nicslab

Version 1.4

XDAC - MUB

Product Reference Manual

CE RoHS

Copyright © 2026 Nicslab Ops, Inc.

www.nicslab.com

nicslab

Version 1.4

XDAC - MUB

A versatile multichannel source measurement system supporting multiple voltage/current sourcing and measurement.







Version: 1.4
Date 11 June 2026

Important Notice and Disclaimer:

No part of this document may be reproduced in any form or by any means (including electronic storage and retrieval or translation into a foreign language) without prior agreement and written consent from Nicslab. No responsibility is assumed by Nicslab for its use, nor for any infringements of patents or other rights of third parties that may result from its use. Trademarks and registered trademarks are the property of their respective owners.

This product is designated for skilled users. You are entirely responsible for (1) choosing the appropriate Nicslab products for your operation, (2) designing, validating, and testing your operation, (3) ensuring your operation meets applicable standards, and any other safety, security, or other requirements.

Copyright © 2026, Nicslab.

Safety Note

Do not operate this product in any manner not specified by Nicslab. Failure to comply with these precautions or with specific warnings or instructions elsewhere in this manual violates safety standards of design, manufacture, and intended use of the instrument. Nicslab assumes no responsibility for any damage caused by mishandling that is beyond normal usage defined in this manual of this product.

Before Applying DC Power Supply

Verify that the DC power supply is in good condition and safe to use. It is imperative to use ONE DC power supply as a source power for this product and the input voltage is no more than ± 18 V, or it can impair this product. Make all connections to the unit before applying power.

Do Not Discard the Instrument Cover

Only authorized personnel from Nicslab should remove the instrument cover.

Do Not Alter the Instrument

Do not put any unauthorized parts or modify the instrument without Nicslab approval and warranty.

NOTICE

This symbol indicates the hazard of any operating procedure, practice, or the like that, if not correctly performed or adhered to, could result in damage to the product or loss of important data.

Copyright © Nicslab 2026

Contents

List of Tables 7

List of Figures 7

1. Introduction 8

Overview 8

System Diagram 9

Packing List 9

Additional Accessories 9

What's Inside The USB 10

2. System Requirements 11

Environment Requirements 11

Power Supply Requirements 11

Host Requirements (PC) 12

3. Getting Started 13

Panel Overview 13

Hardware Installation 15

Software Installation 17

System Shutdown 19

4. XDAC-MUB Specifications 20

Power Envelope 20

Electrical Specifications 21

Mechanical Specifications 21

5. Software and Graphical User Interface (GUI) 23

Graphical User Interface 23

Initializing the GUI 25

Premium Upgrade 25

Constant Current Mode (CC Mode) 27

Constant Voltage Mode (CV Mode) 27

Value Increment Setting 28

Save and Upload 28

Sequence Automation 30

Record 31
Settings 32
6. Operating XDAC through SCPI command 37
Python Installation (Example) 37
Run Python Code (Example) 38
Python Function (Example) 40
SCPI Commands 43
7. Troubleshooting 47
8. Warranty 48
9. Compliance 48
10. Contact 48

Copyright © Nicslab 2026

List of Tables

Table 1. Included Items..... 9
Table 2. Environment Requirements..... 11
Table 3. Power Supply Requirements..... 11
Table 4. Power Supply Configuration..... 16
Table 5. XDAC Electrical Specification..... 21
Table 6. XDAC-MUB Series Dimensions and Weight..... 21
Table 7. Troubleshooting..... 47

List of Figures

Figure 1. XDAC-MUB System Diagram..... 9
Figure 2. XDAC-MUB Series Front and Back Panel..... 13
Figure 3. XDAC-MUB Power Supply Connections..... 15
Figure 4. XDAC-MUB Work Station Connection..... 16
Figure 5. Voltage Supply 12 V..... 20
Figure 6. Voltage Supply 14 V..... 20
Figure 7. Voltage Supply 16 V..... 20
Figure 8. Voltage Supply 18 V..... 20
Figure 9. XDAC-MUB Series Form Factor Illustrations..... 22
Figure 10. GUI..... 23

1. Introduction

Overview

Nicslab XDAC-MUB system is a versatile multichannel source measurement system. The XDAC-MUB supports multiple voltage/current sourcing and voltage/current measurement. The system is suitable for sourcing and measuring low-power applications from simple electronic circuits to complex photonic integrated circuits.

The XDAC-MUB provides independent 120, 80, 40, and 8 channels controlled by Graphical User Interface (GUI) and Standard Commands for Programmable Instruments (SCPI) through an Ethernet port. The system has two modes: Constant Current (CC) ranging from 5 to 500 mA (source and sink) per channel and Constant Voltage (CV) ranging from bipolar ± 2.5 Volt, ± 5 Volt, ± 10 Volt, and ±16 Volt per channel (please check your feature selection).

The features for XDAC-MUB in detail are:

- Enable voltage range configuration through software (technology that enables the user to select the output range with software without losing control of the high-resolution feature).
- Flexible 16-bit voltage output configuration supporting ranges of ±2.5 V, ±5 V, ±10 V, and ±16 V (Premium Upgrade).
- Flexible 16-bit current output, configurable over a ±500 mA range, with a current control dead zone between −5 mA and +5 mA.
- Control and measurement update rate: 15 ms
- Intuitive GUI.
- Real time voltage reading (16-bits resolution = 1 mV).
- Real time current reading (16-bits resolution = 30 µA).
- Save function to create a database *(Premium Upgrade)*.
- Upload function to generate the registrable voltage and current pattern *(Premium Upgrade)*.
- Sequence function for continuous voltage and current *(Premium Upgrade)*.
- SCPI command support (Python, C#, Matlab, and LabVIEW).
- SCPI Library *(Premium Upgrade)*.
- Windows, Mac, and Linux support.
- Ethernet port.

The XDAC-MUB needs to be connected with DC Power then you can plug into the Device-Under-Test (DUT) or multi-connector first. The voltage/current can be controlled through GUI or SCPI command via Ethernet or USB (Ethernet to USB port converter).

Copyright © Nicslab 2026

System Diagram

The system diagram is as follows:

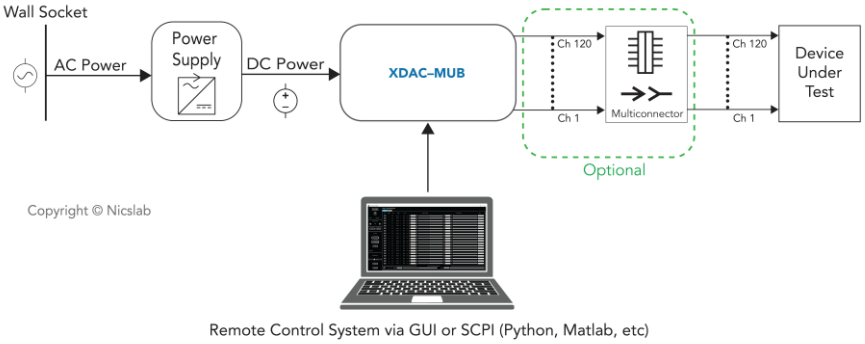


Figure 1. XDAC-MUB System Diagram

Packing List

The purchase of the device includes the following items:

Table 1. Included Items

Device		**XDAC-120MUB-R4G8**	**XDAC-80MUB-R4G8**	**XDAC-40MUB-R4G8**	**XDAC-8MUB-R4G8**
No	Item	Qty (pc)			
1	DC Cable (1.5 m)				
	Red	3	2	1	1
	Green	4	3	2	2
	Black	3	2	1	1
2	Ethernet cable	1	1	1	1
3	USB 3.0 Ethernet Network Adaptor	1	1	1	1
4	USB flash drive	1	1	1	1

Every XDAC delivery includes a packing list. If there is any difference between the contents of Table 1 and the Packing List shall take precedence and be considered the authoritative document.

Additional Accessories

The following accessories are available for separate purchase:

- Multi-connector
- Ribbon Cable
- FFC Cable

For pricing, availability, and purchase, please Contact Us directly.

What's Inside The USB

The USB flash drive included in the device package contains the following items:

- XDAC Key
- IP Address
- Device Manual PDF
- GUI Installer
- Test Report
- Premium Serial Key (Premium Upgrade)
- Python Template (Premium Upgrade)
- CC / CV Sequence Template (Premium Upgrade)

Copyright © Nicslab 2026

2. System Requirements

Environment Requirements

The following section outlines the environmental requirements necessary for proper system operation.

Table 2. Environment Requirements

Items	Conditions
Room Temperature	0 ~ 35 °C
Humidity	5 ~ 80 % (No Condensing)
Waterproof/Dustproof	To be operated under room conditions
Calibration period	2 years

Power Supply Requirements

The following outlines the power supply requirements necessary for proper system operation.

Table 3. Power Supply Requirements

Device / Parameters	XDAC-120 and 80	XDAC-40	XDAC-8	Unit
	Value			
Number of Channels	2	2	2	
Minimum Voltage Out Per-Channel	12	12	12	V
Recommended Voltage Span per Channel	0 - 18	0 - 18	0 – 18	
Minimum Current Compliance Per-Channel	5	3	2	A
Recommended Current Compliance for Full	30	15	8	A
Series Mode	Good to have			

- Maximum current output for 40, 80, and 120 channels simultaneously is 150mA.
- Maximum channel control for 500mA output is 6 channels simultaneously each board, which is 6 channels from channel 1 – 40, 6 channels from channel 41 – 80, and 6 channels from channel 81 – 120.

Host Requirements (PC)

The GUI software is suitable for the following operating systems:

- Windows® 7 (32-bit, 64-bit).
- Windows® 10 (32-bit, 64-bit).
- Windows® 11 (64-bit).
- macOS Big Sur (newer versions available upon request).
- Linux Ubuntu.

The requirements for the PC/Laptop to be used for this product installation are:

- Resolution Min. 1024 x 768 pixel
- Hard disk Min. 500 MB of available free space (32-bit and 64-bit operating system)
- USB Port USB 2.0
- RAM Min. 2 GB
- CPU 2.4 GHz or faster
- Ethernet port or internet connection via a router.

Copyright © Nicslab 2026

3. Getting Started

Panel Overview

The details of the front and back panels of the box are described below:

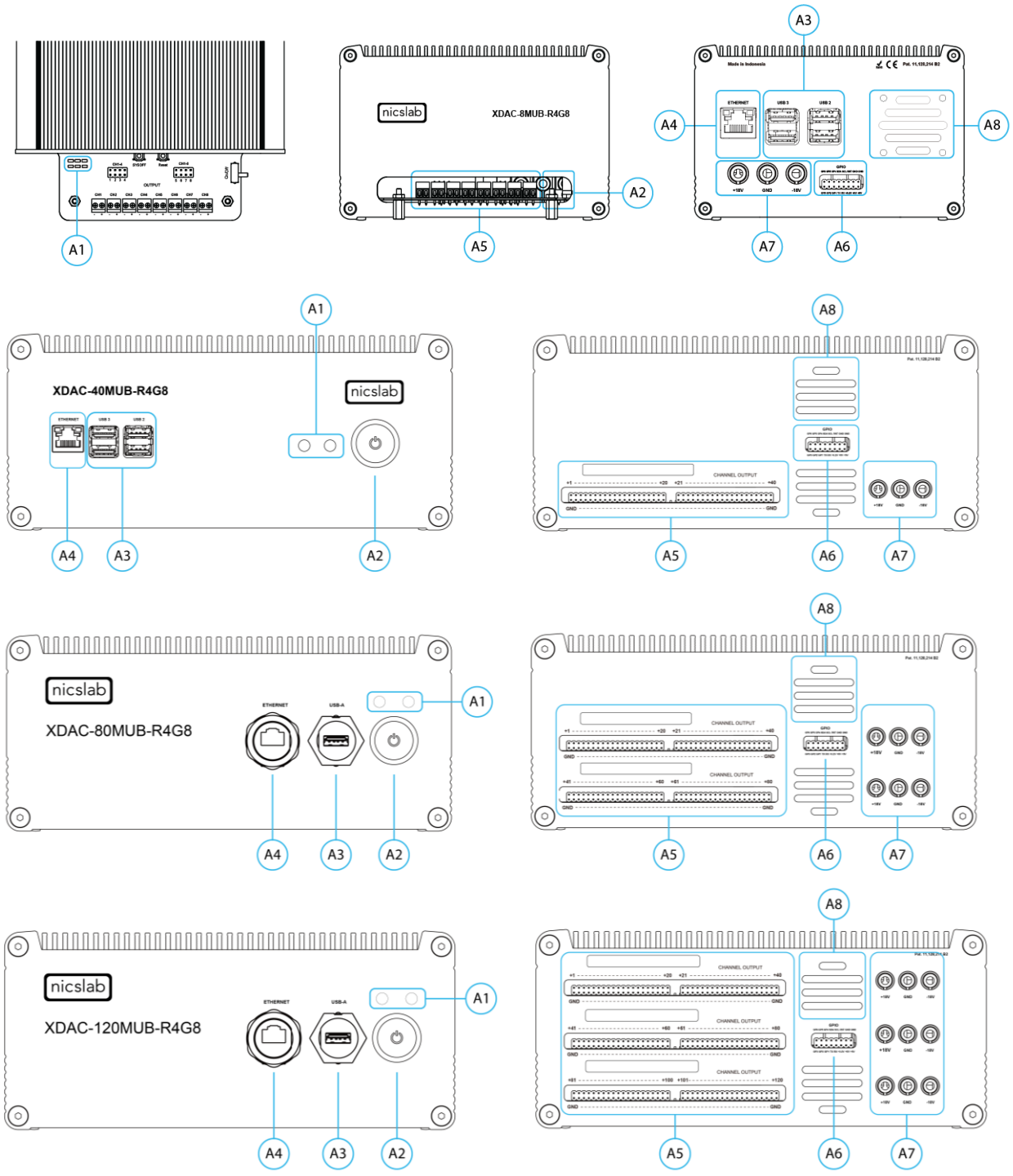


Figure 2. XDAC-MUB Series Front and Back Panel

Note:

A1	Indicator Light	8 channels: Red -> Power Indicator. Green -> Firmware Ready Indicator. Yellow -> Communication Establishment Indicator. 40, 80, and 120 channels: Blue -> Firmware Ready Indicator. Green -> Communication Establishment Indicator.
A2	Power Switch	Turns the instrument on or off. **NOTICE** 1. **Before powering on the device, ensure that all wiring connections and power supply settings are correctly configured.** 2. **Before turning ON, please make sure there is no load attached to the XDAC-MUB.** **Before turning OFF** please **close the GUI or type shutdown (SCPI command)** to minimize the risk of corrupting the system file (such as data loss).
A3	USB-A	USB port type A.
A4	Ethernet port	Use an Ethernet cable to connect. An Ethernet-to-USB converter can also be used if the host doesn't have an Ethernet port.
A5	Pin Output	To connect to the Device Under Test (DUT) via a cable or multiconnector. Row 1: Channel 1 to 40, Channel 1 to 8 (for the 8 Channel Model) Row 2: Channel 41 to 80 Row 3: Channel 81 to 120
A6	GPIO	It can be used to generate a pulse signal.
A7	Input DC MAX ±18V	**NOTICE** **Please follow the hardware installation guide carefully.** Green insert to the ground terminal **Black** inserts to the negative terminal (MAX: -18 V)

Copyright © Nicslab 2026

		Red inserts to the negative terminal (MAX: +18 V)
A8	Airflow	For air circulation inside the box.

Hardware Installation

This section describes how to setup XDAC-MUB and how to connect your Device Under Test (DUT) to the output terminals.

The steps are as follows:

NOTICE

1. May emit unintended voltage or current - Connecting the DUT before the device initialization is complete is strongly discouraged, as the device may emit unintended voltage or current during the initialization process.
2. Ensure the power supply output is turned off while setting up the XDAC.

1. Connect to the DC power supply.

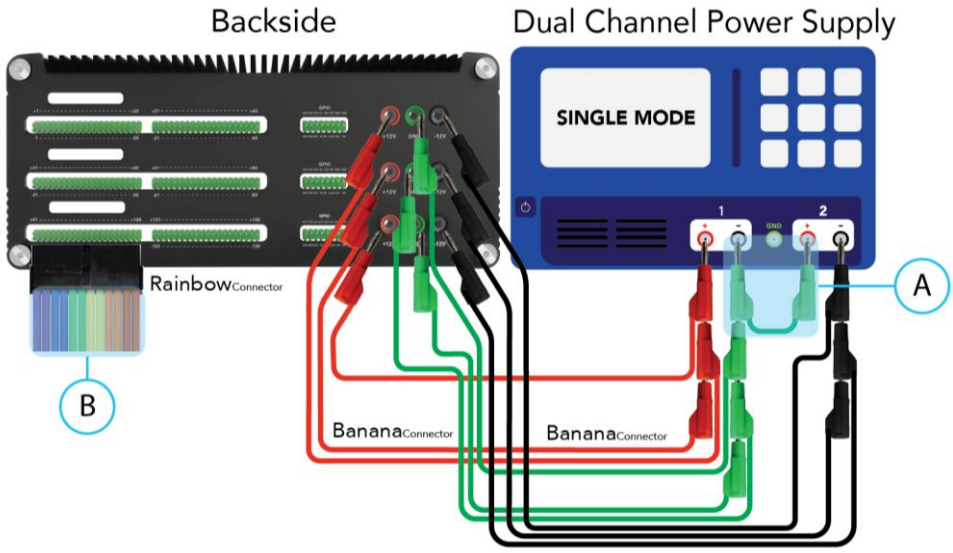


Figure 3. XDAC-MUB Power Supply Connections

A The connector is used to place the two power supply channels in series. This connection is not required if the power supply has an internal series function.

B Ribbon cable used to connect to the DUT

2. Configure the power supply settings as follows.

Table 4. Power Supply Configuration

Parameters \ Device	XDAC-120 and 80	XDAC-40	XDAC-8
DC Supply Max (potential between red & green DC in).	(+12 V) – (+18 V)		
DC Supply Min (potential between black & green DC in).	(-18 V) – (-12 V)		
Current Compliance Minimum: to boot up.	3.3 A	1.5 A	1.0 A
Required headroom	1.4 – 2 V.	1.4 – 2 V.	1.4 – 2 V.

NOTICE

To minimize the risk of device overheating, set the supply voltage to the intended maximum output voltage plus 3 V. However, if this value is below the minimum input voltage, set the supply to the minimum required level (±12 V).

For example, if a DUT requires a current of 100 mA at 10 V, the recommended power supply setting would be 13 V (10 V + 3 V).

3. Connect the Ethernet cable to your workstation (PC/Laptop) via Ethernet Port or USB 3.0 Ethernet Network Adaptor.

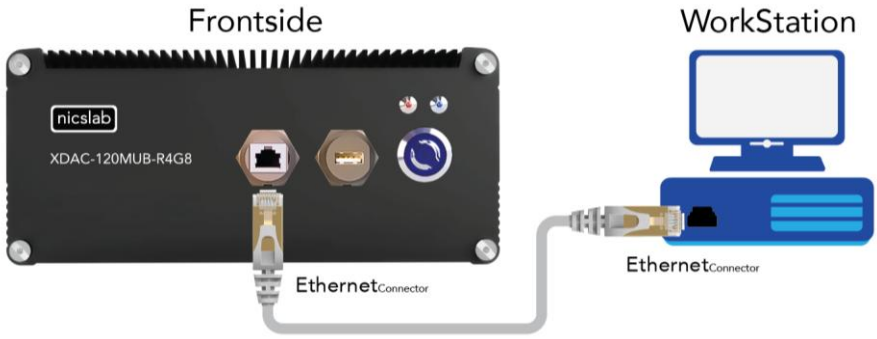


Figure 4. XDAC-MUB Work Station Connection

4. Install the software/GUI from the flash drive (Refer to the **Software Installation** section).

5. Turn ON the power supply output.

6. Turn ON the XDAC-MUB power switch.

7. For 8 channels:

Copyright © Nicslab 2026

Wait until the Green LED is turned on (the system is ready to use).

For 40/80/120 channels:

Wait until the Blue LED is turned on (the system is ready to use).

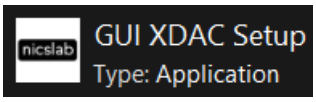
8. You may now open the GUI and establish communication by entering the IP address and XDAC key, or connect using Python code.

9. Connect XDAC output (B) to your Device Under Test (DUT).

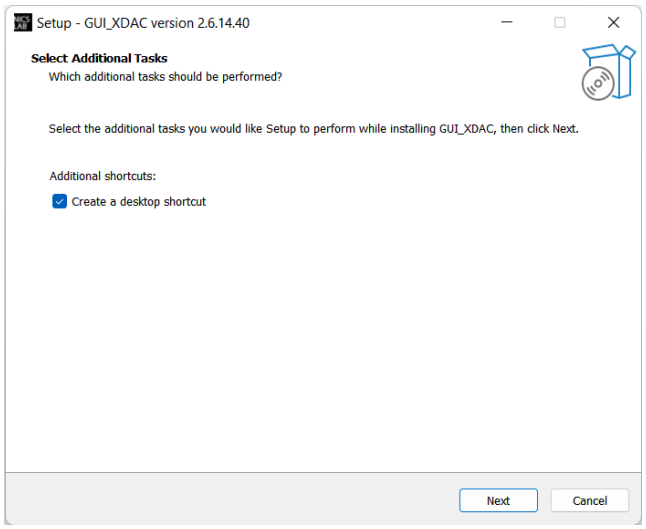
Software Installation

Windows Installation

The first step is to install the XDAC_setup.exe file into your computer, then double-click to launch the GUI. The icon is as below:



At the end step of the installation, check a 'Create a desktop shortcut'.



Double-click the executable GUI icon (as shown below) on your desktop to launch the GUI.



macOS and Linux Installation

Installation packages and instructions for macOS and Linux are available upon request. Refer to the **Contact** section

Copyright © Nicslab 2026

System Shutdown

This section describes how to shut down the XDAC-MUB.

In the case of using GUI, the steps are as follows:

1. Set OFF all the channels in the GUI.
2. Press the ON/OFF Button in GUI (B1,**Figure 10**). It will change the color of the button from green to grey.
3. Close the GUI (it will soft shut down the program inside the XDAC-MUB).
4. Press the power switch (A1,**Figure 2**).
5. Turn off or disconnect the DC Power Supply.

In the case of using SCPI Command, the steps are as follows:

1. Use `setOff(channel)` function to set off the channel used before.
2. Use `lock()` and `shutdown()` functions to soft shut down the program inside the XDAC-MUB.
3. Press the power switch (A1,**Figure 2**).
4. Turn off or disconnect the DC Power Supply.

NOTE: Once the soft shutdown occurred, the Green (8 channels) or Blue (40/80/120 channels) LED will be turned off (Refer to the Panel Overview section for light indicator explanation), and XDAC-MUB cannot directly be used again, since the system is not ready (refers to Hardware Installation). To use XDAC-MUB after a soft shutdown occurred, restart the power from DC Power Supply (using button A8 or unplug and plug the DC Power Supply).

4. XDAC-MUB Specifications

Power Envelope

The power envelope graph defines the safe operating area for simultaneous operation across all channels. The available output range depends on the supply voltage provided to the XDAC-MUB. A higher input voltage enables the XDAC-MUB to deliver a higher output voltage; however, increasing the supply voltage may reduce the maximum allowable current during simultaneous operation.

The graph below illustrates the safe operating area for simultaneous operation of the XDAC-MUB at different input voltage levels.

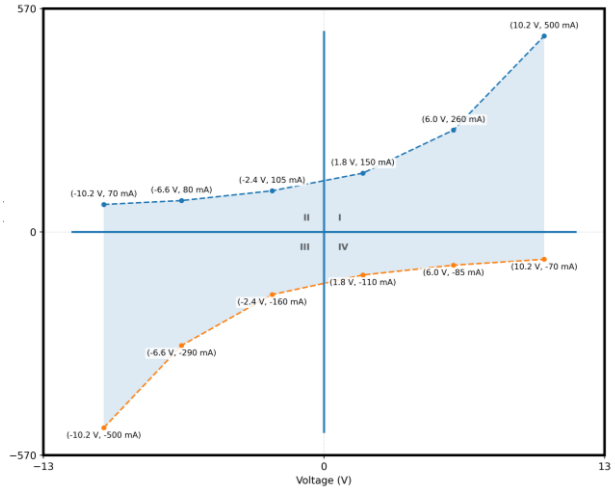


Figure 5. Voltage Supply 12 V

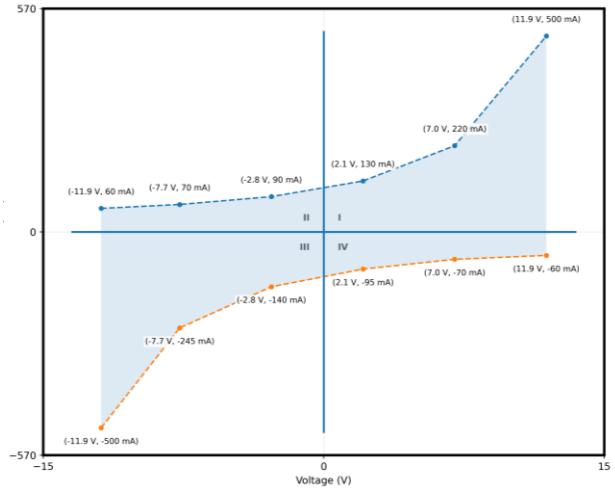


Figure 6. Voltage Supply 14 V

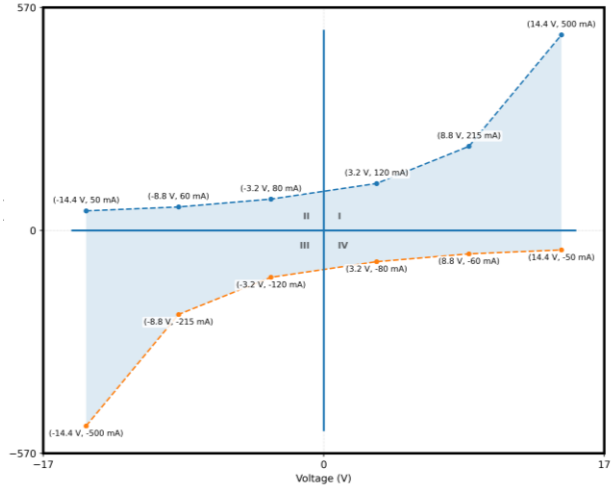


Figure 7. Voltage Supply 16 V

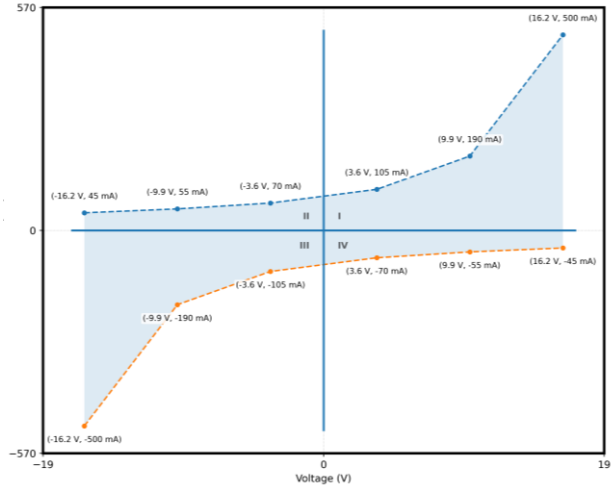


Figure 8. Voltage Supply 18 V

Copyright © Nicslab 2026

Electrical Specifications

This section presents the electrical specifications of the XDAC-MUB.

Table 5. XDAC Electrical Specification

Parameters	Value				Unit
General Specifications					
Number of Channels	120, 80, 40, 8				
Output Quadrant	4 Quadrant				
Update Rate[1]	15				ms
Voltage Sourcing Specifications					
Range	± 2.5	± 5.0	± 10.0	± 16.0	V
Resolution	0.15	0.3	0.5	1	mV
Accuracy	± 0.1	± 0.1	± 0.1	± 0.2	%FSR
Slew Rate	1.0				V/µs
Min Pulse Width	100				µs
Current Sourcing Specifications					
Range[2]	±500				mA
Resolution[3]	25.0				µA
Accuracy	± 0.3				%FSR
Voltage Measurement Specifications					
Range	± 16.0				V
Resolution	1.0				mV
Accuracy	± 0.3				%FSR
Current Measurement Specifications					
Range	±500				mA
Resolution	30.0				µA
Accuracy	± 0.3				%FSR

[1] Specifies the frequency at which output set values and measurement readings are updated within the system.

[2] A current control dead zone exists between −5 mA and +5 mA.

[3] The 16-bit specification refers to the DAC resolution. Effective system resolution is limited by the analog front end and overall system performance.

Mechanical Specifications

This chapter provides detailed information on the physical characteristics of the device, including its dimensions and weight. An illustration of the device is also included below for reference.

Table 6. XDAC-MUB Series Dimensions and Weight

Device	Height (mm)	Width (mm)	Length (mm)	Weight (Kg)
XDAC-120MUB-R4G8	102	232	450	7.9
XDAC-80MUB-R4G8	102	232	450	6.9
XDAC-40MUB-R4G8	102	232	333	5.0
XDAC-8MUB-R4G8	91	141	186	1.0

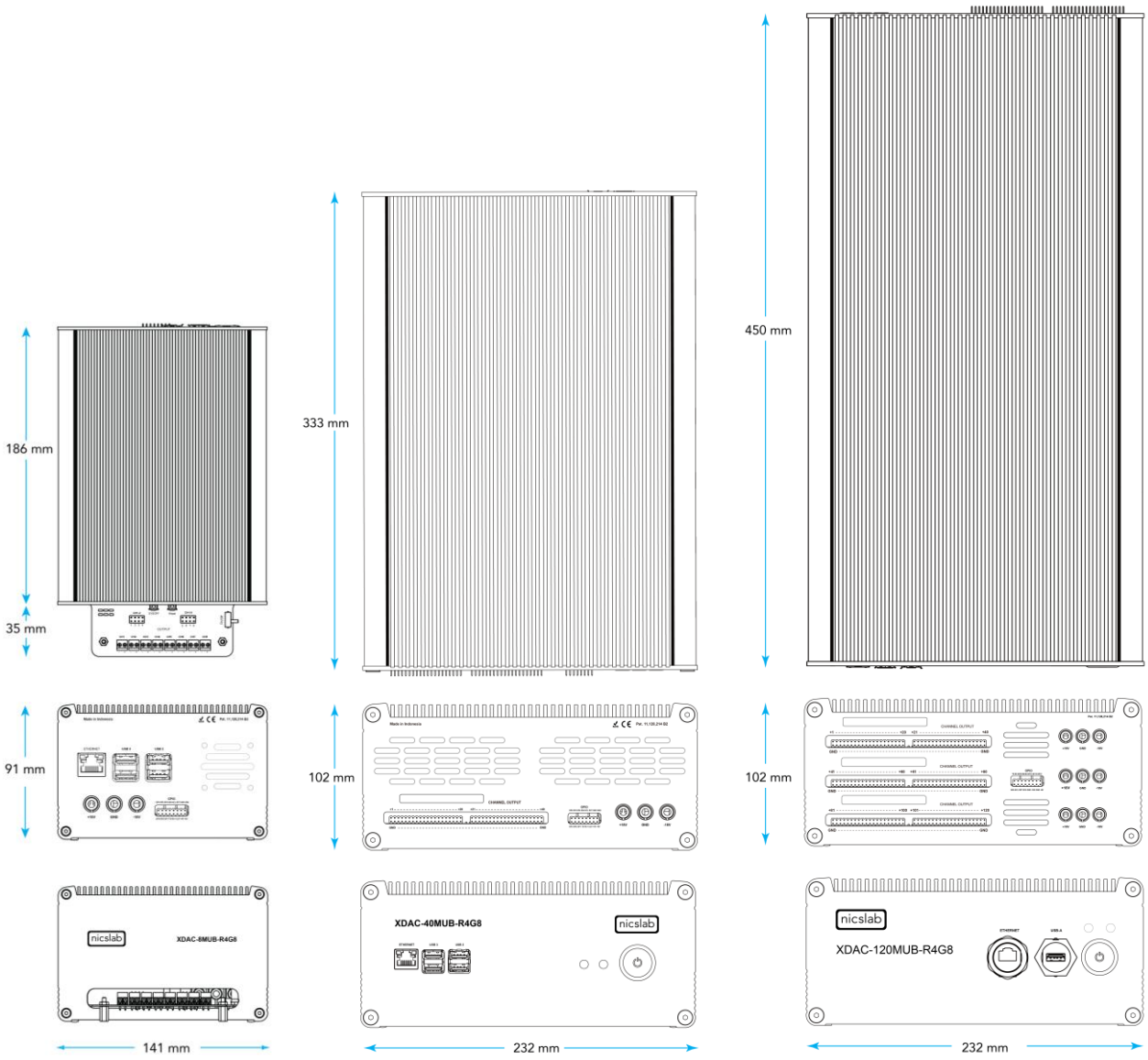


Figure 9. XDAC-MUB Series Form Factor Illustrations

Copyright © Nicslab 2026

5. Software and Graphical User Interface (GUI)

Graphical User Interface

Start the XDAC by pressing the ON button, then you can control it by GUI. the display details are on the next page. See **Hardware Installation** section for more details.

First, determine the XDAC's IP address by checking the sticker or label on the device casing. Alternatively, insert the included USB flash drive into your computer and refer to the "What's Inside The USB" section, where the assigned IP address is provided. As another option, you may scan your local network using a general IP scanner tool to locate the XDAC. Once you have obtained the IP address, simply enter it into the software to establish the connection to your instruments.

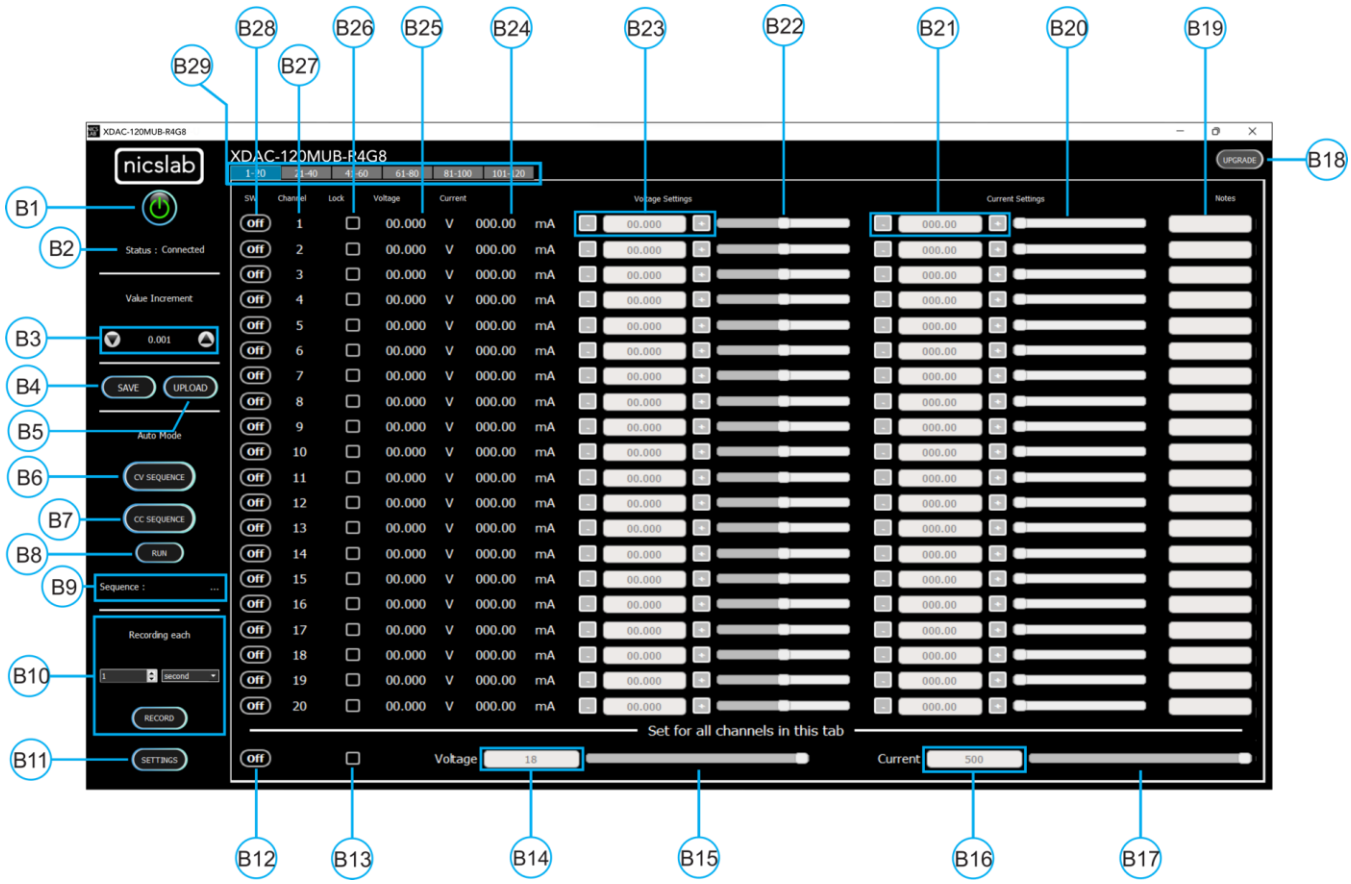


Figure 10. GUI

Note:

Callout	Description
B1	ON/OFF Switch
B2	Status of connection
B3	Increment Settings
B4	Save File Button - *Premium Feature*
B5	Upload File Button - *Premium Feature*
B6	Auto Feature Sequence: Upload Table Button | CV Mode - *Premium Feature*
B7	Auto Feature Sequence: Upload Table Button | CC Mode - *Premium Feature*
B8	Auto Feature: Run Button CV and/or CC Mode - *Premium Feature*
B9	Name of the Sequence - *Premium Feature*
B10	Record Data Button - *Premium Feature*
B11	Setting for: 1. Set Limit voltage and current values - *Premium Feature* 2. V Range (16-bit precision for every range of voltages: ±2.5 V, ±5 V, ±10 V, ±16 V) - *Premium Feature* 3. Set the Reading speed of Voltage and Current (Fast, Medium, Slow) - *Premium Feature*
B12	ON/OFF Button for the current Tab
B13	Enable/Disable (Lock) Channel Controller for all channels in the current tab
B14	Text area to set the voltage for all channels in the current tab
B15	Slider to set the voltage for all channels in the current tab
B16	Text area to set the current for all channels in the current tab
B17	Slider to set current for all channels in the current tab
B18	Upgrade Button
B19	Notes - *Premium Feature*
B20	Current Settings Slider
B21	Current Value Based on Increment Setting
B22	Voltage Settings Slider
B23	Voltage Value Based on Increment Setting
B24	Current Value
B25	Voltage Value
B26	Enable/Disable (Lock) Channel Controller
B27	Number of channels
B28	ON/OFF Button per Channel
B29	Tab Channel

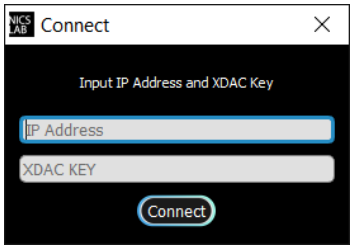
Copyright © Nicslab 2026

Initializing the GUI

This section shows how to initialize the GUI:

1. Launch the program by double-clicking the "XDAC_setup_exe" icon.

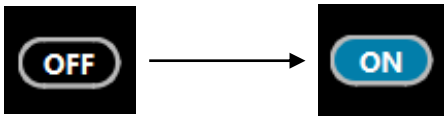
2. Enter XDAC's IP address and XDAC key as given. If the connection is successful, then the GUI will open and the Yellow (8 channels) or Green (40/80/120 channels) LED turns on. (Refer to the **Panel Overview** section for light indicator explanation),



3. Press the 'ON/OFF' button (B1) to start the GUI.



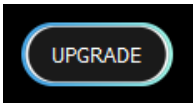
4. Press Turn ON button (B28) on each channel to set the output voltage and current values.



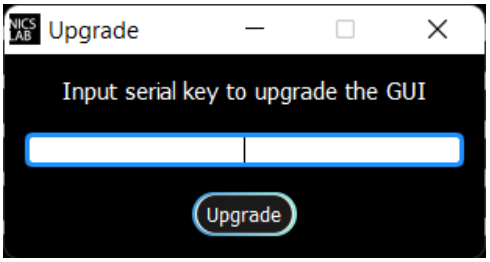
Premium Upgrade

This section shows how to upgrade the GUI to enable premium features.

1. Press the upgrade button (B18) at the top right corner of the window



2. After the upgrade window opened, input the provided Premium Upgrade Key.

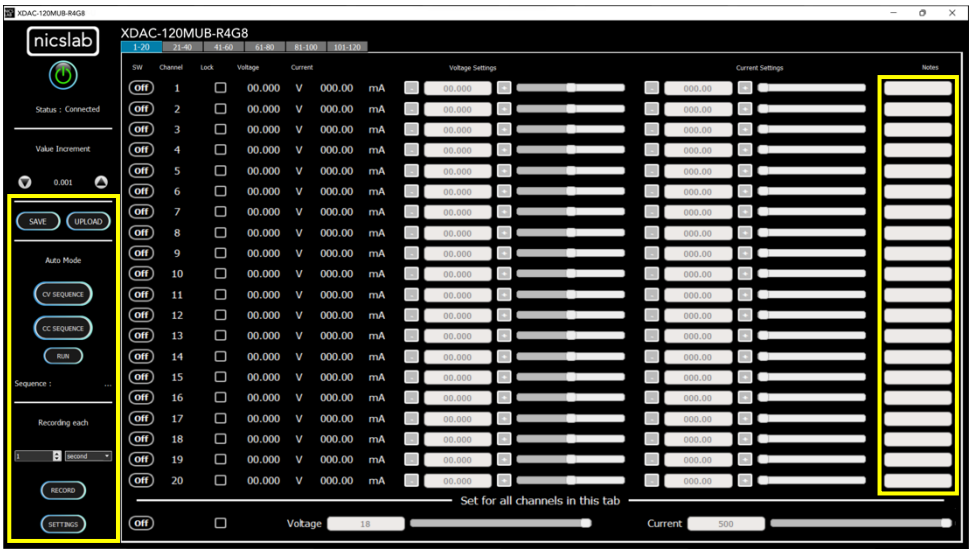


3. If your Premium Upgrade Key is valid, you will get a message that indicates a successful upgrade.



4. You can use several features that were previously locked





The next few sections are the advanced features that are enabled after upgrading the GUI.

Copyright © Nicslab 2026

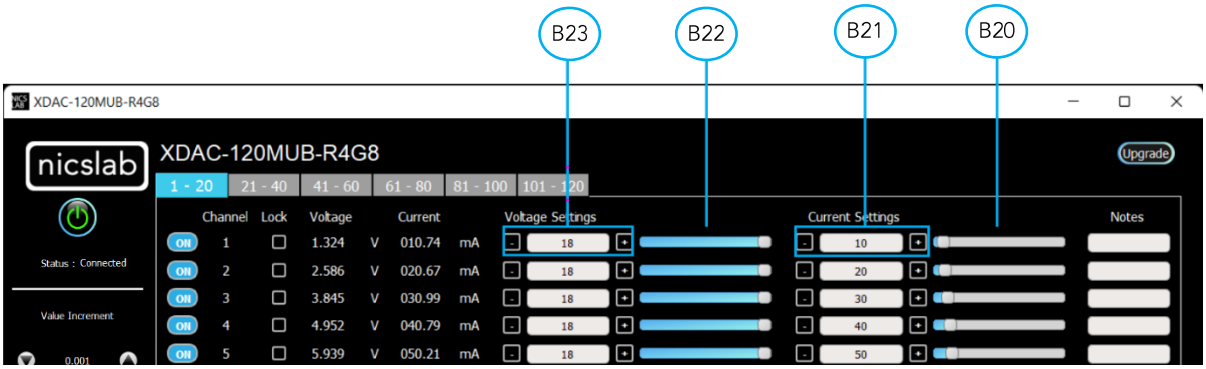
Constant Current Mode (CC Mode)

To operate in CC mode, first set the desired voltage limit to a sufficiently high value by moving the voltage slider (B22) or entering the voltage value (B23). Then set the desired current value using the current slider (B20) or current value field (B21).

The XDAC will enter CC mode when the connected load tries to draw more current than the set current limit. In this mode, the XDAC will automatically regulate (reduce) the output voltage to maintain the set current.

Example: Channels 1 to 5 in the figure below were configured with a 120 Ω load and operated in CC mode.

Important note: When you manually input the values, always press 'Enter'.



Constant Voltage Mode (CV Mode)

To operate in CV mode, first set the desired current limit to a sufficiently high value by moving the current slider (B20) or entering the current value (B21). Then set the desired voltage value using the voltage slider (B22) or voltage value field (B23).

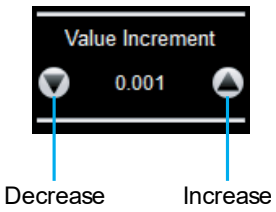
The XDAC will enter CV mode when the connected load draws less current than the set current limit. In this mode, the XDAC maintains the set output voltage while the output current varies according to the load.

Important note: When you manually input the values, always press 'Enter'.



Value Increment Setting

This setting defines the step size used when adjusting voltage and current. The increment can be set from 0.001 to 1. Use the arrow buttons (B3) to increase or decrease the increment value.



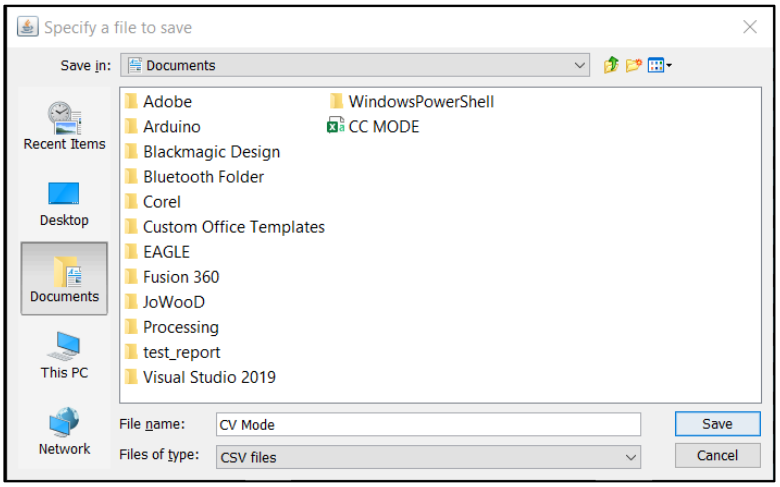
Save and Upload

The CSV file (.csv) resulting from the Save function can be uploaded again through the Upload button (B5). You may also create your own CSV file of voltage and current and upload it later.

1. To save the configuration, click the 'Save' button (B4).



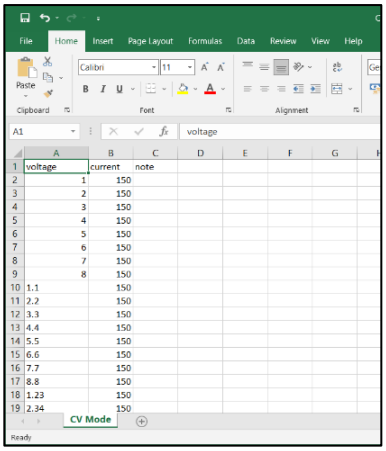
2. Select a directory and write the file name.



3. The file will be saved as a .csv file.

4. Check the .csv file that you have saved.

Copyright © Nicslab 2026

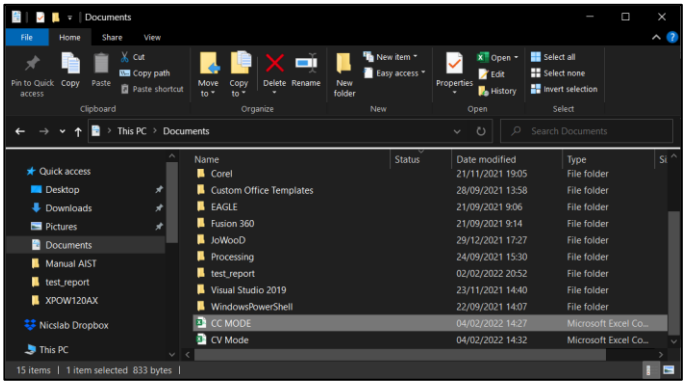


The voltage, current, and notes are recorded. If the file doesn't appear to have saved data from all channel, consider trying to open the file with another program, like Notepad, for further inspection.

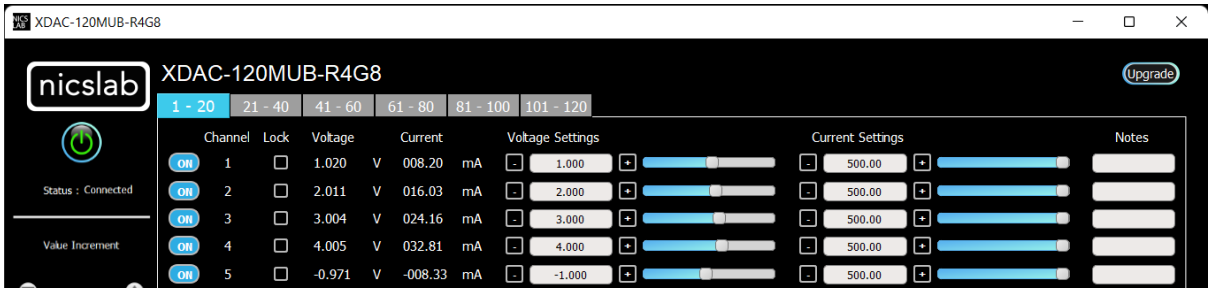
5. To upload the configuration, click the 'Upload' button (B5).



6. Choose and open the intended file.



7. It will upload the configuration like the previous configuration.



Sequence Automation

Sequence is the setting that automates the determined values of current (mA) or voltage (V) given the certain Delay Time (in milliseconds).

1. The template of the Sequence is given, then you need to input your intended values of CC Sequence (from 5 to 500 mA), CV Sequence (± 16 V), and Delay Time (in milliseconds). Set the delay time to more than 2 seconds to have more accurate values. To have a faster response (switching time) you can set it via the SCPI command (see Operating XDAC through SCPI command).

	A	B	C	D	E	F	G	H	I	J
1		Seq 1	Seq 2	Seq 3	Seq 4	Seq 5	Seq 6	Seq 7	Seq 8	Note
2	Delay Time	6000	5478	4912	3409	4213	5902	6012		
3	Channel 1	5	50	0	100	150	150	0	300	Fan1
4	Channel 2	10	50	0	100	160	150	0	300	Fan2
5	Channel 3	15	50	0	100	170	150	0	300	Motor1
6	Channel 4	20	50	0	100	180	150	0	300	Motor2
7	Channel 5	25	50	0	100	190	150	0	300	Sensor1
8	Channel 6	30	50	0	100	200	150	0	300	Sensor2
9	Channel 7	35	50	0	100	210	150	0	300	Sensor3
10	Channel 8	40	50	0	100	220	150	0	300	Not Used

A

B

Note:

A. Template given for CC and CV sequences.

B. Input your intended values according to the modes (CC: 5 – 500 mA, CV: ±16 V).

2. Choose the sequence mode that you will use, either CV Sequence (B6) or CC sequence (B7). When you click, for example, if you want to use a CC sequence, you need to open the corresponding CSV sequence file.

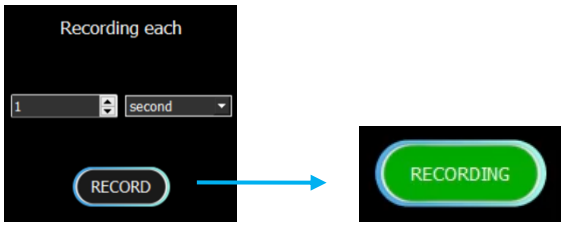
3. After uploading, choose sequence mode by clicking Run' (B8). It will run either CC, CV, or CC & CV Sequence depends on the .csv file that you uploaded before.

   Important note: when 'Run CCCV' use the same delay time on the template .csv of CC and CV sequence.

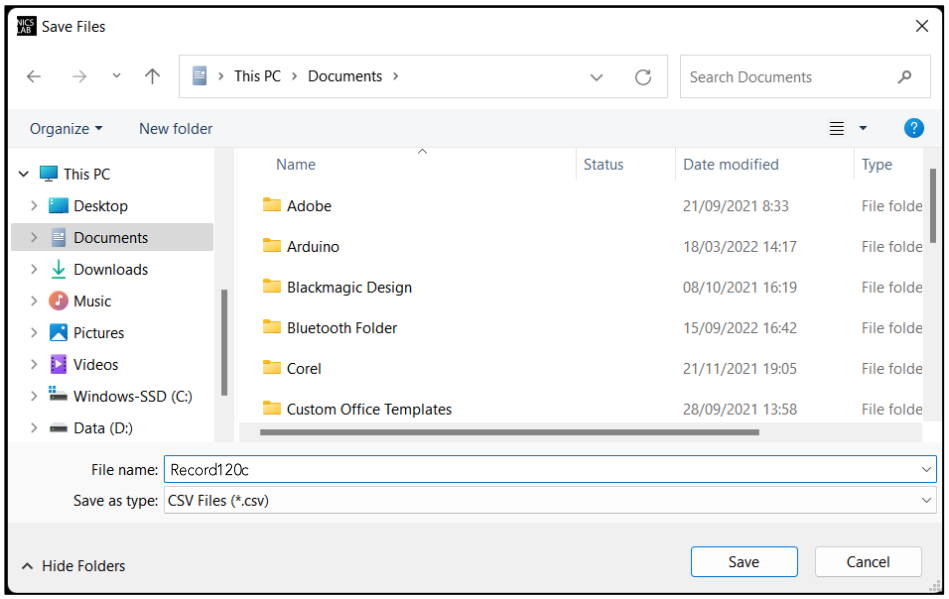
Copyright © Nicslab 2026

Record

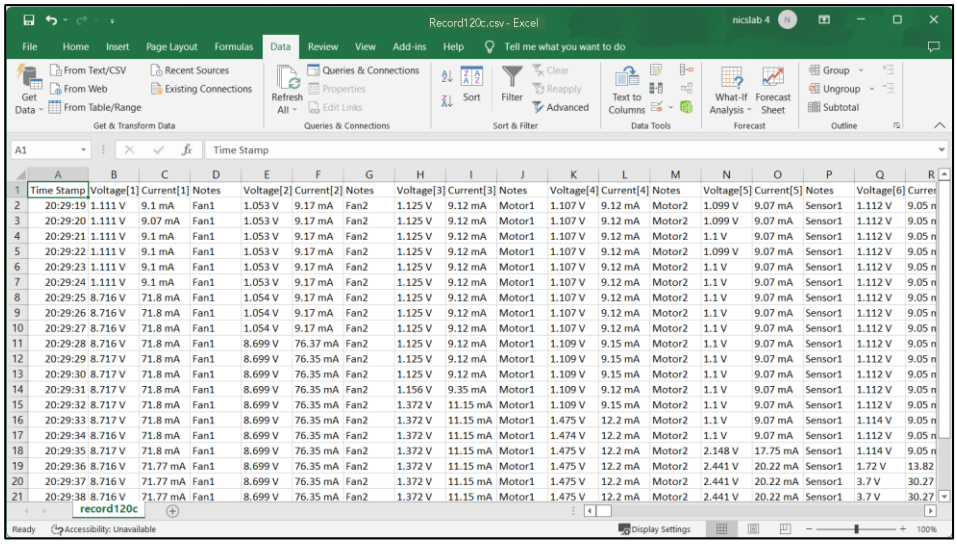
'Record' (B10) keeps data on voltage and current values. You can choose how often the data is stored in a unit of time. The default value is the data will be stored each one second. The record starts by the time you click the Record button and finish when you click again the same button.



Click the same button to stop Recording. After that, put the file in any directory



This is the output of the recorded file



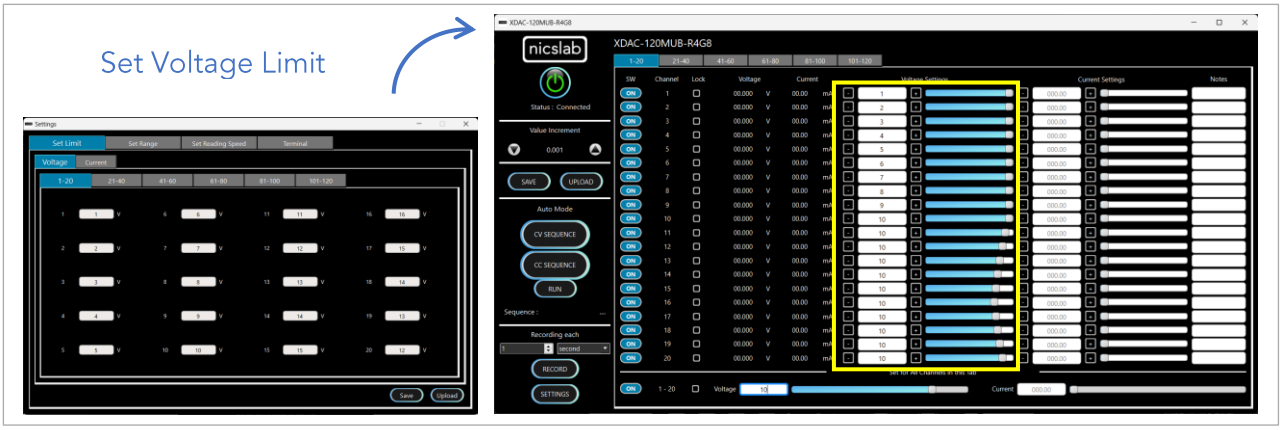
Settings

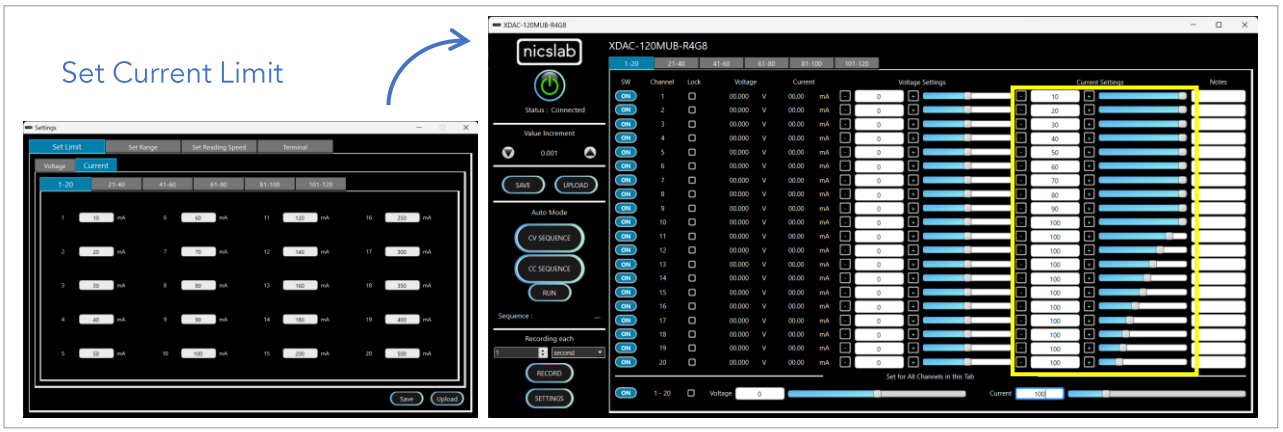
Click the 'Settings' button (B11).



The 'Settings' feature consists of:

- Set the maximum limit for both current and/or voltage values

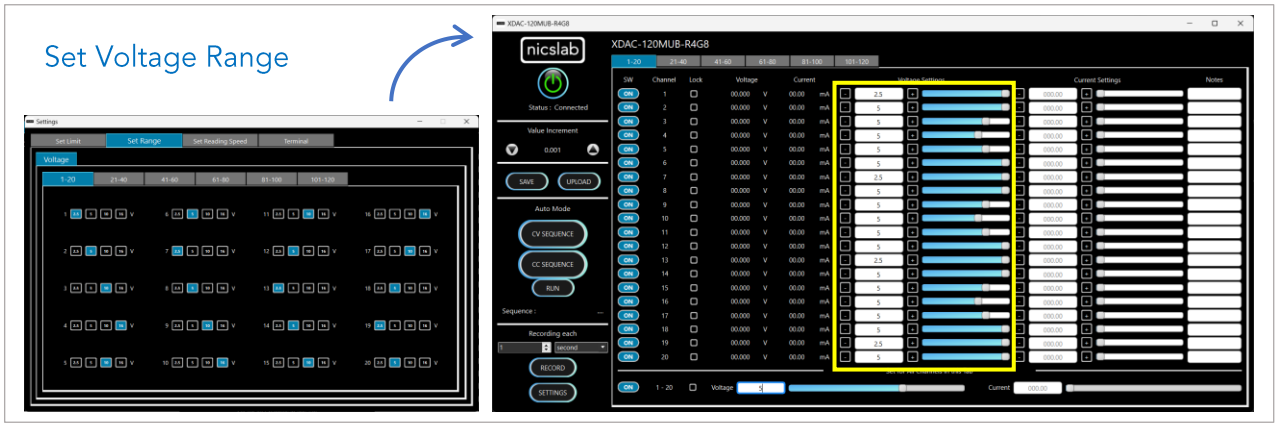




Important note: When you input the values, always press 'Enter'.

Copyright © Nicslab 2026

- Set the range for voltage values where you can choose the voltage range to limit the voltage values (B22, B23, and B25), the range of voltages are ±2.5 V, ±5 V, ±10 V, and ±16 V. Each range has 16-bit precision. The set range setting is also restricting the set limit setting, so the limit cannot exceed the range.



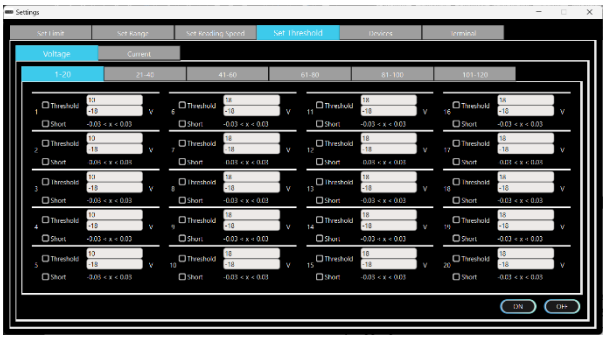
- Set the reading speed to adjust different speeds for reading voltage and current. The speed is based on averaging the number of sample output values. There are three options which are Fast, Medium, and Slow. Faster options can make conversion time smaller but the results noisier.

Reading Speed

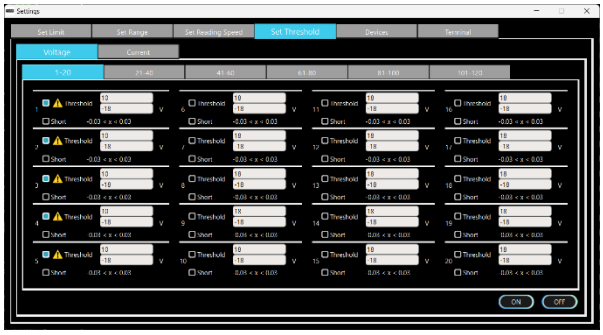


- Set threshold for voltage and current measurement value (B24 & B25). The range is similar to set limit which is ±16 V for voltage and ±500 mA for current. User can set the upper and lower bound value. User can turn on or off this feature at will by toggling the checkbox beside each channel number. If the measured value reached or exceeds the threshold value, the hardware will adjust the value and a warning sign will appear in the setting window. After the threshold is triggered and the channel is turned off, you need to re-enable the threshold feature and re-enter the control value for the channel that turned off. This feature is useful for voltage or current sensitive equipment that cannot exceed a certain value.

Set Threshold (OFF)

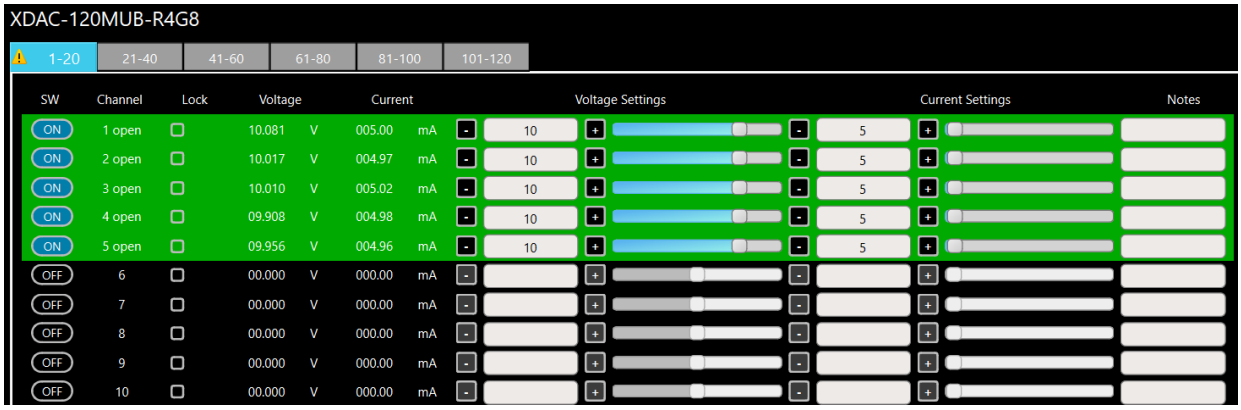


Set Threshold (ON and Triggered)



Measured Value at > 10 V

In the main window, each channel that have threshold feature triggered is also turned green:

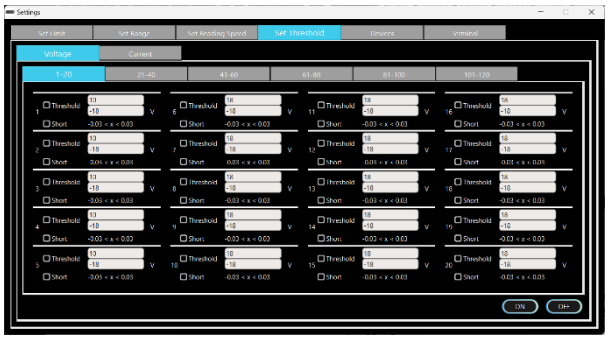


Important note: Voltage and Current threshold configuration only available on Firmware version 4.1.1.1 and up

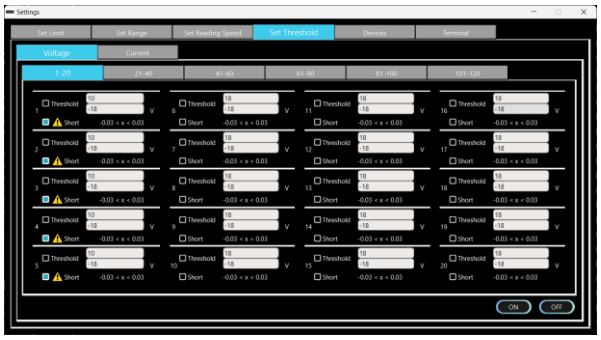
Copyright © Nicslab 2026

- Set shorted for voltage and current measurement value (B24 & B25). The trigger condition is when voltage value on a channel is between -0.03 to 0.03 and the current value is between -5 to 5. User can turn on or off this feature at will by toggling the checkbox beside each channel number. If the measured value is inside the range of shorted value, a warning sign will appear in the setting window. After the shorted is triggered and the channel is turned off, you need to re-enable the shorted feature and re-enter the control value for the channel that turned off. This feature is useful for voltage or current sensitive equipment that cannot last long in a shorted situation.

Set Shorted (OFF)



Set Shorted (ON and Triggered)



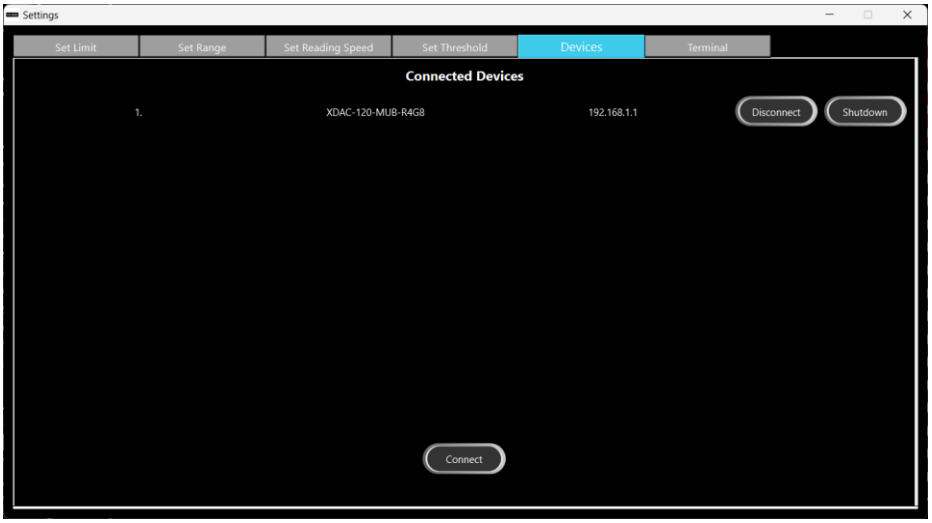
Measured Value at 0 V and 7.5 mA

In the mainwindow, each channel that have shorted feature triggered is also turned red:

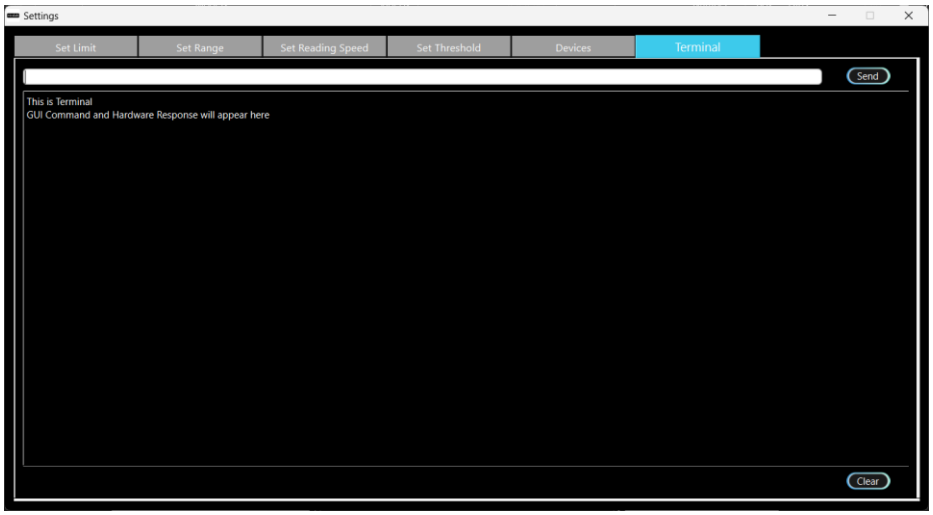


Important note: Voltage and Current shorted configuration only available on Firmware version 4.1.1.1 and up

- Devices to connect additional devices that can be controlled using one GUI. This feature is useful when you have multiple XDACs and need to connect them using one GUI. You can also disconnect or shutdown a particular device. **This feature is an optional addition to your XDAC, so contact our team beforehand.**



- Terminal to read the input from software to hardware and the corresponding hardware response. This feature is useful to find problems with the hardware or software.



Copyright © Nicslab 2026

6. Operating XDAC through SCPI command

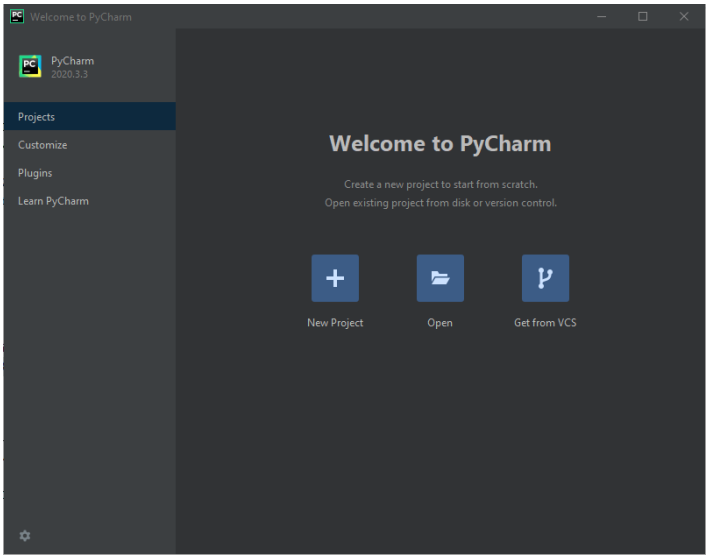
This section set guidelines to help you develop a program for any language that suits you best. As an example, we give the Python example.

Python Installation (Example)

Please follow the steps below for dynamic programming using the SCPI command through Python via TCP/IP.

The following Python versions and packages need to be installed:

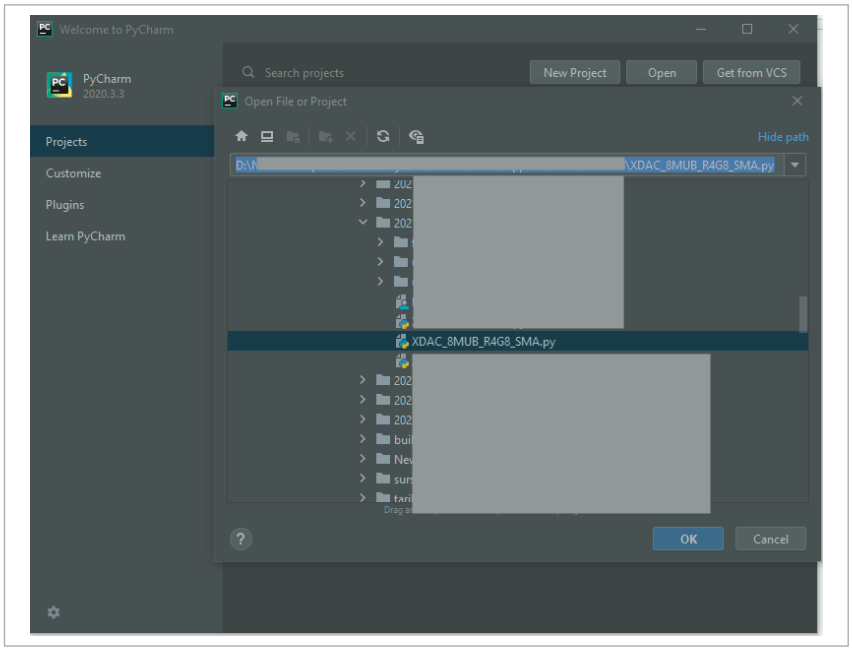
1. Python 2.7 or Python 3.X (download and install the latest version from www.python.org). *Tested with Python 3.9.
2. PyCharm 2017.3.4 or the latest version (download and install the latest version from https://www.jetbrains.com/pycharm/)



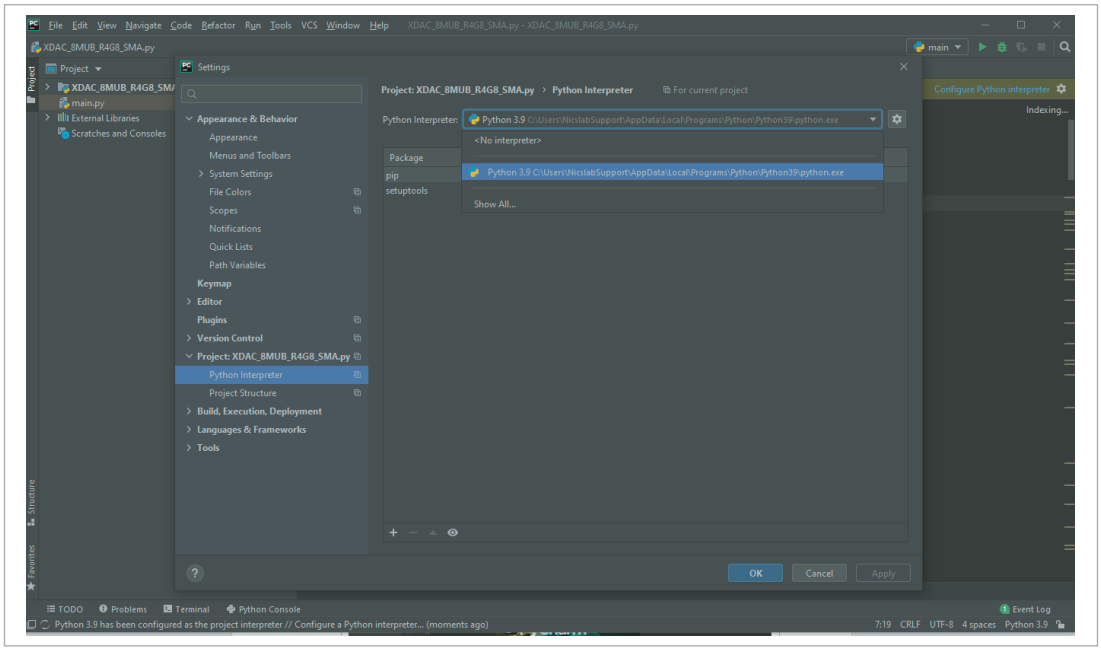
Run Python Code (Example)

To run the Python code please follow the steps below:

1. Open PyCharm software and open file example (e.g XDAC-8MUB-R4G8-SMA.py)



2. Configure the Python interpreter (see figure below) by clicking Configure Python Interpreter link on the drop-down menu, or in File >> Settings >> Project Interpreter.



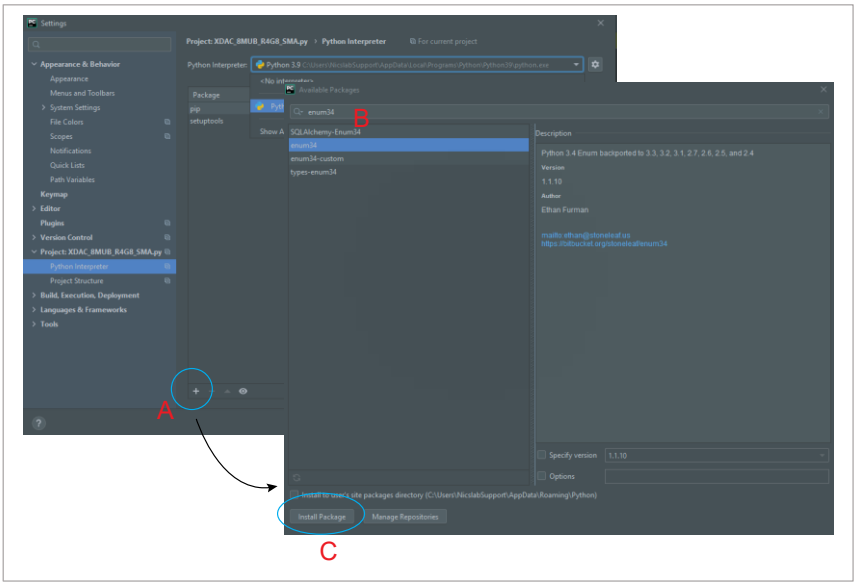
Copyright © Nicslab 2026

3. Install additional packages, for example enum34, by:

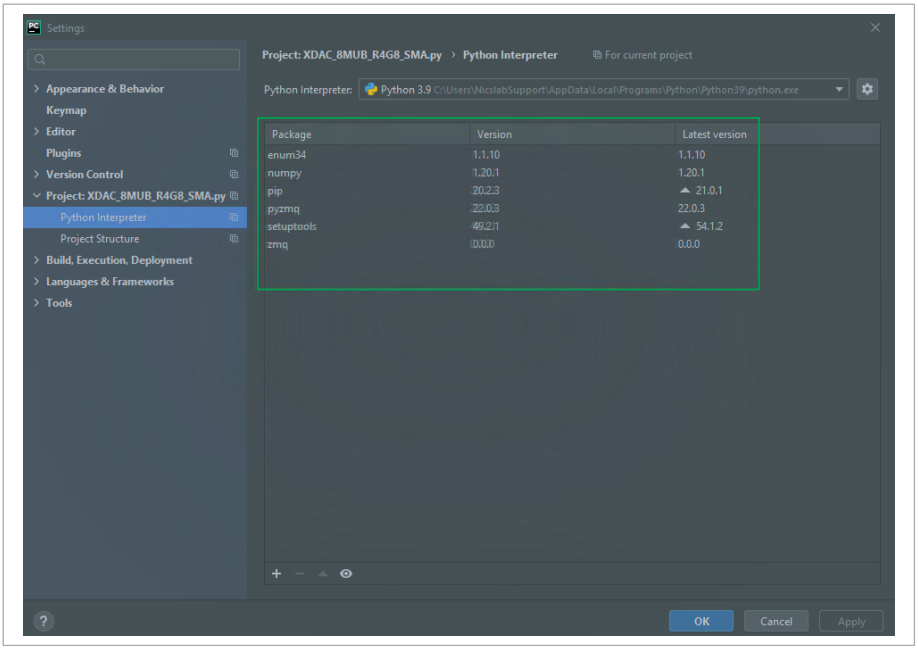
   A. Clicking '+' button

   B. Search and choose enum34

   C. Install all the packages.



4. The packages for the Python Interpreter are listed in the green rectangle.



5. Select Python Configuration and choose the file name.

6. Run the file by clicking the green arrow button on the top right corner to test the XDAC (Please refer to the code and SCPI commands references).

Python Function (Example)

1. Input IP Address

```
XDAC_IP = "169.254.xx.xx"
```

2. Unlock and Lock XDAC

```
print(unlock("XDACkey"))
lock()
```

note: You must unlock your XDAC first before you can use

3. Set XDAC voltage range for all channels and measurement mode

```
setXDAC(voltRange,  voltReadingMode, currentReadingMode )
```

`voltRange (int list):` List for all channels range

`voltReadingMode (string):` `"FAST"` or `"MEDIUM"` or `"SLOW"`

`currentReadingMode (string):` `"FAST"` or `"MEDIUM"` or `"SLOW"`

Example:

```
AllRValues = [5, 5, 6, 7,5, 5, 7,4]
setXDAC(AllRValues, "FAST", "SLOW")
```

4. Set Voltage for single channel

```
setChannelVoltage(channel, voltageVal)
```

`channel (int):` channel number

`voltageVal (float):` `-16 – +16` V

Example:

```
SetChannelVoltage(1, 15)
```

#Set voltage to 15 V In channel 1

5. Set Current for single channel

```
setChannelCurrent(channel, currentVal)
```

`channel (int):` channel number

`currentVal (float):` `5 – 500` mA

Example:

```
SetChannelCurrent(1, 200)
```

#Set current to 200 mA in channel 1

Copyright © Nicslab 2026

6. Set Voltage Range for single channel

```
setChannelVoltageRange(channel, range)
```

`channel (int):` channel number

`range (int): 4 - 7`

Description:

`4:` -2.5 – 2.5 V

`5:` -5 – 5 V

`6:` -10 – 10 V

`7:` -16 – 16 V

7. Set for all channels

```
setVoltageAllChannels(AllVValues)
```

`AllVValues (float array):` voltage values in an array (V)

```
setCurrentAllChannels(AllCValues)
```

`AllCValues (float array):` current values in an array (mA)

```
setRangeAllChannels(AllRValues)
```

`AllRValues (float array):` range values in an array

Example:

```
AllCValues = [100, 150, 100, 50, 200, 10, 10]
AllVValues = [20.1, 2.5, 13.0, 4, 5, 10.5, 9.5, 22]
AllRValues = [5, 5, 6, 7,5, 5, 7,4]
setRangeAllChannels(AllRValues)
setVoltageAllChannels(AllVValues)
setCurrentAllChannels(AllCValues)
```

8. Set OFF for single channel

```
setOff(channel)
```

`channel (int):` channel number

9. Set averaging method and count for measurement

   `setReadingModeVoltage(mode, count)`

   `setReadingModeCurrent(mode, count)`

   `count (int):` number of measurements to be averaged

   `mode (string):` "`MOVING`" or "`REPEAT`"

   Example:

   `mode: "MOVING", count: 5`

   `#n :` read `#n` from sensor

   `[#1, #2, #3, #4, #5 ]` ⇒ averaged ⇒ reading `#1`

   `[#2, #3, #4, #5, #6 ]` ⇒ averaged ⇒ reading `#2`

   `mode: "REPEAT", count: 5`

   `#n :` read `#n` from sensor

   `[#1, #2, #3, #4, #5 ]` ⇒ averaged ⇒ reading `#1`

   `[#6, #7, #8, #9, #10 ]` ⇒ averaged ⇒ reading `#2`

10. Read voltage or current for single channels

    `readSingleChannelVoltage(channel)`

    `readSingleChannelCurrent(channel)`

    `channel (int):` channel number

    Return value of voltage or current in one channel

11. Read measurement values for all channels

    `readAllChannelVoltage()`

    Return list of voltage from all channels

    `readAllChannelCurrent()`

    Return list of current from all channels

Copyright © Nicslab 2026

12. Set one channel to run automatically and record it

    `sweepOne(channel, seqValueV, seqValueC, duration)`

    `channel (int):` channel number

    `seqValueV:` voltage values in an array (V)

    `seqValueC:` current values in an array (mA)

    `duration (int):` duration in seconds

13. Shutdown

    `shutdown()`

    * For the equivalent SCPI command, see EXIT on page 45.

SCPI Commands

The XDAC can be controlled using Standard Commands for Programmable Instruments (SCPI). To initialize the SCPI commands, you need to import ZMQ library. Then you must use Req-Rep mode in port "5555". After that you can type your commands and send it to the XDAC. You can see the example below:

```
import zmq

# Change with XDAC IP Address
XDAC_IP = "192.168.[redacted]"

# Connect to Req Server on XDAC via ZMQ
context = zmq.Context()
req_socket = context.socket(zmq.REQ)
req_socket.connect("tcp://%s:5555" % XDAC_IP)
```

Description: Unlock XDAC by XDAC Key

Format:

`GETINFO:{KEY}`

Example 1: Unlock XDAC with XDAC Key: `nicslab`.

`GETINFO:nicslab`

Description: Lock XDAC

Format:

```
LOCK
```

Description: Set output voltage for single channel

Format:

```
SETV:{CHANNEL}:{VOLT}
```

Example 1: Set the output of channel 1 to 16 V.

```
SETV:1:16
```

Example 2: Set the output of channel 3 to -12.5 V.

```
SETV:3:-12.5
```

Description: Set output current for single channel

Format:

```
SETC:{CHANNEL}:{CURRENT}
```

Example 1: Set the output of channel 1 to 500 mA.

```
SETC:1:500
```

Example 2: Set the output of channel 3 to 50 mA.

```
SETC:3:50
```

Description: Set output voltage range for single channel

Format:

```
SETR:{CHANNEL}:{RANGE}
```

```
Range (int): 4 – 7
```

4 = -2.5 – 2.5 V

5 = -5 – 5 V

6 = -10 – 10 V

7 = -16 – 16 V

Example 1: Set the voltage range of channel 1 from -16 to 16 V.

```
SETR:1:7
```

Description: Set voltage and current values for multiple channels

Format:

```
SETMULTIA;:{VCH}:{VVAL};:{CCH}:{CVAL}
```


Copyright © Nicslab 2026

Example 1: set the voltage and current output of channel 1 – 3

```
SETMULTIA;:V1:1.000:V2:2.000:V3:3.000;:C1:50.00:C2:100.00:C3:200.00
```

Description: Read voltage of a single channel

Format:

```
MEASV:{CHANNEL}
```

Example 1: Get the voltage output of channel 1

```
MEASV:1
```

Description: Read current of single channel

Format:

```
MEASC:{CHANNEL}
```

Example 1: Get the current output of channel 1

```
MEASC:1
```

Description: set averaging mode and count of voltage measurement

Format:

```
MEASV:MODE:{MODE}:{COUNT}
```

Example 1: Set voltage measurement averaging to repeat mode and count 100.

```
MEASV:MODE:REPEAT:100
```

Example 2: Set voltage measurement averaging to moving mode and count 5.

```
MEASV:MODE:MOVING:5
```

Description: set averaging mode and count of current measurement

Format:

```
MEASC:MODE:{MODE}:{COUNT}
```

Example 1: Set current measurement averaging to repeat mode and count 100.

```
MEASC:MODE:REPEAT:100
```

Example 2: Set current measurement averaging to moving mode and count 5.

```
MEASC:MODE:MOVING:5
```

Description: Set zero voltage for a single channel

Format:

```
ZERO:{CHANNEL}
```

example: Set zero of channel 1

```
ZERO:1
```

Description: Shutdown System

Format:

```
EXIT
```

* For the equivalent Python API command, see shutdown() on page 42.

Copyright © Nicslab 2026

Troubleshooting

Please use the following guidelines to identify a particular problem. If the solution does not rectify the problem, contact us at support@nicslab.com.

Table 7. Troubleshooting

Problem	Cause	Solution
Failed to connect at GUI	The DC power supply is OFF	Turn ON the DC power supply and switch ON the power
Failed to connect at GUI	The switching power is OFF	Switch ON the power
Failed to connect at GUI	No Green light (no data transfer)	Restart the GUI
The Green light offs when software is active or software freeze	Initialization failed	Restart the software, or unplug - plug the USB/Ethernet connector, or Press the Reset Button
No channel output detected at the device under test	Connection failed	Check the metal pad checkpoint to the intended channel
Unable to upload the file	File format problem	Make sure the file format is .csv
No value after uploading the file	File problem	Check the file content, and make sure there is no blank space on each row.
Unable to use the Auto Mode feature	File format problem	Check file format. It should be a CSV file. Check content format

7. Warranty

Nicslab warrants the hardware and software designed by Nicslab to work accordingly, fulfilling the highest standard of a quality product. All Nicslab products are covered by a **3-year limited warranty** from the date of shipment. Nicslab is not liable for consequential or incidental damages for errors in subject to misuse, neglect, accident, modification, use in critical operation, or has been soldered or altered in any way outside stated by us or unauthorized maintenance.

Nicslab retains the right to change the material and technical data of this manual at any time without notice, in future editions.

Please do not hesitate to contact us at support@nicslab.com if you would like to have more information on the warranty or return and refund policy.

8. Compliance

This product complies with the requirements of the European Union's *Conformité Européenne* (CE) and Restriction of Hazardous Substances in Electrical and Electronic Equipment (RoHS) Directive 2015/863 (RoHS3). The certificates can be accessed here.

9. Contact

New York

Nicslab Ops, Inc.
260 E. Main St., Suite 6408
Rochester, NY 14604
United States
Phone: +1 (585) 565-6369
Email: support@nicslab.com
Website: www.nicslab.com

California

Nicslab Ops, Inc.
228 Hamilton Avenue
3rd Floor, Palo Alto
Silicon Valley, CA 94301
United States

Indonesia

PT Nicslab Global Industri
Menara Asia Afrika, Jl. Asia Afrika No.133-137 LT. 9
Kb. Pisang, Kec. Sumur Bandung
Kota Bandung, Jawa Barat 40112
Indonesia
Phone: +62 22 8602 6854
Email: nicslab.id@nicslab.com

Copyright © Nicslab 2026

Book Meeting here.