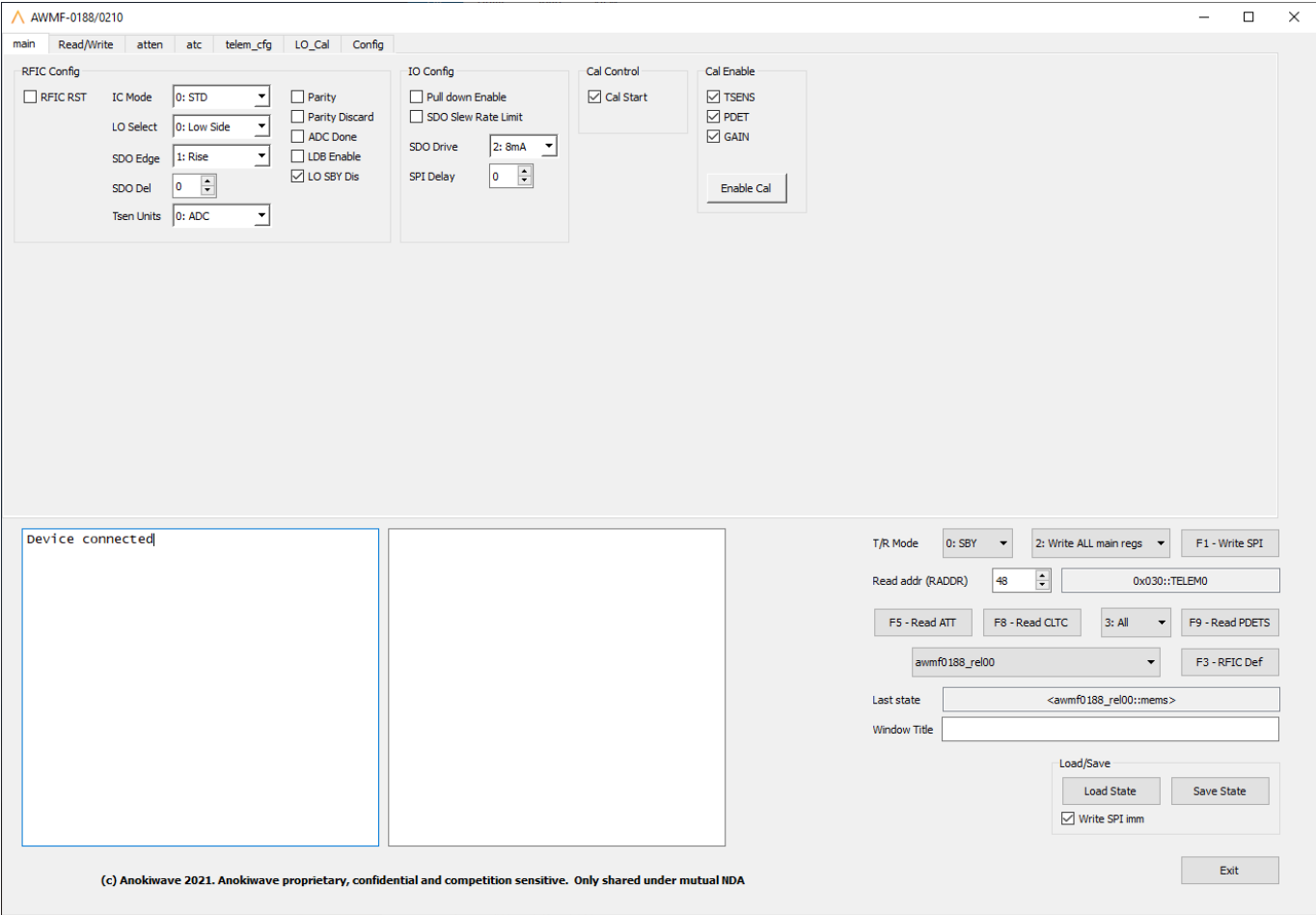


Figure 19: Control Software: Main Tab

5 POWER UP PROCEDURE

Note that it is critical that the steps in the following section are carefully followed to avoid damage to the device.

5.1 Controller Connections

The cables should be connected as detailed in Table 1 and illustrated in Figure 20 and Figure 21.

Table 1: Connections Between DC/SPI Interposer Board and EVB

	PCB-10036-V1-A_Rev2	PCB-0161-EVB-V2
SPIO IO cable	P3	X2
Power cable	P5	X1

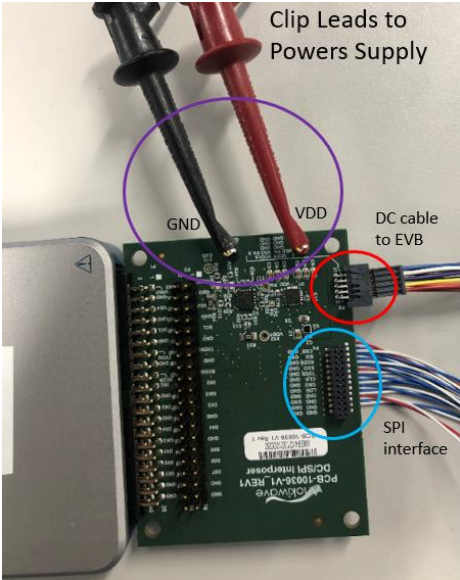


Figure 20: Connect IO Cable to J7 on Evaluation Board

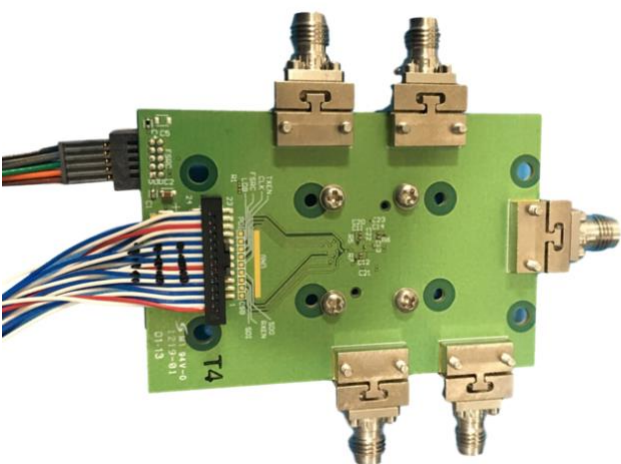


Figure 21: Connect IO Cable to X3 on Interposer Board

5.2 Power Supply Connections

Ensure that the power supply is turned off. Connect X9 and X10 to the positive and ground terminals of the supply, respectively. Configure the power supply according to Table 2.

Table 2: Power Supply Configuration

Supply Voltage Vdd (V)	2.5
Current limit (mA)	1000
Over voltage protection limit (V)	4

The power supply output should then be enabled. The part will power up in standby mode and the expected current consumption is ~10 mA. The quiescent current of the regulator is ~1 mA and thus the indicated current consumption on the power supply should be ~11 mA. Typical power dissipation can be found in the AWMF-0188/0210 Datasheets for all the operating modes. Device specific current consumption can be found in the associated Developer Kit Data Report.

	AWMF-0188/0210 Developer Kit User Guide	Document	AWMF-0188-0210-DK-UG
		Issue Date	3/7/23
		Revision	1.2
		Page	12 of 12

5.3 Additional Recommendations

- Any unused RF port should be terminated with a high quality 2.4 mm termination.
- The evaluation board is shipped with a heatsink attached and all data documented for this part is with the heatsink assembly attached to the board.