

# Nano-10 Web Control Quick Start Guide

This quick start guide is intended to help get your Nano-10 PLC powered and connected to the Internet and show you how to access the two preloaded web pages, which allow you to control the PLC from your PC or iPhone browser.

In order to perform the tasks of this guide, you will need the following:

- A Nano-10 PLC and a 24VDC power source.
- An RJ-45 Cat 5 or Cat 6 cable
- A live Ethernet port with Internet access (spare port in a router or Ethernet network)
- A web browser (Internet Explorer, Firefox, or Safari) on a PC or iPhone that is networked to the router (wired or wirelessly)

## 1) Connect Power to the Nano-10 PLC

You will need a 24V DC power supply to power the Nano-10. Connect the power supply to the +24V and 0V terminal on the PLC and make sure that the polarity is correct. The +24V terminal on your power supply should be connected to the +24V terminal on the Nano-10 and the 0V terminal should be connected to the 0V terminal.

Please refer to section “1.3 Power Supply” in chapter 1 of the Nano-10 user manual for more information on how to connect the power supply to the Nano-10 PLC.

## 2) Connect the Nano-10's Ethernet Port to Your Router

You will need use a standard CAT5 or CAT6 cable with RJ45 plugs to the Ethernet port on the Nano-10 and an open port on your router.

Note that the Nano-10 has a default IP address of 192.168.1.5 so you don't need to configure any Ethernet settings if your router's IP address is the commonly used address: 192.168.1.1. However, some routers use a slightly different address, which is: 192.168.0.1 so you will need to configure the Nano-10 Ethernet port if this is the case (or if your router has a non-standard IP address).

For more information on how to configure the Nano-10 Ethernet port, please see section “2.1 Configuring The Ethernet Port” in chapter 2 of the Nano-10 user manual.

Once you have physically connected the Nano-10 to your router and configured the Ethernet settings as necessary, it will be part of your local area network (LAN). To test that the Nano-10 is successfully connected to your LAN you can PING it from a PC that is on the same LAN. To do this, open up a command prompt window, which is normally located in the start menu under Programs > Accessories. Then enter the command: `ping 192.168.1.5`

If you have changed the Nano-10 PLCs IP address to match your router, you will need to ping your new IP address. If the PLC is connected to the LAN, you will get replies from the Nano-10 IP address that you pinged. Otherwise, it will say something like “No Response” and you will need to repeat the above steps to ensure a proper connection.

### 3) Open the First Web Page Stored in the Nano-10 Web Server from a PC or iPhone Browser

In order to connect to the Nano-10 web pages you will need to:

1. Open a PC browser or iPhone browser
2. Enter the IP address of the Nano-10 with port number in the format: <http://192.168.1.5:9080>

Without entering any specific file name after the port number you will be accessing the default preloaded web page, which is called "0.HTM". This is what you should see:



Note that if you have changed the PLC program from the program that shipped with the PLC, you may see something slightly different. More information on how the PLC program affects the web page will be shown later in this quick start guide.

0.HTM

### 4) Interact with the Nano-10 via the Web Page

As long as the default PLC program ([i-Relay.PC6](#)) is loaded, the four Nano-10 outputs are linked to the output labels on the above web page (Output1 to Output4). Click on the output buttons and you will see the Nano-10 outputs turn on one by one. Each output label will also change colour from grey to yellow when it is clicked on, indicating that an output is activated. Then the label will change back to grey when it is clicked on again, indicating that the output is deactivated.

### 5) Activate the Nano-10 Physical Inputs

First you will need to check the "Continuous Update" box at the top of the web page so that the PLC data and I/O status is updated regularly. If you leave this unchecked, then any changes made on the PLC side, such as input status, will not be updated on the web page until it is manually refreshed. This can be done by clicking on the "Refresh" button or any of the "Output" buttons.

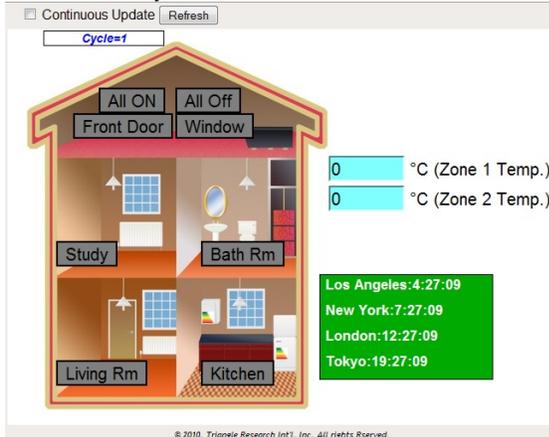
Now use a wire or conductive probe and connect the 0V terminal of the power supply to the Nano-10 inputs #1,2,3, and 4 one at a time and you will see the status updated on the browser screen.

**Caution:** Ensure that the +24V and 0V power supply are connected to the correct terminals before power ON. Connecting wrongly could damage the PLC and is not covered under warranty.

## 6) Open the Second Web Page Stored in the Nano-10 Web Server from a PC or iPhone Browser

Now repeat step 3) and change the address to include the file name of the second web page, which is "2.HTM", as follows: <http://192.168.1.5:9080/2.htm>

This is what you should see:



Notice how the blue border is gone and replaced by an image of the interior of a house.

Also notice the different arrangement of components.

The same data and buttons are available as in the first web page but this web page looks completely different overall.

2.HTM

## 7) Repeat steps 4) and 5)

Try interacting with the web page and PLC as in steps 4) and 5) so that you can see how the components are the same but renamed and in a completely different layout.

## 8) Customizing the Web Pages

You can easily design your own custom web pages to control the Nano-10 PLC by making changes to either of the 0.HTM or 2.HTM files. These files can easily be edited using a standard text editor program. Here is a comparison of the HTM files opened in a text editor that shows how they define basic display and layout properties of the resulting web page displayed in the browser. You can see how the resulting web pages would be displayed according to these files in sections 3 and 6 above.

```
0.HTM - Notepad
File Edit Format View Help
* Level 1 User Modifications Begins here
*****/
function userPreference()
{
  bgimagesrc="http://tri-plc.com/nano/hmipics/panelblue1.jpg"
  LCDXY = [22,52]
  LCDSIZE=[185,21]
  LCDbgcolor = '#ffffAA'
  LCDtextcolor = 'black'
  IOname = ['output1','output2','output3','output4',
           'input1','input2','input3','input4']
  IOnameColor = 'black'
  IOwidth = 80
  IOheight = 0
  IOLocX = [24,120,24,120,24,120,24,120]
  IOLocY = [142,142,164,164,267,267,290,290]
  ONcolor = 'yellow'
  OFFcolor = 'grey'
  DMlabel = ['DM[1]','DM[2]','DM[3]','DM[4]']
  DMlabelBgColor = '#efffff'
  DMwidth = 175
  DMheight = 20
  DMLocX = [24,24,24,24]
  DMLocY = [185,205,225,245]
}

2.htm - Notepad
File Edit Format View Help
* Level 1 User Modifications Begins here
*****/
function userPreference()
{
  bgimagesrc="http://tri-plc.com/nano/hmipics/homepic2.jpg"
  LCDXY = [370,320]
  LCDSIZE=[200,30]
  LCDbgcolor = '#00AA00'
  LCDtextcolor = 'white'
  IOname = ['Study','Bath Rm','Living Rm','Kitchen',
           'All ON','All Off','Front Door','window',]
  IOnameColor = 'black'
  IOwidth = 0
  IOheight = 0
  IOLocX = [60,230,60,230,110,200,80,200]
  IOLocY = [280,280,420,420,100,100,130,130]
  ONcolor = 'yellow'
  OFFcolor = 'grey'
  DMlabel = ['&deg;C (Zone 1 Temp.)','&deg;C (Zone 2 Temp.)','','']
  DMlabelBgColor = 'white'
  DMwidth = 0
  DMheight = 25
  DMLocX = [380,380,380,380]
  DMLocY = [180,215,215,215]
}
```

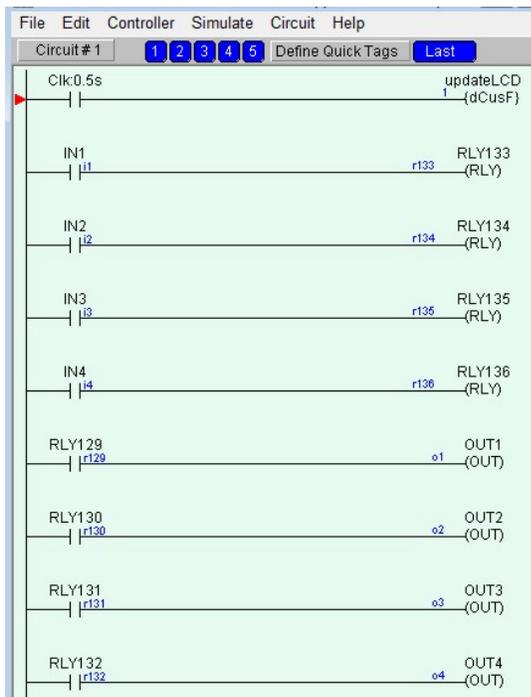
0.HTM

2.HTM

**Note:** The self-explanatory comments in the actual files have been removed in order to save space and make it easier to compare the two files here. More details on customizing web pages for the Nano-10 can be found under Section 2.10 “Accessing and Customizing the HTML Web Interface for Control and Monitoring” in chapter two of the Nano-10 User’s Manual.

## 9) Integrating the Web Pages with Your PLC Program

The Nano-10 PLC is shipped with a default program, called [i-Relay.PC6](#), that maps the web page controls to the PLC inputs and outputs. Since the web page actually maps the buttons to some internal relay bits inside the PLC, your PLC program can easily assign them to be mapped to any I/Os. You will need to learn the PLC’s Ladder+BASIC programming language in order to make changes to the PLC program. Here is a snapshot of the i-Relay.PC6 program :



**i-Relay.PC6**

The first circuit controls what is displayed on the PLC LCD, which is also mapped to the web pages to emulate an LCD screen.

The next four circuits map the PLC physical inputs to four of the relay bits used in the web pages.

The last four circuits map the other four relay bits from the web pages to the PLC physical outputs.

For more details on the relationship between i-Relay.PC6 and the HTML files, please see Section 2.10.2 “Control and Monitoring Components in the Default HTML Files” in chapter two of the Nano-10 User’s Manual.

## 10) Getting More Information

You can visit our documentation download page for access to technical documents such as the Nano-10 User Manual and the I-Trilogi Programmers Reference Manual from the following link.

<http://www.tri-plc.com/documentlist.htm>