USER GUIDE

NI-TimeSync

Version 1.1

Introduction, Installation, and Configuration

About the NI-TimeSync Driver Software

NI-TimeSync, shown in Figure 1, is a distribution of software synchronization plug-ins. You can use these plug-ins alone or alongside compatible hardware products including NI-Sync devices to create a synchronized system.

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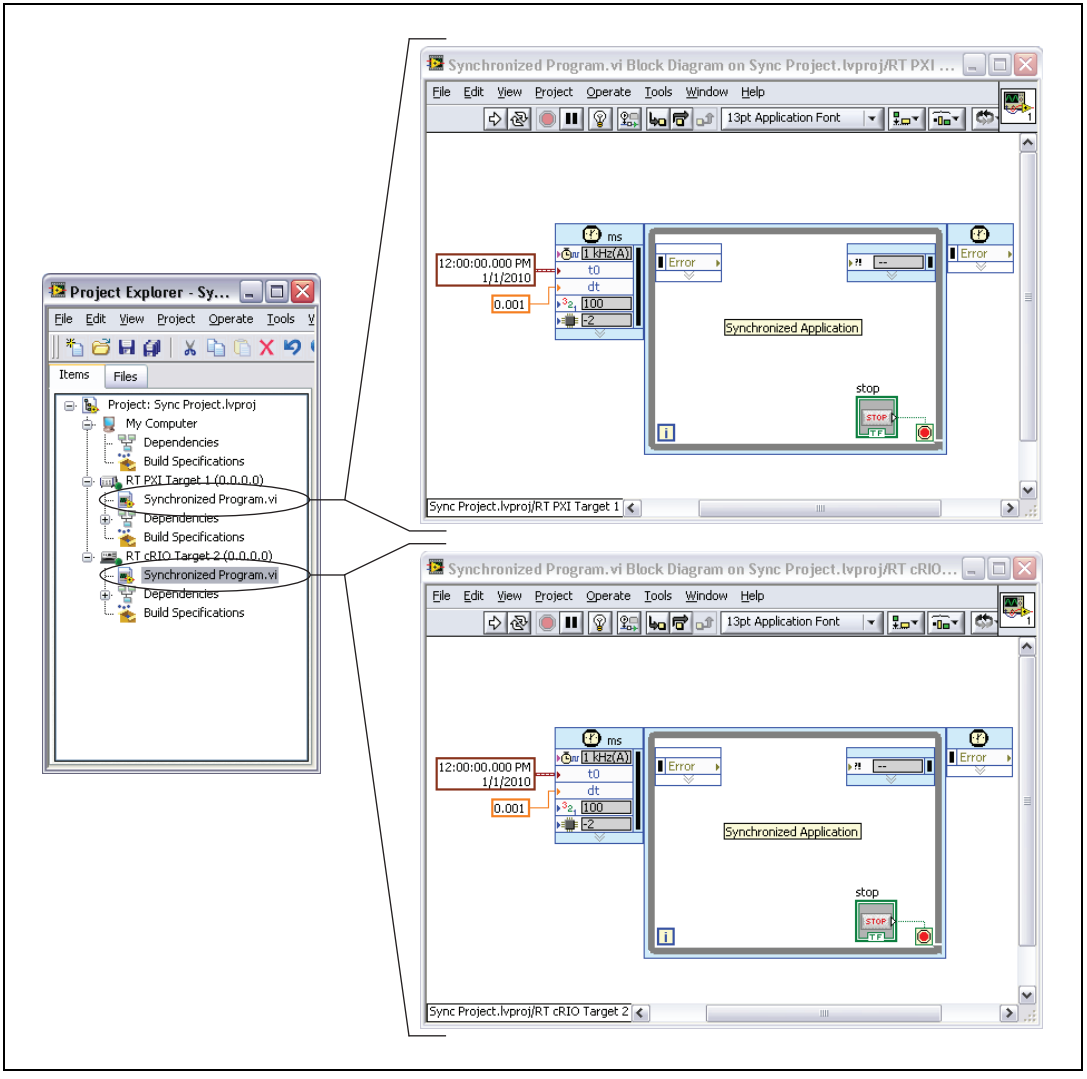

Figure 1. Multitarget System Using Synchronized Time

Time References Supported

NI-TimeSync supports IEEE 1588-2008.

Hardware Requirements

NI-TimeSync requires LabVIEW RT target hardware.

Software Requirements

NI-TimeSync requires LabVIEW RT 2009 SP1 or later.

Application Software and Programming Language Support

NI-TimeSync supports LabVIEW RT 2009 SP1 or later.

Installing the Software

Follow these steps to install the NI-TimeSync software:

1. Run `setup.exe` to install the software to the development machine.
2. Install the software to your LabVIEW RT target through Measurement & Automation Explorer (MAX).

Note When installed to the LabVIEW RT target, the NI-TimeSync plug-in is set as the active plug-in. Configuration of other time references including Logos or SNTP overrides this configuration.

Building and Programming Applications

API Basics

The NI-TimeSync plug-in automatically synchronizes the LabVIEW RT system date and time. The API is based on interacting with the system time. Two primary LabVIEW palettes useful in using the system time are **Programming»Timing** and **Programming»Structures»Timed Structures**.

Programming»Timing

This LabVIEW Timing palette, shown in Figure 2, includes functions for reading the current time, programmatic waits, and other useful functions. The timing used for each function is based on the synchronized LabVIEW date and time.

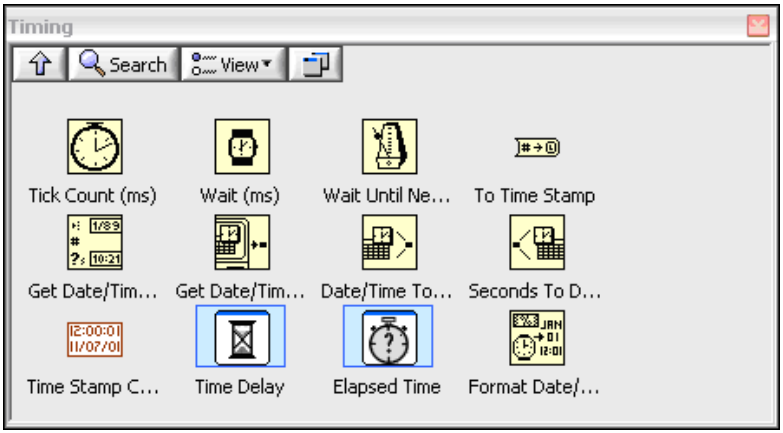

Figure 2. LabVIEW Timing Palette

Programming»Structures»Timed Structures

The Timed Structures palette, shown in Figure 3, allows you to control code execution using the Timed Loop and Timed Sequence structures. The built-in timing sources, shown in Figure 4, use the synchronized LabVIEW date and time. The “absolute time” sources, also shown in Figure 4, allow you to control the execution based on global time. Refer to your LabVIEW documentation for additional information.

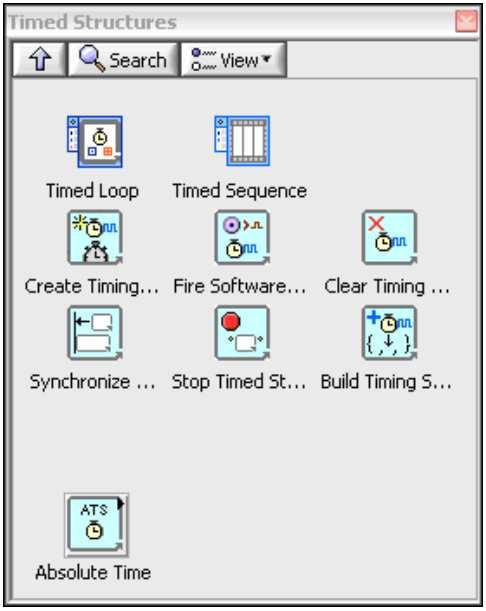

Figure 3. LabVIEW Timed Structures Palette

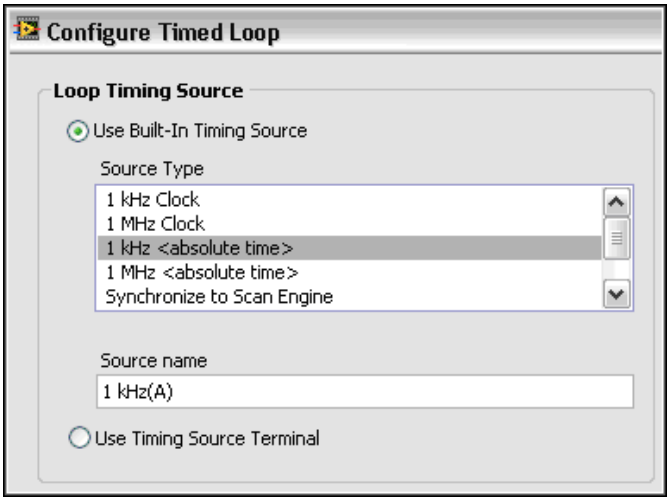

Figure 4. Timed Loop Configuration

Property Node

You can use the NI-TimeSync property node to query the synchronization plug-in properties

The property node is in the **Programming»Structures»Timed Structures»Absolute Time** palette.

Monitoring Synchronization Status and Quality

Timekeeper Synchronized

This property returns whether the timekeeper is synchronized to the time reference within 1 ms. It is useful for program start-up to wait for synchronization to stabilize or to simply query the current state.

Timekeeper Synchronization Disrupted

You can query this latching property periodically to determine whether the timekeeper synchronization has been disrupted since it was last read. Disruption criteria include exceeding the 1 ms synchronization threshold or the time reference changing. You can use this property to determine whether a disruption to synchronization has occurred.

Example Programs

The example programs are installed to your `LabVIEW\examples\TimeSync` directory.

The examples demonstrate methods of using a synchronized absolute time to coordinate multiple targets or chassis. These are simple, scalable fundamentals you can use to build powerful, distributed control and data acquisition applications.

Start Timed Loop at Absolute Time.vi

This example shows how to start a timed loop at an absolute time (LabVIEW timestamp) with a loop period specified in unit time (seconds).

Scheduling Execution at Future Time Events.vi

This example shows how to execute code at a series of defined future times.

Timestamp Events.vi

This example shows how to use the system time to timestamp an event (in this case, the action of a user clicking a button).

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