

Smacq DAQ Software User Guide

Software Introduction

Smacq DAQ Software is a data acquisition software developed by Smacq for the USB-3000 and USB-5000 series data acquisition cards. It helps users without programming experience to quickly obtain experimental data. The design of Smacq DAQ Software is mainly aimed at basic applications. For complex applications, users need to choose the appropriate development environment and program related functions according to the actual situation. Smacq provides various development examples and documentation, which can be downloaded from www.smacq.cn or <http://www.smacq.com/> by contacted via service@smacq.com if needed.

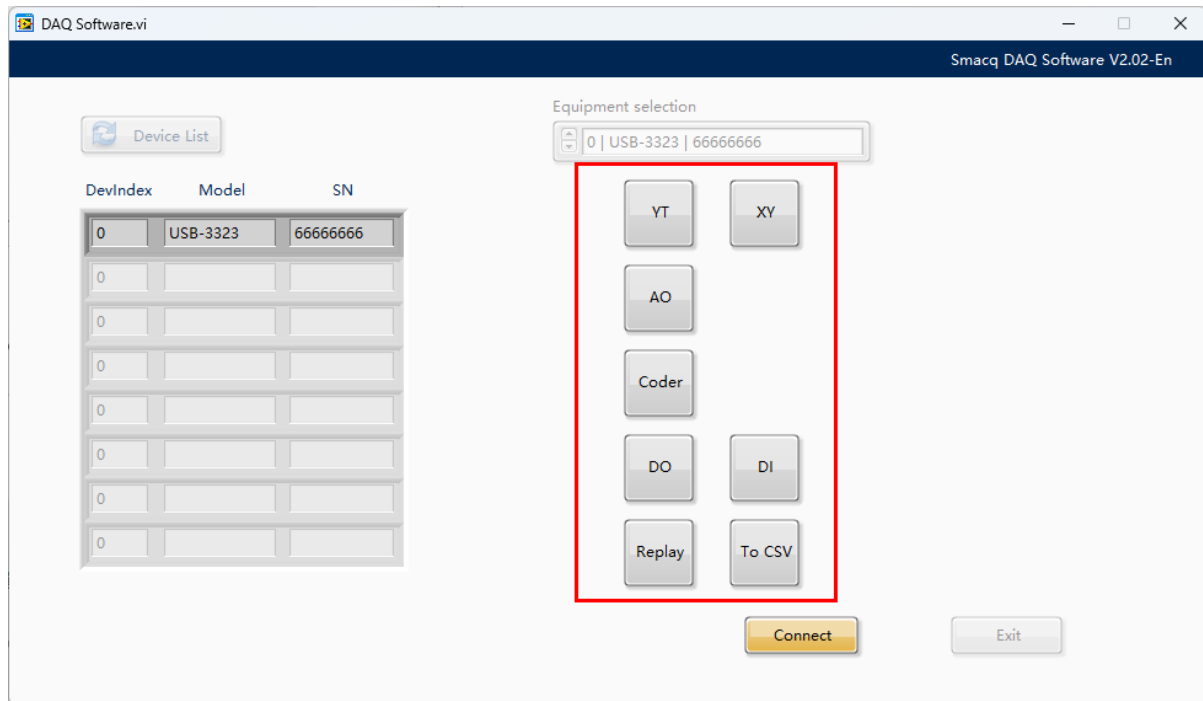
Driver Installation

Before operating the data acquisition card, connect the USB data acquisition card to the USB interface, and then confirm whether the driver is correctly installed. If the driver is not correctly installed, please refer to the document "USB Interface Data Acquisition Card Driver Installation Method" for installation, which is not repeated here.



Function Description

The software offers various functions:



YT Button: For analog input in YT mode, displaying the curve of voltage changing with time.

XY Button: For analog input in XY mode, displaying the curve showing the relationship between two channels.

AO Button: For setting the voltage output of analog output.

DO Button: For setting digital output.

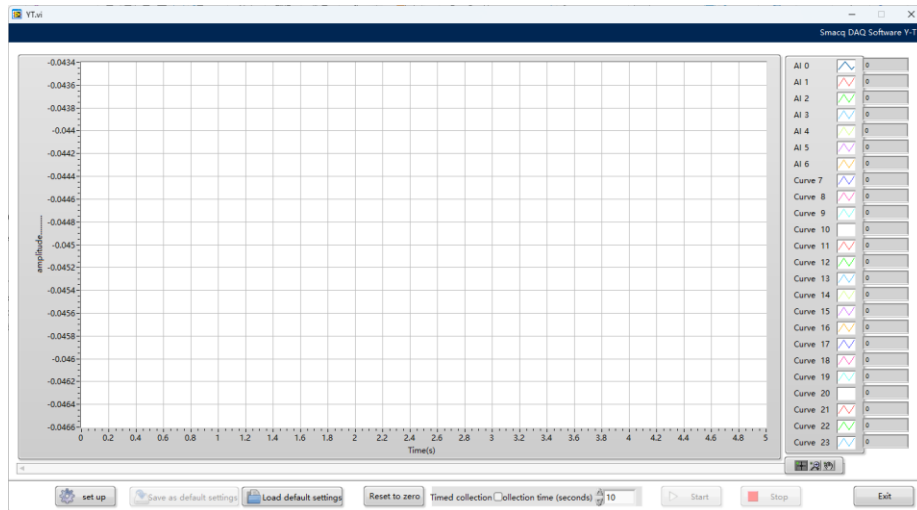
DI Button: For displaying the waveform of digital input changing over time.

Replay Button: For replaying the YT mode of analog input.

To CSV Button: For converting data files recorded in YT mode of analog input into CSV format.

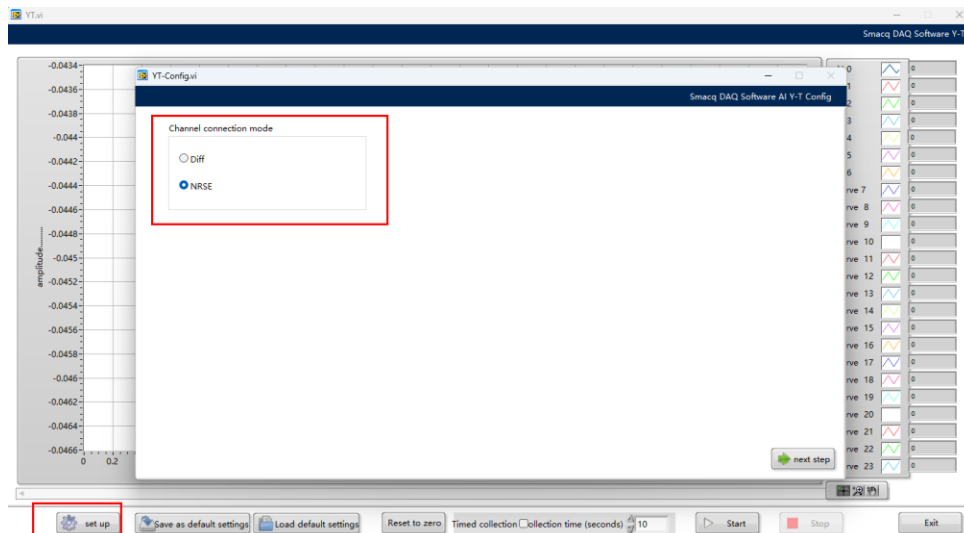
YT Mode

Displays the curve of voltage changes over time. Before data collection, it is necessary to set up the acquisition card, including channel mode, channel annotation, range, sampling rate, and unit transformation. After connecting the data acquisition card, click the YT button to enter YT mode. This is the most frequently used function, displaying the curve of voltage changing with time. Before data collection, the acquisition card needs to be set up properly.



Analog Collection Settings

In YT mode, click Settings to enter the YT-Config interface. First, set the analog input channel mode based on the hardware connection method. If unsure, refer to section 3.2 of the user manual on signal connection methods.



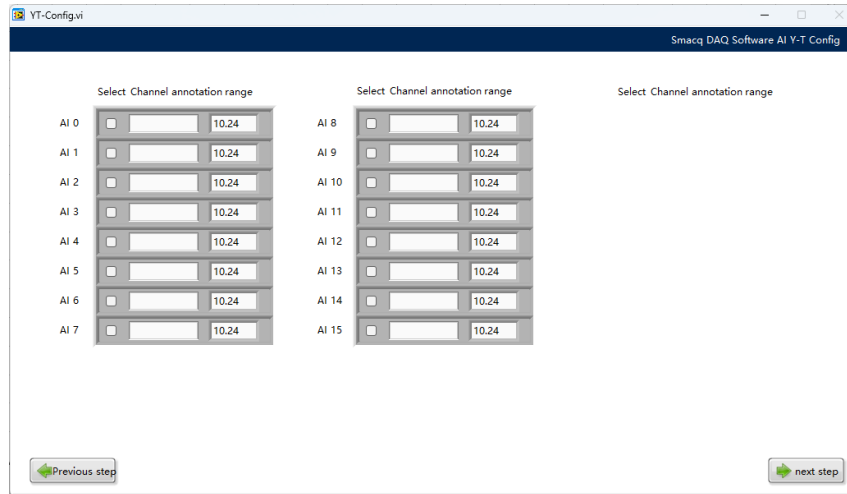
Channel Connection Method

Click Next to enter Channel Settings.

Channel checkboxes are used to select the channels to be used.

Channel comments are used to label channels, which will appear in the legend of the analog input display page and also in historical data.

Range is selected based on the voltage range of the measured signal.



Channel Settings

Click Next to enter Sampling Rate Settings.

Sampling rate indicates the number of samples per channel per second and can be set according to needs. Note that the maximum value must not exceed the maximum sampling rate of the acquisition card, and the minimum value must be at least 5.



Sampling Rate Settings

Click Next to enter Unit Transformation Settings.

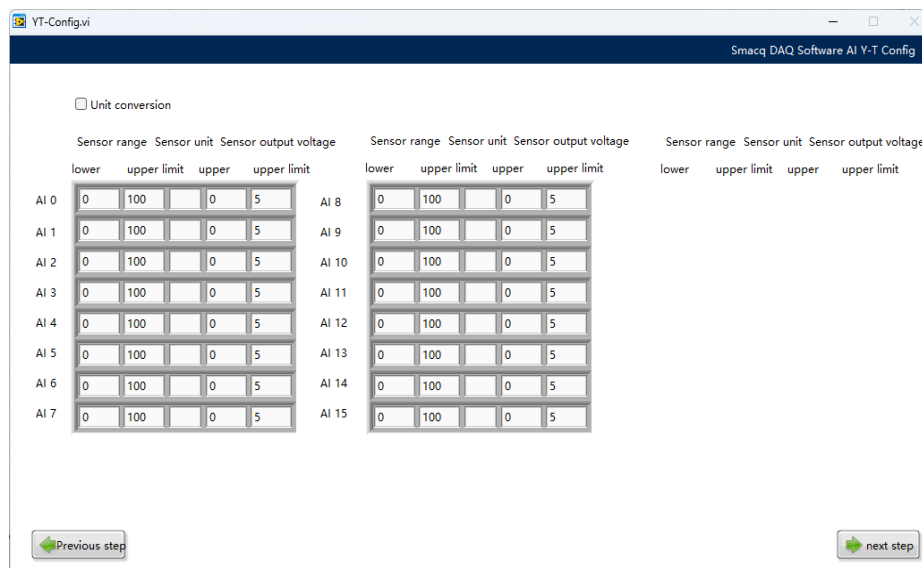
Many applications of data acquisition cards require the use of sensors. For example, when connecting a pressure sensor, the data of interest is not just the voltage or current but the pressure at a certain point in MPa. This requires unit transformation of the collected voltage or current data. This can be done either by the user after obtaining the voltage or current data or by using the analog input unit transformation function of USB-3000 DAQ Software. The following example illustrates this with a pressure sensor. The pressure range of sensor A is 0 to 50 MPa, with an output voltage of 0-10V.

Sensor range indicates the range of the measured physical quantity of the sensor in use, with the lower limit at 0 and the upper limit at 50 for sensor A.

Sensor output range indicates the output voltage or current corresponding to the range of the sensor in use, with the lower limit at 0 and the upper limit at 10 for sensor A.

Sensor unit indicates the unit of the sensor in use. If multiple types of sensors are used, multiple units can be entered. This setting is only used for the vertical axis display of the analog input display part. For sensor A, MPa should be entered here.

Check the Sensor unit transformation checkbox to transform the collected analog input data according to the settings; if not checked, no transformation will be performed.

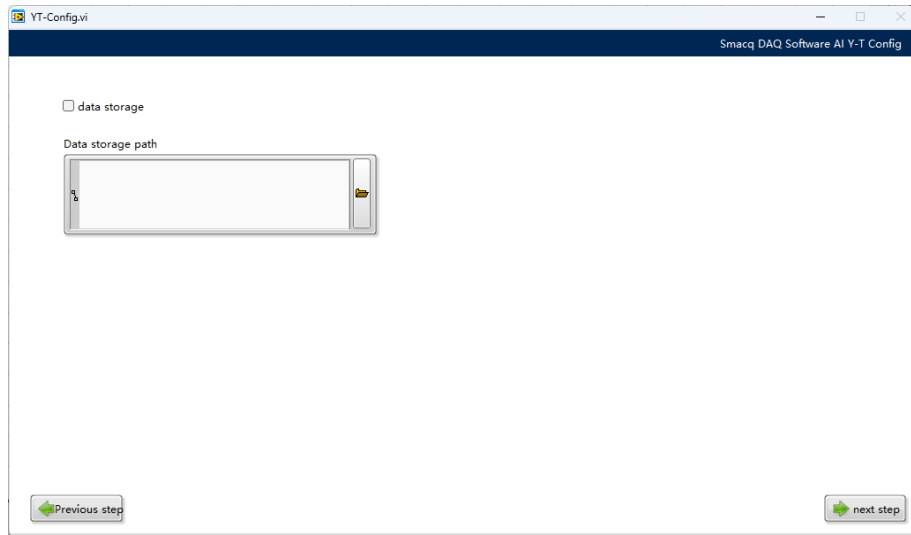


Unit Transformation Settings

Click Next to enter Storage Settings.

Data storage path is used to specify the storage location of the data. You can directly enter the path and file name, or click the button to select the path in the dialog box and set the file name before confirming. The file name set here is not the final file name. The final saved file name will be "set file name + date + time + .smq".

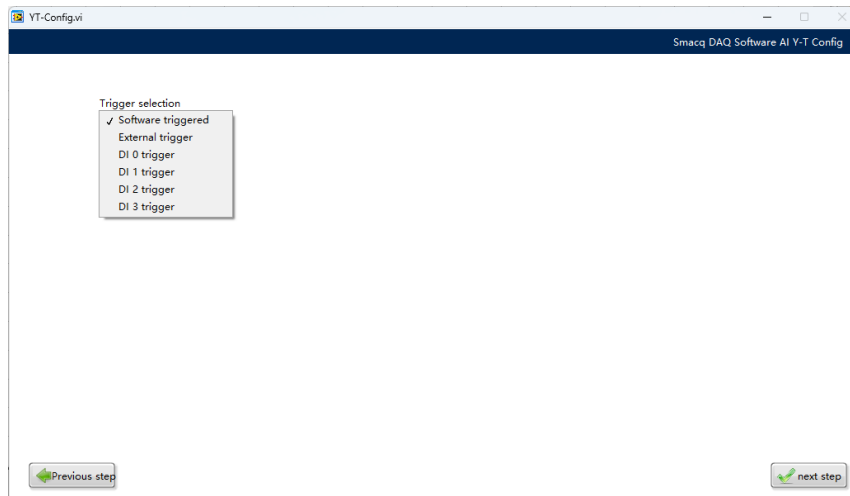
The Data storage checkbox, when checked, stores the collected analog input data to the location specified by the data storage path.



Setting Save File

Click Next to enter Trigger Selection Settings.

The trigger source is set to immediate trigger by default, which is software trigger and is suitable for most applications. For other trigger methods, please refer to the user manual for selection.



Settings Trigger

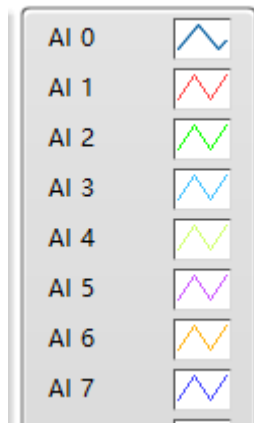
Click the Complete button to finish the settings.

After setting, click the Save as Default Settings button to save the current settings as default settings. When you need to collect data with default settings, just click Load Default Settings.

Start and Stop Collection

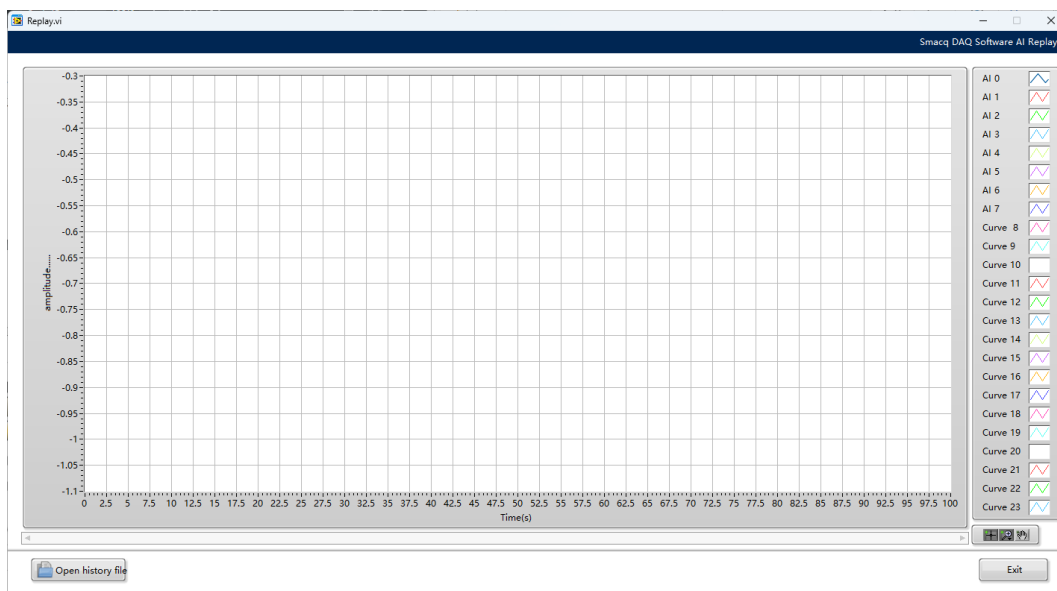
After the settings are completed, data collection can be started by clicking the Start button and stopped by clicking the Stop button.

Legend indicates the correspondence between the channels and the waveform curves, and you can also right-click on the legend of a channel to set the color, line style, and line width of the curve. These functions generally do not need to be adjusted.



Legend Change Line Color

Waveform display is used to display the collected analog input data in waveform form. The displayed waveform data length is 1M samples per channel. If the collected data length exceeds 1M samples, only the latest 1M points of data will be displayed.



Coordinate adjustment

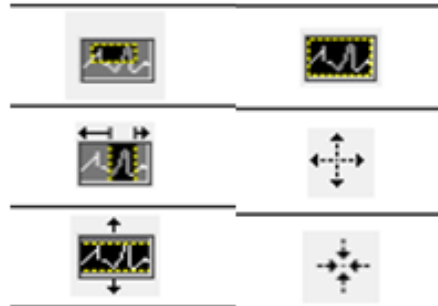
Automatic Coordinate Adjustment: The software defaults to automatic adjustment of the Y ruler. At high sampling rates, it is not recommended to use automatic adjustment of the X ruler, as it requires higher computer performance and may affect data collection. To enable or disable automatic adjustment of rulers, right-click on the waveform and check or uncheck the automatic adjustment of X/Y rulers in the menu.

Manual Coordinate Adjustment: To manually adjust the coordinates, first turn off the automatic adjustment function for the corresponding coordinate. Then click on the coordinate to be modified. When the coordinate is in the editable state as shown in the figure below, enter the corresponding value and press the Enter key.

Graphic Tool Panel: Located at the bottom left of the page, the three buttons have the following functions: mouse function, zoom function, and hand drag function.

Mouse function: The standard function of the mouse, equivalent to no function.

Zoom function: The main function area of the graphic tool panel. After clicking, a secondary menu with six options appears, as shown in the figure below, and the function description is given in the table below.



Zoom In: The selected range of the mouse is magnified and displayed on the entire canvas.

Horizontal Zoom: The selected range of the mouse is horizontally magnified.

Vertical Zoom: The selected range of the mouse is vertically magnified.

Full Display: Click to automatically adjust the XY coordinates to display all data.

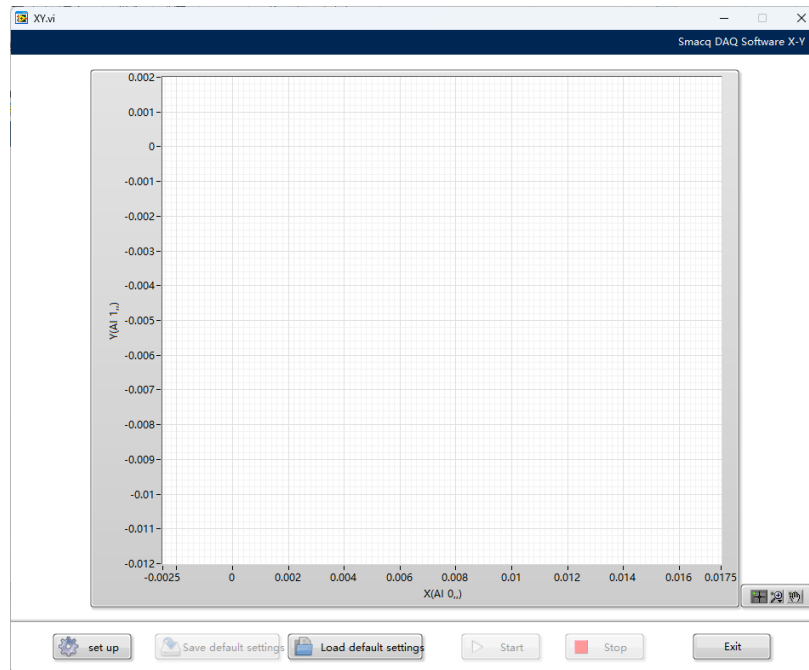
Click Zoom In: Click to magnify the display centered on the clicked location.

Click Zoom Out: Click to reduce the display centered on the clicked location.

Hand drag function allows you to freely drag the waveform on the waveform diagram by clicking and holding the mouse after selecting it.

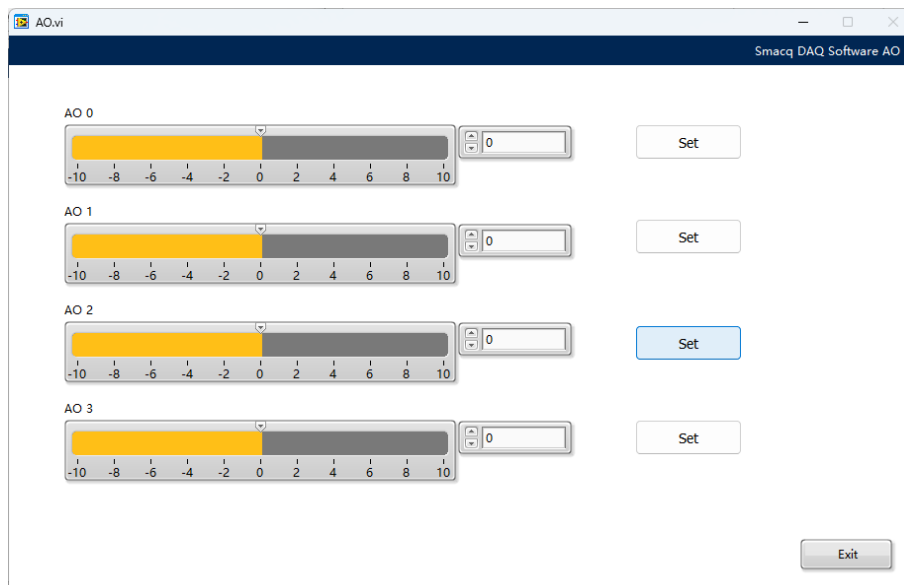
XY Mode

The settings for XY mode are similar to those for YT. XY Mode Uses only two channels, with the X-axis representing the data of one channel and the Y-axis representing the data of another channel.



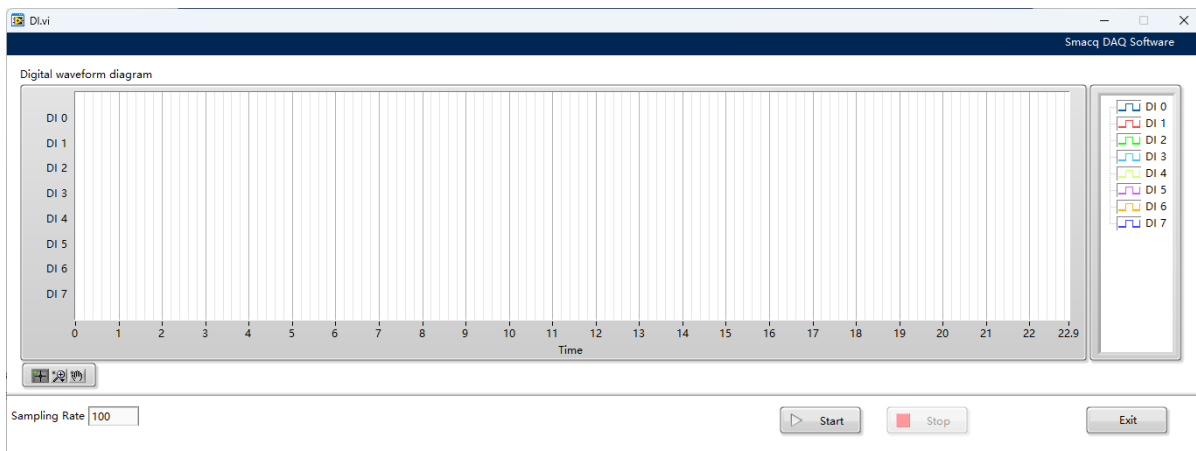
Analog Output

Available for USB-5100, USB-3100, and USB-3300 series, allowing the setting of voltage output from 0 to 10V.



Digital Output and Input

Digital output is used for controlling external devices, and digital input is used for collecting waveforms that change over time.



Conclusion

Smacq DAQ Software is simple to use and suitable for basic applications. For users whose requirements cannot be met by Smacq DAQ Software, it is recommended to use software such as LabVIEW, Matlab, VB, C#, etc., for programming and development. Smacq provides development examples and manuals. If you have any questions or problems during use, please contact service@smacq.com.