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Using NI-DAQmx Property Nodes for Analog Input Channels

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The National Instruments Getting Started with NI-DAQmx Series is aimed at helping you learn NI-DAQmx programming fundamentals. Through video and text tutorials, this series will take you from verifying your device's operation in Measurement & Automation Explorer (MAX) to programming data acquisition applications using LabVIEW. It is intended for both the beginner who wants to learn how to use the DAQ Assistant, as well as the experienced user who wishes to take advantage of advanced NI-DAQmx functionality.

This document is part of the Getting Started with NI-DAQmx Series

Overview

The NI-DAQmx driver exposes most of the advanced attributes or properties related to a data acquistion task via various property nodes. This document introduces few of these property nodes related to an analog input data acquistion task.

Before You Begin

While creating this document, the following versions of software and driver were used

- LabVIEW Professional Development System Version 8.20
- NI-DAQmx Driver Version 8.3

Its not required to have these versions of software/driver installed on your system to follow this tutorial, but kindly keep in mind that the available properties (or attributes) could depend on your system configuration.

NI-DAQmx Channel Property Node

You can use a NI-DAQmx channel property node to read or configure different properties associated with an analog input channel. This property node can be found in the **DAQmx - Data Acquisition** sub-palette under **Measurement I/O** palette. Figure 1 indicates the exact location of this property node.

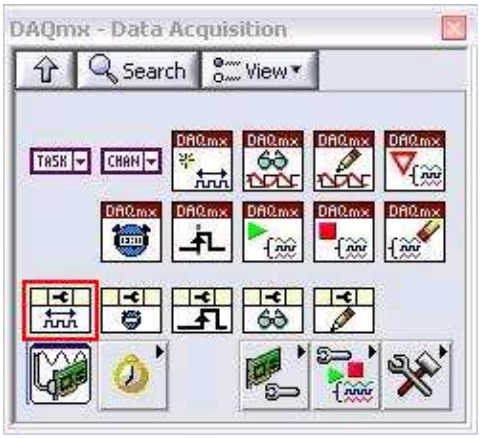

Figure 1: NI-DAQmx Channel Property Node

You can also find this property node under the **DAQmx Constants & Property Nodes** sub-palette located under the **DAQmx Advanced** sub-palette. Figure 2 illustrates this.

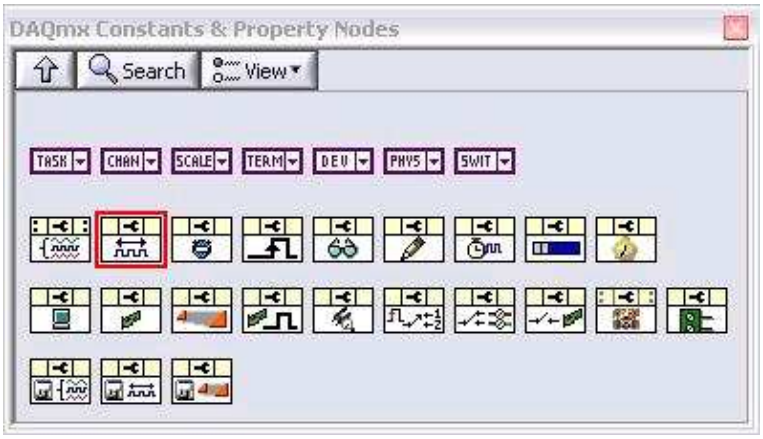

Figure 2: DAQmx Constants & Property Node Sub-palette

Properties for An Analog Input Channel

The NI-DAQmx channel property node categorizes different properties into either general properties or channel specific properties. This is necessary because, for example, properties valid for an analog input voltage channel would not hold valid for an analog input current channel. Figure 3 shows the available properties (and categories of properties) for an analog input channel.

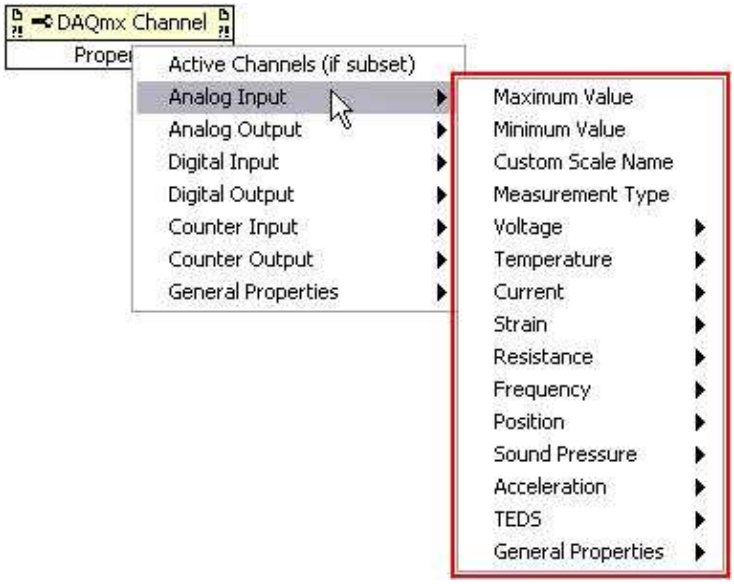

Figure 3: Analog Input Channel Properties

Examples of Analog Input Channel Properties

Figure 4 illustrates two examples of AI channel properties. Figure 4(a) illustrates the situation in which the DAQmx channel property node is being used to define the channel terminal configuration. The different terminal configurations that are available are Referenced Single Ended (RSE), Non-Referenced Single Ended (NRSE), Differential and Pseudodifferential. Figure 4(b) shows the case where the property node is being used to define the type of the thermocouple connected analog input channel.

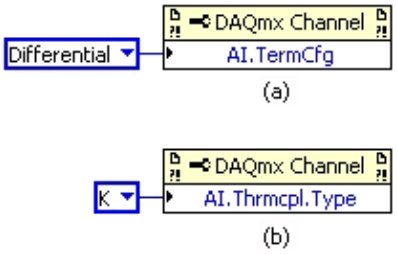

Figure 4: Examples of Analog Input Channel Properties

NI-DAQmx Read Property Node

Besides using the NI-DAQmx Channel Property Node, you can also use the **NI-DAQmx Read Property Node** to tweak your data acquistion tasks. You can use this property node to, for example, configure from what position in

a buffer you want to start the read operation or perhaps query the current status of the read operation. This property node can be located on the **DAQmx - Data Acquistion** sub-palette. Figure 5 shows the location of this property node on this palette.

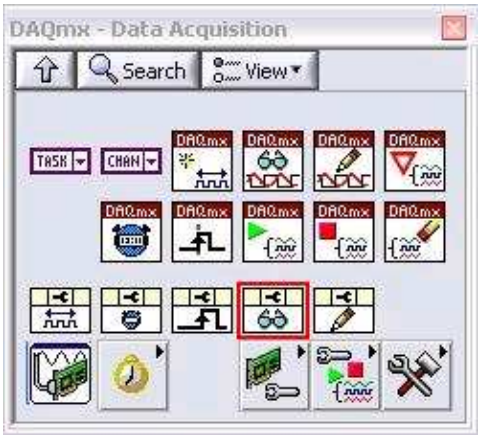

Figure 5: NI-DAQmx Read Property Node

Examples of Read Properties

Figure 6 shows three example of the read properties. In figure 6(a) the NI-DAQmx Read property node is being used to query the number of available samples to read per channel. Figure 6(b) shows the **Total Samples Per Channel Acquired** property. Figure 6(c) illustrates the **OverWrite Mode** property which is used to specify whether to overwrite samples in the buffer that you have not yet read or not.

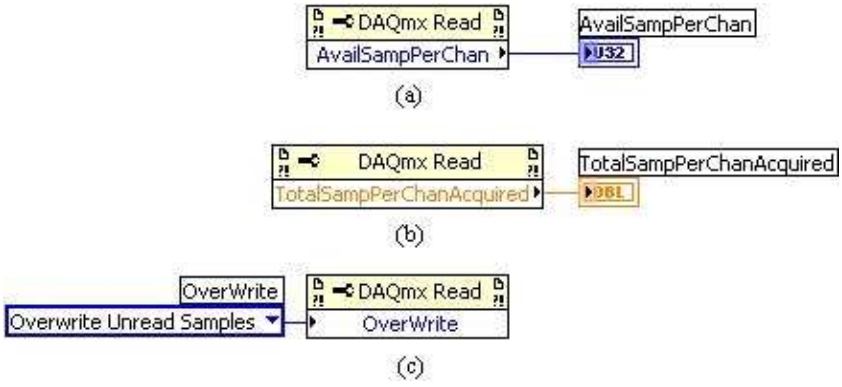

Figure 6: Examples of NI-DAQmx Read Property Node

Conclusion

The DAQmx Channel and Read property nodes can be used to programmatically read or configure different attributes associated with an analog input task. For example programs refer to the shipping examples which could be accessed using the NI Example Finder.

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