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Accelerometer Sensor Node for Wireless Sensor Network. EV-CLUSTER-WSN-1Z

FEATURES

- Plug and Play Wireless Sensor Network Node
- Preprogrammed as accelerometer 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-2Z). It has a unique MAC address assigned to it. It is recommended to refer to UG-874 (User Guide for the WSN eval kit)

SYSTEM BLOCK DIAGRAM

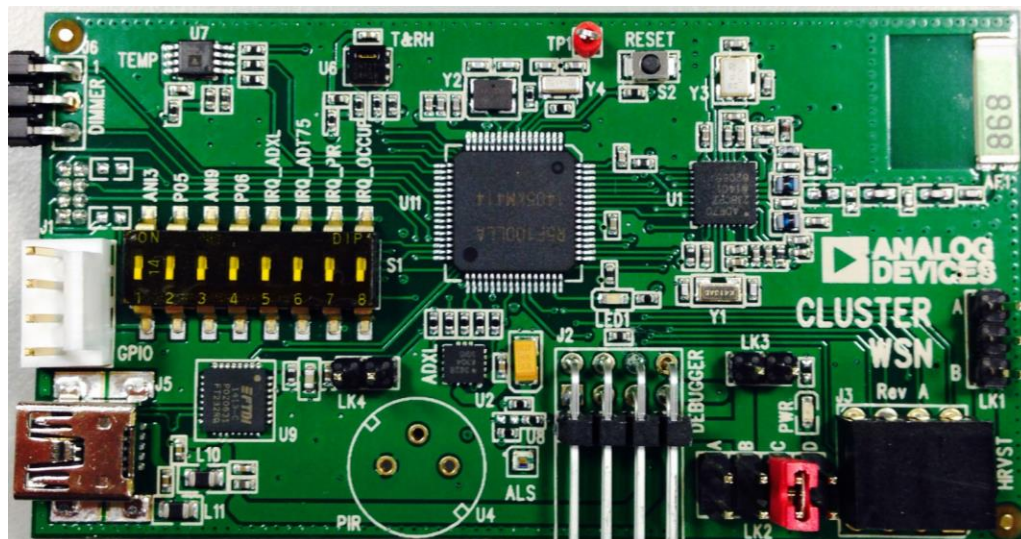


Figure 1. System Block Diagram

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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.

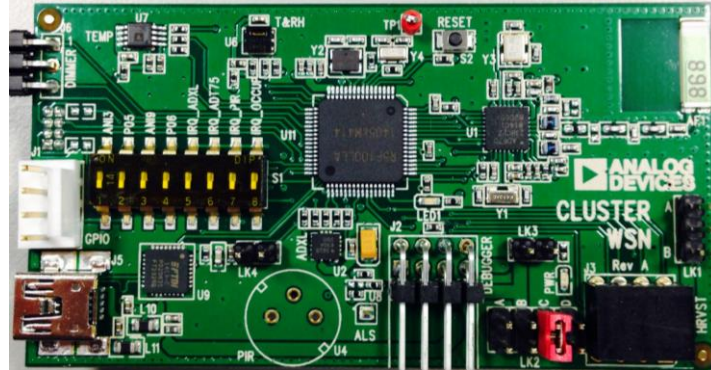


Figure 2. CLUSTER WSN Sensor Node

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

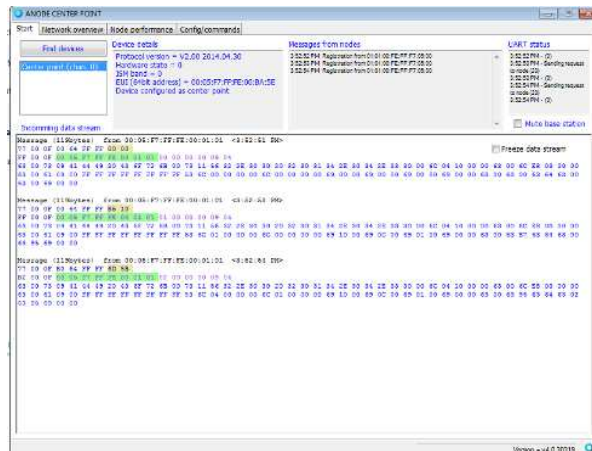


Figure 3. Raw Data Appearing

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

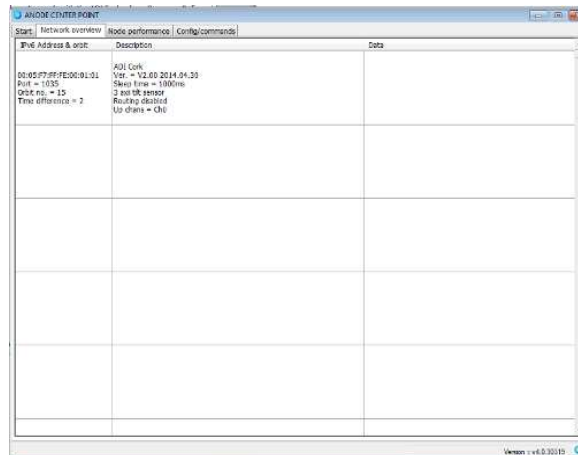


Figure 4. Data Streaming

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

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 accelerometer data from the ADXL362.

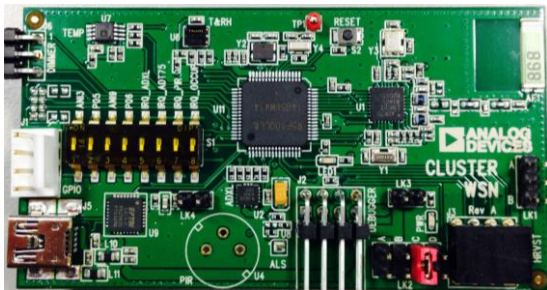


Figure 5. CLUSTER WSN Board.

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
EngineerZone Homepage	Support Homepage
Firmware Download	Latest Firmware for ADRadioNET
ADuCRF101	Product Page, ADuCRF101 Integrated ADC, MCU and RF transceiver.
ADXL362	Product Page, ADXL362 Accelerometer
ADXL345	Product Page, ADXL345 Accelerometer
ADT75	Product Page, ADT75 temperature sensor
ADT7310	Product Page, ADT7310 temperature sensor
AD7151	Product Page, AD7151 Capacitive to Digital Converter
ADP121	Product Page, ADP121 LDO
ADP160	Product Page, ADP160 LDO
WSN Homepage	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.

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