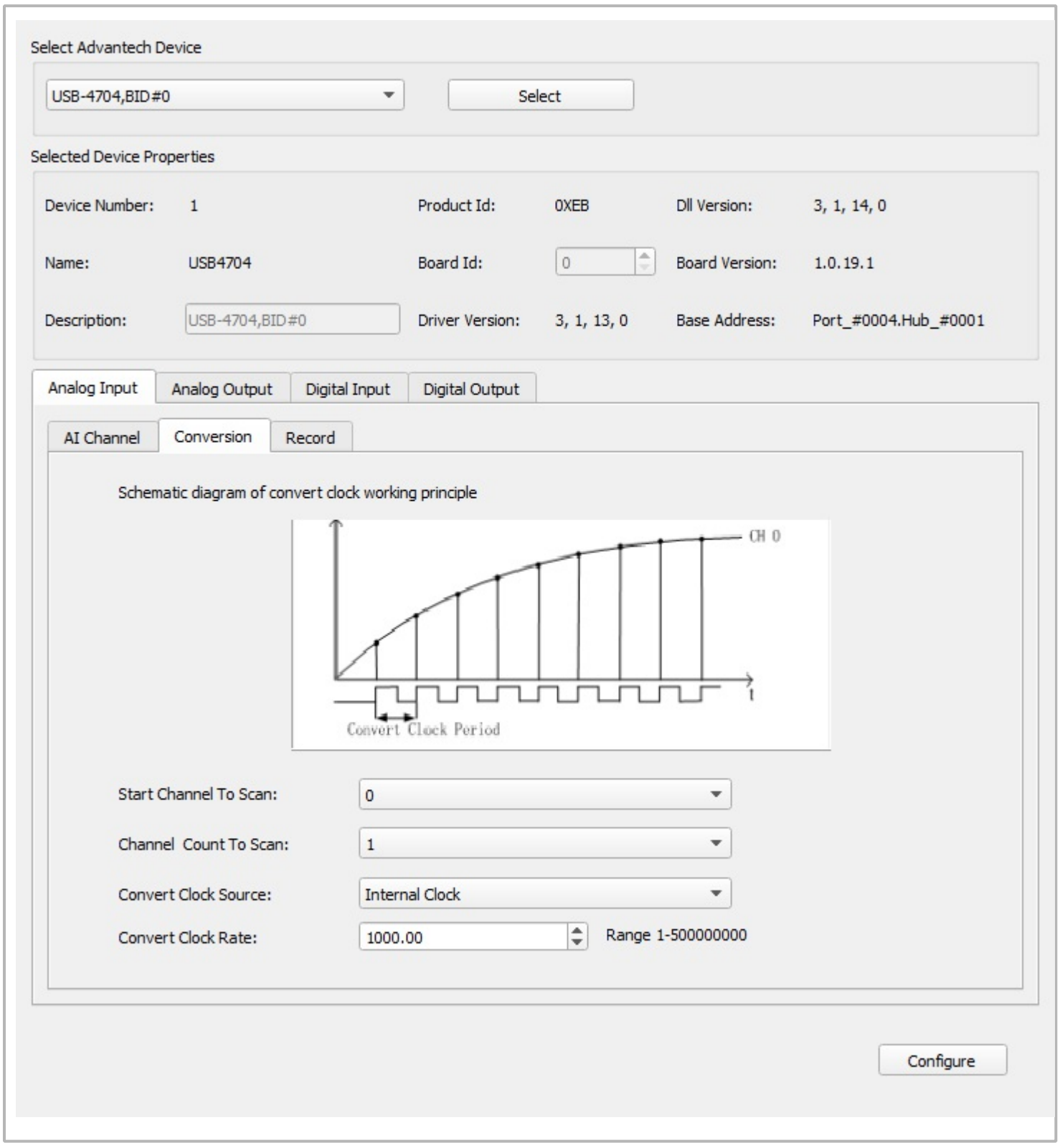
Advantech - Analog Output

In this example, we illustrate how to produce analog outputs at a given AO channel. This process is divided into several steps. The first step is to configure the range of desired output channels. The AO range should be set to +/- 10V. The range can be set using a GUI, the device selection should be changed in line 1.

```
1 sel :="USB-4704,BID#0"
2 AO := atconfig_form(0, "AO11", sel)
```



The waveform data is generated in such a manner that there is a single column vector which contains data to be written to the AOs in parallel. The function GenrateWaveform() is given at the end of this document.

```
ONE_WAVE_POINT_COUNT := 512
xaxis := ynodes(x, 0, 511, 512)
//waveform := sin(2 * cpi() * xaxis / 100)
waveform := vector_create(ONE_WAVE_POINT_COUNT, false, 0)
```

Next, we select the AO channel to write:

```
chanStart := 0
chanCount := 1
```

Everything is ready to output data, which is done in three steps.

Step 1: Open the AO device in non- buffered mode.

```
sel1 := 1 //Select device
// Open AO device in nonbuffered mode.
AOhandle := atdevice_ao_open(sel1, false)
AIhandle := atdevice_ai_open(sel1, false)
```

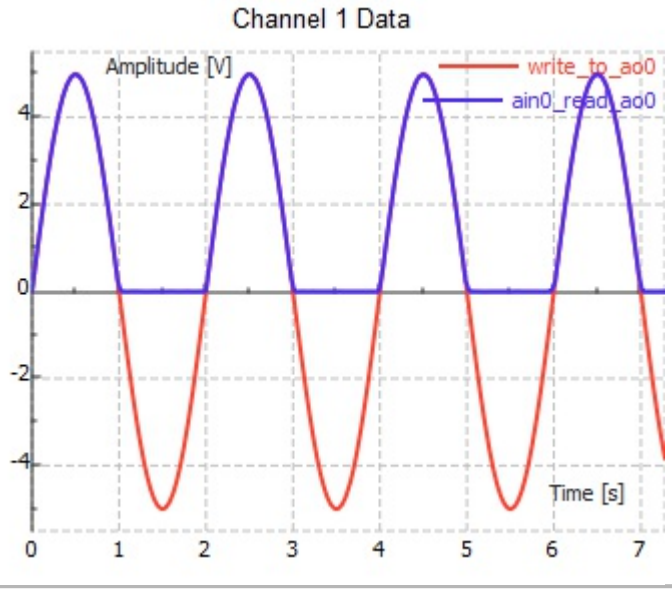
Step 2: Output the data

```
ai_var := vector_create(size(waveform), false, 0)
freq := 0.5
t0 := timenow()
for(i := 0; i < ONE_WAVE_POINT_COUNT; i += 1)
{
  xaxis[i] = timenow() -t0
  waveform[i] = 5 * sin(2 * cpi() * xaxis[i] * freq)
  atdevice_ao_write(AOhandle, chanStart, waveform[i])
  ai_var[i] = atdevice_ai_read(AIhandle,chanStart)
}
write_to_ao0 := join_mat_cols(xaxis, waveform)
ain0_read_ao0 := join_mat_cols(xaxis, ai_var)
```

Step 3: Close the device

```
atdevice_close(AOhandle)
atdevice_close(AIhandle)
```

The data output at AO0 is displayed in the graph below.


Channel 1 Data
Amplitude [V]
write_to_ao0
ain0_read_ao0
4
2
0
-2
-4
Time [s]
0
1
2
3
4
5
6
7