

Exercise 1: Remote LED Controller Using Shared Variables

Objectives

- Understand the difference between Single-Process Shared Variables (SPSV) and Network-Published Shared Variables (NPSV)
- Publish a sensor value from the myRIO to a PC
- Control a myRIO LED from a PC using a Network-Published Shared Variable
- Build a minimal RT application combining two loops and two SVs

Concept

The myRIO reads a simple sensor (button, accelerometer magnitude, etc.).

The value is published to the PC using a Network-Published Shared Variable.

The PC can remotely turn a LED ON or OFF on the myRIO through another Shared Variable.

This is the “Hello World” of Shared Variables.

Tasks

1. Create a Shared Variable Library

Create one library and add the following variables:

- ✓ Network-Published Shared Variables (Visible by both myRIO and the host PC)
 - SensorValue_NP (Double)
 - LEDCommand_NP (Boolean)
- ✓ Single-Process Shared Variable (Used only inside the myRIO RT application)
 - LEDState_SP (Boolean)

2. myRIO Real-Time Application

Loop 1 — Sensor Reader

- Read any available myRIO input:
 - Button (digital input)
 - Accelerometer magnitude
 - Potentiometer (if you have an external board)
- Write the measured value to the network-published variable:
→ SensorValue_NP

Loop 2 — LED Controller

- Read LEDCommand_NP (coming from the PC)
- Copy this value into LEDState_SP
- Drive one of the myRIO user LEDs using the value of LEDState_SP

(The SPSV is intentionally simple: the goal is just to illustrate internal vs. networked communication.)

3. PC Host Application

Create a small VI that:

- ✓ Reads SensorValue_NP and displays it (numeric indicator or chart)
- ✓ Has a toggle switch that writes into LEDCommand_NP
- ✓ When toggled → the LED on the myRIO must turn ON/OFF in real time