

# Quick Start Guide

## NCD Component Library



### Communications Tool for NCD Product Line

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**NOTICE: Portions of this Manual REQUIRE Internet Access**

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# Introduction

## **NCD Component Library**

With the NCD Component Library, you will receive over 40 samples from A/D Conversion to Duration and Pulse Timing and best of all, it's FREE!! We want the user to be able to experiment with all the different samples available, so as of right now the samples cannot be downloaded individually.

### **Quick Summary of NCD Component Library**

- Simplifies the communications to the NCD product line
- Samples available for specific applications
- A/D Conversion
- Motion Detection
- Keypad Data
- Potentiometer Values
- Storage Features
- Duration and Pulse Timing
- ProXR Timer Calibration and Testing
- Setting/Reading the Status of up to 256 Relays
- Samples available for specific relays
- Up to 8 Channel Relays
- 16 Channel Relays
- ProXR Relays
- SCAN Series Controllers
- 802.15.4 Wireless Relays
- ZigBee Relays
- Source code included so you can customize the sample to fit your needs
- All samples are FREE
- [SignalSwitch](#) Compatible

### **Download NCD Component Library**

With the NCD Component Library we've "started" the programming for you. We say 'started' because these are fully functioning samples, but we've also included the source code so you can customize them to your exact needs.

- Start by downloading and installing the NCDComponentSetup.zip file: [NCDComponentSetup.zip](#)

### **Plugin for Visual Basic**

The NCD Component library is a plugin for the Microsoft Visual Basic that greatly simplifies the communications to the NCD product line. The sample can be run in Visual Basic and fully customizable to your needs. It is compatible with version 2005, 2008, and 2010. The instructions are shown using Visual Basic Express 2010.

- Download and install Visual Basic 2010 Express. The program may be downloaded from the Microsoft website: <http://www.microsoft.com/visualstudio/en-us/products/2010-editions/visual-basic-express>

### **C# Language**

The NCD Component Library also supports the C# programming language for those who are more comfortable with this program.

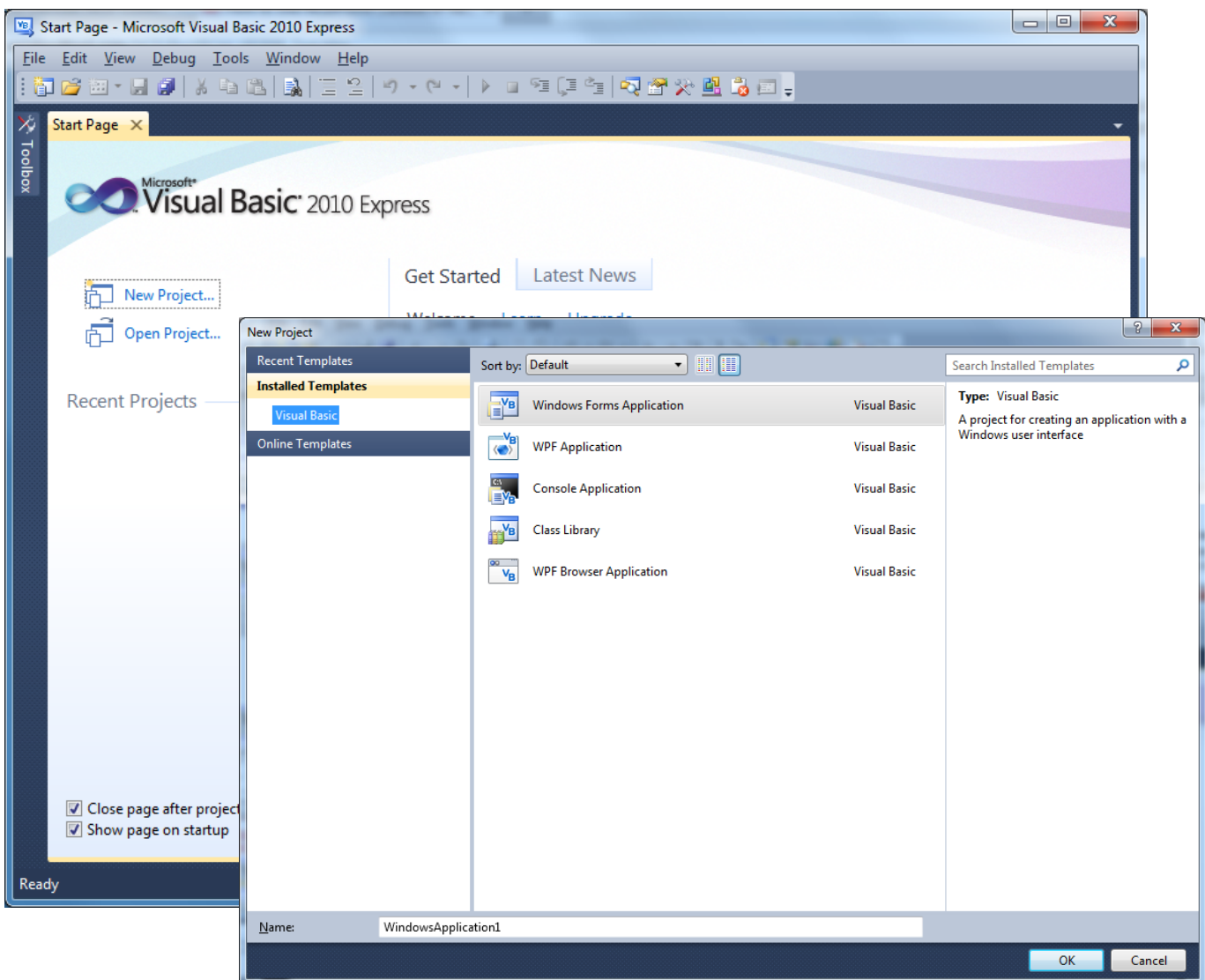
# Building your first Visual Basic Application

Visual Basic is our preferred language for communicating to the NCD product line. Visual Basic is engineered for productively building type-safe and object-oriented applications.

The following set of instructions will guide you in learning how to operate your device using the NCD Component Library in Visual Basic. The example provided here is developed for Visual Basic 2010 Express Edition. Follow these simple steps and you will be on your way to controlling the NCD device from your desktop computer in 30 minutes or less.

## Step 1: Start Visual Basic Program

- ▶ From the Windows Start Menu, open the Visual Basic Express 2010 program.
- ▶ Click the 'New Project' link on the left.
- ▶ From the 'New Project' dialog box, select 'Windows Forms Application' and click 'OK'.
- ▶ Name your application file.

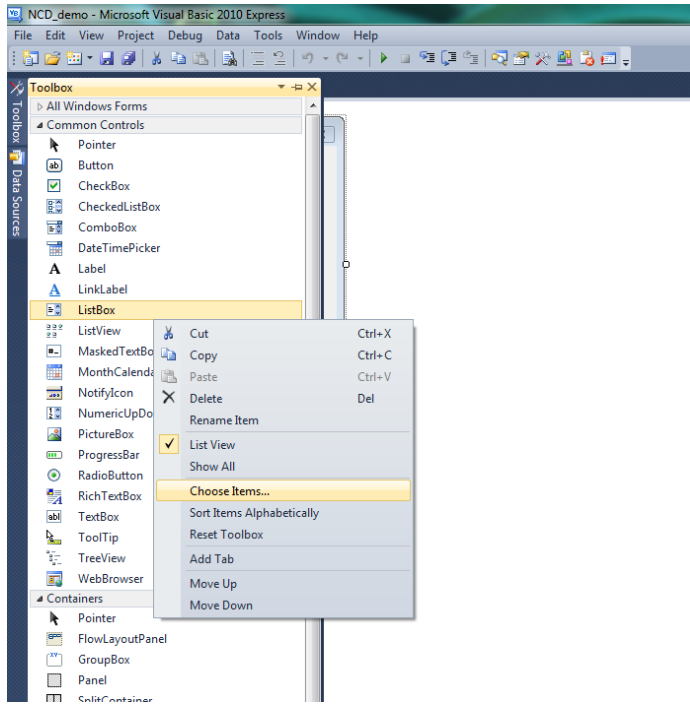


# Building your first Visual Basic Application

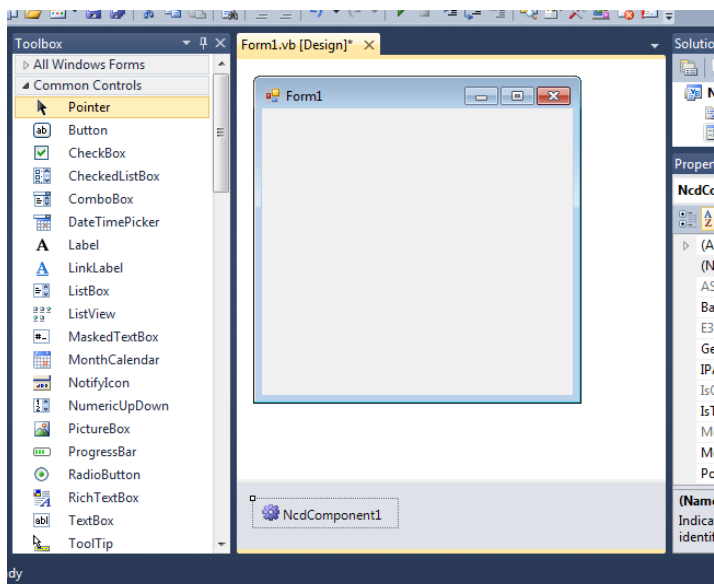
## Step 2: Add the NCD Component to your toolbox.

The project will open displaying Form1.

- ▶ Expand the Toolbox menu at the left.
- ▶ Right-click in the Toolbox menu and select 'Choose Items'.



- ▶ Browse to select 'ncdcomponent.dll' from your computer.  
*Note: NCDComponent has to be installed, it can be downloaded from [here](#).*  
NcdComponent default install position is:
  - ▶ C:\Program Files (x86)\NCD Component v2.0\bin for 64 bits OS
  - ▶ C:\Program Files\NCD Component v2.0\bin for 32 bits OS
- ▶ Add NCD Component to the Form by dragging and dropping the component onto the form.  
*Note: It will not display on the form; however, it will display under the form.*

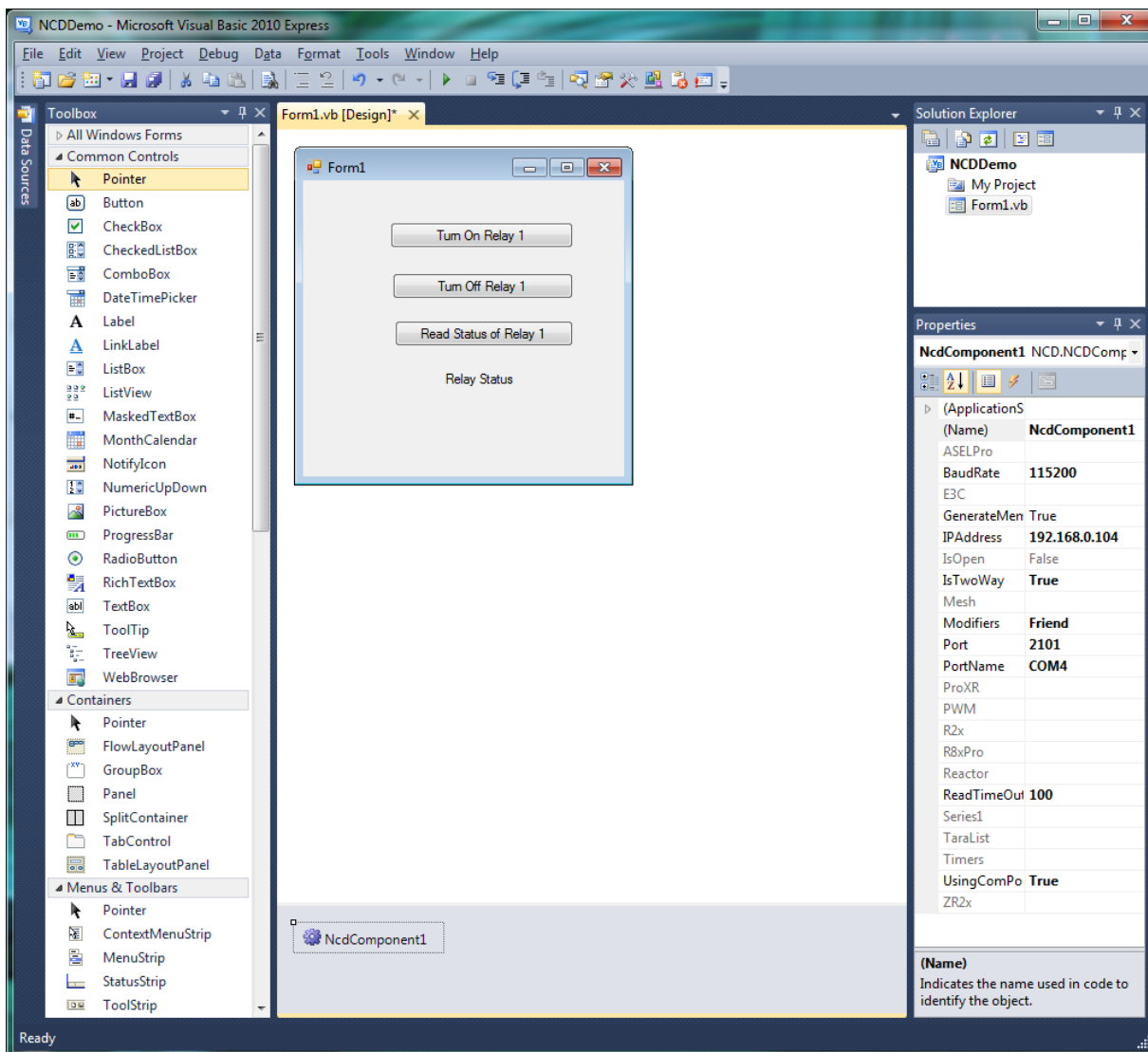


# Building your first Visual Basic Application

## Step 3: Set Properties of NCDComponent

The next step is to set up the properties of your device.

- ▶ Click on the NcdComponent1 at the bottom of the Visual Basic window as shown below.
- ▶ Make sure that the Properties Window is displayed; it is shown at the right below.
- ▶ **If you are connecting your device through the serial port:**
  - ▶ Set the 'Using ComPort' to 'True'
  - ▶ Set the PortName
  - ▶ Set the Baud Rate
- ▶ **If you are connecting your device through TCP/IP:**
  - ▶ Set the 'Using ComPort' to 'False'
  - ▶ Set the IP Address
  - ▶ Set the Port



# Building your first Visual Basic Application

## Step 4: Add Buttons to the Form

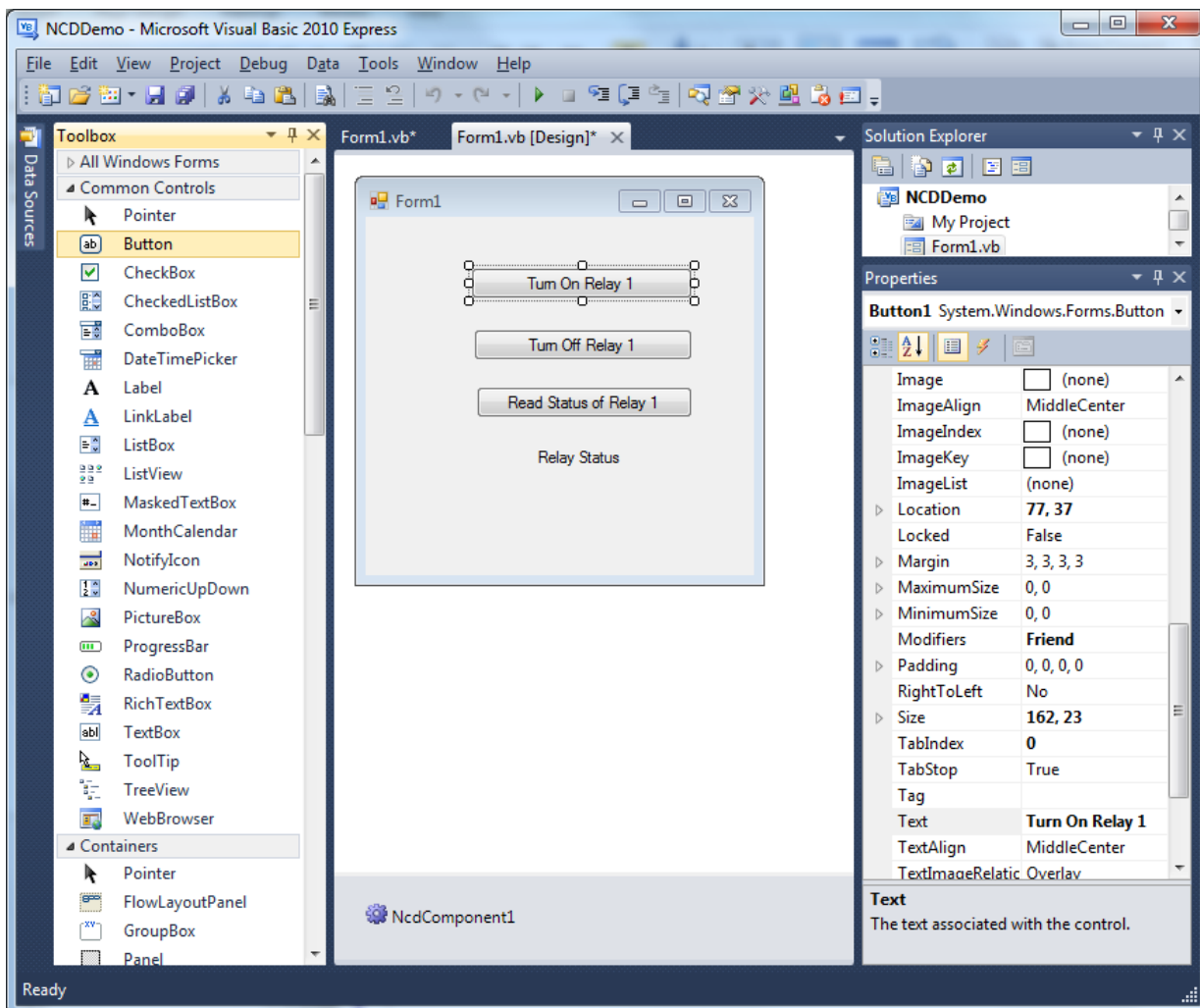
The next step is to add three buttons to the Form to allow you to make selections with your device.

- ▶ Click on the 'Button' menu control in the Toolbox and drag it to your form. Repeat this step two times.
- ▶ Properties Window is displayed; it is shown at the right below.
- ▶ Use the Text property to change the words displayed on each button.
  - ▶ Click on 'Button1' and set the Text to "Turn On Relay 1"
  - ▶ Click on 'Button2' and set the Text to "Turn Off Relay 1":
  - ▶ Click on 'Button2' and set the Text to "Read Status of Relay 1"

## Step 5: Add a Label to the Form

The next step is to add a label to the form that will allow you to display the status of the relay.

- ▶ Click on the 'Label' menu control in the Toolbox and drag it to your form.
- ▶ Use the Text property to change the words displayed on the label.
  - ▶ Click on 'Label1' and set the Text to "Relay Status"

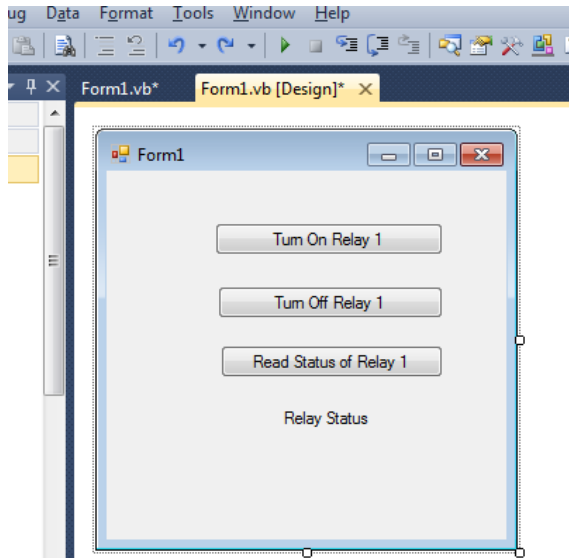


# Building your first Visual Basic Application

## Step 6: Add Code to Open the Port

The next step is to add the visual basic code that will open the port when the form is loaded.

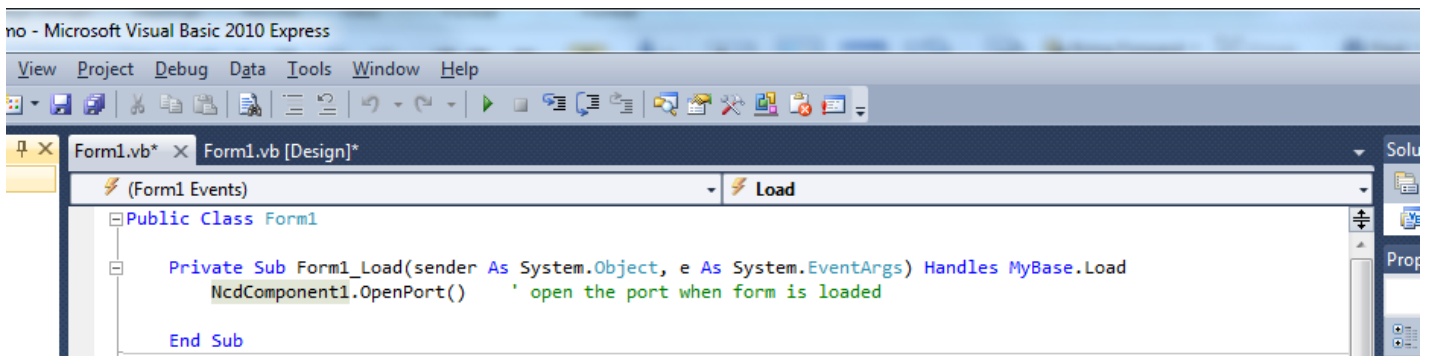
- ▶ Double-click on the background of the Form1 in the 'Design' view as shown below. This will take you to the coding window for the Load event.



- ▶ Type the following code on the line between the Private Sub and End Sub lines

- ▶ **NcdComponent1.OpenPort()**

*Note: As you type, you may select the appropriate commands from the shortcut menu that appears.*



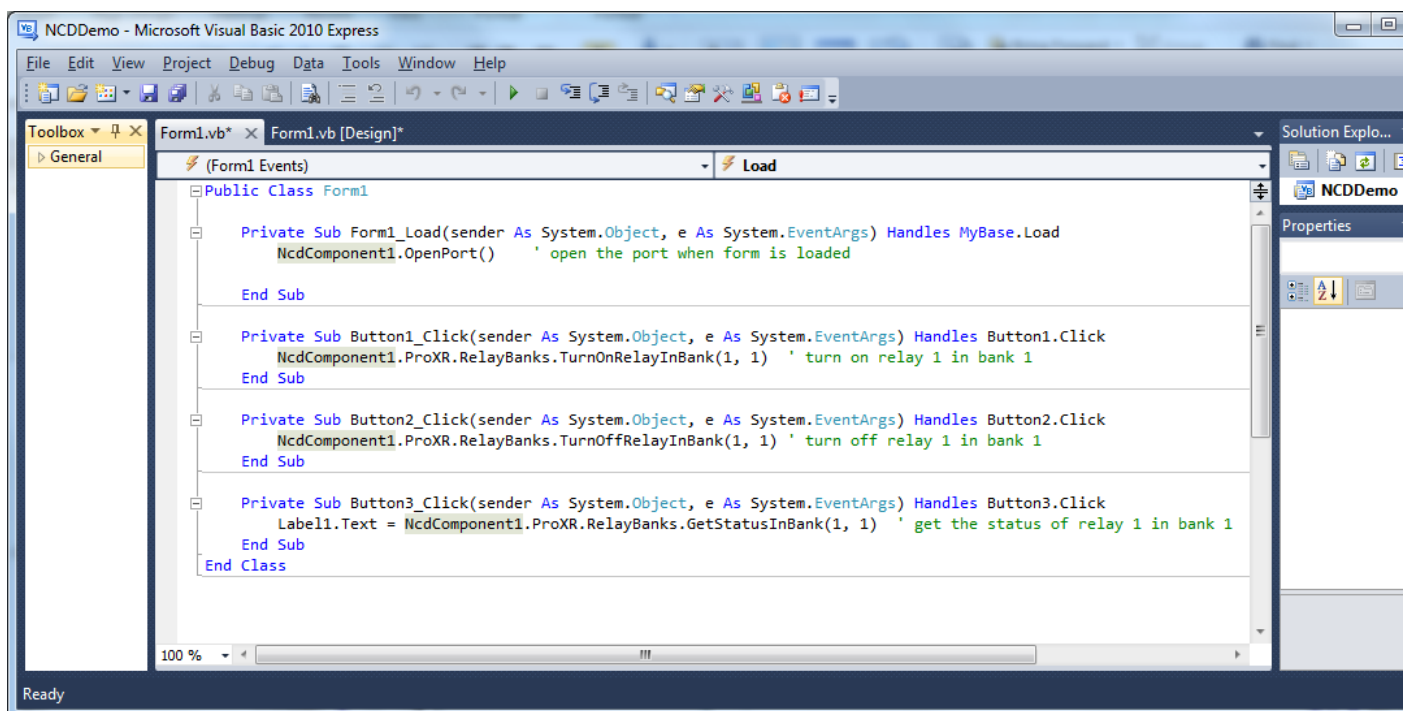


# Building your first Visual Basic Application

## Step 6: Add Code to the Buttons

The next step is to add the visual basic code that will turn the relay on or off and read status of the relay in the button's click event.

- ▶ Return to "Design" view of the form and double-click on the **first** button. This will take you to the coding window for the button's Click event.
- ▶ Type the following code on the line between the Private Sub and End Sub lines
  - ▶ **NcdComponent1.ProXR.RelayBanks.TurnOnRelayInBank(1, 1)***Note: As you type, you may select the appropriate commands from the shortcut menu that appears. Choose the appropriate NCD device (such as ProXR).*
- ▶ Return to "Design" view of the form and double-click on the second button. This will take you to the coding window for the button's Click event.
- ▶ Type the following code on the line between the Private Sub and End Sub lines
  - ▶ **NcdComponent1.ProXR.RelayBanks.TurnOffRelayInBank(1, 1)**
- ▶ Return to "Design" view of the form and double-click on the **third** button. This will take you to the coding window for the button's Click event.
- ▶ Type the following code on the line between the Private Sub and End Sub lines
  - ▶ **Label1.Text = NcdComponent1.ProXR.RelayBanks.GetStatusInBank(1, 1)***Note: This will read the status of the relay and display it on the label on the Form.*



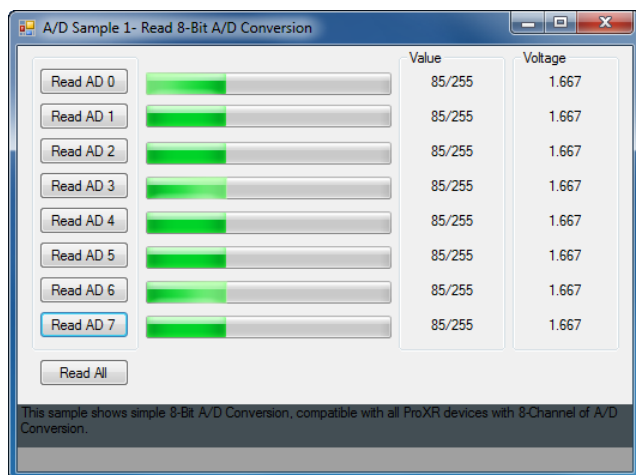
## Step 7: Run Program

Click the "Play" button on the Toolbar to test and debug your application.

# NCD Component Library Samples

## ADSample1.exe

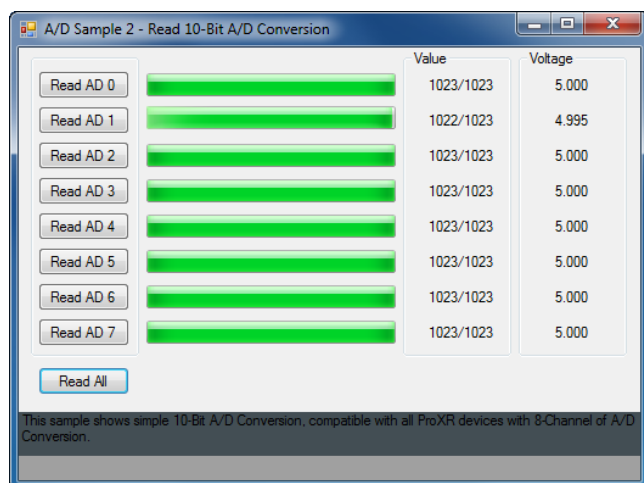
Analog to Digital Converter Sample 1



This sample shows simple 8-Bit A/D Conversion, compatible with all ProXR devices with 8-Channels of A/D Conversion.

## ADSample2.exe

Analog to Digital Converter Sample 2



This sample shows simple 10-Bit A/D Conversion, compatible with all ProXR devices with 8-Channels of A/D Conversion.

## ADSample3.exe

Analog to Digital Converter Sample 3



This sample shows 16-Channel 8-Bit A/D Conversion, compatible with all ProXR devices with AD1216 Feature Set, including UXP Series Controllers.

## ADSample4.exe

Analog to Digital Converter Sample 4

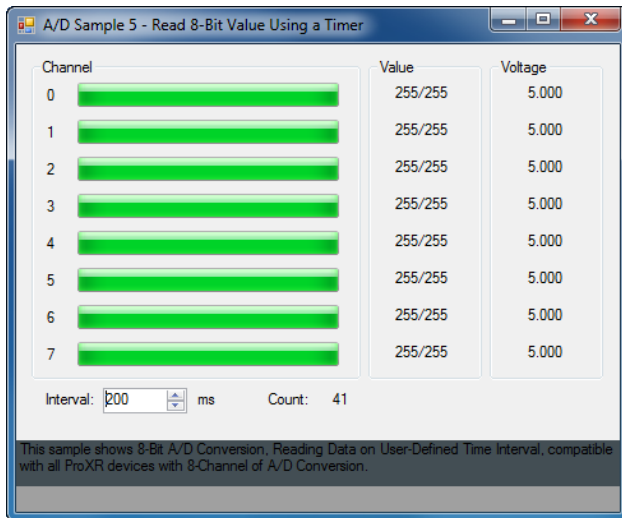


This sample shows 16-Channel 12-Bit A/D Conversion, compatible with all ProXR devices with AD1216 Feature Set, including UXP Series Controllers.

# NCD Component Library Samples

## ADSample5.exe

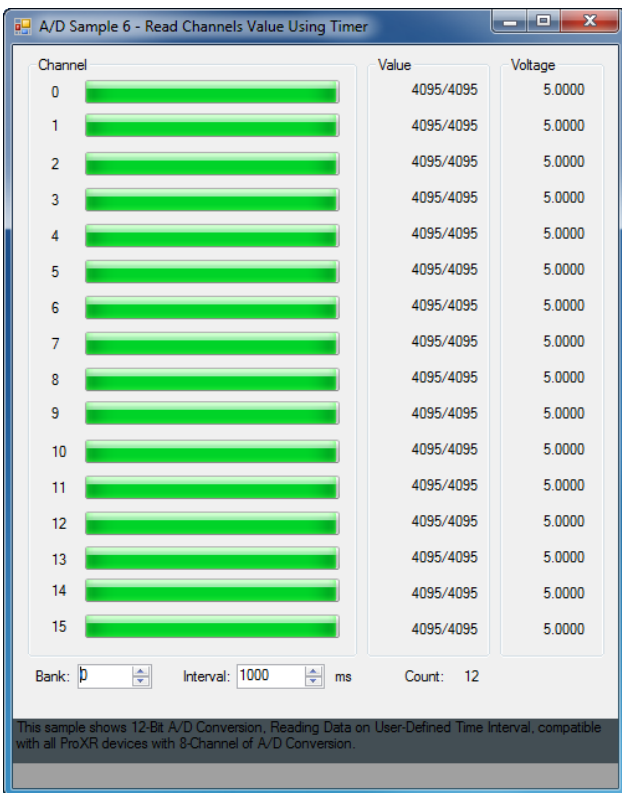
Analog to Digital Converter Sample 5



This sample shows 8-Bit A/D Conversion, Reading data on User-defined Time Interval, compatible with all ProXR devices with 8-Channels of A/D Conversion.

## ADSample6.exe

Analog to Digital Converter Sample 6



This sample shows 12-Bit A/D Conversion, reading data on User-defined Time Interval, compatible with all ProXR devices with 8-Channels of A/D Conversion.

## ADSample7.exe

Analog to Digital Converter Sample 7

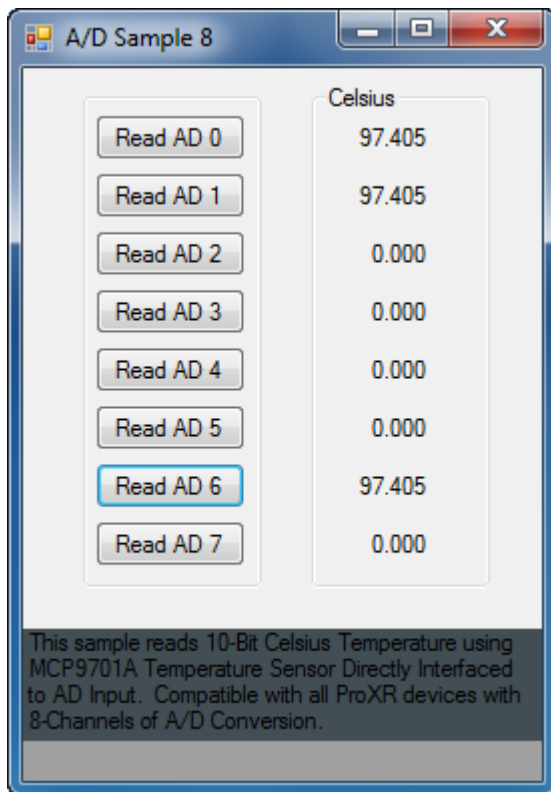


This sample shows 16-Channel 12-Bit A/D Conversion, reading data on User-defined Time Interval, compatible with all ProXR devices with AD1216 Feature Set, including UXP Series Controllers.

# NCD Component Library Samples

## ADSample8.exe

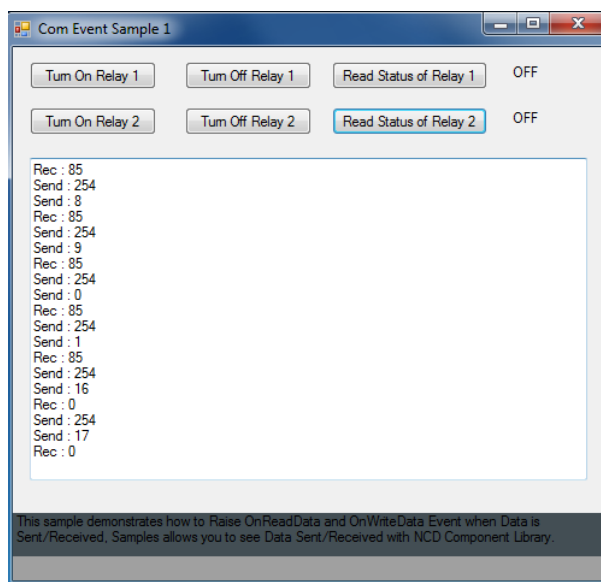
Analog to Digital Converter Sample 8



This sample reads 10-Bit Celsius Temperature using MCP9701A Temperature Sensor directly interfaced to AD Input. Compatible with all ProXR devices with 8-Channels of A/D Conversion.

## ComEventSample1.exe

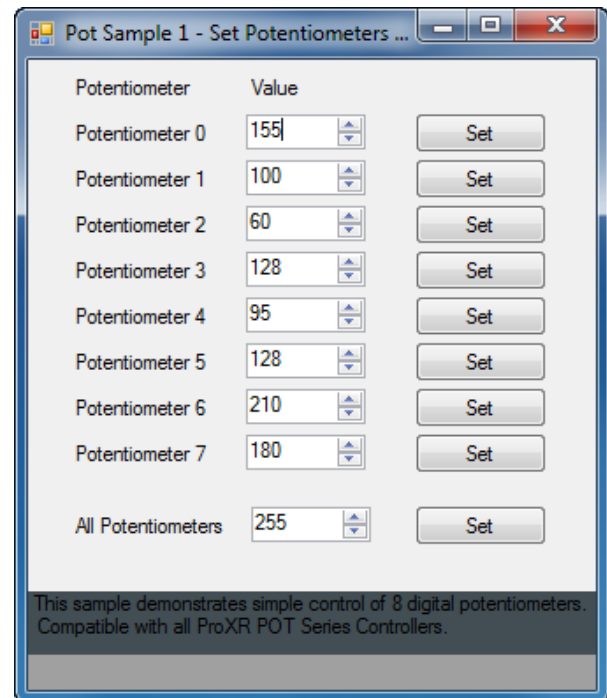
Com Event Sample 1



This sample demonstrates how to Raise OnReadData and OnWriteData Event when data is Sent/Received, samples allows you to see data Sent/Received with NCD Component Library.

## PotSample1.exe

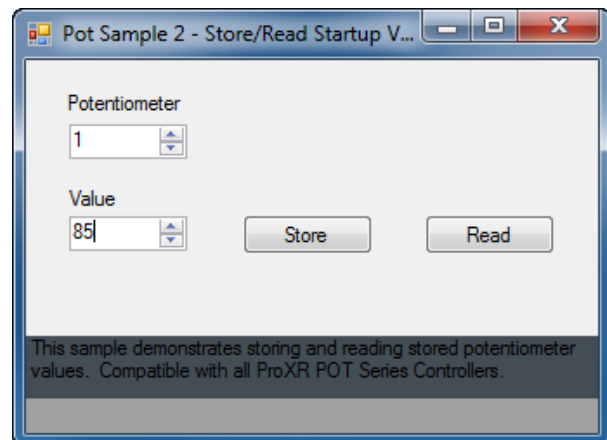
Potentiometer Sample 1



This sample demonstrates simple control of 8 digital potentiometers. Compatible with all ProXR POT Series Controllers.

## PotSample2.exe

Potentiometer Sample

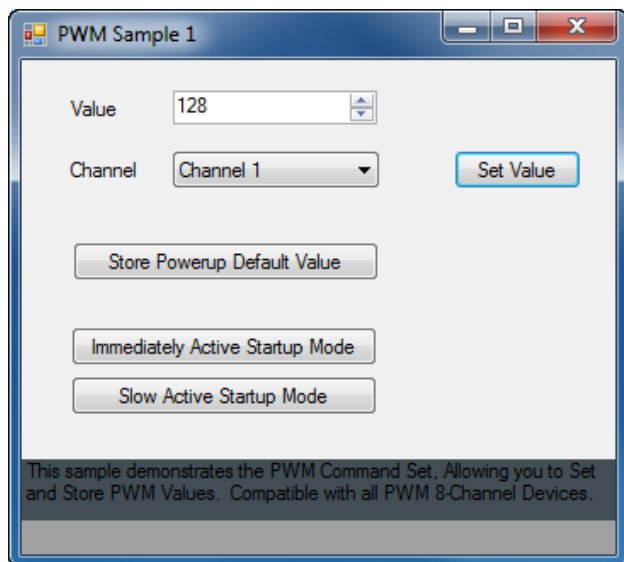


This sample demonstrates storing and reading stored potentiometer values. Compatible with all ProXR POT Series Controllers.

# NCD Component Library Samples

## PWMSample1.exe

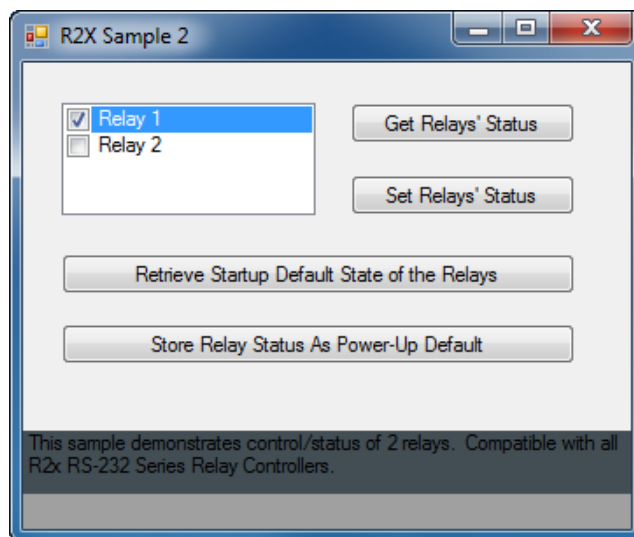
PWM Sample 1



This sample demonstrates the PWM Command Set, allowing you to Set and Store PWM values. Compatible with all PWM 8-Channel Devices.

## R2xSample2.exe

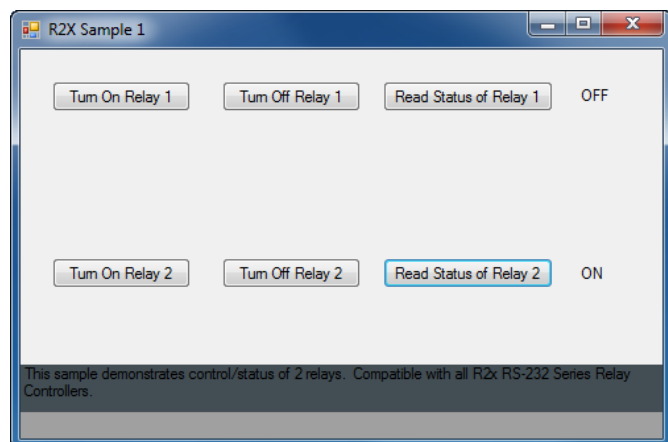
2 Relay Control Sample 2



This sample demonstrates control/status of 2 relays and demonstrates data storage features. Compatible with all R2x RS-232 Series Relay Controllers.

## R2xSample1.exe

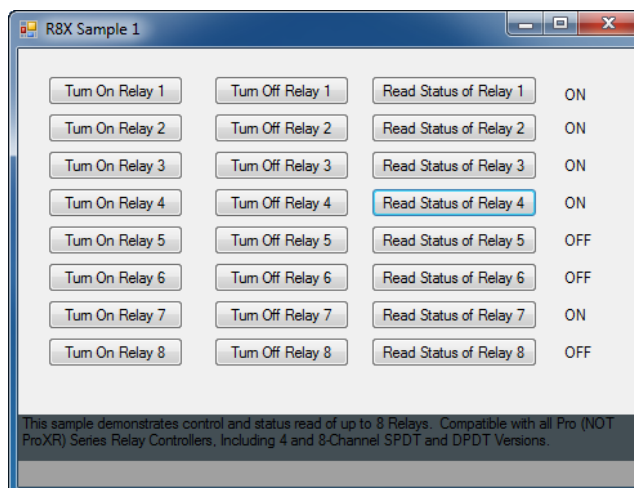
2 Relay Control Sample 1



This sample demonstrates control/status of 2 relays. Compatible with all R2x RS-232 Series Relay Controllers.

## R8XSample1.exe

8 Relay Control Sample 1

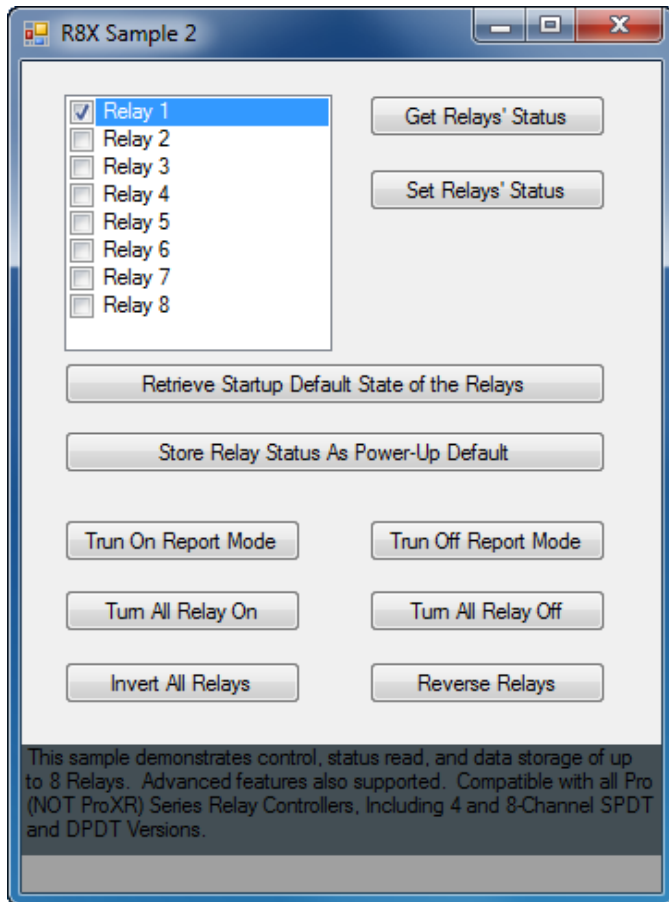


This sample demonstrates control and status read of up to 8 Relays. Compatible with all Pro (Not ProXR) Series Relay Controllers, including 4 and 8-Channel SPDT and DPDT Versions

# NCD Component Library Samples

## R8XSample2.exe

8 Relay Control Sample 2



This sample demonstrates control, status read, and data storage of up to 8 relays. Advanced features also supported. Compatible with all Pro (Not ProXR) Series Relay Controllers, including 4 and 8-Channel SPDT and DPDT Versions.

## ProXRRelaySample1.exe

Up to 8 Channel ProXR Sample



This sample demonstrates control and status read of up to 8 relays. Compatible with all ProXR (Not Pro) Series Relay Controllers.

## ProXRRelaySample2.exe

ProXR bank Selection Features



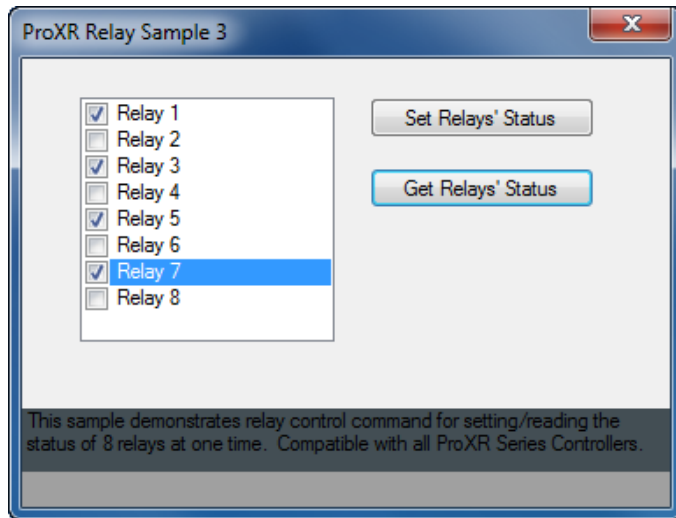
This sample demonstrates bank selection features of ProXR Series Relay Controllers.



# NCD Component Library Samples

## ProXRRelaySample3.exe

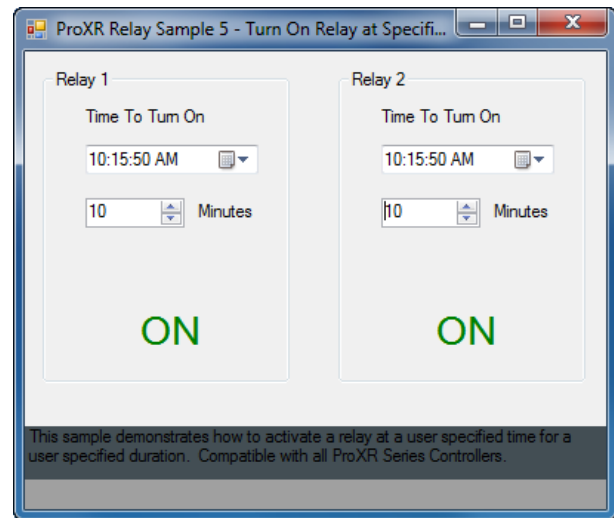
Setting/Reading the status of 8 Relays at one time



This sample demonstrates relay control command for setting/reading the status of 8 relays at one time. Compatible with all ProXR Series Controllers.

## ProXRRelaySample5.exe

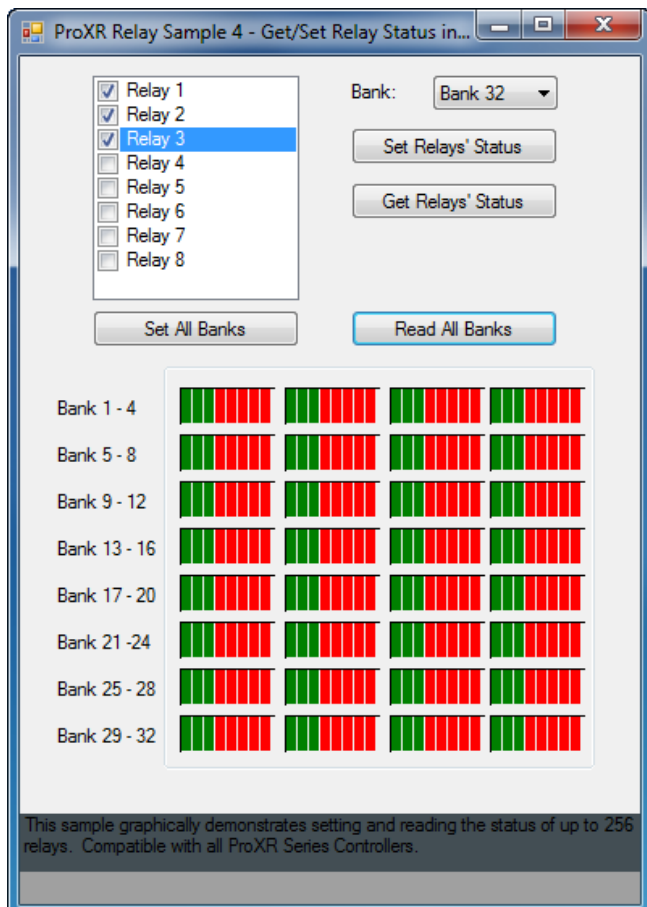
Activate a Relay with Specified Time/Duration



This sample demonstrates how to activate a relay at a user specified time for a user specified duration. Compatible with all ProXR Series Controllers.

## ProXRRelaySample4.exe

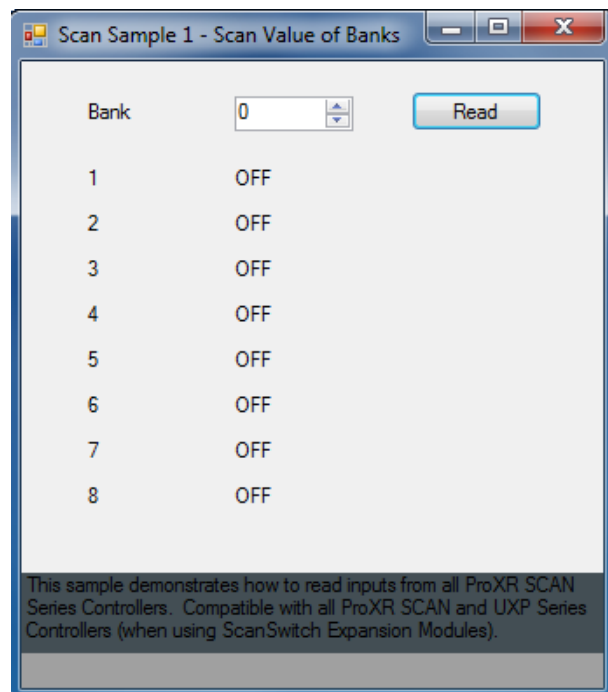
Setting/Reading the Status of up to 256 Relays



This sample graphically demonstrates setting and reading the status of up to 256 Relays. Compatible with all ProXR Series Controllers.

## ScanSample1.exe

Reads inputs from all ProXR SCAN Series Controllers

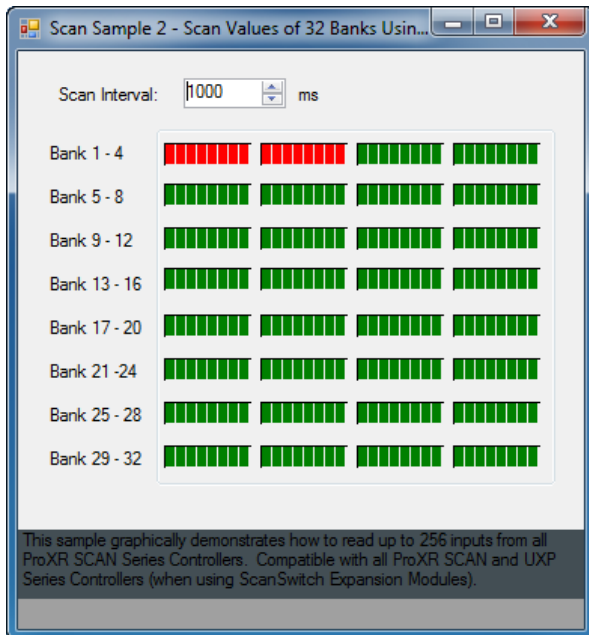


This sample demonstrates how to read inputs from all ProXR SCAN Series Controllers. Compatible with all ProXR SCAN and UXP Series Controllers (when using ScanSwitch Expansion Modules).

# NCD Component Library Samples

## Scan Sample2.exe

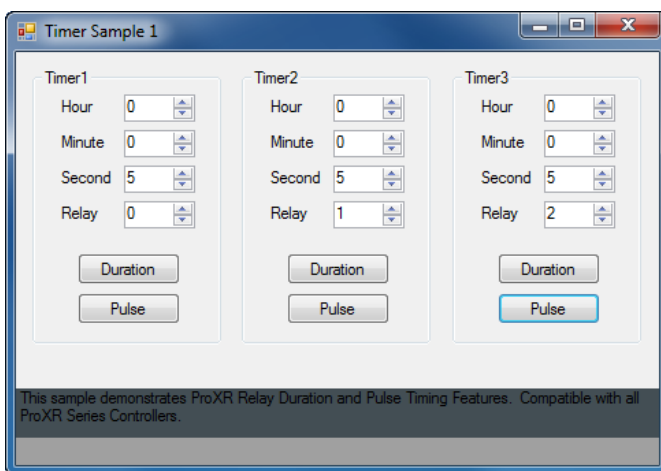
Read up to 256 Inputs from All ProXR SCAN Series.



This sample demonstrates relay control command for setting/reading the status of 8 relays at one time. Compatible with all ProXR Series Controllers.

## TimerSample1.exe

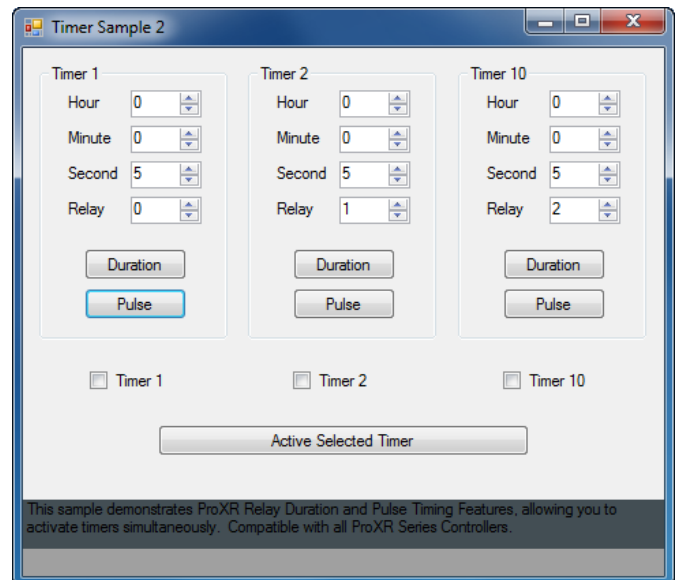
ProXR Relay Duration and Pulse Timing Features



This sample demonstrates ProXR Relay Duration and Pulse Timing Features. Compatible with all ProXR Series Controllers.

## TimerSample2.exe

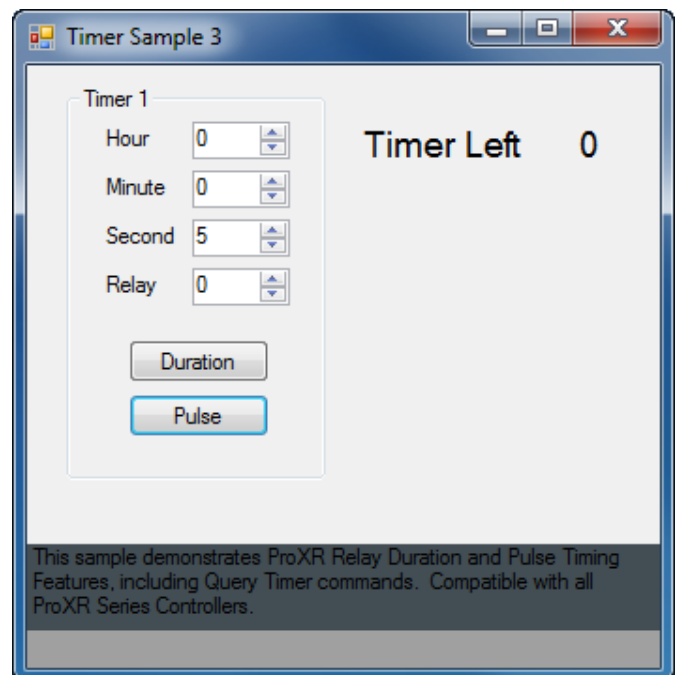
Timing Features to Activate Timer Simultaneously



This sample demonstrates ProXR Relay Duration and Pulse Timing Features, allowing you to activate timers simultaneously. Compatible with all ProXR Series Controllers,

## TimerSample3.exe

Timing Features, Including Query Timer Command



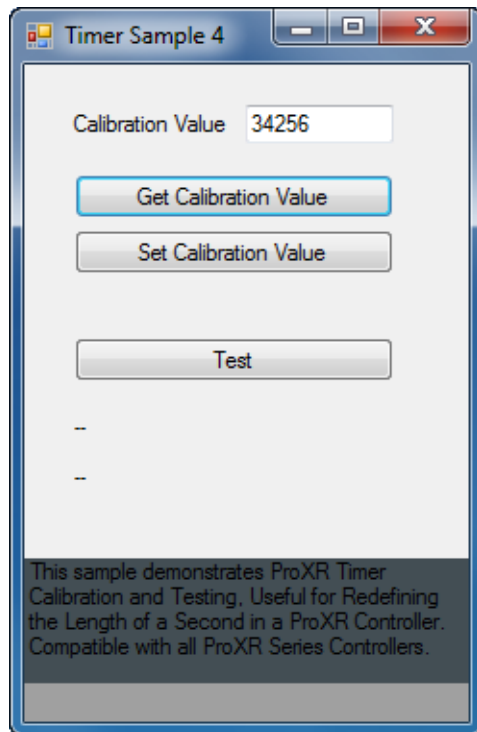
This sample demonstrates ProXR Relay Duration and Pulse Timing Features, including Query Timer Command. Compatible with all ProXR Series Controllers.



# NCD Component Library Samples

## TimerSample4.exe

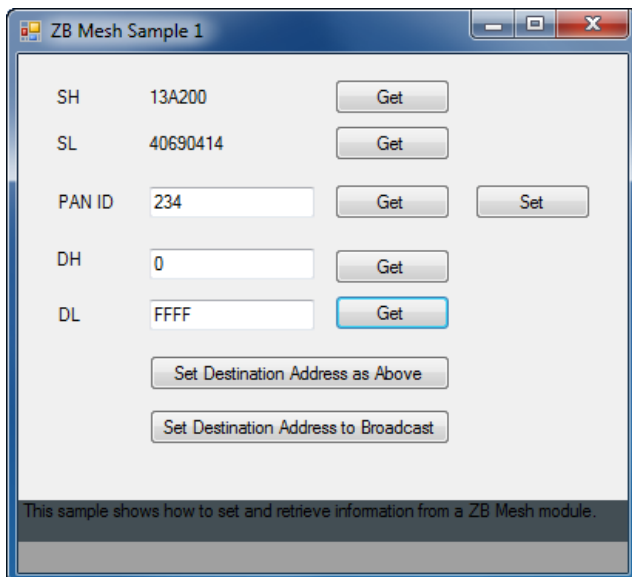
ProXR Timer Calibration and Testing



This sample demonstrates ProXR Timer Calibration and Testing. Useful for Redefining the Length of a Second in a ProXR Controller. Compatible with all ProXR Series Controllers.

## ZBMeshSample1.exe

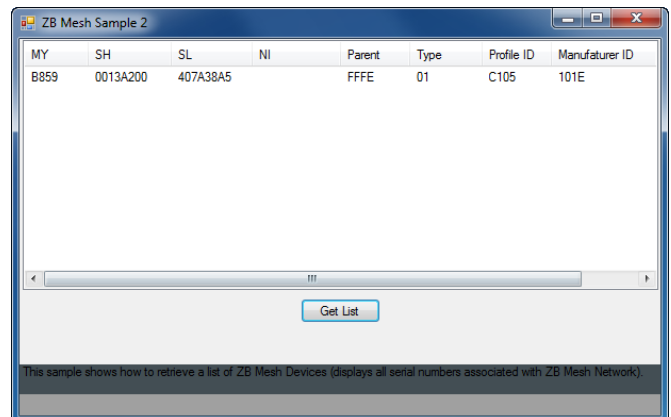
Set & Retrieve Information From a ZigBee module



This sample shows how to set and retrieve information from a ZigBee module.

## ZBMeshSample2.exe

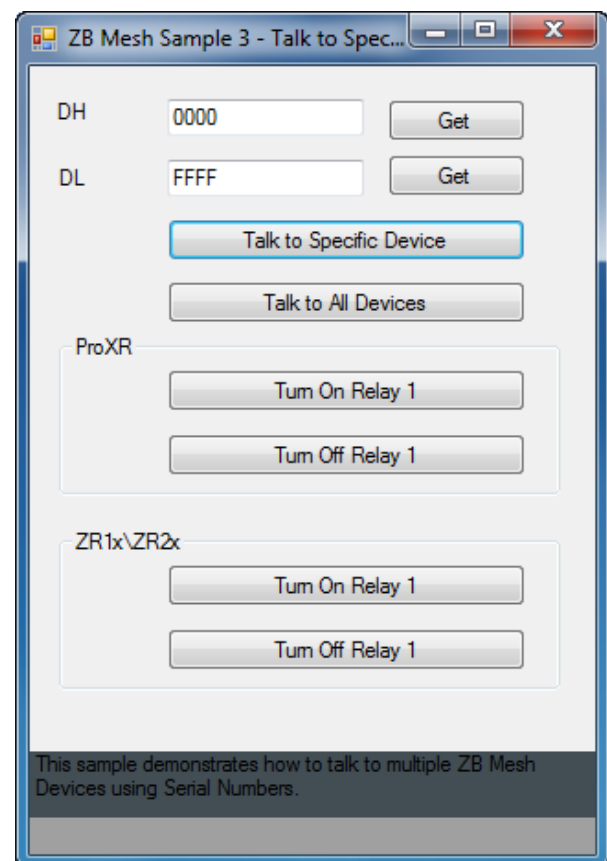
How to retrieve a List of ZigBee Devices



This sample shows how to retrieve a list of ZigBee Devices (displays all serial numbers associated with ZigBee Mesh Network).

## ZBMeshSample3.exe

Talk to Multiple ZigBee Devices Using Serial Numbers

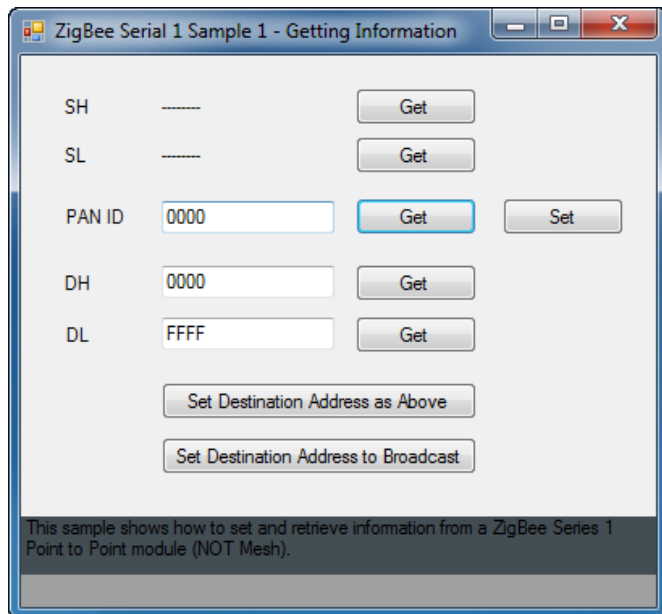


This sample demonstrates how to talk to multiple ZigBee Devices using Serial Numbers.

# NCD Component Library Samples

## ZBSeries1Sample1.exe(802.15.4 Wireless Serial)

Set and Retrieve Information from a 802.15.4 Wireless Series

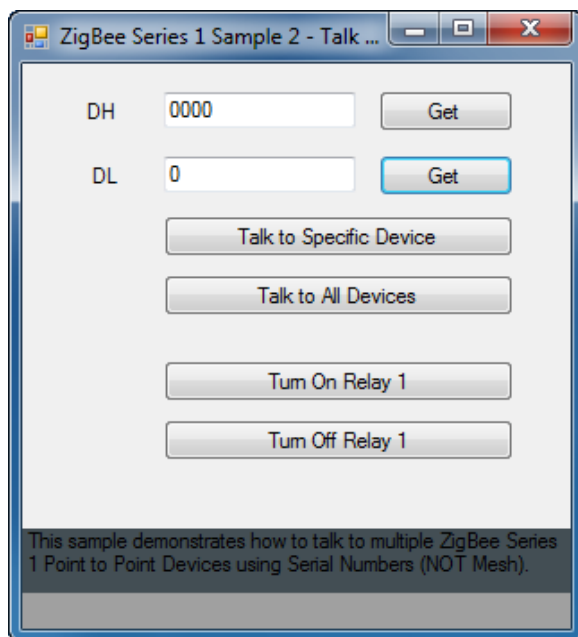


The screenshot shows a Windows application window titled "ZigBee Serial 1 Sample 1 - Getting Information". It contains several input fields and buttons for interacting with a ZigBee device. The fields are labeled SH, SL, PAN ID, DH, and DL. SH and SL have empty text boxes with "-----" as a placeholder. PAN ID, DH, and DL have text boxes containing "0000", "0000", and "FFFF" respectively. Each field has a "Get" button next to it. Additionally, there is a "Set" button next to the PAN ID field. Below these fields are two buttons: "Set Destination Address as Above" and "Set Destination Address to Broadcast". At the bottom of the window, there is a text box containing the following text: "This sample shows how to set and retrieve information from a ZigBee Series 1 Point to Point module (NOT Mesh)."

This sample shows how to send and retrieve information from a 802.15.4 Wireless Series 1 Point to Point module (NOT Mesh).

## ZBSeries1Sample2.exe (802.15.4 Wireless Serial)

Talk to Multiple 802.15.4 Wireless Series 1 Point to Point Devices



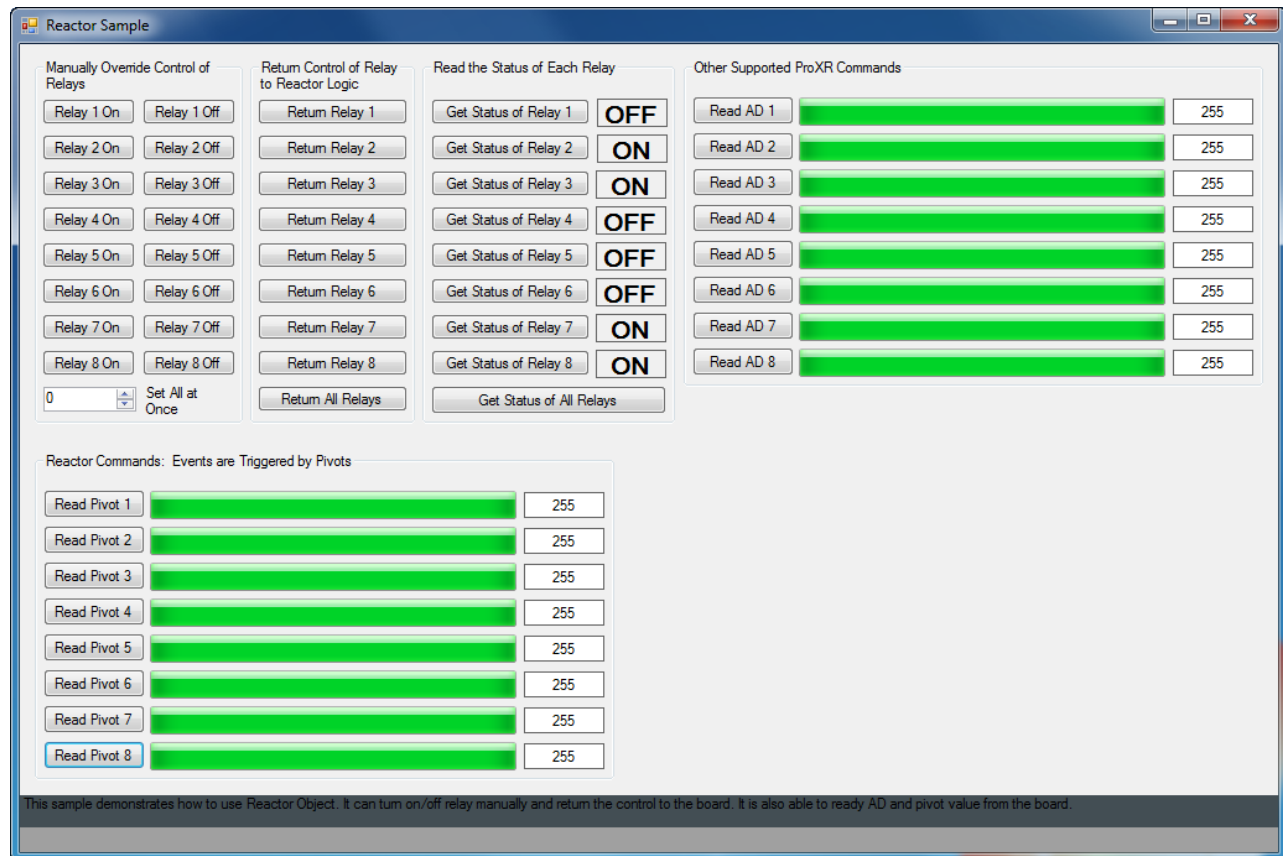
The screenshot shows a Windows application window titled "ZigBee Series 1 Sample 2 - Talk ...". It contains input fields and buttons for interacting with multiple ZigBee devices. The fields are labeled DH and DL. DH has a text box containing "0000" and a "Get" button. DL has a text box containing "0" and a "Get" button. Below these fields are four buttons: "Talk to Specific Device", "Talk to All Devices", "Turn On Relay 1", and "Turn Off Relay 1". At the bottom of the window, there is a text box containing the following text: "This sample demonstrates how to talk to multiple ZigBee Series 1 Point to Point Devices using Serial Numbers (NOT Mesh)."

This sample demonstrates how to talk to multiple 802.15.4 Wireless Point to Point Devices using Serial Numbers (NOT Mesh).

# NCD Component Library Samples

## ReactorSample1.exe

Test Hardware and Basic Functions of all Reactor Series Controllers



Set and Receive Relay Status and Read AD Input values for all Reactor Series Controllers.

# NCD Component Library Samples

## TaralistSample1.exe

Test Hardware and Basic Functions for all Tara list Series Controllers

The screenshot shows the 'Taralist Sample' application window. It features a top menu bar with 'Send Commands to Relay Bank: 1'. Below this, the interface is divided into several sections:

- Control Relays 1-8:** A column of buttons for 'Turn Relay 1 Off' through 'Turn Relay 8 Off', followed by 'Turn On All Relays' and 'Turn Off All Relays'.
- Read Status of Relays 1-8:** A column of buttons for 'Read Relay 1 Status' through 'Read Relay 8 Status', followed by 'Read Status of All'. Each button has a status indicator (e.g., 'On' or 'Off').
- Set Control of Relays:** A grid of buttons for 'Computer Controls Relay 1' through 'Computer Controls Relay 8', 'Device Controls Relay 1' through 'Device Controls Relay 8', and 'Computer Controls All Relays' and 'Device Controls All Relays'.
- Who Has Control of Relays?:** A column of buttons for 'Who Controls Relay 1' through 'Who Controls Relay 8', followed by 'Who Controls All Relays?'. Each button has a status indicator (e.g., 'DEVICE' or 'COMPUTER').

At the bottom, there is a time setting section with 'Current Time: 00:00:00' and 'New Time:' fields for Year, Month, Day, Week Day, Hour, Minute, and Second. Below these are 'Sync Time with PC Time' and 'Set Time Manually' buttons.

A footer note states: 'This sample demonstrates how to use TaraList Object method. It will read current time from TaraList and be able to set time, turn on/off relay manually.'

Set and Receive Relay Status and Read AD Input Values for all Tara list Series Controllers.

# Technical Support

Technical support is available through our website, [controlanything.com](http://controlanything.com).

**AccessNCD** is the way we connect NCD engineers to our customers.

Click on the **AccessNCD** button located on the top right of the header of each page of our website.



For technical support and application information, contact Travis Elliott, our technical engineer. If you feel that you have discovered a bug in the firmware of our controllers, contact Ryan Sheldon, our hardware developer. If you have programming-related questions or have discovered a bug in our software, please contact Shirui Xu, our software engineer.

Click the '*Tech Support Staff*' tab and click on the appropriate engineer link for assistance. Click on our '*Forum*' tab if you would like to post publicly or review problems that other customers have had and our recommended solutions.



Our engineers monitor questions and respond continually throughout the day. Before requesting telephone technical support, we ask that customers please try to resolve their problems through **AccessNCD** first. However, for persistent problems, NCD technical support engineers will schedule a phone consultation.

## Contact Information

### National Control Devices, LLC

PO Box 455  
Osceola, MO 64776  
417-646-5644 phone  
866-562-0406 fax  
Open 9 a.m. - 4 p.m. CST

**All orders *must* be placed online at our website, [www.controlanything.com](http://www.controlanything.com)**

#### Notice:

The only authorized resellers of NCD products are

- 4 ▶ [www.controlanything.com](http://www.controlanything.com)
- 4 ▶ [www.relaycontrollers.com](http://www.relaycontrollers.com)
- 4 ▶ [www.relaypros.com](http://www.relaypros.com)
- 4 ▶ [www.amazon.com](http://www.amazon.com)

All other websites are not authorized dealers; we have noticed some retailers offering our products fraudulently.