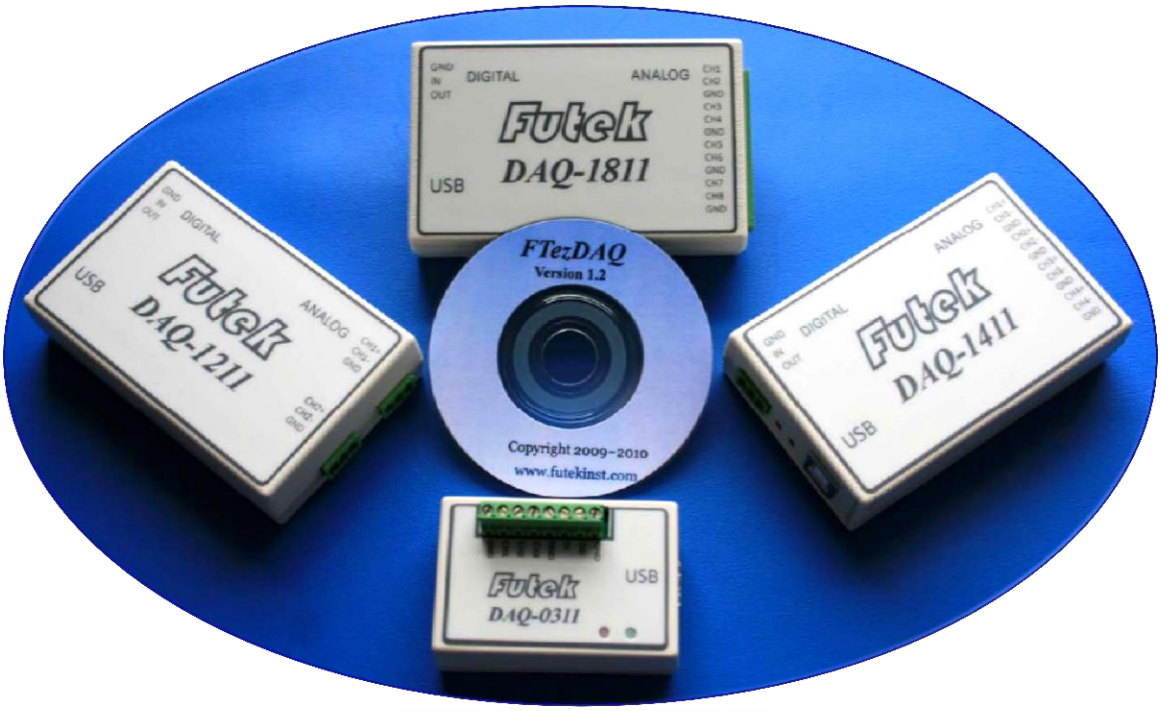
Version 2.2.0

Jmida Technology

FT_ez_DAQ User's Manual



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1. Introduction

Jmida (formerly Futek) ezDAQ multi-function data acquisition system is an integrated hardware and software system. It includes analog inputs, analog outputs, digital inputs/outputs, counters and timers. It is powered by PC USB port without external power supply needed.

The application software FTezDAQ is designed for easy run in Windows® Operation System.

Key Features:

- Multiple analog inputs ranges
- High analog input impedance
- Digital Outputs, can output TTL level voltage and PWM signal.
- Digital Input, 32bit Counters, Event triggers, Timer.
- Analog Outputs:
  - SIN waveform.
  - TRIANGLE waveform.
  - SAWTOOTH waveform.
  - User set voltage
- Full-speed USB communications
- Powered by USB
- Easy to use application software FTezDAQ runs in Windows® operation system.

Specifications of different models are as below:

Model		DAQ-0311A	DAQ-1211	DAQ-1211H	DAQ-1411	DAQ-1411H	DAQ-1811	MF-28	MF-126
Digital I/O	Input	1	1	1	1	1	1	2	7
	Output	1	1	1	1	1	1	2	3
Analog Inputs		3	2	2	4	4	8	8	14
	12Bit								14SE
	16Bit	2SE/1DI							
	24Bit		2DI	2DI	4DI	4DI	8SE/4DI	8SE/4DI	
Input Impedance		>3MΩ	>3MΩ	7MΩ	>3MΩ	7MΩ	>3MΩ	>3MΩ	400KΩ
Max Sample Rate SPS		100	320	320	320	320	320	450	31K
Analog Input Ranges		±1.25V	±1.25V	±1.25V	±1.25V	±1.25V	(±)1.25V	(±)1.25V	0~+10V
		±2.5V	±2.5V		±2.5V		(±)2.5V	(±)2.5V	
		±5V	±5V		±5V		(±)5V	(±)5V	
		±10V	±10V		±10V		(±)10V	(±)10V	
Bridge Power Provided								Yes	
Analog Outputs		N/A	N/A	N/A	N/A	N/A	N/A	1	4
DAC Bit		N/A	N/A	N/A	N/A	N/A	N/A	8	12
Analog Output Modes		N/A	N/A	N/A	N/A	N/A	N/A	SIN	SIN
								Triangle	Triangle
								Sawtooth	Sawtooth
								Voltage	Voltage
Max Frequency		N/A	N/A	N/A	N/A	N/A	N/A	1KHz	1KHz
PWM Output		N/A	N/A	N/A	1	1	1	2	3
PWM Max Frequency		N/A	N/A	N/A	1KHz	1KHz	1KHz	1KHz	1MHz
Timers		1	1	1	1	1	1	1	1
32 bit Counters		N/A	N/A	N/A	N/A	N/A	N/A	1	2
Max Frequency								1MHz	66KHz

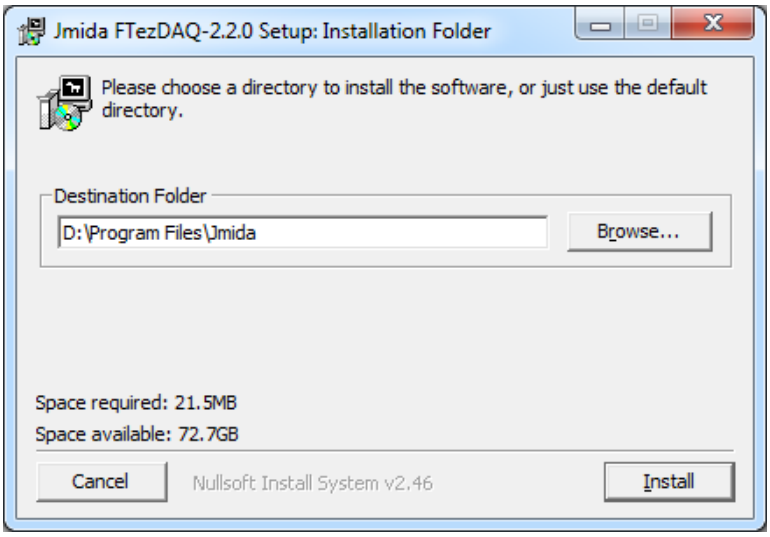
2. System Requirements

The computer requires 32bit or higher Windows® Operation System with USB 1.0 or 2.0 ports.

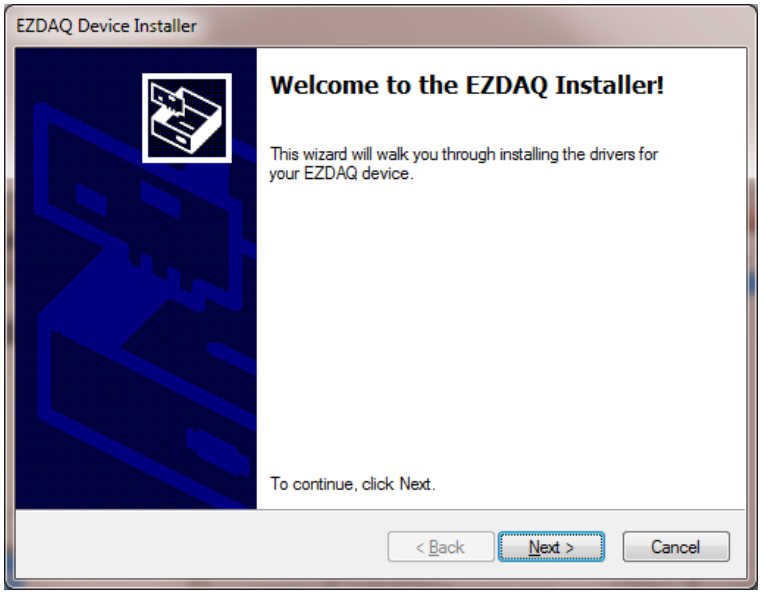
3. Software Installation

3.1 Application software and USB driver installation

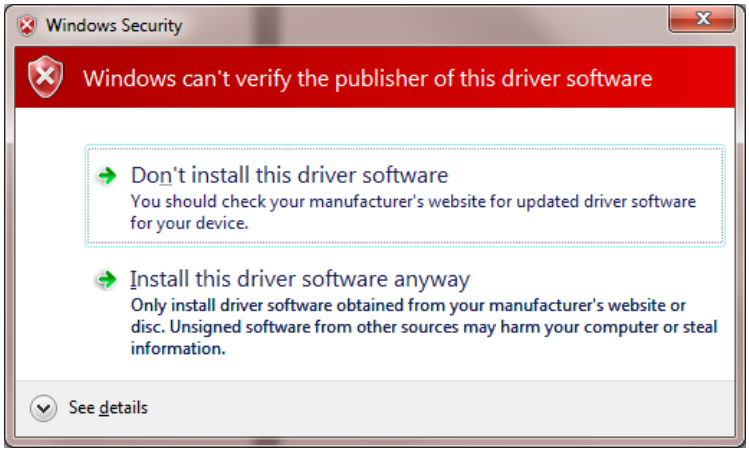
Download FTezDAQ_2_x_x.zip file from Jmida website support page, and unzip it, then run **FTezDAQ-setup-2.2.0.exe**. The following window will pop up.



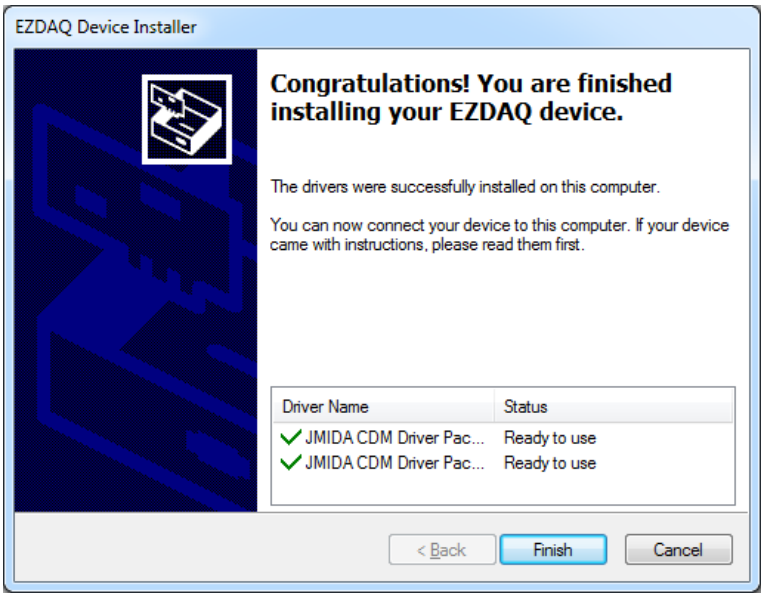
Select the folder which you want to install.

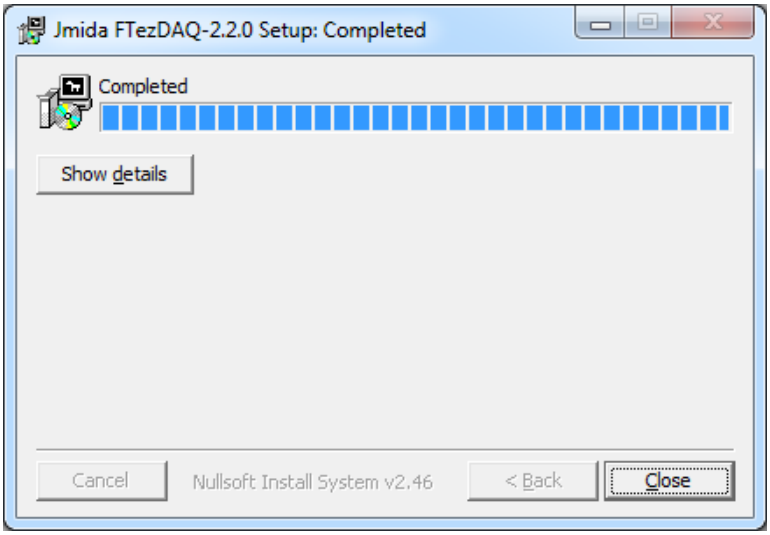


Click “Next”, then select “Install this driver software anyway”



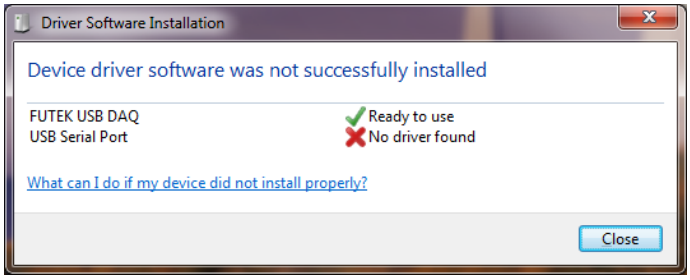
After the driver installation completed, click “Finish” and close the following windows.





The USB driver and application software has been installed.

**Note: For DAQ-1X11 and DAQ-0311A, PC may show the following message,



Please ignore this error message and close this window.

3.2 Windows 8 USB driver installation

For Windows® 8 system, “Driver Signature Enforcement” must be disabled before installation. You need to take the following steps:

(1). Windows Key + R

(2). Enter shutdown.exe /r /o /f /t 00

(3). Click the "OK" button

(4). System will restart to a "Choose an option" screen

(5). Select "Troubleshoot" from "Choose an option" screen

(6). Select "Advanced options" from "Troubleshoot" screen

(7). Select "Windows Startup Settings" from "Advanced options" screen

(8). Click "Restart" button

(9). System will restart to "Advanced Boot Options" screen

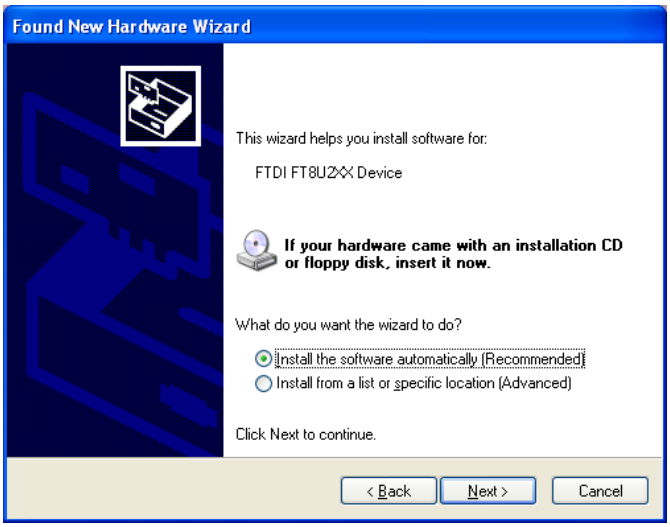
(10). Select "Disable Driver Signature Enforcement"

Once the system starts, run the installation file as you would on Windows 7. When installation finishes, restart the system and “Driver Signature Enforcement” will get enabled automatically.

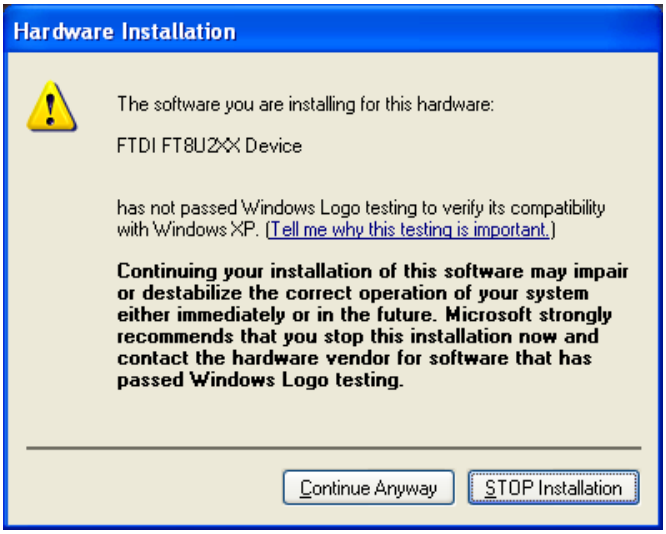
3.3 Windows Vista/XP/2000 USB driver installation

For Windows® Vista/XP/2000 operation system, sometimes, when first time the device is connected to PC USB port, PC will show “Found New Hardware”.

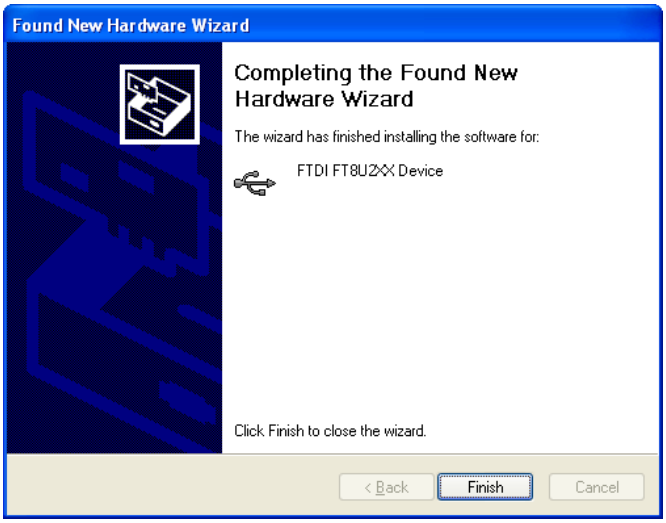
Select “No, not this time”, then click “Next”.



Select “Install the software automatically”, then”Next”



Select “Continue Anyway”



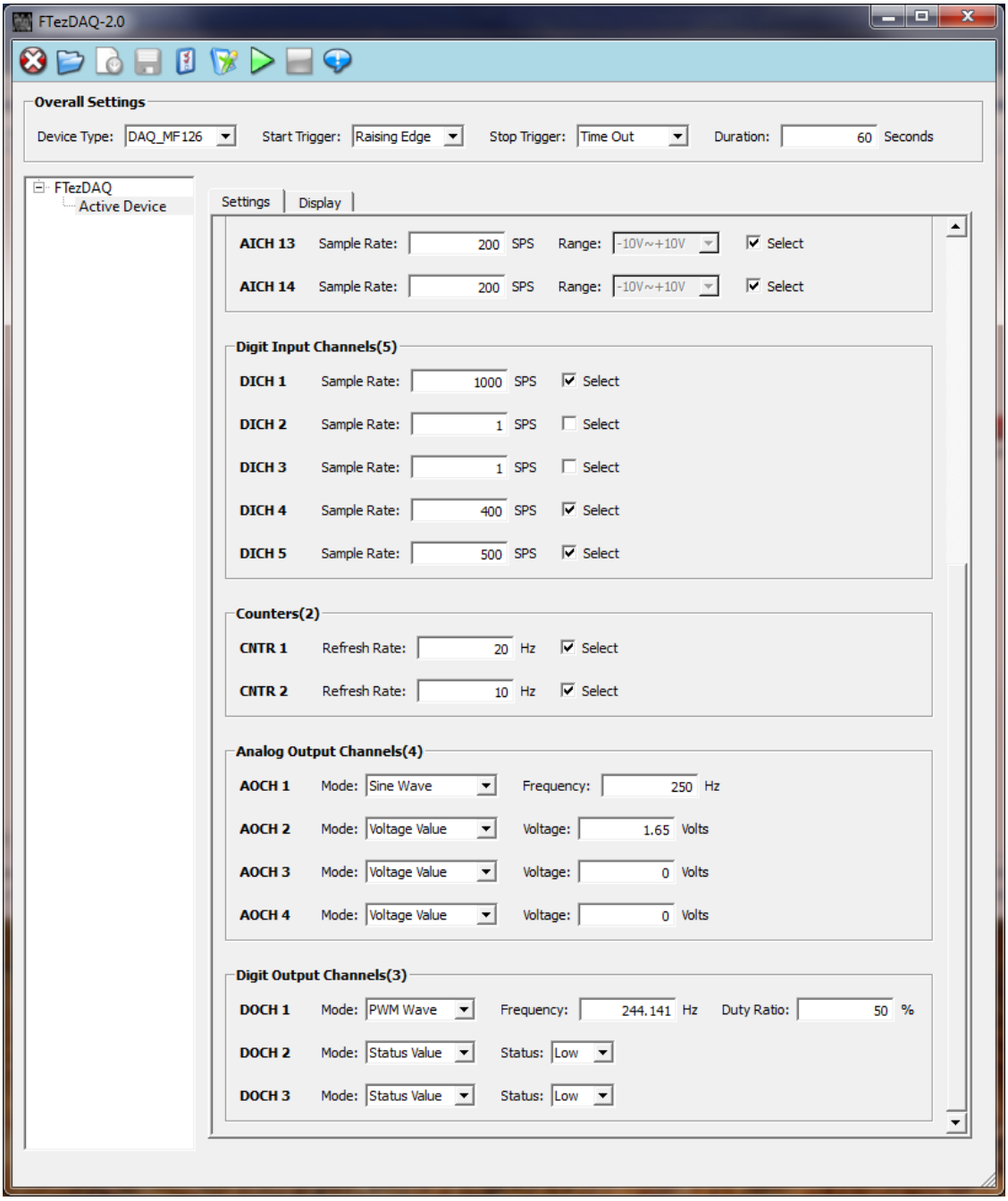
Click “Finish” to complete the driver installation.

Sometimes, PC will show “Found New Hardware” again, just repeat above steps.

4. FTezDAQ-2.0 Software

4.1 FTezDAQ-2.0 Data Acquisition Software

The FTezDAQ-2.0 data acquisition software is easy to use and user friendly. User can start this program from PC “Start” menu, or create a short cut icon on the desktop. The following window will show up when run this program,



For the different device type, the functions in the above window are little bit different base on different hardware specification.

4.2 Icon Functions

The functions of the icons on the top left side are as below

Start: Start data acquisition.

Stop: Stop data acquisition.

Save Settings: Save all settings, such as Device Type, Input Voltage Ranges, Sampling Rate, Analog Output Mode, Start Trigger, Channels selection, etc. The file is saved as xml format.

Load Setting: Load the saved settings.

Save Data: Save test result data for all channels which has been selected. The file is saved as txt format.

Save Project: Save all settings and test data. The file is saved as xml format.

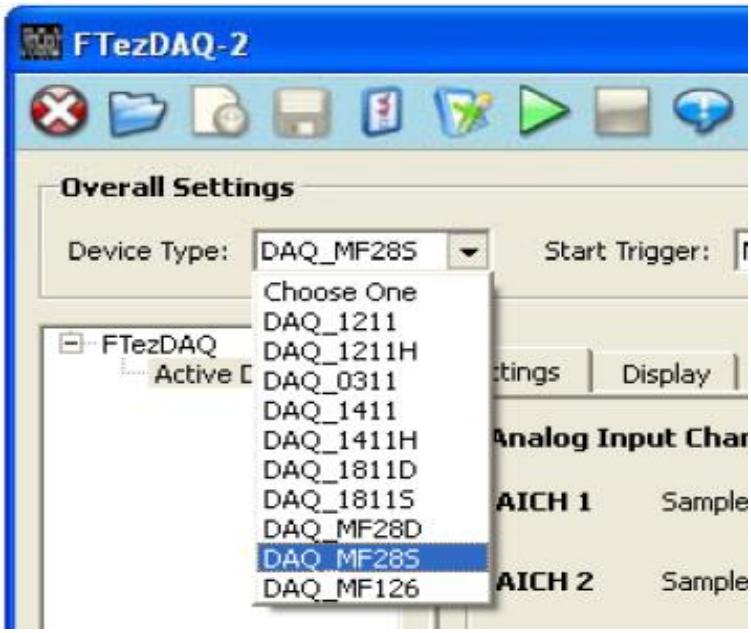
Load Project: Load saved project.

About: Software version.

Exit Program: Exit the program and close the window.

4.3 Device Type Selection

Pull down the Device Type selection window and select the device type which user purchased.

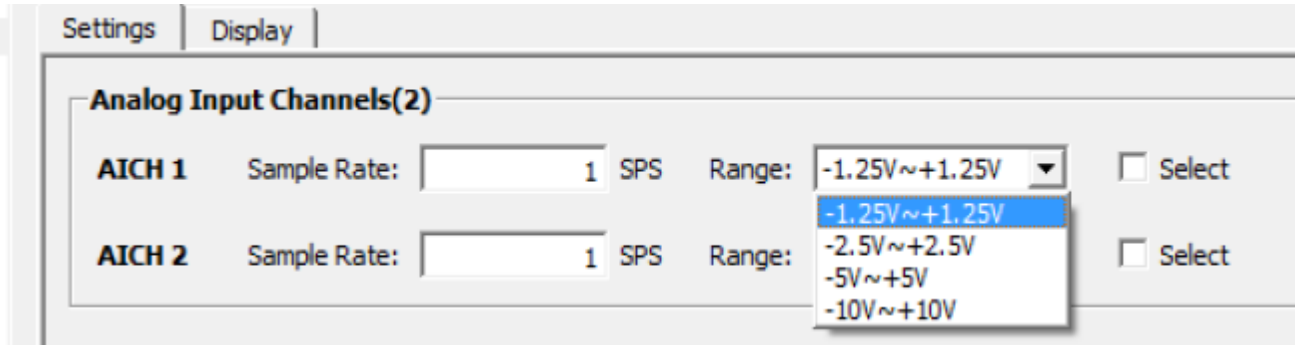


After select the Device Type, the dedicate window with functions which that device has will show up.

The detailed functions for each device will describe later.

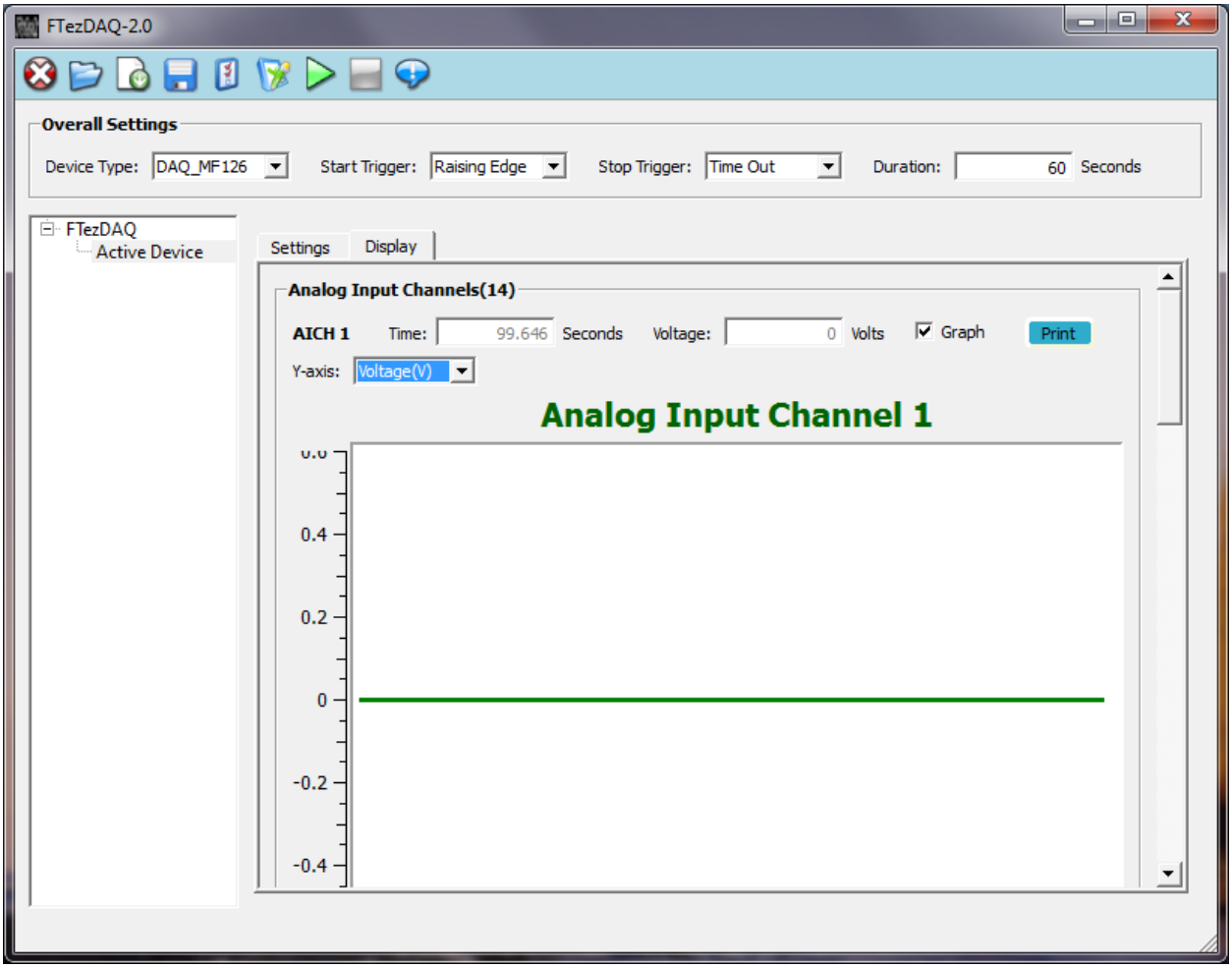
4.4 Analog Input Setting and Display

From “Settings”→”Range” window, user can select the analog input voltage ranges.



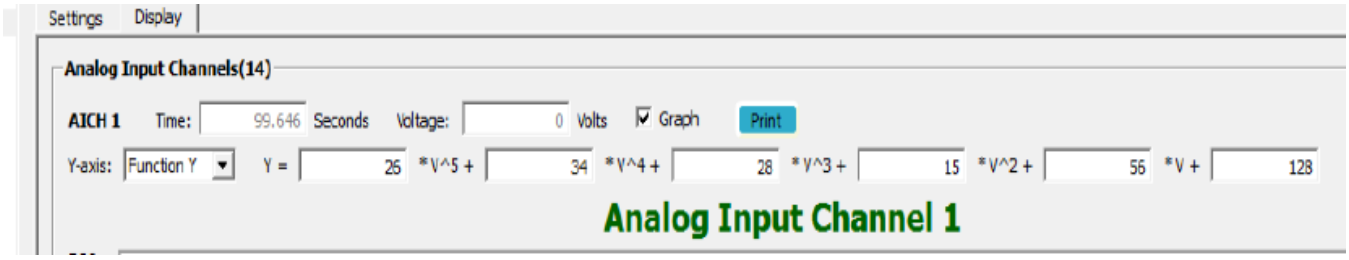
Check “Select” to select this channel will be measured. Input the Sampling Rate to set the data sampling rate for this channel. (** Max sampling rate is difference for different device. The max value of Sampling Rate is limited by the device).

In the “Display” section, check “Graph”, will display the test result plot.



In the Y-axis window, if select “Voltage”, the window will display the plot for input voltage vs time.

If select “Function Y”, the window will display the plot with the function of input voltage, user can input the coefficients base on the measured voltage to display the physical characters.



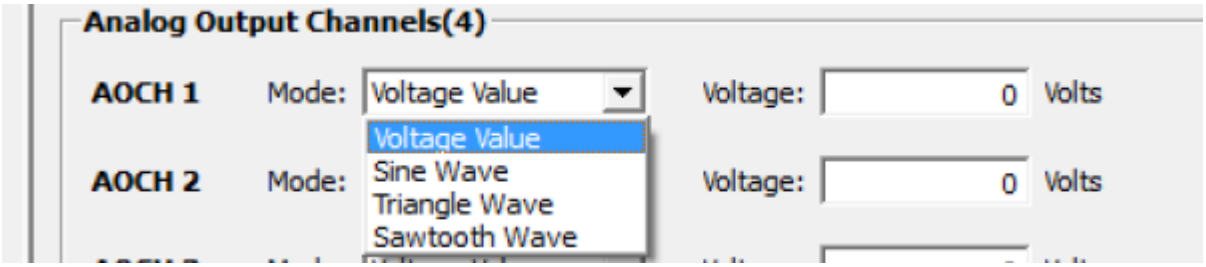
4.5 Digital Input Setting and Display

Digital input channel setting and display are similar as analog, just set the sampling rate and check “select” to select the channel which will be measured.

4.6 Analog Output Channels Setting

The analog output channel has different output mode:

It can output user defined voltage at “Voltage Value” mode. It also can output fixed amplitude Sin, Triangle and Sawtooth waveform, the frequency can be changed, normally the max frequency is 1KHz.

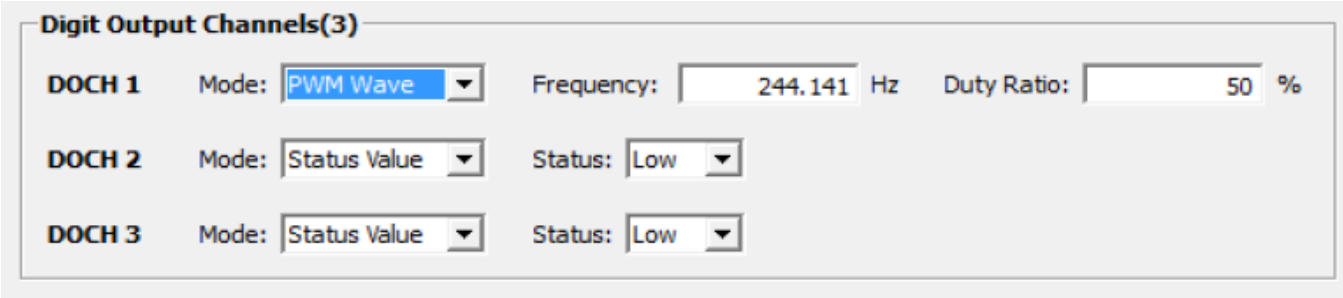


4.7 Counters Input

Some device has digital input counters, they count the input voltage *falling edges*.

4.8 Digital Output Channels Settings

Digital output channels can output TTL level digital signal or PWM waveform.



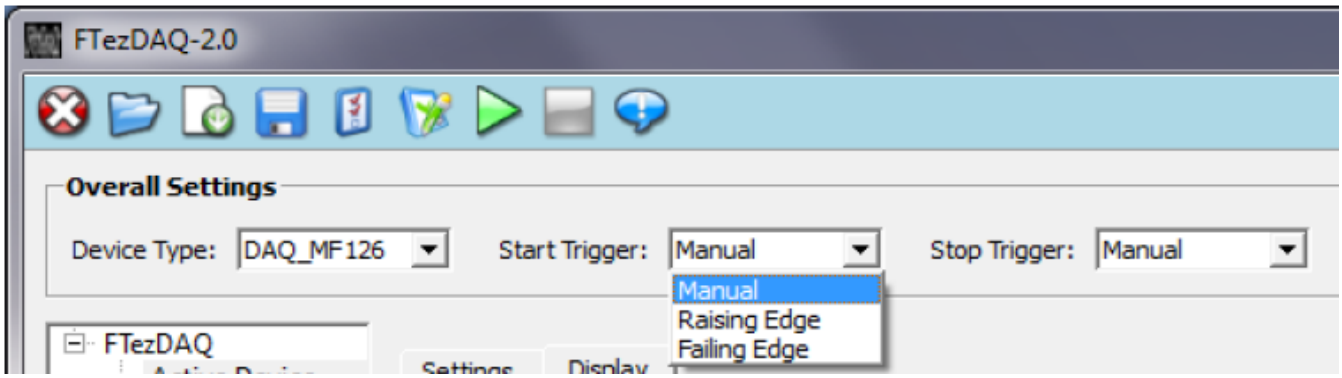
When select output mode as “Status Value”, it will output the TTL signal High or Low. When select output mode as PWM Wave, it will output PWM waveform, user can input the frequency and duty ratio.

4.9 Data Acquisition Starting Methods

There are several ways to start data acquisition.

The “Start Trigger” can be:

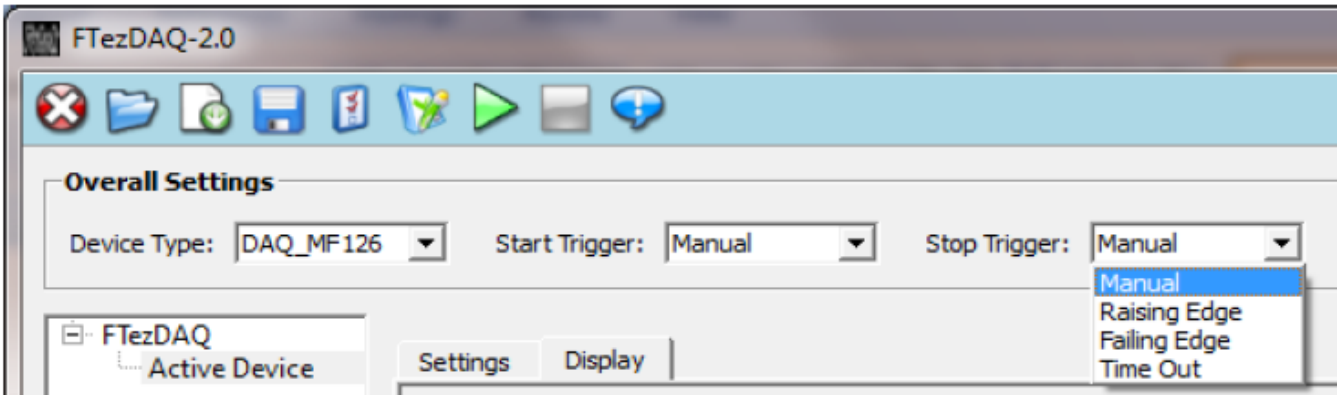
- Manual
- Raising Edge
- Falling Edge



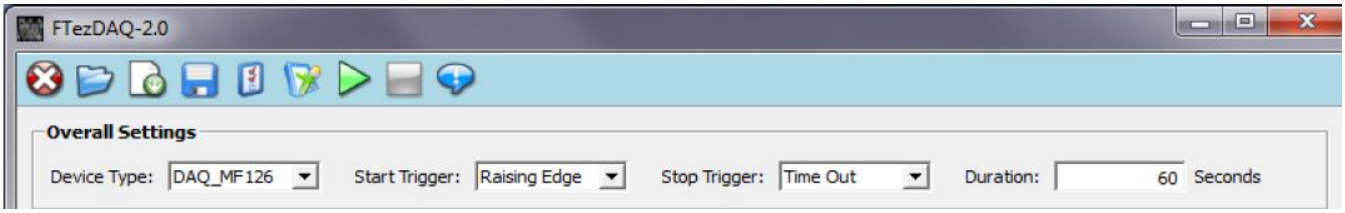
Except “Manual”, the trigger signal comes from **Digital Input Channel 1**.

The “Stop Trigger” can be

- Manual
- Raising Edge
- Falling Edge
- Time Out



If choose stop trigger mode as “Time Out”, user can define the test duration.

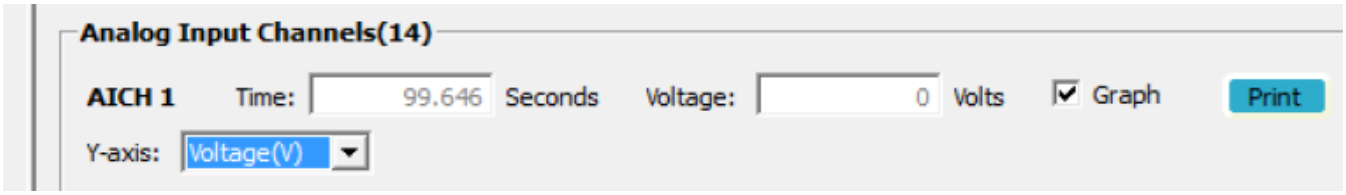


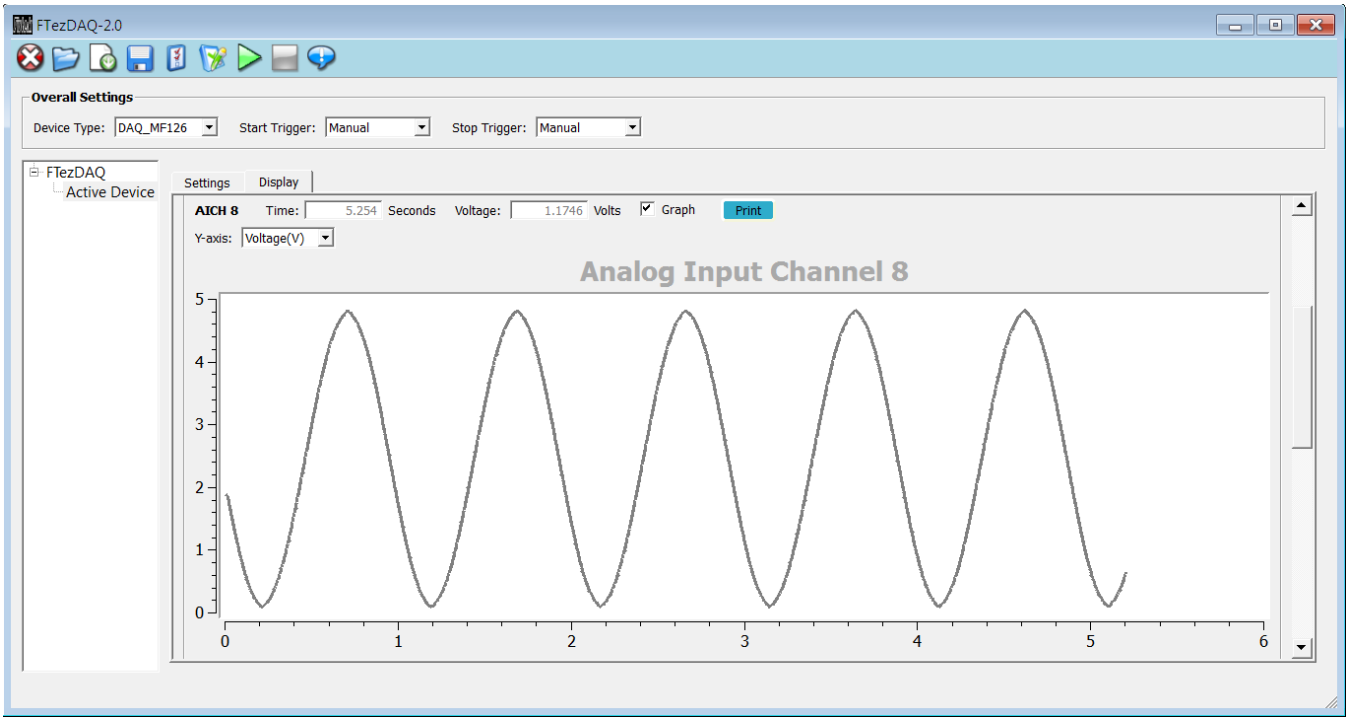
If choose the Start Trigger and Stop Trigger are both Manual, when click “Start” icon  , will start the test; when click “Stop” icon  will stop the test.

If choose the Start Trigger is not Manual, after click “Start” icon , the test will not start until the trigger signal occurs.

4.10 Data Graph Print

After the testing, if the “Graph” has been checked, the graph can be printed by click “Print”.





4.11 Timer

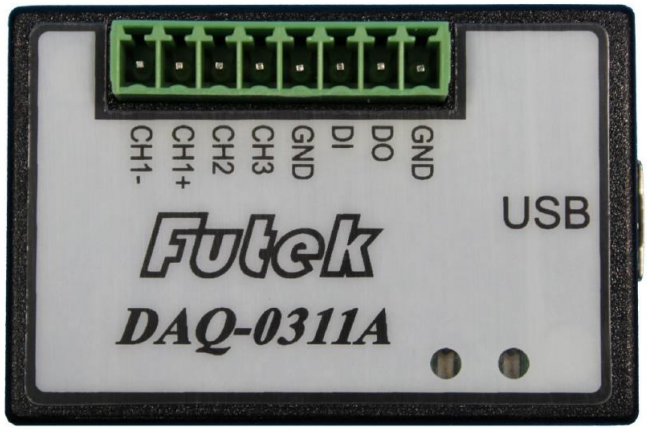
User can use Digital Input Channel 1 as Start and Stop Trigger to measure external event timing.

5. DAQ Device Specifications

This chapter describes the detailed specifications for different DAQ Models.

5.1 DAQ-0311(A)

Model DAQ-0311



Model DAQ-0311A

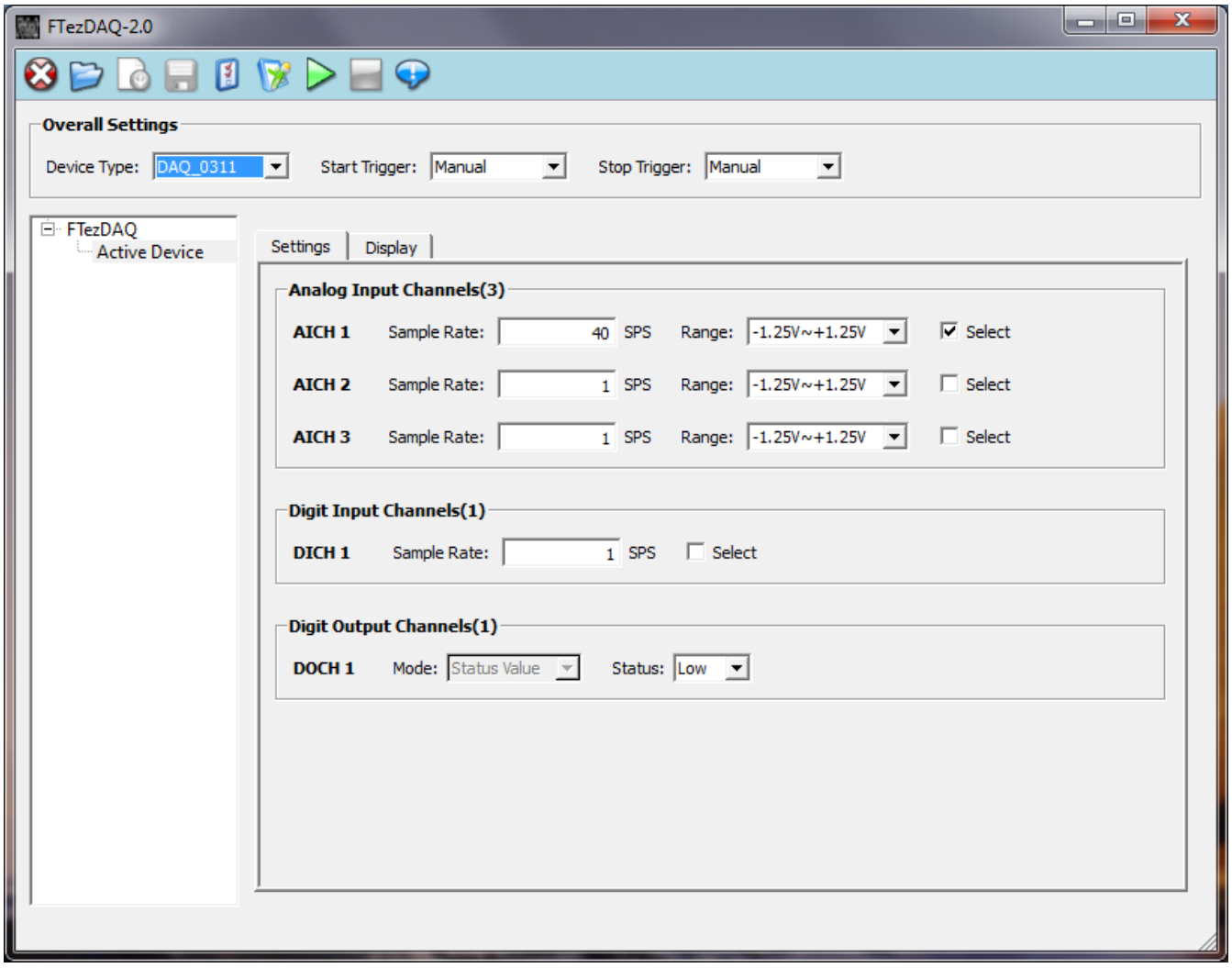
The main difference of DAQ-0311 and DAQ-0311A is:
DAQ-0311 has 3 single ended analog inputs, CH1, CH2 and CH3;
DAQ-0311A has 2 single ended analog inputs CH2 and CH3 and one differential analog input CH1+ and CH1-.

Specifications:

- Analog Inputs: 3
- Input voltage range:
  - 1.25V, 2.5V, 5V and 10V for single ended input
  - ±1.25V, ±2.5V, ±5V and ±10V for differential input (DAQ-0311A CH1)
- Input Impedance: > 3MΩ
- ADC Bits: 16
- Digital Output: 1 DO

- Digital Input: 1 DI
- Max Data Sampling Rate: 100 samples/second

The FTezDAQ-2.0 window



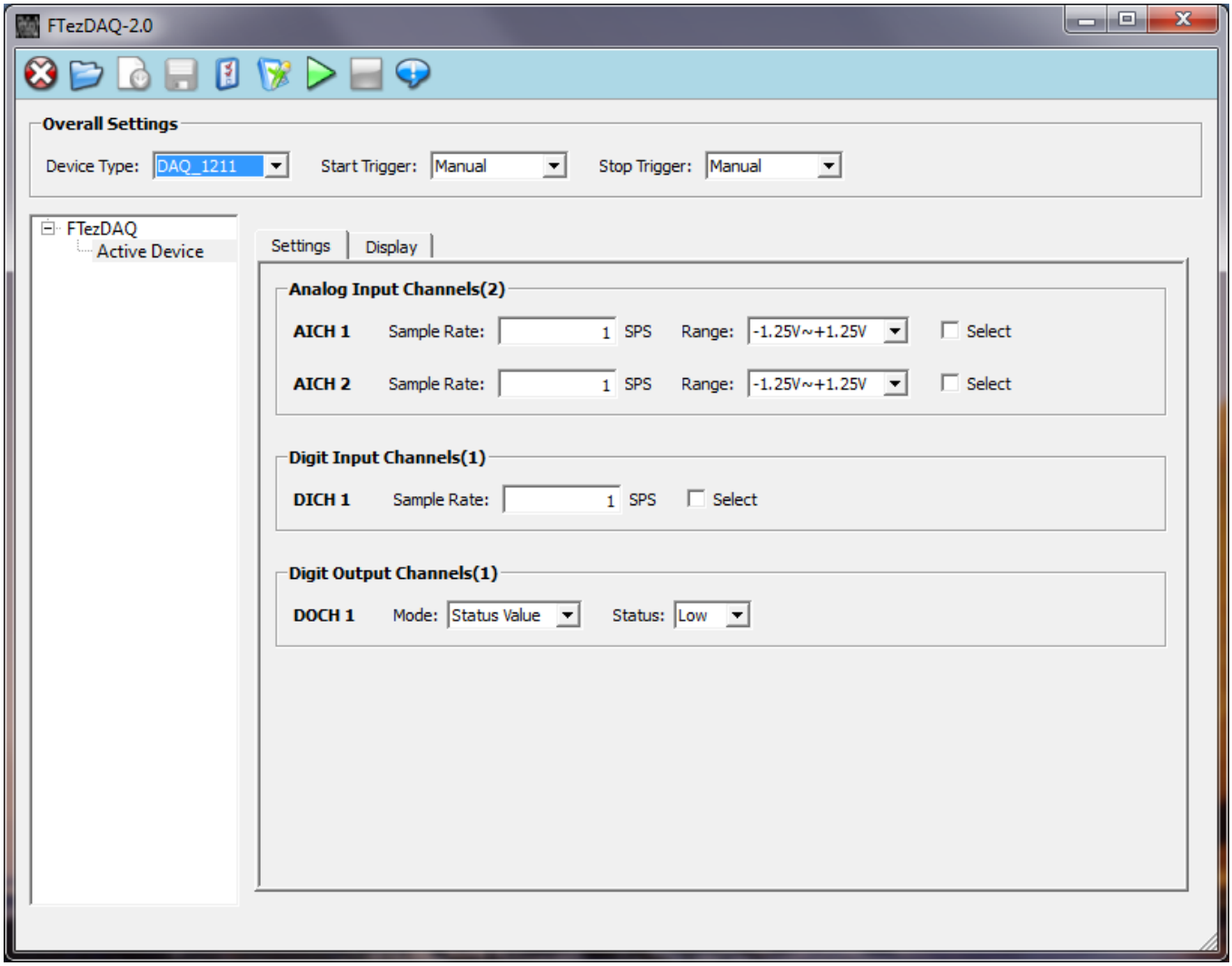
5.2 DAQ-1211(H)

Model DAQ-1211(H)

Specifications:

- Analog Inputs: 2 differential inputs
  - Channel1 → CH1+, CH1-
  - Channel2 → CH2+, CH2-
- Input Differential Voltage Range:
  - ±1.25V, ±2.5V, ±5V and ±10V (DAQ-1211)
  - ±1.25V Only (DAQ-1211H)
- Input Impedance:
  - > 3 MΩ (DAQ-1211)
  - > 1 GΩ (DAQ-1211H)
- ADC Bits: 24
- Digital Output: 1 DIGITAL OUT
- Digital Input: 1 DIGITAL IN
- Max Data Sampling Rate: 320 samples/second
- Timer: 1 Input from DIGITAL IN

The FTezDAQ-2.0 window



5.3 DAQ-1411(H)

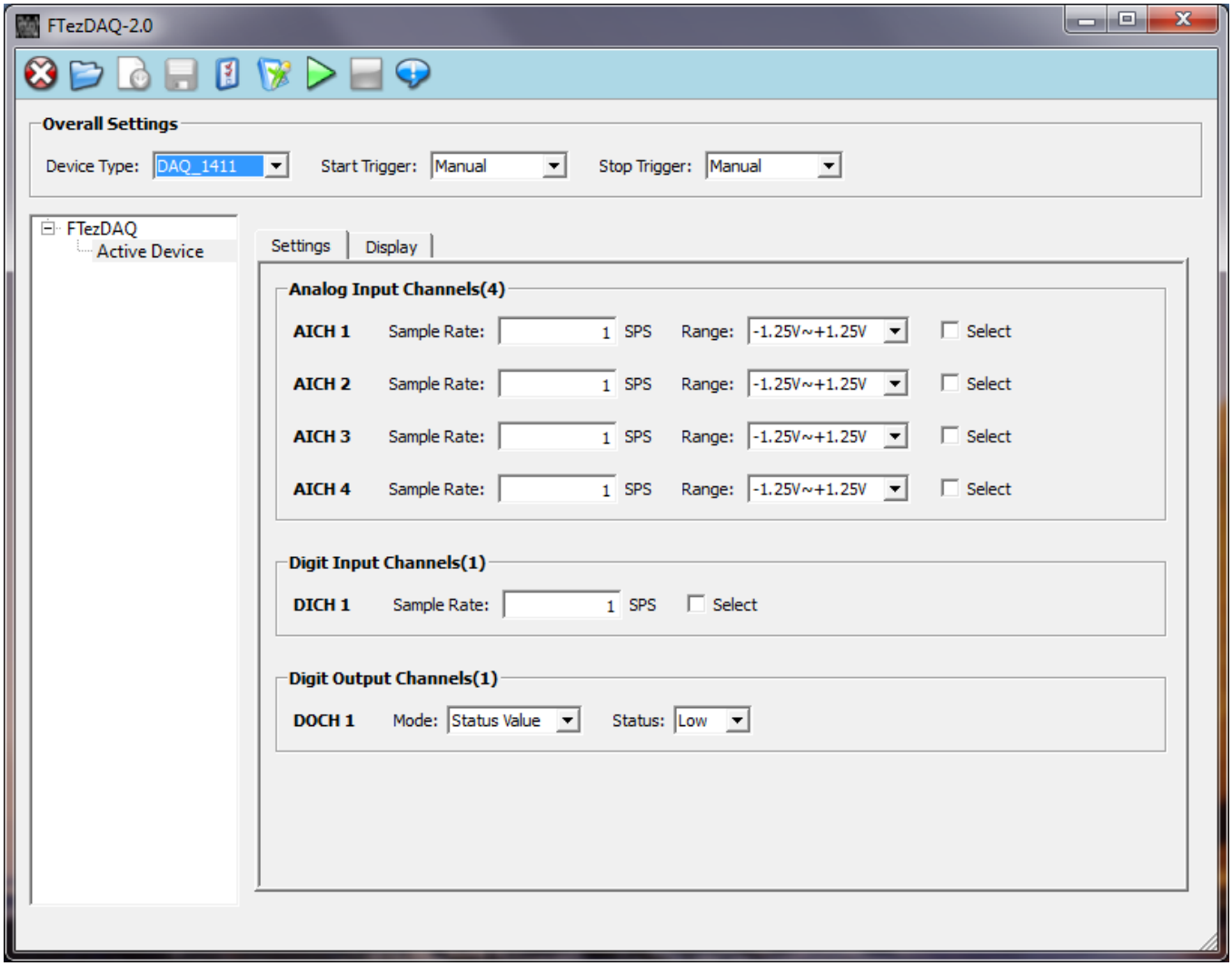
Model DAQ-1411(H)

Specifications:

- Analog Inputs: 4 differential inputs
  - Channel1 → CH1+, CH1-

    - Channel2 → CH2+, CH2-
    - Channel3 → CH3+, CH3-
    - Channel4 → CH4+, CH4-
- Input Differential Voltage Range:
    - ±1.25V, ±2.5V, ±5V and ±10V (DAQ-1411)
    - ±1.25V Only (DAQ-1411H)
- Input Impedance:
    - > 3 MΩ (DAQ-1411)
    - > 1 GΩ (DAQ-1411H)
- ADC Bits: 24
- Digital Output: 1 DIGITAL OUT
- Digital Input: 1 DIGITAL IN
- Max Data Sampling Rate: 320 samples/second
- PWM Output: 1 Max Frequency 1KHz, output from DIGITAL OUT
- Timer: 1 Input from DIGITAL IN

The FTezDAQ-2.0 window



5.4 DAQ-1811

The analog inputs of DAQ-1811 can be configured as 8 single ended inputs (**DAQ-1811S**) or 4 differential inputs (**DAQ-1811D**).

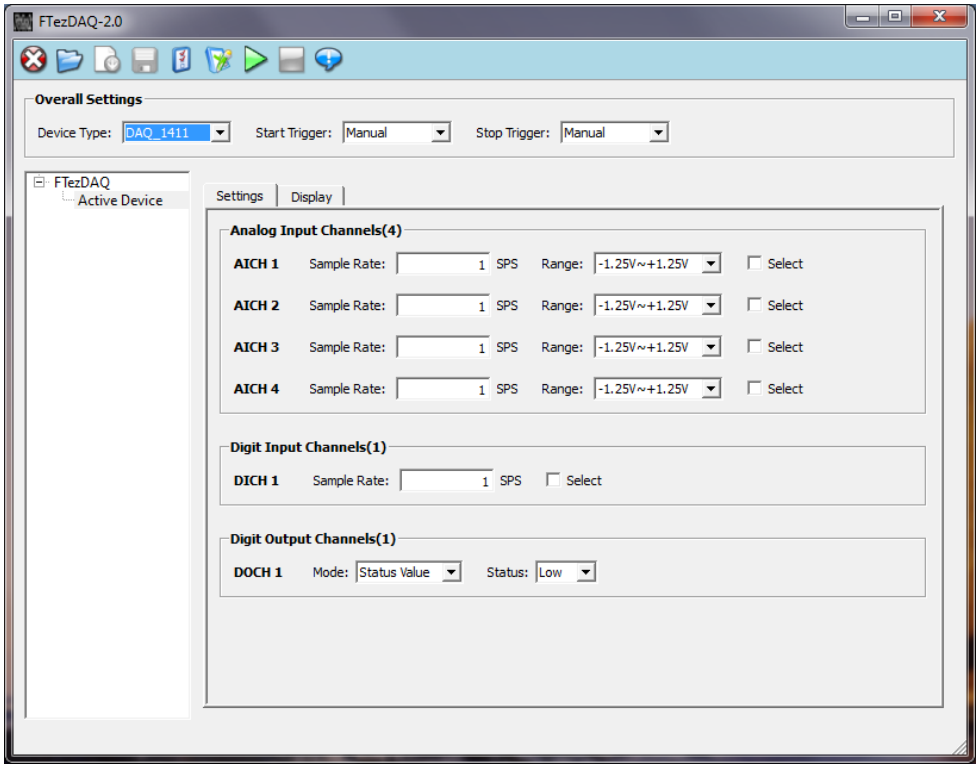
Model DAQ-1811

Specifications:

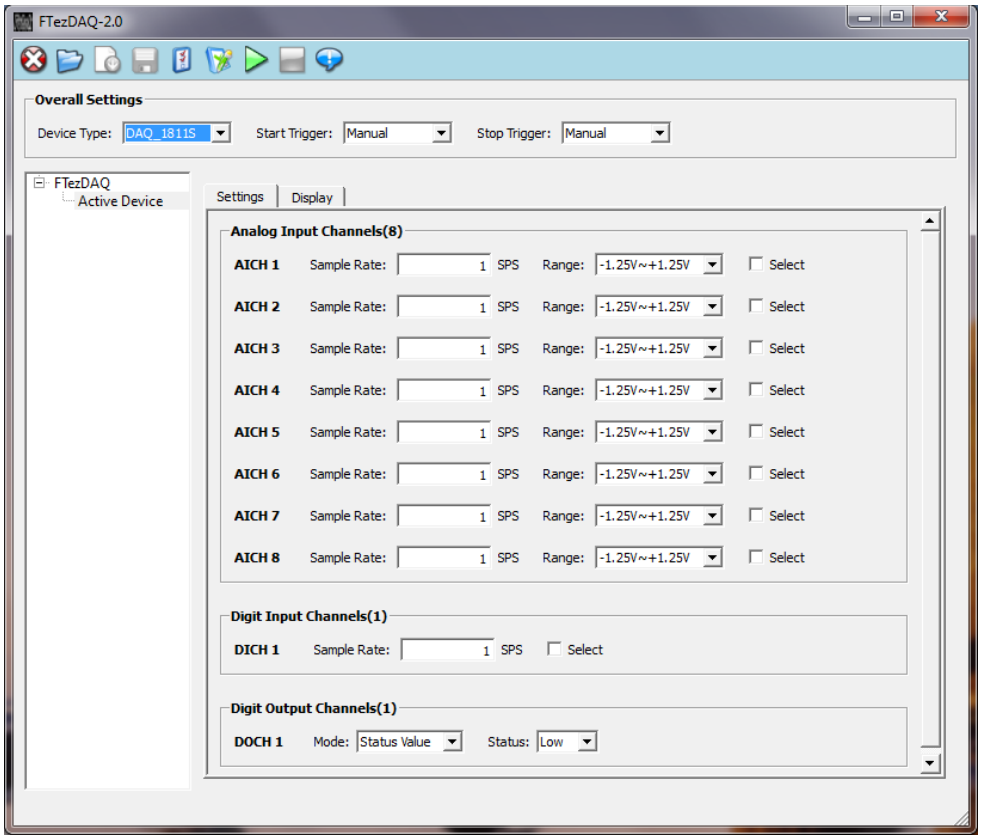
- Analog Inputs:
    - When configured as 4 differential inputs (**DAQ-1811D**), the connections as below
        - Channel **1** differential input **+** → CH1
        - Channel **1** differential input **-** → CH2
        - Channel **2** differential input **+** → CH3
        - Channel **2** differential input **-** → CH4
        - Channel **3** differential input **+** → CH5
        - Channel **3** differential input **-** → CH6
        - Channel **4** differential input **+** → CH7
        - Channel **4** differential input **–** → CH8
    - When configured as 8 single ended inputs (**DAQ-1811S**), the connections as marked.
- Differential Input Voltage Range: ±1.25V, ±2.5V, ±5V and ±10V (**DAQ-1811D**)
- Single Ended Input Voltage Range: 1.25V, 2.5V, 5V and 10V (**DAQ-1811S**)
- Input Impedance: > 3MΩ
- ADC Bits: 24
- Digital Output: 1 DIGITAL OUT
- Digital Input: 1 DIGITAL IN
- Max Data Sampling Rate: 320 samples/second
- PWM Output: 1 Max Frequency 1KHz, output from DIGITAL OUT
- Timer: 1 Input from DIGITAL IN

The FTezDAQ-2.0 window

When Configured as DAQ-1811D



When Configured as DAQ-1811S



5.5 MF-28

The analog inputs of **MF-28** can be configured as 8 single ended inputs (**MF-28S**) or 4 differential inputs (**MF-28D**).

Model MF-28

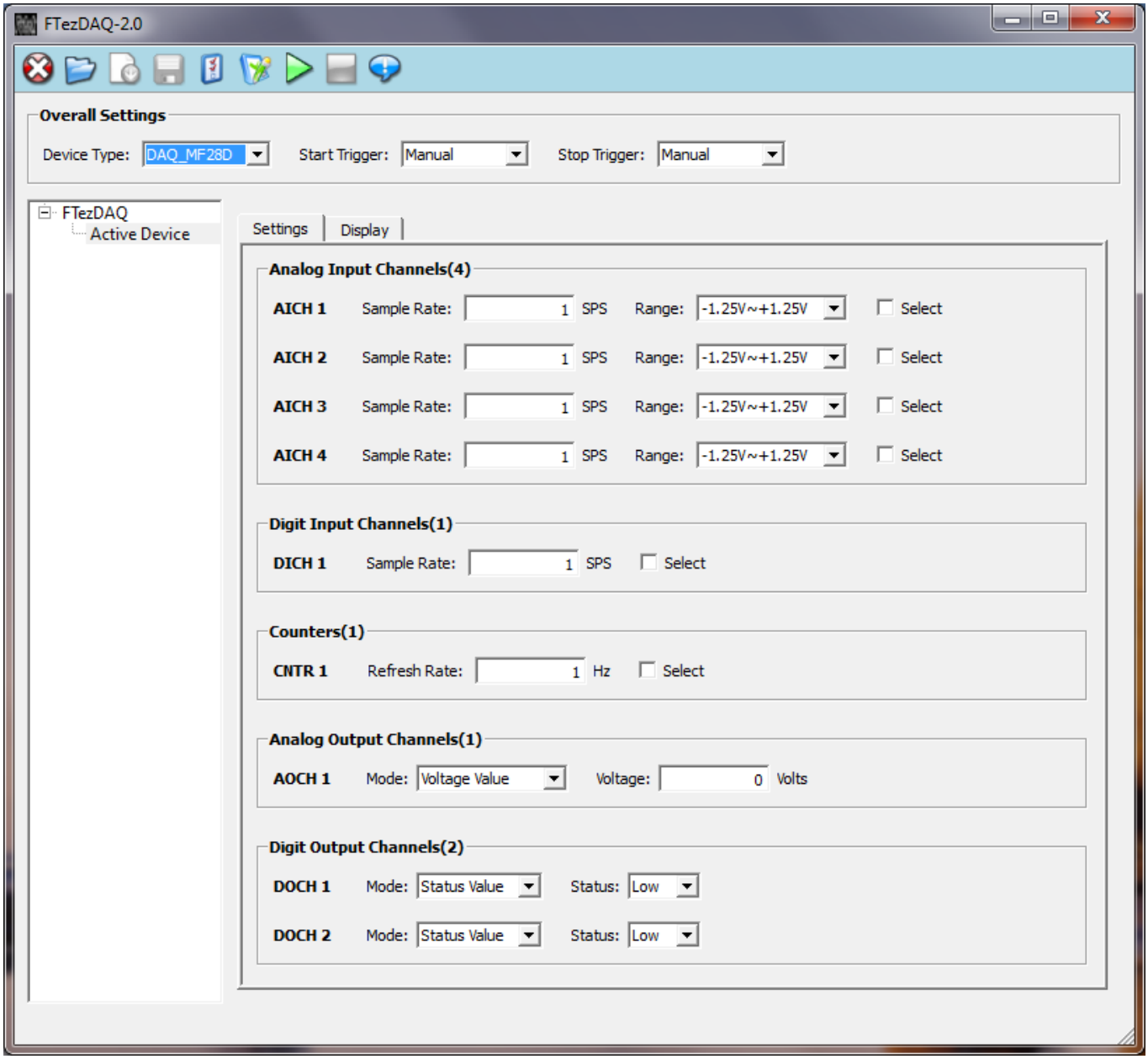
Specifications:

- Analog Inputs:
  - When configured as 4 differential inputs (**MF-28D**), the connections as below
    - Channel **1** differential input **+** → CH1
    - Channel **1** differential input **-** → CH2
    - Channel **2** differential input **+** → CH3
    - Channel **2** differential input **-** → CH4
    - Channel **3** differential input **+** → CH5
    - Channel **3** differential input **-** → CH6
    - Channel **4** differential input **+** → CH7
    - Channel **4** differential input **–** → CH8
  - When configured as 8 single ended inputs (**MF-28S**), the connections as marked.
- Differential Input Voltage Range: ±1.25V, ±2.5V, ±5V and ±10V (**MF-28D**)
- Single Ended Input Voltage Range: 1.25V, 2.5V, 5V and 10V (**MF-28S**)
- Input Impedance: > 3MΩ
- ADC Bits: 24
- Digital Output: 2 **DO1, DO2**
- Digital Input: 2
  - Digital Input Channel 1: **DI1**
  - Digital Counter Input: **DI2**
- Max Data Sampling Rate: 450 samples/second
- PWM Output: 1 Max Frequency 1KHz, output from **DO1** and **DO2**
- DC Power Output: 1 4.7V Max 50mA, output from PWR
- 32 bits Counter: 1 Input from **DI2**
- Timer: 1 Input from **DI1**
- Analog Output: 1 Output from **VOUT**, Range 0 to 4V, 8bit DAC

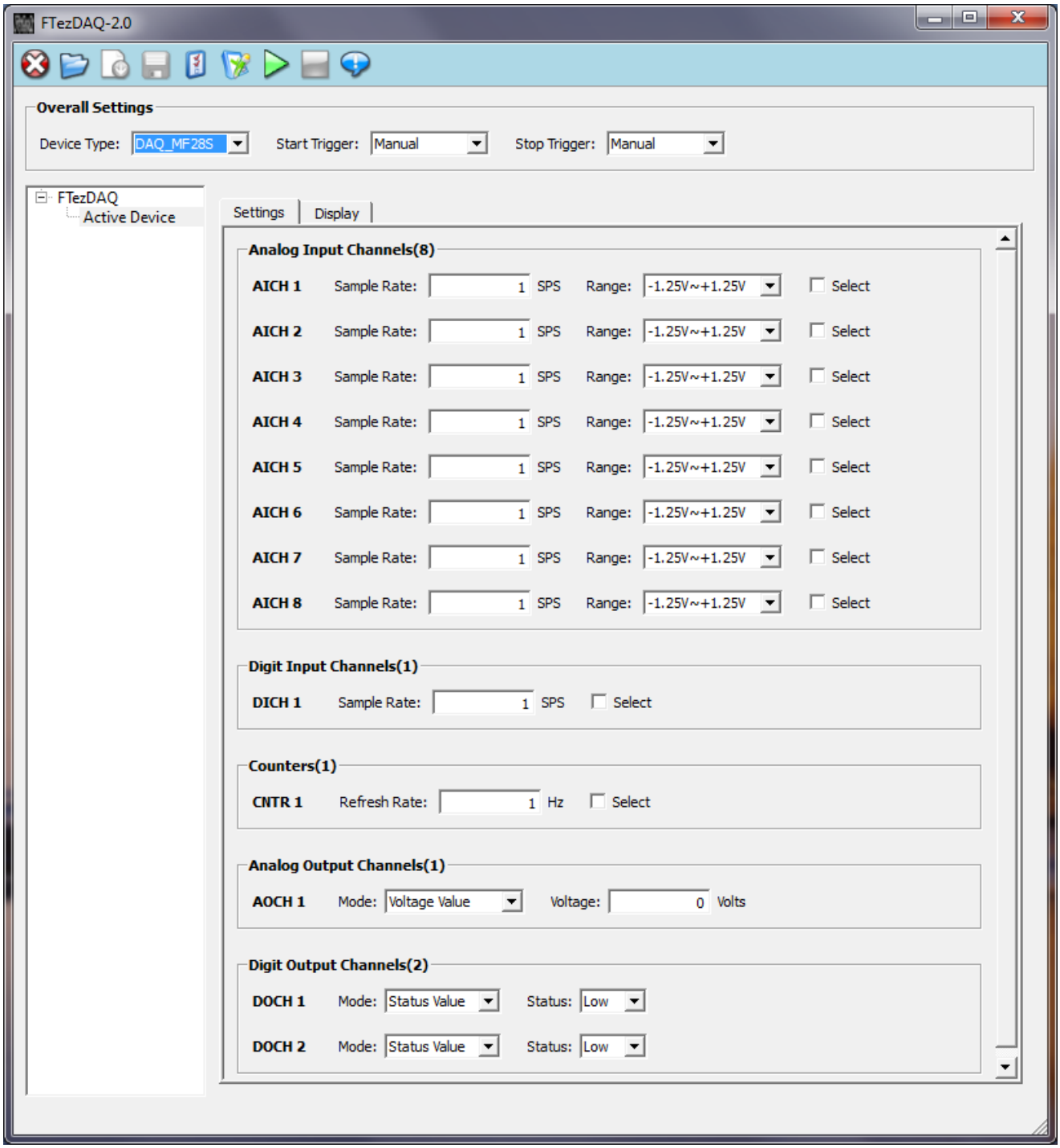
- Output Waveform: Max Frequency 1KHz; fixed amplitude 4V.
  - Sin
  - Triangle
  - Sawtooth
- User Set Voltage 0 to 4V.

The FTezDAQ-2.0 window

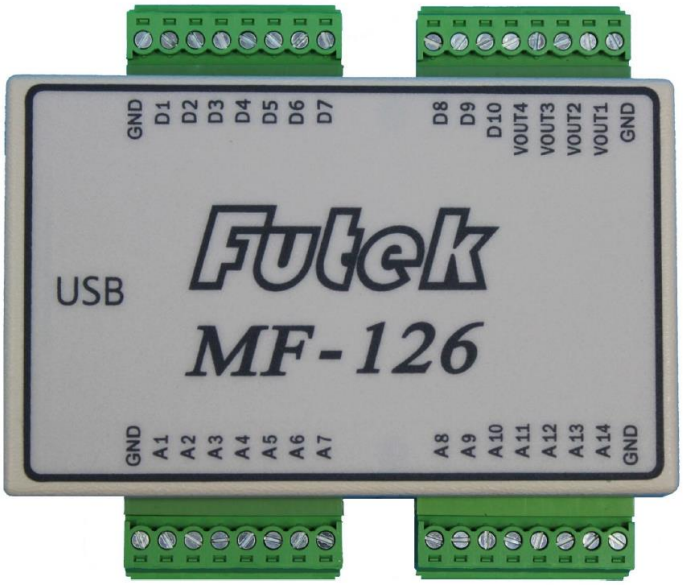
When Configured as DAQ-MF28D



When Configured as DAQ-MF28S



5.6 MF-126

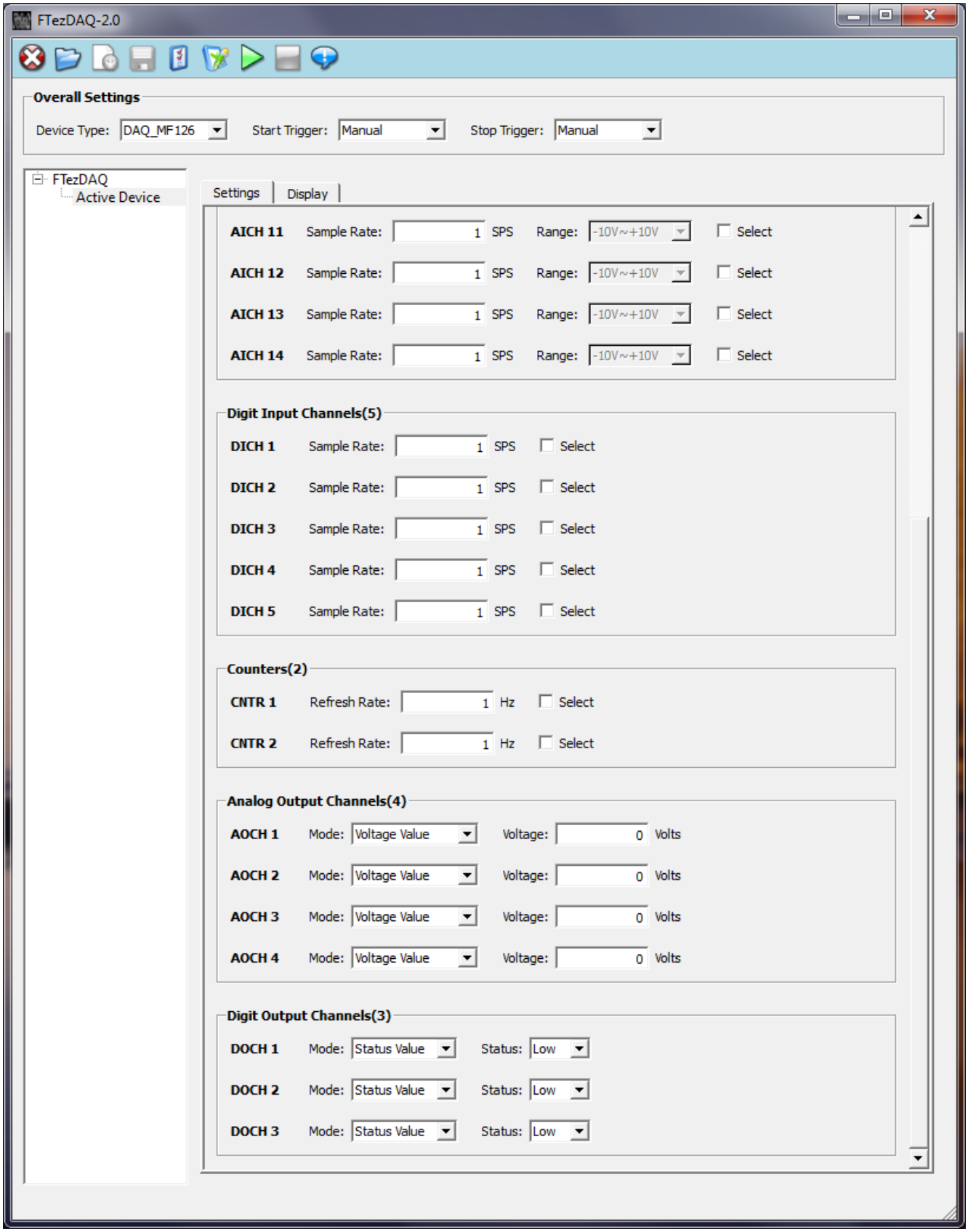


Model MF-126

Specifications:

- Analog Inputs: 14 **A1 to A14**
- Input Voltage Range: 0 to10V
- Input Impedance: $\geq 400K\Omega$
- ADC Bits: 12
- Digital Output: 3 **D6(DOCH1), D8(DOCH2), D9(DOCH3)**
- Digital Input: 5 **D1(DICH1), D2(DICH2), D3(DICH3), D4(DICH4), D5(DICH5)**
- Max Data Sampling Rate: 31K samples/second
- PWM Output: 3
    - **D6(DOCH1)** Max Frequency 1MHz,
    - **D8(DOCH2)** Max Frequency 1KHz,
    - **D9(DOCH3)** Max Frequency 1MHz,
- 32 bits Counter: 2 Max Frequency 66KHz, Falling Edge Count
    - Counter1: **D7 (CNTR1)**
    - Counter2: **D10 (CNTR2)**
- Timer: 1 Input from **D1**
- Analog Output: 4 12bit DAC, Range 0 to 2.5V. **VOUT1 to VOUT4**
    - Output Waveform: Max Frequency 1KHz; fixed amplitude 2.5V.
        - Sin
        - Triangle
        - Sawtooth
    - User Set Voltage, Range 0 to 2.5V.

The FTezDAQ-2.0 window


FTezDAQ-2.0
Overall Settings
Device Type: DAQ_MF126
Start Trigger: Manual
Stop Trigger: Manual
FTezDAQ
Active Device
Settings
Display
AICH 11 Sample Rate: 1 SPS Range: -10V~+10V Select
AICH 12 Sample Rate: 1 SPS Range: -10V~+10V Select
AICH 13 Sample Rate: 1 SPS Range: -10V~+10V Select
AICH 14 Sample Rate: 1 SPS Range: -10V~+10V Select
Digit Input Channels(5)
DICH 1 Sample Rate: 1 SPS Select
DICH 2 Sample Rate: 1 SPS Select
DICH 3 Sample Rate: 1 SPS Select
DICH 4 Sample Rate: 1 SPS Select
DICH 5 Sample Rate: 1 SPS Select
Counters(2)
CNTR 1 Refresh Rate: 1 Hz Select
CNTR 2 Refresh Rate: 1 Hz Select
Analog Output Channels(4)
AOCH 1 Mode: Voltage Value Voltage: 0 Volts
AOCH 2 Mode: Voltage Value Voltage: 0 Volts
AOCH 3 Mode: Voltage Value Voltage: 0 Volts
AOCH 4 Mode: Voltage Value Voltage: 0 Volts
Digit Output Channels(3)
DOCH 1 Mode: Status Value Status: Low
DOCH 2 Mode: Status Value Status: Low
DOCH 3 Mode: Status Value Status: Low