



Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



## Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832

Email & Skype: info@chipsmall.com Web: www.chipsmall.com

Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China



## Humidity and Temperature Sensor Node for Wireless Sensor Network. EV-CLUSTER-WSN-2Z

### FEATURES

- Plug and Play Wireless Sensor Network Node
- Preprogrammed as Humidity and Temperature Sensor node
- Several Sensor Types supported
- Runs ADRadioNET wireless communications protocol
- RoHS compliant

### GENERAL DESCRIPTION

The CLUSTER-WSN-1Z is an accelerometer sensor node. It is pre-programmed to be compatible with the WSN eval kit (EV-ADRN-WSN-1Z). It has a unique MAC address assigned to it. It is recommended to refer to UG-474 (User Guide for the WSN eval kit)

### SYSTEM BLOCK DIAGRAM

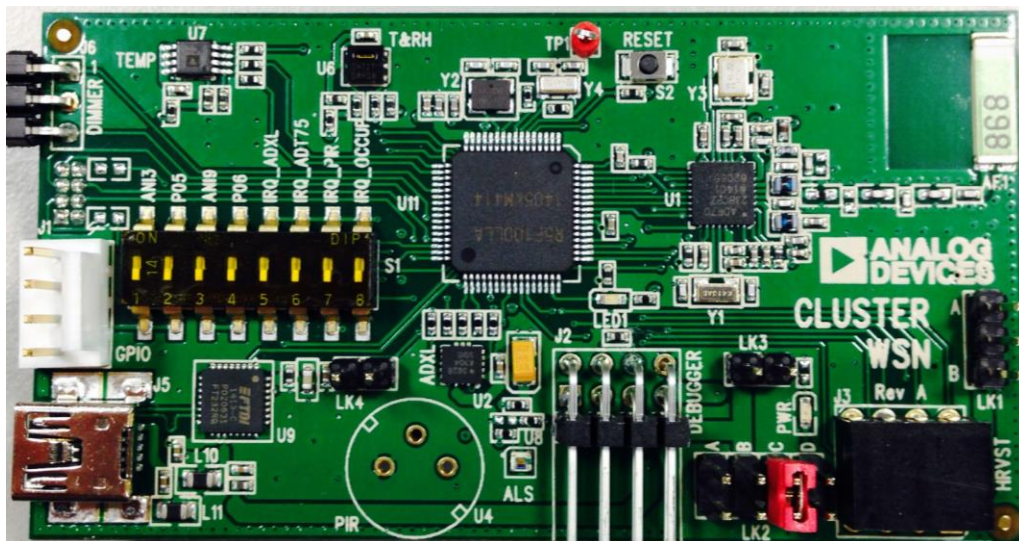


Figure 1. System Block Diagram



**TABLE OF CONTENTS**

Features .....	1	CLUSTER WSN Boards.....	4
General Description.....	1	Powering the Nodes.....	5
System Block Diagram.....	1	Power Management of the Nodes .....	5
Revision History.....	2	Firmware.....	6
Quick Start Guide.....	3	Overview .....	6
Evaluation Board Hardware.....	4	Ordering Information.....	7
Overview.....	4	Related Links.....	7
Schematics.....	4		

**REVISION HISTORY**

9/12—Revision 0: Initial Version

## QUICK START GUIDE

This section explains how to connect this sensor node to a WSN network that is already up and running.

1. CLUSTER WSN Node setup: Connect a jumper into position LK2C.

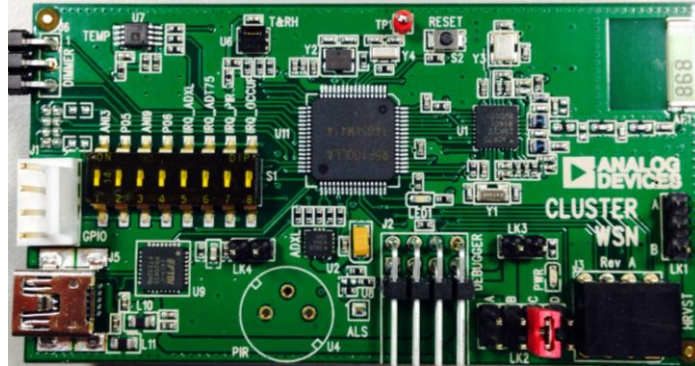


Figure 2. CLUSTER WSN Sensor Node

2. On the WSN GUI, once a node has been powered up, raw data will appear in the large window of the GUI.

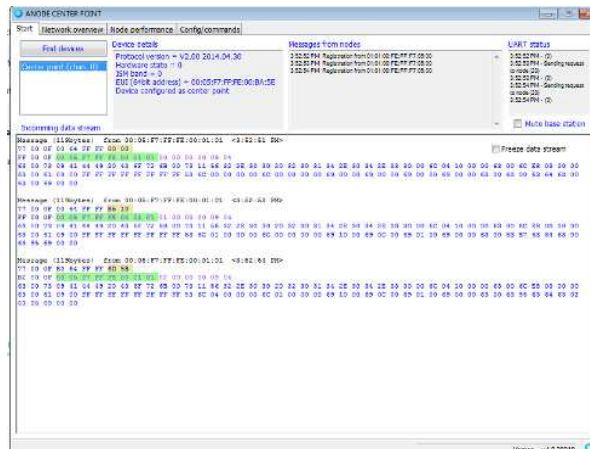


Figure 3. Raw Data Appearing

3. Data will appear in the Network Overview tab. The sensor data will then start streaming in from each node at regular intervals.

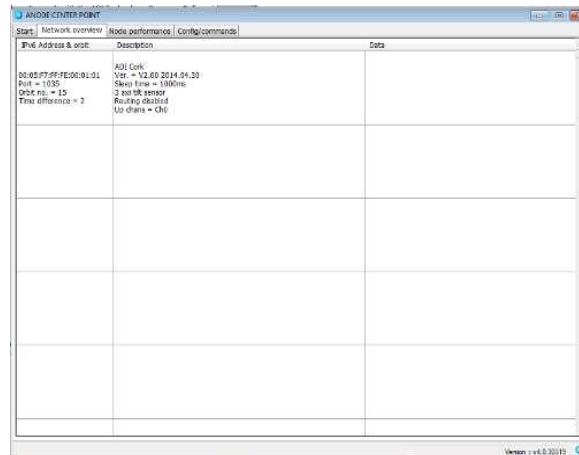


Figure 4. Data Streaming

## EVALUATION BOARD HARDWARE

### OVERVIEW

The WSN platform is modular and flexible. This allows the user to connect different combinations of sensors, and design a customized network of sensors in a very short time. The hardware comes pre-programmed, so that it works out of the box without any programming necessary by the user.

### SCHEMATICS

For schematics and layout files, see separate documentation included with the evaluation kit, or go to [wiki.analog.com/wsn](http://wiki.analog.com/wsn)

### CLUSTER WSN BOARDS

The CLUSTER WSN board is compatible with the WSN platform also. It comes with the following on-board sensors: ADXL362 accelerometer, ADT75 temperature, Panasonic PIR sensor, Avago Ambient Light Sensor. It also has a 4-pin connector for connecting to a GPIO. It can also be powered in several ways, allowing the ability to evaluate energy harvesting and battery technologies.

This kit comes with 1 of these boards. It is configured to send humidity and temperature data from the SHT21 sensor.

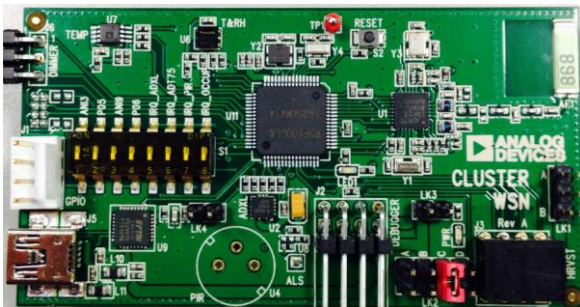


Figure 5. CLUSTER WSN Board.

**POWERING THE NODES**

There are several methods to power the nodes. A CR2032 coin cell battery comes with every board. The nodes can also be powered using external power sources, using the UART/USB board. It is advised to remove the links when the nodes are not in use. This saves the battery.

Board	Power Source	Connector	Connect Link
CLUSTER WSN	CR2032 Battery	None	LK2 Position C
CLUSTER WSN	USB	J2	None
CLUSTER WSN	Energy Harvesting	J3	LK2 Position D

Table 1. Powering the sensor nodes

**POWER MANAGEMENT OF THE NODES**

When using the node, there are different options for power management. These include the ability to use or bypass an LDO, and to include or exclude a supercap in the design. See schematics for more details.

Board	Description	Connect Links
CLUSTER WSN	Power Node directly from battery (bypass ADP160 LDO)	LK2 Position C
CLUSTER WSN	Power Node from battery through ADP160 LDO	LK1 Position A LK2 Position A LK2 Position B
CLUSTER WSN	Power Node directly from Energy Harvesting J3 connector (bypass ADP160 LDO)	LK2 Position D
CLUSTER WSN	Power Node from Energy Harvesting J3 connector through ADP160 LDO	LK1 Position B LK2 Position A LK2 Position B

Table 2. Power Management of Sensor Nodes

## FIRMWARE OVERVIEW

The node is already pre-programmed, so no initial programming is required by the user. However, all of the firmware that is running on the sensor node is available to the user for development purposes.

The latest ADRadioNET firmware is available from here:

<http://www.analog.com/en/dsp-software/adradio-net/sw.html>

ADRadioNET is a self-healing wireless communications protocol focused on providing a high level of scalability, extreme ease of use, and small code footprint. The firmware includes application layer example code for quick prototyping and development of end-user applications.

All support questions regarding the firmware should be directed here:

<https://ez.analog.com/community/wireless-sensor-networks>

## ORDERING INFORMATION

### RELATED LINKS

Table 3.

Resource	Description
<a href="#">EngineerZone Homepage</a>	Support Homepage
<a href="#">Firmware Download</a>	Latest Firmware for ADRadioNET
<a href="#">ADuCRF101</a>	Product Page, ADuCRF101 Integrated ADC, MCU and RF transceiver.
<a href="#">ADXL362</a>	Product Page, ADXL362 Accelerometer
<a href="#">ADXL345</a>	Product Page, ADXL345 Accelerometer
<a href="#">ADT75</a>	Product Page, ADT75 temperature sensor
<a href="#">ADT7310</a>	Product Page, ADT7310 temperature sensor
<a href="#">AD7151</a>	Product Page, AD7151 Capacitive to Digital Converter
<a href="#">ADP121</a>	Product Page, ADP121 LDO
<a href="#">ADP160</a>	Product Page, ADP160 LDO
<a href="#">WSN Homepage</a>	WSN Homepage



## NOTES

**ESD Caution**

**ESD (electrostatic discharge) sensitive device.** Charged devices and circuit boards can discharge without detection. Although this product features patented or proprietary protection circuitry, damage may occur on devices subjected to high energy ESD. Therefore, proper ESD precautions should be taken to avoid performance degradation or loss of functionality.

**Legal Terms and Conditions**

By using the evaluation board discussed herein (together with any tools, components documentation or support materials, the "Evaluation Board"), you are agreeing to be bound by the terms and conditions set forth below ("Agreement") unless you have purchased the Evaluation Board, in which case the Analog Devices Standard Terms and Conditions of Sale shall govern. Do not use the Evaluation Board until you have read and agreed to the Agreement. Your use of the Evaluation Board shall signify your acceptance of the Agreement. This Agreement is made by and between you ("Customer") and Analog Devices, Inc. ("ADI"), with its principal place of business at One Technology Way, Norwood, MA 02062, USA. Subject to the terms and conditions of the Agreement, ADI hereby grants to Customer a free, limited, personal, temporary, non-exclusive, non-sublicensable, non-transferable license to use the Evaluation Board FOR EVALUATION PURPOSES ONLY. Customer understands and agrees that the Evaluation Board is provided for the sole and exclusive purpose referenced above, and agrees not to use the Evaluation Board for any other purpose. Furthermore, the license granted is expressly made subject to the following additional limitations: Customer shall not (i) rent, lease, display, sell, transfer, assign, sublicense, or distribute the Evaluation Board; and (ii) permit any Third Party to access the Evaluation Board. As used herein, the term "Third Party" includes any entity other than ADI, Customer, their employees, affiliates and in-house consultants. The Evaluation Board is NOT sold to Customer; all rights not expressly granted herein, including ownership of the Evaluation Board, are reserved by ADI. CONFIDENTIALITY. This Agreement and the Evaluation Board shall all be considered the confidential and proprietary information of ADI. Customer may not disclose or transfer any portion of the Evaluation Board to any other party for any reason. Upon discontinuation of use of the Evaluation Board or termination of this Agreement, Customer agrees to promptly return the Evaluation Board to ADI. ADDITIONAL RESTRICTIONS. Customer may not disassemble, decompile or reverse engineer chips on the Evaluation Board. Customer shall inform ADI of any occurred damages or any modifications or alterations it makes to the Evaluation Board, including but not limited to soldering or any other activity that affects the material content of the Evaluation Board. Modifications to the Evaluation Board must comply with applicable law, including but not limited to the RoHS Directive. TERMINATION. ADI may terminate this Agreement at any time upon giving written notice to Customer. Customer agrees to return to ADI the Evaluation Board at that time. LIMITATION OF LIABILITY. THE EVALUATION BOARD PROVIDED HEREUNDER IS PROVIDED "AS IS" AND ADI MAKES NO WARRANTIES OR REPRESENTATIONS OF ANY KIND WITH RESPECT TO IT. ADI SPECIFICALLY DISCLAIMS ANY REPRESENTATIONS, ENDORSEMENTS, GUARANTEES, OR WARRANTIES, EXPRESS OR IMPLIED, RELATED TO THE EVALUATION BOARD INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTY OF MERCHANTABILITY, TITLE, FITNESS FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT OF INTELLECTUAL PROPERTY RIGHTS. IN NO EVENT WILL ADI AND ITS LICENSORS BE LIABLE FOR ANY INCIDENTAL, SPECIAL, INDIRECT, OR CONSEQUENTIAL DAMAGES RESULTING FROM CUSTOMER'S POSSESSION OR USE OF THE EVALUATION BOARD, INCLUDING BUT NOT LIMITED TO LOST PROFITS, DELAY COSTS, LABOR COSTS OR LOSS OF GOODWILL. ADI'S TOTAL LIABILITY FROM ANY AND ALL CAUSES SHALL BE LIMITED TO THE AMOUNT OF ONE HUNDRED US DOLLARS (\$100.00). EXPORT. Customer agrees that it will not directly or indirectly export the Evaluation Board to another country, and that it will comply with all applicable United States federal laws and regulations relating to exports. GOVERNING LAW. This Agreement shall be governed by and construed in accordance with the substantive laws of the Commonwealth of Massachusetts (excluding conflict of law rules). Any legal action regarding this Agreement will be heard in the state or federal courts having jurisdiction in Suffolk County, Massachusetts, and Customer hereby submits to the personal jurisdiction and venue of such courts. The United Nations Convention on Contracts for the International Sale of Goods shall not apply to this Agreement and is expressly disclaimed.