

Ember Quick Start Guide

Development Kit and JumpStart Edition for EM250 and EM260
Systems

13 January 2009
120-4023-000F

EM250

EM260

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About this Guide

Purpose

This document is a step-by-step guide that covers hardware and software installation procedures required to set up an EM250 or EM260 Development Kit with factory default settings. The Ember InSight Desktop provides an easy-to-use and effective way to analyze network traffic on an Ember system.

In addition to your Development Kit, make sure you have the following items available:

- A PC with at least 450MB disk space, an Ethernet connection, and Windows XP installed
- A DHCP server in the network (e.g., from the Ethernet router or network server)

Audience

This document is intended for embedded software engineers who are responsible for developing wireless applications with the Ember Development Kit.

Documentation Conventions



This section only applies to the EM250.



This section only applies to the EM260.

Getting Help

Development Kit customers are eligible for training and technical support. You can use the Ember web site www.ember.com to obtain information about all Ember products and services, and to sign up for product support. You can also contact Ember technical support at support@ember.com.

If you have any questions about your Ember product, contact your Ember account representative at one of the following locations:

United States	47 Farnsworth Street Boston, MA 02210 Telephone: 617-951-0200 Fax: 617-951-0999
Asia/Pacific	HK Spinners Industrial Bldg, Phase 5 5/F Flat D 760-762 Cheung Sha Wan Rd Kowloon Hong Kong Telephone: +852-8120-5375
Europe	Unit 300 Science Park Milton Road Cambridge CB4 0XL, UK Telephone: 44 (0) 1223 423322 Fax: 44 (0) 1223 423390



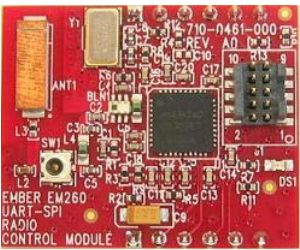
Setting Up the Ember Hardware

Follow these steps to set up the Ember hardware:

- Step 1: Check Kit Contents
- Step 2: Connect the InSight Adapters and RCMs with the InSight Cables
- Step 3: Check the Power Mode of the InSight Adapters
- Step 4: Check the Network Connections
- Step 5: Verify the ISA Has Obtained an IP Address

Step 1: Check Kit Contents

Check that you have the following components in your Ember kit.

Item	Quantity in Development Kit	Quantity in JumpStart Edition
InSight Adapters (ISAs) 	8	3
Radio Communication Modules (RCMs) <div style="display: flex; flex-direction: column; align-items: flex-start;"> <div style="display: flex; align-items: center; margin-bottom: 10px;"> <div style="border: 2px solid red; border-radius: 50%; width: 40px; height: 40px; display: flex; align-items: center; justify-content: center; margin-right: 10px;">EM250</div>  </div> <div style="display: flex; align-items: center;"> <div style="border: 2px solid red; border-radius: 50%; width: 40px; height: 40px; display: flex; align-items: center; justify-content: center; margin-right: 10px;">EM260</div>  </div> </div>	8	3

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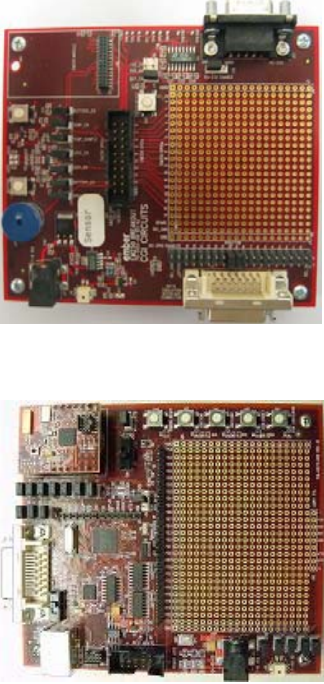


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Item	Quantity in Development Kit	Quantity in JumpStart Edition
<p>Breakout boards</p> 	8	3
<p>Power-over-Ethernet Switch (with power adapter)</p> 	1 (16 ports)	1 (8 ports)
<p>InSight port cables</p> 	8	3

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Item	Quantity in Development Kit	Quantity in JumpStart Edition
Data Emulation Interface (DEI) cables 	8	3
Ethernet cables 	8	3
USB cable 	1	1
Murata Switch Connector Adapter 	1	1

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Item	Quantity in Development Kit	Quantity in JumpStart Edition
AC Power Adapter Kit 	8	3
Non-US AC Adapter Kit for Power over Ethernet Switch 	1	1
Battery packs 	8	3

Step 2: Connect the InSight Adapters and RCMs with the InSight Cables

Connect the InSight adapters and RCMs with InSight cables.



Step 3: Check the Power Mode of the InSight Adapters

On the front panel of the InSight Adapters, make sure the RCM Power Select switch is set to Int.



Step 4: Check the Network Connections

The ISAs and PC should be inside the same IP subnet. The default configuration of the ISA is a DHCP client, which requires the ISA to obtain an IP address from a DHCP server in the network.

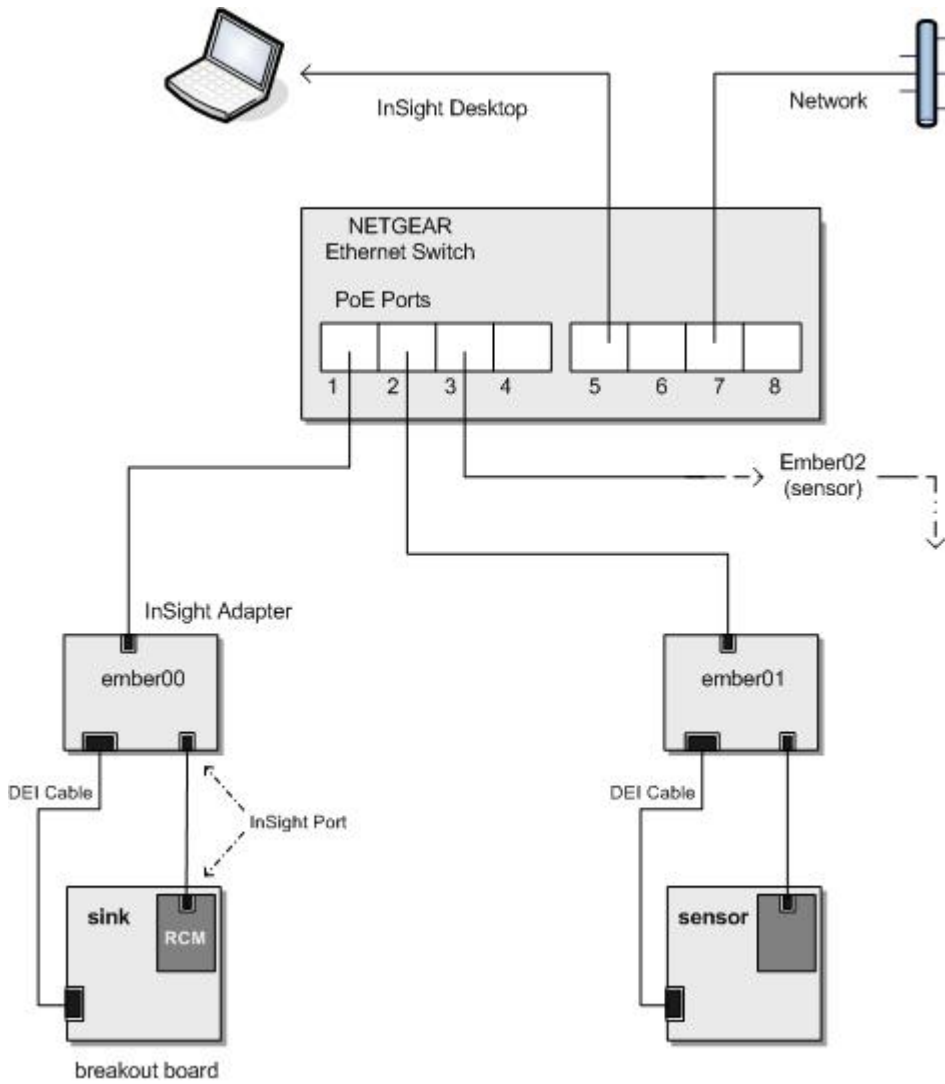
1. Power up the Power-over-Ethernet (PoE) switch.
2. Connect the InSight adapters to one of the PoE Ports of the PoE switch with an Ethernet cable. A green LED on the Ethernet port should be on if it is connected.



3. Connect the PC to the PoE switch's Ethernet port with an Ethernet cable. The Ethernet port's green LED should be on if it is connected.
4. Configure the PC's Ethernet port to obtain an IP address automatically.
5. Connect the Ethernet port's PoE switch to the DHCP server.

Figure 1 illustrates these network connections.

Figure 1. Diagram of the network connections



Step 5: Verify the ISA Has Obtained an IP Address

A steady green LED and a flashing red LED verifies that the ISA has obtained an IP address.



Refer to the “Troubleshooting and Further Reading” section if you do not see this LED pattern.

Installing the Software

Follow these steps to install the software:

- Step 1: Download and Install the Java Runtime Environment
- Step 2: Install InSight Desktop
- Step 3: Install Other Software
- Step 4: Locate Ember Software Serial Number

Step 1: Download and Install the Java Runtime Environment

Running InSight Desktop requires the installation of the Java Runtime Environment (JRE). InSight Desktop runs on JRE version 1.5 or above. You can download JRE updates from the following site:

<http://java.sun.com/javase/downloads/index.jsp>

Step 2: Install InSight Desktop

From the Development Kit installation CD, run ISD_1.3b30.exe.

Note: Your filename may reflect a newer ISD build number.

Step 3: Install Other Software

You must install the following software for compiling firmware:



Run xIDE_EM250_1.5.2.exe. (Note: your filename may reflect a newer build number.)



Install the 30-day evaluation copy of IAR Embedded Workbench, using the supplied IAR CD.

Note: The RCMs in the Development Kit are pre-loaded with a sink-sensor demo application. For instructions on installing and using that application, refer to the appropriate *User Guide* for your Ember platform.

Step 4: Locate Ember Software Serial Number

Locate the Ember Software Serial Number card supplied with your Development Kit. Refer to the appropriate *User Guide* for your Ember platform for more information. You will need to include the 20-digit serial number with your license request.

Capturing Network Traffic

Follow these steps to capture network traffic:

- Step 1: Start InSight Desktop
- Step 2: Connect Adapters in ISD
- Step 3: Start Capturing in ISD
- Step 4: Press Button 0 on Sink Device to Allow Join
- Step 5: Press Button 0 on Sensor Device to Join Network
- Step 6: Review Traffic Captured

Step 1: Start InSight Desktop

Double-click the ISD icon on the desktop to start InSight Desktop and verify that the nodes are powered on.

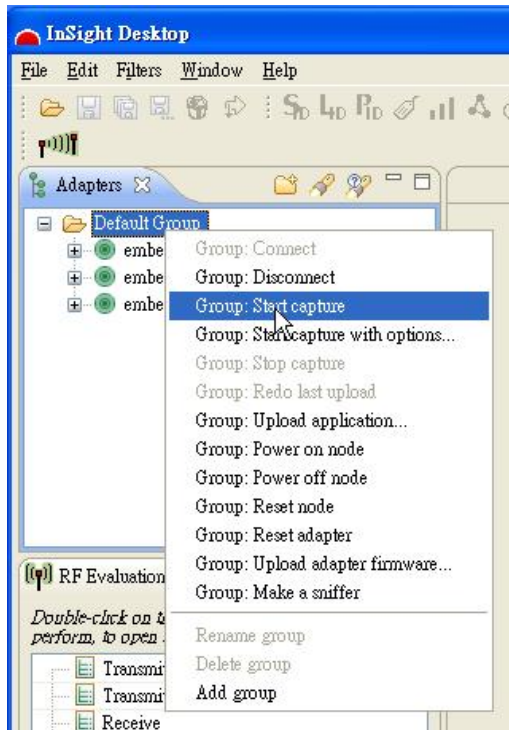
Step 2: Connect Adapters in ISD

Right-click on Default Group, then click on Group: Connect to connect all the InSight Adapters.

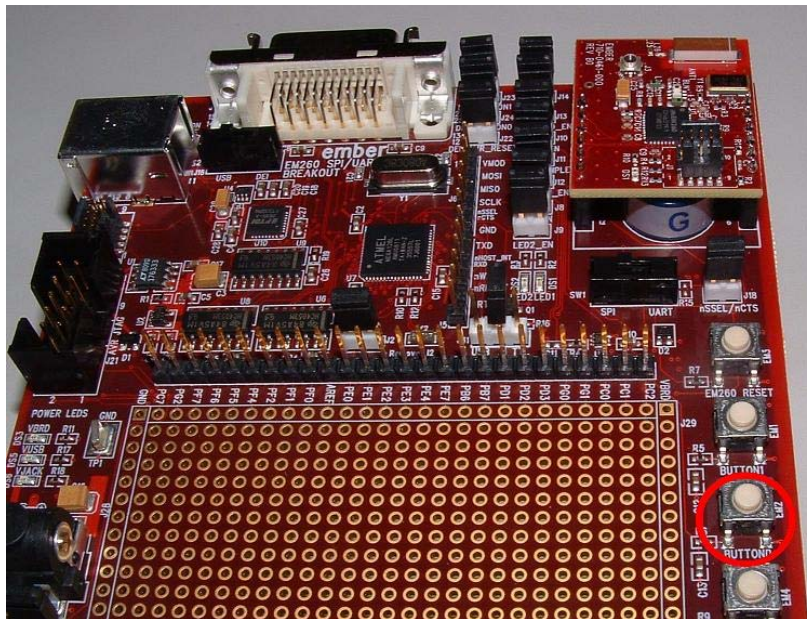
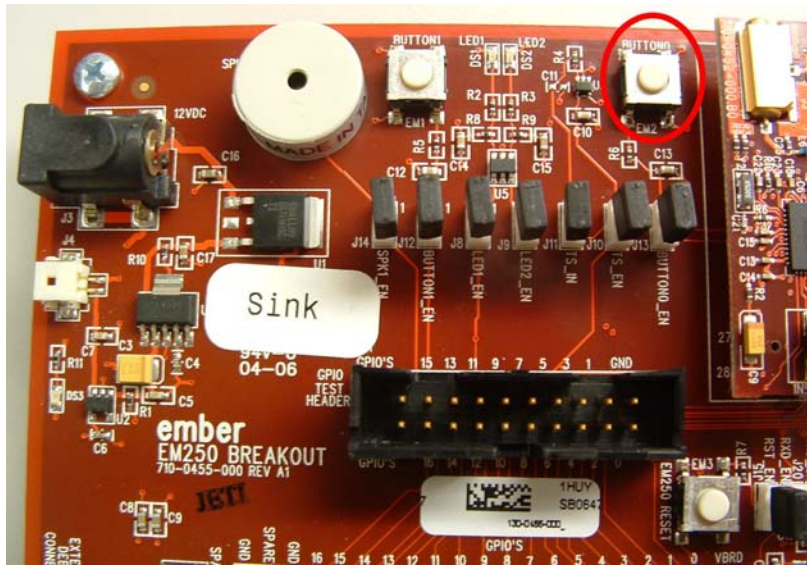


Step 3: Start Capturing in ISD

Right-click on Default Group, then click on Group: Start capture to start capturing from all nodes. The green circle icons turn to yellow arrows when the nodes start capturing network traffic.

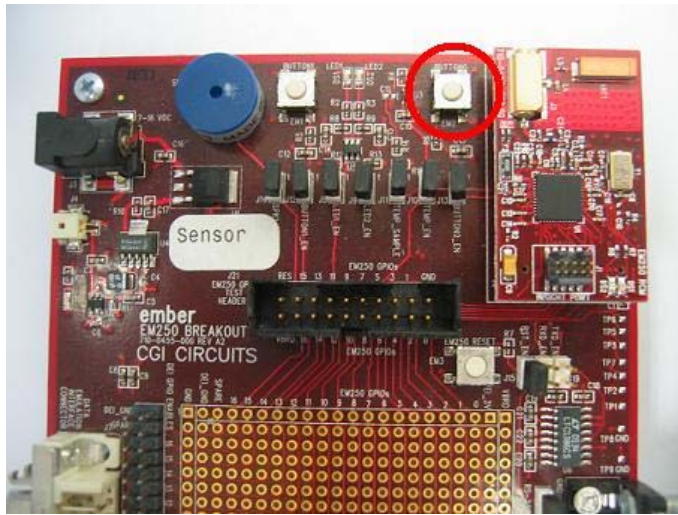


Step 4: Press Button 0 on Sink Device to Allow Join

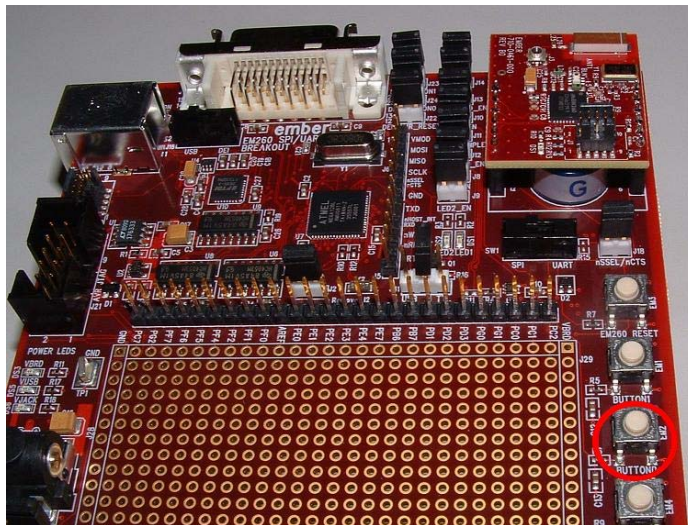


Step 5: Press Button 0 on Sensor Device to Join Network

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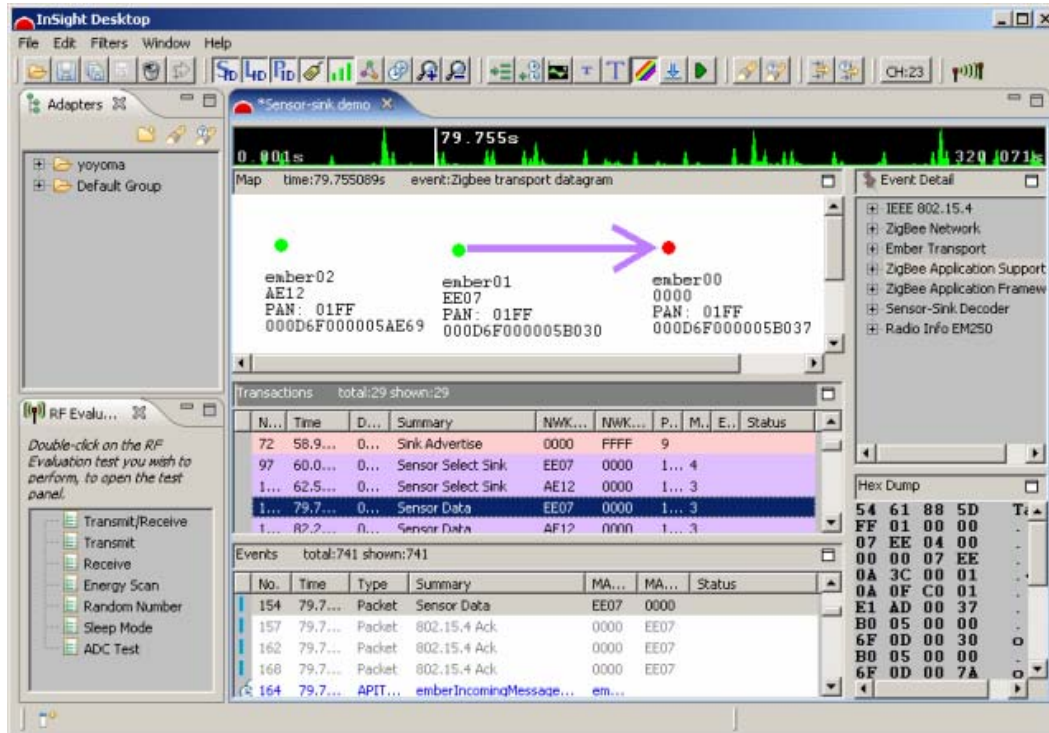
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Step 6: Review Traffic Captured

You should see a screen like the one in Figure 2 from after capturing traffic. This screen shows the over-the-air traffic between the sensor and sink nodes.

Figure 2. ISD Capture Screen



Congratulations, you are operating a ZigBee network and capturing the network traffic for viewing and analysis!

Troubleshooting and Further Reading

For more details on operation and troubleshooting, refer to the appropriate *User Guide* for your Ember platform: 120-4024-000 for the EM250 and 120-4027-000 for the EM260.

For more information about application development with the Ember system, please refer to the *EmberZNet Application Developer's Guide* (120-4028-000) or the *EmberZNet Application Developer's Reference Manual* (120-3021-000).