Advantech - Analog Output, Universal Example

In this example, we illustrate how to produce analog outputs at a given AO channel. The process is divided into several steps. The first step is to configure the range of the 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 the GUI.

```
1   AO := atconfig_form(0, "AO10", "")
```

$$\text{atconfig\_form\_configure}(\text{AO})$$

$$\text{AOhandle} \texttt{:=} \text{atconfig\_form\_device\_handle}(\text{AO , "ao"})$$

$$\text{AIhandle} \texttt{:=} \text{atconfig\_form\_device\_handle}(\text{AO , "ai"})$$

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

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

Next, we select the AO channel to write:

```
6   chanStart := 0
7   chanCount := 1
```

Everything is ready to output data, which is done in the remaining two steps.

Step 2: Output the data

```
8    ai_var := vector_create(size(waveform), false, 0)
9    freq := 0.5
10   t0 := timenow()
11   for(i := 0; i < ONE_WAVE_POINT_COUNT; i += 1)
12   {
13     xaxis[i] = timenow() -t0
14     waveform[i] = 5 * sin(2 * cpi() * xaxis[i] * freq)
15     atdevice_ao_write(AOhandle, chanStart, waveform[i])
16     ai_var[i] = atdevice_ai_read(AIhandle,chanStart)
17   }
18   write_to_ao0 := join_mat_cols(xaxis, waveform)
19   ain0_read_ao0 := join_mat_cols(xaxis, ai_var)
```

Step 3: Close the device

```
20   atdevice_close(AOhandle)
21   atdevice_close(AIhandle)
```

The data output at AO0 is displayed in the graph below

Channel 1 Data