Onyxx® Cellular Router
USER GUIDE

LYNXSPRING®

Onyxx-CE121

Inbound and Outbound
Communication Capabilities

Table of Contents

Introduction

The Onyxx® CE121 Cellular Router provides routing to devices on your network via a cellular IP connection. It is built on top of the Onyxx Platform with a customized and simplified user interface which is accessible through a standard web browser.

The web application is divided into three main sections:

✓ **Device Settings Page**—Configure the network settings required by the Onyxx-CE121 and retrieve the Cellular IP address of the device.

✓ **Define Routes Page**—Setup and configuration of Routes to other devices.

✓ **Help Page**—Documentation of the features and limitations of the Onyxx-CE121.

The basic steps for setting up the Onyxx-CE121 are as follows:

1. Configure the device settings.
2. Define the routes the Onyxx-CE121 will use to connect to other devices.

NOTE: *If you are using* **Internet Explorer 11**, *please see the section entitled* INTERNET EXPLORER USER SETTINGS *(page 13) for further details about the settings that will need to be modified.*

Quick Help Dialog

This section will display helpful information about terms or textboxes. All you need to do is hover over the term or textbox with the pointer to view additional information.

Logging On

Figure 1

In the upper-left hand corner of the interface, you will find the LOGIN link in the WELCOME section.

Navigating to the DEVICE SETTINGS or DEFINE ROUTES screens without being logged on will re-direct to the login screen.

Clicking LOGIN will bring up the administrator Login screen.

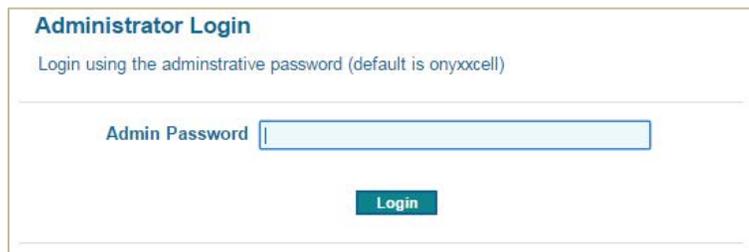## Administrator Login Screen

Below is a screen shot of the Login page:

Administrator Login

Login using the adminstrative password (default is onyxxcell)

Admin Password [   ]

[Login]

Figure 2

Logging Off

Welcome

Logout
Model Onyxx-CE121
Version 1.0.0
Serial # 000622150093

Figure 3

After logging on, the WELCOME section in the upper-left hand corner of the page will now have the LOGOUT link.

Clicking LOGOUT will log the current Admin User out and will allow access to the HOME and HELP pages only.

Device Settings *(IP Configuration)*

NOTE:

✓ Any changes made to the IP settings will need to be saved in order to take effect.

[Save Changes] [Cancel Changes]

Figure 4

✓ Changing this device's IP settings will force it to restart its network services.

✓ If you change the IP Address of this device and are using that IP address to access the web interface, you will need to also change that address in the browser to the *new* IP Address.

✓ If you change the DHCP setting to "on" DHCP Enabled ☑ , you will need to ask your Network Administrator for the new IP in order to use it to access the web interface.

To navigate to the Device Settings, click DEVICE SETTINGS in the menu bar.

[Device Settings]

Figure 5

This will open the DEVICE SETTINGS screen.

Figure 6

Factory Default IP Settings

Hostname: localhost

Hosts File: 127.0.0.1 localhost.localdomain localhost

IP Address: 192.168.1.101

Subnet Mask: 255.255.255.0

NOTE: *All other fields are empty by default.*

Changing Device Settings

Change the settings according to the IP network(s) the Onyxx-CE121 will attach to. All settings on this page can be modified except for the CELLULAR ROUTER INFORMATION section.

Cellular Router Information

This section displays the Device IP information that will be used to connect remotely.

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Define Routes

To navigate to the Define Routes click on DEFINE ROUTES in the menu bar.

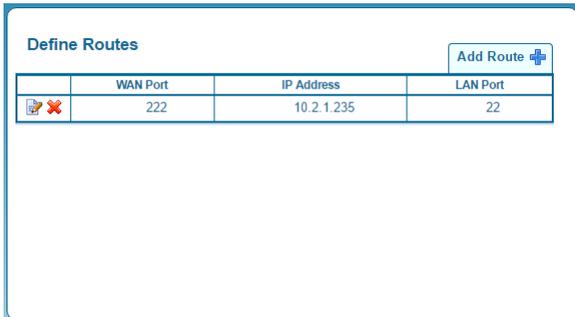

Figure 13

This will open the DEFINE ROUTES Screen below:

Figure 14

Adding a Route

NOTE: *All routes added are configured for both TCP and UDP protocols.*

Click the in the upper right hand corner of the page.

The ADD NEW ROUTE dialog box will appear below:

Figure 15

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There are three fields:

- ✓ **WAN Port**—This *required* section specifies the port that will be used to connect to the destination device and allow it to be displayed. *Accepted port numbers range from 0 and 65535.* Using port 80 will limit web user interface access. See PORT 80 section of CONNECTING BY CELLULAR TO DEVICES (page 8) for more details.

- ✓ **IP Address**—This *required* section will specify the IP Address of the destination device. Accepted IP addresses should be in the form of xxx.xxx.xxx.xxx where the xxx represents a number 0 to 255.

- ✓ **LAN Port**—The optional section will specify the port actually being used by the destination device. *Accepted port numbers range from 0 and 65535.* If the LAN port is left blank then the WAN port number is used.

Editing a Route

Click EDIT on the left hand side of the route you want to edit. Text boxes will appear allowing editing of the three fields: WAN Port, IP Address, and LAN Port. See ADDING ROUTE section above for more information on each field.

Deleting a Route

Click DELETE on the left hand side of the route you want to delete. A dialog box will appear for you to confirm the deletion of the Route.

NOTE: *When communicating to multiple web interfaces, it is recommended that each interface be defined by its own unique port number. For example, when using several JENE devices with FOX; change the FOX port number under* NIAGARA FOX SERVICE *to a unique value. This should be followed by changing both the WAN and LAN ports in the* DEFINED ROUTES *tab of the router to match the newly assigned FOX port.*

Optional Accessories

A remote mount antenna can be purchased if the device needs to be mounted in a basement or inside of an electrical panel: *Part Number: OX-CMA-3WR-12.*

Go to shop.lynxspring.com to: Purchase Your Antenna

If this is a private IP on the cellular network, please refer next to the OPEN VPN INSTRUCTIONS FOR ESTABLISHING YOUR CONNECTION provided on Page 14 of this document.

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Connecting by Cellular to Devices

The Cellular IP Address is located at the bottom of the DEVICE SETTINGS screen. This IP address will be used to access the devices being routed to on your network. Please note that UDP connections require the Default Gateway of the device being connected to be set to the Cellular Router's internal IP Address.

Received Signal Strength

The cell signal strength is displayed in the page header as a bar graph. Be sure to install the Onyxx-CE121 where you receive the best signal level.

Figure 16
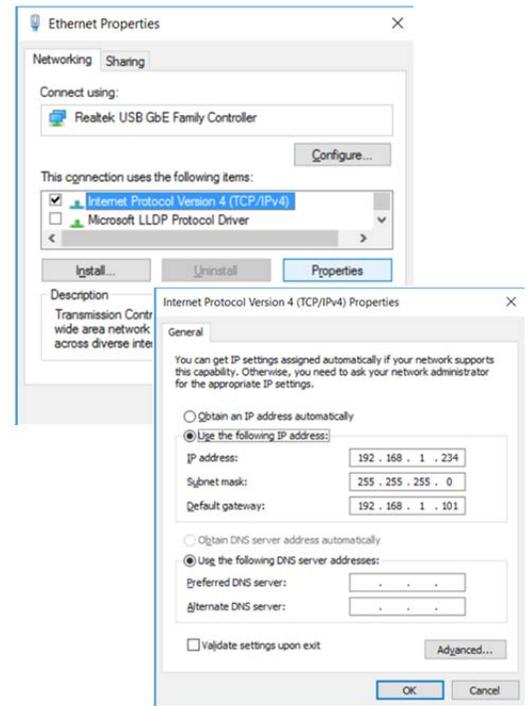
Port 80

The Cellular IP can also be used to access the web interface for this device if you have not assigned port 80 as a WAN Port for a route. To do this you will use the Cellular Router Device IP address and the WAN port that was specified for the device.

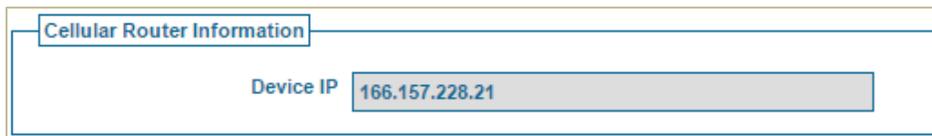Cellular Router Device IP can be found on the DEVICE SETTINGS page.

Figure 17

WAN Port numbers can be found on the Define Routes page

	WAN Port	IP Address	LAN Port
	4444	100.0.1.26	80

Figure 18: Example Route

The web interface can now be accessed by combining these two items by a colon.

Below is an example:

In our examples above (figure 17 and figure 18) you would enter into your web browser:

http://166.157.2258.21:4444

http://166.157.228.21:4444

Figure 19: Accessing Example route shown in Figure 17 through Cellular IP example shown in Figure 18.

In this example, one would be able to access the web interface for the device at 100.0.1.26 on Port 80.

Viewing the Audit Log

To View the devices AUDIT LOG of activity, go to the DEVICE SETTINGS Screen. At the bottom is a button for the AUDIT LOG. After clicking this button you will see the AUDIT LOG WINDOW.

The SELECT ALL Button [Select All] in the bottom of the Log Window will select all the text in the window for copying.

In addition to the scroll bar that will appear in the log window you can expand its height to see more. In the lower right-hand corner of the Log Window is a handle for dragging the window's height.
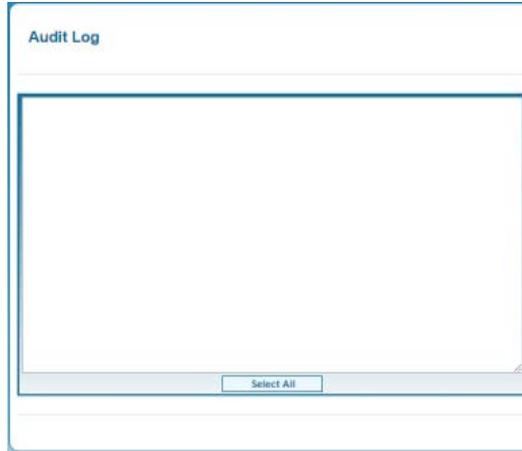
Figure 20: Audit Log Screen

Changing the Admin Password

The default password for the CE-121 is onyxxcell which we highly recommend changing to increase security for your new device. To change the admin password go to the DEVICE SETTINGS screen and click the CHANGE PASSWORD button at the bottom of the screen. The CHANGE ADMIN PASSWORD dialog box below will appear:

Please enter the new password.

Old Password
New Password
Verify the new password

Submit   Cancel

Figure 21: Change Admin Password Dialog

There are three fields:

✓ **Old Password**–Enter the current password for user verification.
✓ **New Password**–Enter new password.
✓ **Verify New Password**–Re-enter the new password for match verification.

NOTE: *This new password is needed to login again or to change the Admin password again.*

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Using the Cell Router to Establish Connections
(Outbound Communication)

When the requirements are to connect a device connected to the Cellular Router to an outside resource, simply update the device and ensure that its Gateway is set to that of the Cellular Routers internal IP Address. The following example shows the setup for an outgoing connection on a JENEsys device. *It is not necessary to define routes for outgoing connections.*

Cellular Router IP Settings

Hostname	localhost
Hosts File	Mouse over or click expand to view hosts
DNS Domain	
DHCP Enabled	☐
IP Address	192.168.1.10
Subnet Mask	255.255.255.0
Gateway	

JENEsys IP Settings

Host Name	JENE7Demo
Hosts File	⬇
Use IPv6	☐ Yes
DNS Domain	
IPv4 Gateway	192.168.1.10
DNSv4 Servers	⊕ ⊖ ⋀ ⋁
IPv6 Gateway	

Internet Explorer User Settings

When using Microsoft Internet Explorer 11 to access the web interface, it may not display all information correctly unless changes are made to the settings. To use Internet Explorer, please follow the instructions below to modify these settings:

Figure 22: Internet Explorer Tools menu

1: To change your settings, go to the TOOLS menu and select INTERNET OPTIONS at the bottom of the menu.

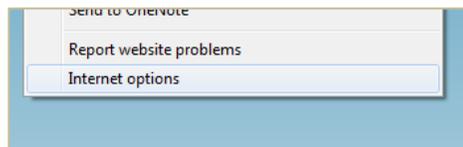Figure 23: Internet Options in the Tools menu

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2: The INTERNET OPTIONS dialog will open up.

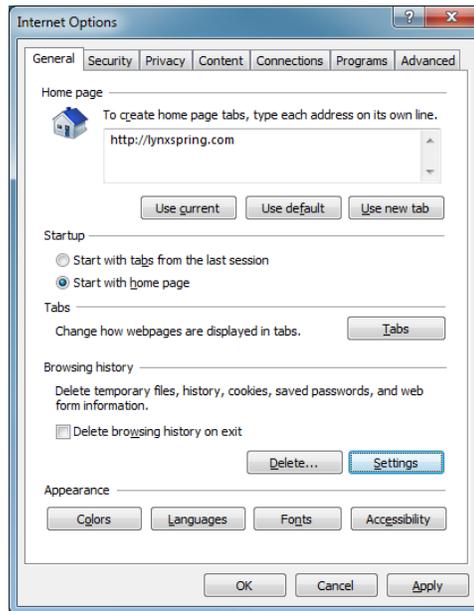In the section labeled BROWSING HISTORY, click SETTINGS.

Figure 24: Internet Options Dialog

3: This will open up the WEBSITE DATA SETTINGS dialog box.

In the TEMPORARY INTERNET FILES tab, make sure the EVERY TIME I VISIT THE WEBPAGE radio button is selected under the heading CHECK FOR NEWER VERSIONS OF STORED PAGES.
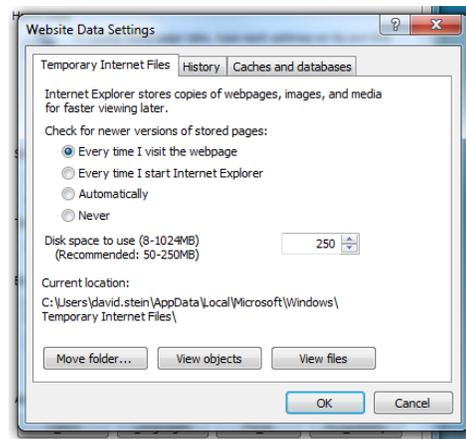
Next click OK twice (2) to save these changes.

Figure 25: Website Data Settings Dialog

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Open VPN Instructions for Establishing Your Connection

1. Once you have received your login credentials *(your username and password)*

2. In a standard web browser *(Chrome is preferred)* go to: https://e2e.lynxspring.com

3. In the drop down menu → select LOGIN.

   Enter your *Username* and *Password* at the screen below:
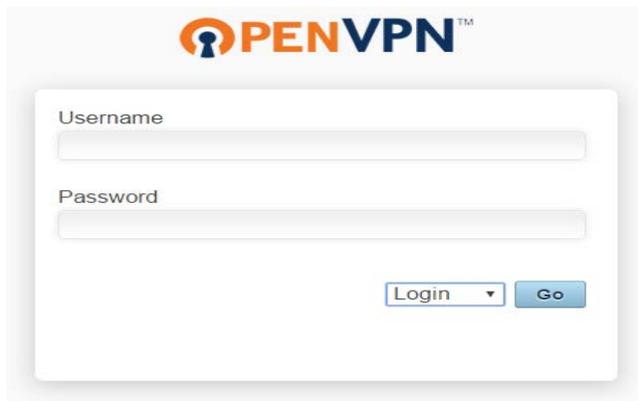
4. Choose the corresponding Platform.

   ✓ The installer will run from here and create your connection.

   ✓ All of this will be established through a standard Web browser *(preferably Google Chrome)*.

   ✓ After the setup has completed, your connection will be established and you will be given access to the software installation page.

5. Once the software has finished installing on your computer, there will be an icon that will allow you to connect to OpenVPN.
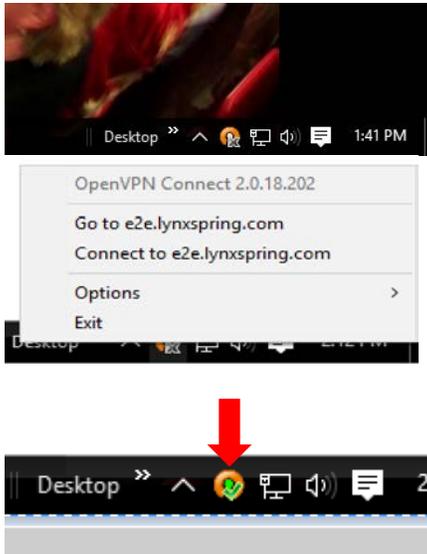
- ✓ From here you will be asked to login.
- ✓ From this Icon you can also gain access to https://e2e.lynxspring.com
- ✓ This green check mark icon *(at left)* indicates a successful connection:

6. You can also connect through https://e2e.lynxspring.com

7. Verification of your established connection:

You will now have access to any cellular devices that you have established.

BACnet/IP Inbound Configuration *(Or Other UDP Communication)*

Example assumes to following Cell Router Device Settings:
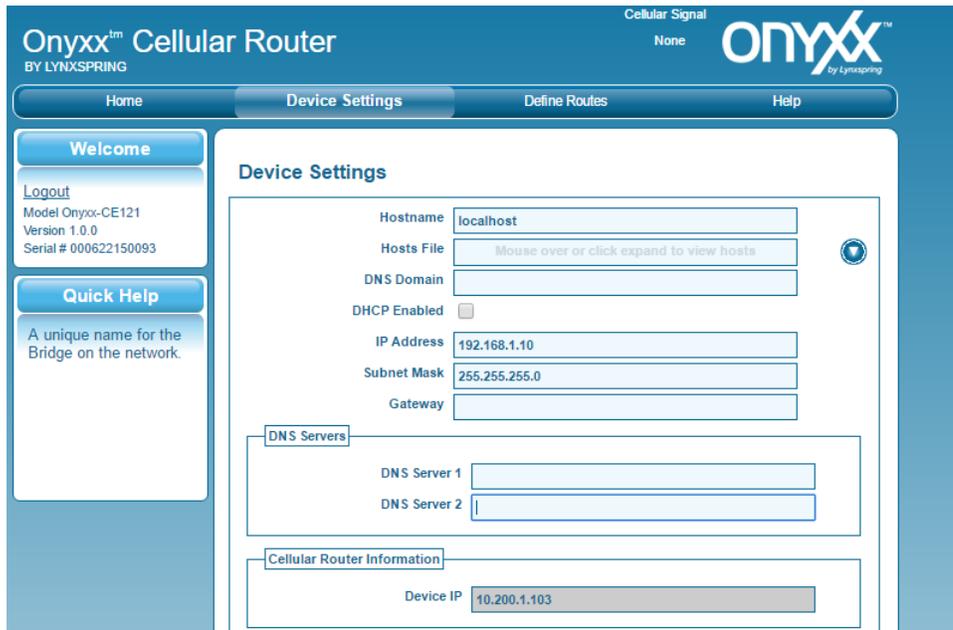
Figure 7

Add the required route as you would any other route…

- ✓ Set the WAN port to the UDP Port in use by the BACnet network *(typically port 47808)*
- ✓ Set the IP Address to match that of the BACnet server device being connected to
- ✓ Set the LAN port only of it differs from the WAN port *(not typical)*
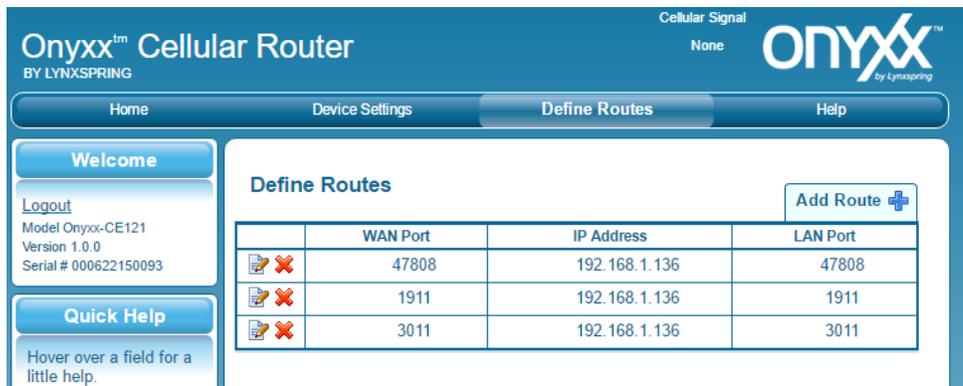
Figure 8

✓ 161.75.85.62 in the example below is the IP Address of the JENEsys Ethernet Port

✓ If Router is on the Private Network, a VPN connection is required

➢ In this case, the Adapter selected should be the virtual adapter created by the VPN connection *(In Windows, this is called a TAP Adapter)*
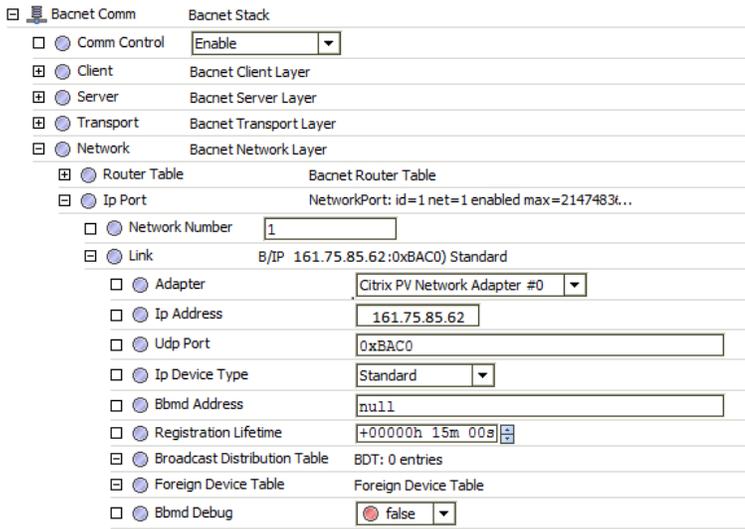
Figure 12

Note: *The internal JENEsys Device Comm Setup is typical – no special configuration needed*

Connecting a JENE to the Cellular Router (BACnet/IP)

Make sure the Device Name, Device ID, and Device Network match the BACnet device. Enter the MAC address as the Public IP address with BACnet Port *(example 161.75.85.62:0xBAC0)*

Figure 10

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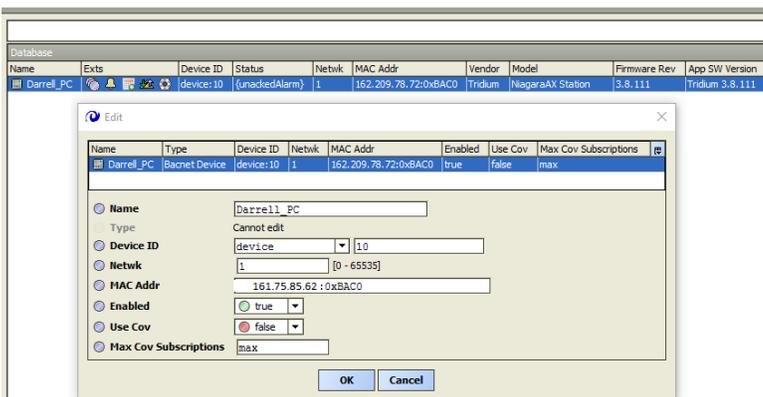
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