ISY994 Series – OpenADR 2.0(a)/(b) Configuration Guide

For Nevada Energy OpenADR 2.0b Hardware Gateway

*Requires firmware 4.2.10
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1. What is the ISY994?

The Universal Devices ISY994 series controller provides users a low cost automation platform for truly controlling energy costs. The ISY994 is the most powerful automation controller for home, business, and industry. Capable of communicating with a wide variety of off-the-shelf devices such as thermostats, lighting, A/V equipment, and pumps wirelessly using ZigBee, Z-Wave, Inseton, or via Network and direct contacts. In addition the ISY994 series, when properly equipped, can read energy consumption from individual devices and smart meters. Unlike other solutions that use ‘the cloud’ to process and store information, the ISY994 allows users to keep their information private by running everything local, but yet accessible from a variety of devices.

The ISY994 has been specifically configured with an ISY2Relay controller for this deployment. The ISY994 accepts the OpenADR signals from Nevada Energy and simply translates them into relay on/of for attachment to an ancillary system.

2. What is OpenADR?

OpenADR (http://www.openadr.org) is a multi-faceted international standard that can be applied in a variety of applications and environments to implement demand/response strategies and thus OpenADR is high on the list of important Smart Grid technologies.

OpenADR communications take place over the Internet with high level of security (Digital Certificates) and therefore not dependent on proprietary protocols. Communications are between a VTN (Virtual Top Node), which is simply a server/service provided by the utilities, and a VEN (Virtual End Node). VENs could be devices as simple as individual thermostats/load controllers and as complex as full-fledged Energy Management Systems (EMS) behind which are a collection of devices. Devices behind a VEN are called Resources. ISY994 Series is a VEN-EMS which automatically controls devices/resources linked thereto based on OpenADR signals.

The simplest cases of OpenADR signals include Mode and Price.

Mode is basically a reflection of the load on the grid and the utility’s desire to effectuate load control strategies. There are 3 important Modes:

a. Normal – nothing needs to be done
b. Moderate – there’s a moderate level of load on the grid and some level of moderate load shedding strategies are required
c. High – there’s a high level of load on the grid which might cause blackout/brownout imminently. Drastic load shedding strategies are required
In some cases, the load on the grid is represented by **Price**. For instance, the higher the load on the grid, the higher the price. In those cases, customers can choose to implement load control strategies based on the price.

Signals have start times and durations with the following states:

1. **Inactive** - the signal is not active and thus nothing should be done
2. **Pending Far** – the signal is for some time in the far future
3. **Pending Near** – the signal is for some time in the near future
4. **Active** – the event is currently active and running

**Far/Near** are defined by the customer in conjunction with the utility. For instance, for industrial customers **Near** might be a week from now whereas for small commercial customers **Near** might be a few hours from now. Using Far/Near, the customer may decide to effectuate pre-signal preparations such as precooling and preheating.

ISY can easily be configured to automate the end-2-end OpenADR signal processing and handling including, but not limited to, Far/Near signals.

### 3. Nevada Energy OpenADR Project

For Nevada Energy Project, ISY comes preconfigured with predefined strategies based on the **Mode** signal. The signal is used by ISY to control two Normally Open relays as follows

a. **Active/Normal, Inactive, Pending Near, and Pending Far** – neither relay is closed (both are off)
b. **Active/Moderate** – Moderate relay is closed (on) and High relay is opened (off)
c. **Active/High** – High relay is closed (on) and Moderate relay is opened (off)

The actual connection of the relays to BMS (Building Management System) are left for the building operators.
4. Hooking up the ISY994 and ISY2Relay controller

Your installation kit should contain the following components at a minimum:

1. ISY994 Controller
2. ISY2Relay Controller
3. (2) Cat5e Ethernet cables
4. Power Supply
5. A link to this guide

1. Connect one of the included Cat5e cable to ISY’s **Network** Port and to your network hub. **Note:** the network must *initially* be DHCP enabled.
2. Connect the other included Cat5e cable to ISY’s Port A at one end and the Relay box at the other. You may remove the panel on the ISY2Relay box to access the connections easier. Please use care when removing the panel as the hinge connectors are fragile.

3. Connect high voltage pigtail relay connections to load or EMS / BMS as defined by the system documentation for the EMS/BMS. The low voltage connections have been factory disabled for this installation.

4. Connect the power adaptor to the ISY2Relay box. The relay box powers the ISY, therefore no power supply is needed for the ISY.

5. ISY Installation

a) If you do not have Java installed, please install the latest for your platform. You may find the latest Java downloads at http://www.java.com/getjava. Please choose the latest JRE for your platform.

b) Point your preferred browser to http://isy.universal-devices.com/nve.jnlp; when prompted to authenticate, enter admin for both user-id and password.

i) If you are not prompted to authenticate, please consult the troubleshooting section.

ii) If you are prompted with a Java warning, ensure the Publisher says Universal Devices, Inc. and the location is http://isy.universal-devices.com please check the box and click Run.
6. Setting Date and Time

Note: By default, ISY’s time zone, latitude, and longitude are configured for Las Vegas, Nevada. You can skip this section if these settings reflect the location of ISY.

a. Activate Date & Time (steps 1 & 2, Figure 6a)
b. For accurate sunrise/sunset calculations, it’s important to provide correct Latitude and Longitude. If you don’t have those numbers, you can use the Locate Me button (step 3, Figure 6a)
c. Click on the Save button for the changes to take effect (step 4, Figure 6a)
7. Verify Communications with VTN

1. Ensure the time is accurate (Figure 7a, step 1). If not, refer to section 6 for setting the date and time
2. Activate My OpenADR Portlet if not already open (steps 2 & 3, Figure 7a)
3. Make sure ISY is communicating with the VTN (step 4, Figure 7a). If not, you will see Offline on the title of the OpnADR window
4. If Online, please skip the rest of this section and move on to Section 8
5. If Offline, activate OpenADR Settings window (step 5, Figure 7a) and follow through with the rest of this section

![Figure 7a – Activating OpenADR Portlet](image)

Before continuing with the rest of this section, ensure that you get the following information from Nevada Energy:

a. Polling Interval (in seconds)
b. Server URL
c. User ID
d. Password
e. VTN ID
f. VEN ID

Once the aforementioned is received:
1. Check the Enabled checkbox (step 1, Figure 7b)
2. Ensure 2-a is selected for Profile (step 2, Figure 7b)
3. Set **Polling Interval**, **Server URL**, **User ID**, and **Password** are filled with those provided by Nevada Energy (step 2, Figure 7b)
4. Ensure **Pull** is selected for the Interaction Mode (step 3, Figure 7b) and Evaluation Interval is set to **5 seconds**

5. Ensure VTN ID and VEN ID are filled with those values provided by Nevada Energy (step 4, Figure 7b)

6. Click on the Save button to save the settings (step 5, Figure 7b)

7. Depending on the Polling interval, it may take a few seconds for ISY to start communicating with the VTN. Ensure that the Offline icon is no longer present
8. Issue a Test Event

a. In conjunction with Nevada Energy, issue a test event.
b. You should now see the Event show up in the OpenADR window (Figure 8a)
c. Click on the Details button to see the details of the event

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![Figure 8a – Test Event](image-url)
9. Advanced Options

Please contact support for either in person or remote training on the advanced programming and configuration options.

10. Troubleshooting

Reboot ISY and observe the status/pattern of lights on the front of the unit. The pattern should be as follows:

- Power light – Solid on
- RX and TX lights – Blink momentarily and then turn off
- Memory light – Blink momentarily and then turn off
- Error light – Solid off

If Power light is not on, please make sure the relay board is plugged into power and also connected, via the Cat5/Ethernet cable, to Port A on ISY.

If either RX or TX lights are solid on, then please check connection/cable from Relay board to Port A on ISY.

If Error and Memory light are blinking simultaneously, then please ensure the router is powered on and check the connection from the Network jack on ISY to the router.

If only the Error light is blinking, then:

- Unplug ISY
- Please reseat the SD Card: pull out the rubber cap above the Micro SD label, use a sharp object and push the Micro SD in so that it pops out. Then push it back in so it clicks in. Put the rubber cap back on
- Plug ISY back in.

If you are still having difficulties, please do not hesitate to contact our support team.
11. Support

Phone: 818-631-0333
Text Message: 818-631-0333 (please include [NVE Urgent] in the message)
Email: support@universal-devices.com (please include [NVE Urgent] in the subject)
Tickets: http://www.universal-devices.com/contact-support/