

0018-08-08-00-000

# HA1.2.1 ZigBee-to-Ethernet Gateway Demo User Guide

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## Introduction

CEL's MeshConnect Ethernet Gateway (ZMC-GW-ETH-1) is designed to be a reliable, secure, low-cost solution to connect a wireless ZigBee mesh network to the Internet. The HA1.2.1 Ethernet Gateway SDK provides a software framework that enables developers familiar with the Silicon Labs EmberZNet PRO stack to create custom ZigBee Home Automation applications which interface to a cloud using the Ethernet Gateway.

The HA1.2.1 Ethernet Gateway SDK includes the APIs necessary to interface with the Ethernet driver and a reference application which connects the following devices to an Exosite cloud portal:

- HA1.2.1 On Off Light
- HA1.2.1 Temperature Sensor
- Combination HA 1.2.1 Temperature/Humidity Sensor

This user guide details the steps necessary to setup and run the demo included in the SDK. This includes forming and joining the ZigBee network, configuring the cloud portal interface, and creating cloud widgets.

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## Demo Prerequisites

1. An account at **cel.exosite.com** with your HA Gateway registered. Follow the CEL instructions on registering a Zigbee HA Gateway in the MeshWorks Exosite Provisioning Guide. Visit <http://meshconnect.cel.com/products/meshworks> for more information (Registration to the CEL MeshConnect 'Members Center' is required. Click the 'Log In' link located in the upper right hand corner of the MeshConnect website to initiate the site registration process.)
2. Access to the internet via Ethernet.

## Initial Setup

1. Connect power to the gateway.
2. Connect the Ethernet cable to the gateway.

## Next Steps

1. The Zigbee HA Gateway will automatically search for a DHCP server and try to get an IP address. While that is occurring, the Red LED will be ON solid and the Green LED will be OFF.
2. Once an IP address is obtained, the Zigbee HA Gateway will try to activate itself at **cel.exosite.com**. During this time, the Red LED will flash 2 times every 500 ms and the Green LED will be OFF. This activation is done when the gateway has come out of the factory.
3. Once activated, the LEDs may have the following behavior:
  - a. If no Zigbee network formed, the Red LED blinks ON for 500 ms and OFF for 500 ms (continuously), and the Green LED is OFF.
  - b. If a Zigbee network exists with no joined devices, the Red LED is OFF and the Green LED flashes 2 times every 500 ms.
  - c. If a Zigbee network exists with nodes joined, the Red LED is OFF and the Green LED is ON.

## Forming a Zigbee Network

To form a Zigbee network, the Zigbee HA Gateway needs to be in the same state when it came out of the factory. It can be activated (but does not need to be activated) to form a Zigbee network. To form a Zigbee network, press the button once.

## Opening Zigbee Network for Joining

Once a Zigbee network is formed, press the button to open the network for joining. The Red LED is OFF and the Green LED blinks ON for 500 ms and OFF for 500 ms.

## Resetting Zigbee HA Gateway to Factory Default

Press and hold button for at least 10 seconds to reset the gateway back to its factory default settings. The factory default has the following properties:

1. No IP address so DHCP will execute and obtain an IP address from a DHCP server.
2. No Zigbee network.
3. No activation with **cel.exosite.com**

## Running the Demo

The Zigbee HA Gateway supports the following devices:

1. On/Off Light
2. Temperature Sensor
3. Humidity Sensor
4. Combo of Temperature and Humidity sensor

## Cloud Prerequisites:

1. Device needs to be activated with Exosite as per the provisioning guide. Make sure to select “HA ZigBee-to-Ethernet Gateway” from the supported device pull down menu when adding your device to the Exosite portal.
2. The device needs to have 2 dedicated data aliases attached to the device record in the Exosite portal.
3. A dashboard with widget to display information and change your On/Off light state.

## Adding data aliases to your device:

Click on 'Devices' within your Exosite portal menu and then click on your device.

Devices		
Name	Alias	Type
HA Ethernet Gateway	0022a3000009606b	HA Zigbee-to-Ethernet Gateway

Device List

Click on '+ Add Data' in the upper right.

The screenshot shows a 'Device Information' window with two main sections: 'Device Update' and 'Data List'.  
**Device Update:**  
 Name: Dave's HA Ethernet Gateway  
 Alias: 0022a3000009606b  
 Type: HA Zigbee-to-Ethernet Gateway  
**Data List:**  
 + Add Data  

Name	Alias	Last Value
Device Info	end_device	{"status":"join","id":"82E...
Device Request	device_request	{}

Device Information Window

Create 2 aliases (One for end\_device and one for device\_request).

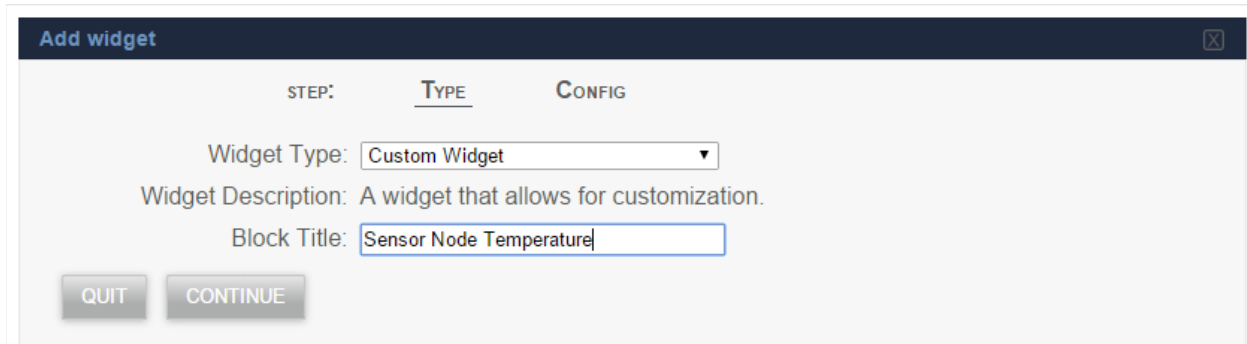
The screenshot shows the 'Data Setup' window in the 'CONFIGURATION' step. On the left, there is a help section titled 'What are Data Source Formats?' and 'How can I tell what to use for "Alias"?'.  
**Configuration Fields:**  
 Data Source Name: Device Info  
 Data Source Format: string  
 Unit:   
 Alias: end\_device  
 Data Source Calculation: NA using   
 Buttons: QUIT, SUBMIT

The screenshot shows the 'Data Setup' window in the 'CONFIGURATION' step, similar to the previous one but for a different data source.  
**Configuration Fields:**  
 Data Source Name: Device Request  
 Data Source Format: string  
 Unit:   
 Alias: device\_request  
 Data Source Calculation: NA using   
 Buttons: QUIT, SUBMIT

Data Source Creation Window

### Adding widgets to your dashboard:

Click on 'ADD WIDGET' on your dashboard. All widgets in this demo are Custom Widget type. The Block Title may be anything you wish.



Widget Creation Window

For data widgets (temperature, humidity, On/Off status), the Data Source should be your Device Info data point. For the On/Off control button widget, Device Request should be the selected data source. Width and Height may be whatever you choose, but 2x2 is the default. Enter 200 for the count and 10 seconds for the refresh rate.

**Sensor Node Temperature**
+ ↻ ▾

Block Title:

Widget Type: Custom Widget [documentation](#)

Widget Size:

Width:

Height:

Data Source:

Select	Name
	Dave's HA Ethernet Gateway
<input checked="" type="checkbox"/>	Device Info
<input type="checkbox"/>	Device Request
<input type="checkbox"/>	GPS Location
<input type="checkbox"/>	JSON Test
<input type="checkbox"/>	Sensor 1 Button

View Data By:  Duration:   ▾

Count:

Script Template:  ▾

Script:

```

1  /**
2   * Gauge
3   * @version 1.0.0
4   */
5  // select one or more data sources from the list above to vie
6  function( container, portal )
7  {
8    var resources,
9        output
10   ;
11
12   // collect data sources for easy iteration.
13   resources = collectDataSources( portal );
14
15   // return if no data sources are selected.
16   if( !resources.length )
17   {
18     errorMsg('Please select a data source from the edit page.
19     return;
20   }
21
22   // ...

```

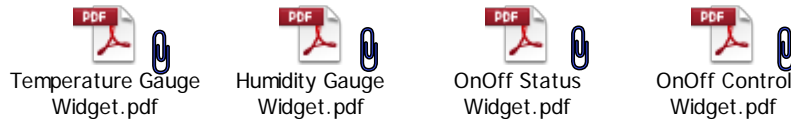
Note: Press F11 (Shift+F12 on Mac OS X) to toggle full screen mode or press Ctrl+Enter to update your script while your cursor is focused on the editor.

Refresh Rate:  Seconds

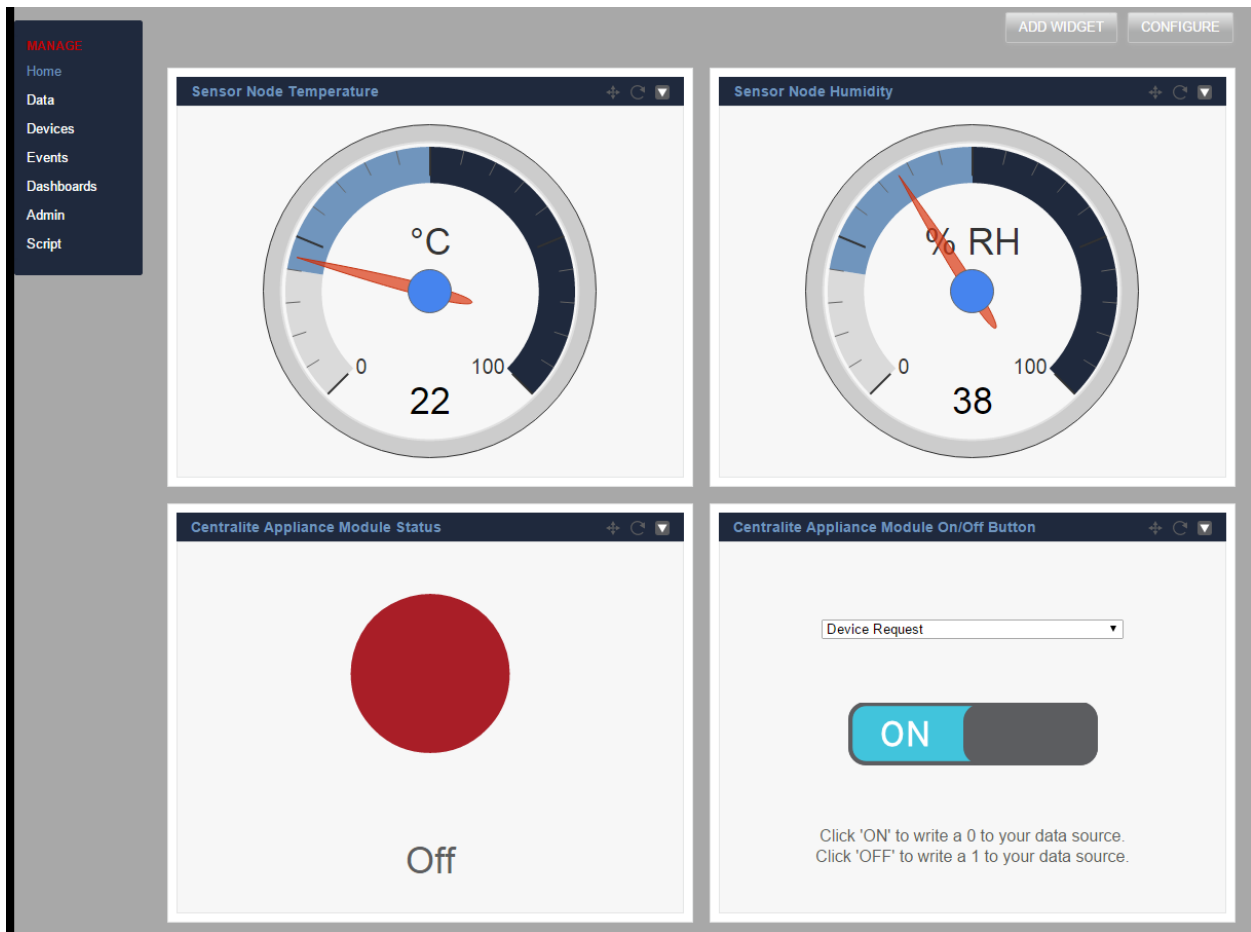
( 0 seconds = no refresh )

Widget Configuration Window

The source code for all demo widgets is embedded below. **Please note that these widgets are provided for demo/reference purposes only and do not represent production-quality widgets.**



As a device joins the network, **cel.exosite.com** is updated with a new node. The node is configured to report appropriate information whenever it changes. A light will report its On/Off state whenever it changes. A temperature sensor reports a new temperature whenever its temperature changes by 1 degree. Temperatures are in Celsius. A humidity sensor reports humidity whenever the humidity changes by 1%. The “reports” are forwarded to **cel.exosite.com** where the corresponding widget is updated.



Sample portal dashboard with widgets



## REFERENCES

Reference Documents	Download
CEL Ethernet Gateway Product Brief	<a href="#">Link</a>
MeshWorks Exosite Cloud Provisioning Guide	<a href="#">Link</a>
HA1.2.1 ZigBee-to-Ethernet Gateway Demo Application Note	<a href="#">Link</a>

## REVISION HISTORY

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## TECHNICAL ASSISTANCE

For Technical Assistance, visit <http://www.cel.com/MeshConnectHelp>