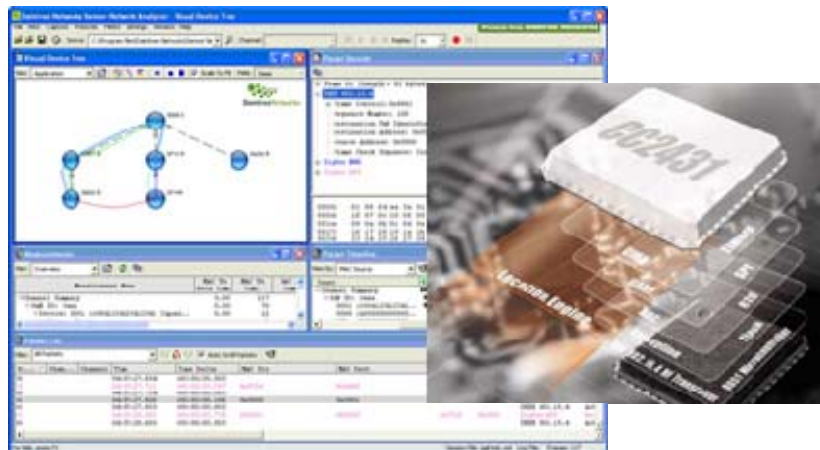


# Daintree Networks Sensor Network Analyzer Firmware Guide for TI's CC2430 and CC2431



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Sensor Network Analyzer Release 2.3 (2008-03-27)

## Available firmware

Daintree's Sensor Network Analyzer (SNA) includes a number of firmware files specifically for use with TI's CC2430 and CC2431 modules. This guide describes the functionality and settings for each of these firmware files:

### Locating and OAD firmware

- [Locating node firmware for OAD from the SNA:](#)
  - TI-2430-ZBv2sp1-R-LocRef-OAD\_20080612r5.bin (Reference node)
  - TI-2430-ZBv2sp1-R-LocRef-OAD\_20080612r6.bin (Reference node)
  - TI-2431-ZBv2sp1-R-LocBlind-OAD\_20080612r5.bin (Blind node)
  - TI-2431-ZBv2sp1-R-LocBlind-OAD\_20080612r6.bin (Blind node)
- [Locating node firmware for flashing from TI's Flash Programmer:](#)
  - TI-2430-ZBv2sp1-R-LocRef-OAD\_20080612r5.hex (Reference node)
  - TI-2430-ZBv2sp1-R-LocRef-OAD\_20080612r6.hex (Reference node)
  - TI-2431-ZBv2sp1-R-LocBlind-OAD\_20080612r5.hex (Blind node)
  - TI-2431-ZBv2sp1-R-LocBlind-OAD\_20080612r6.hex (Blind node)

### Home Automation firmware

- [Home Automation Light \(with Groups\) for flashing from TI's Flash Programmer:](#)
  - TI-2430-ZBv2sp1-R-HA-OnOffLight-20080612r4.hex (Router)
  - TI-2430-ZBv2sp1-RC-HA-OnOffLight-20080808r6.hex (Coordinator-capable Router)
- [Home Automation Switch \(with source bindings\) for flashing from TI's Flash Programmer:](#)
  - TI-2430-ZBv2sp1-ED-HA-OnOffSwitch-20080612r5.hex (End Device)
  - TI-2430-ZBv2sp1-R-HA-OnOffSwitch-20080612r4.hex (Router)

### Notes:

- OTA Upgrades required the TI CC2430/CC2431 SoC (System on a Chip) with the following: Rev D or later (that is, those with a date group of 0642 or later) and OAD (Over the Air Download) Flash Board 1.0.
- For more information about the functionality of **Over the Air Download (OAD)** firmware, refer to the Daintree Networks application note AN017, *Updating firmware over-the-air using TI's SoC and Daintree's SNA*.
- For more information about the functionality of **Locating** node firmware, refer to the Daintree Networks application note AN016, *Locating ZigBee nodes using TI's CC2431 location engine and Daintree's SNA*.
- For more information about (and to download) **TI's Flash Programmer**, visit [zigbee.ti.com](http://zigbee.ti.com) and select **Downloads > CC2430 or CC2431** (depending on which you are using) **> Tools and Software > Chipcon Flash Programmer**.

## Locating node firmware used for OAD from the SNA

Firmware for Locating Nodes used for OAD (Over the Air Downloads) from the Sensor Network Analyzer (SNA):

- [Locating Reference Node firmware for OAD from the SNA](#)
- [Locating Blind Node firmware for OAD from the SNA](#)

See "Notes" on page 3 to find out more about Locating and OAD.

### Locating Reference Node firmware for OAD from the SNA

There are two firmware files provided:

- TI-2430-ZBv2sp1-R-LocRef-OAD\_20080612r5.bin
- TI-2430-ZBv2sp1-R-LocRef-OAD\_20080612r6.bin

The table below shows the features and settings for these files, most of which are common. Any variations are highlighted in **red** for easy identification.

<b>Locating Reference Node</b>	<ul style="list-style-type: none"> <li>• Security = None</li> <li>• Hardware = TI Battery boards with CC2430 or CC2431</li> </ul>
<b>Over the Air Download (OAD)</b>	<ul style="list-style-type: none"> <li>• Daintree Image version = <ul style="list-style-type: none"> <li>○ <b>Ox0005</b> for TI-2430-ZBv2sp1-R-LocRef-OAD_20080612r5.bin</li> <li>○ <b>Ox0006</b> for TI-2430-ZBv2sp1-R-LocRef-OAD_20080612r6.bin</li> </ul> </li> <li>• Daintree Manufacturer id = 0x103A</li> <li>• Daintree Product id = 0x00AD</li> </ul>
<b>Commissioning</b>	<ul style="list-style-type: none"> <li>• Extended PAN id = 0x0050c27710000000</li> <li>• Channels = 0x07FFF800 // all channel # Preferred Channels = 11, 14, 15, 19, 20, 24, 25</li> <li>• In Clusters # Commissioning # Basic</li> <li>• Out Cluster # Basic</li> <li>• Functionality: During network join the LED D1 is flashed until it is joined to a network or is flashing slower if join failed. Reset to default settings is done by pressing (or holding down) button S1 during joining and the LED is on for 3 sec if reset has been done. When forming a new network, or scanning to join a network, the devices scans the channels using the Preferred Channels before scanning the rest of the channels in order to avoid the most commonly used WiFi channels and to improve the user experience during installation.</li> </ul>
<b>ZDO Optional features</b>	<ul style="list-style-type: none"> <li>• Mgmt_Lqi_rsp</li> <li>• Mgmt_Leave_rsp</li> <li>• Mgmt_Permit_Joining_rsp</li> </ul>

## Locating Blind Node firmware for OAD from the SNA

There are two firmware files provided:

- TI-2431-ZBv2sp1-R-LocBlind-OAD\_20080612r5.bin
- TI-2431-ZBv2sp1-R-LocBlind-OAD\_20080612r6.bin

The table below shows the features and settings for these files, most of which are common. Any variations are highlighted in **red** for easy identification.

<b>Locating Blind Node</b>	<ul style="list-style-type: none"> <li>• Security = None</li> <li>• Hardware = TI Battery boards with CC2431</li> </ul>
<b>Over the Air Download(OAD)</b>	<ul style="list-style-type: none"> <li>• Daintree Image version = <ul style="list-style-type: none"> <li>○ <b>0x0005</b> for TI-2431-ZBv2sp1-R-LocBlind-OAD_20080612r5.bin</li> <li>○ <b>0x0006</b> for TI-2431-ZBv2sp1-R-LocBlind-OAD_20080612r6.bin</li> </ul> </li> <li>• Daintree Manufacturer id = 0x103A</li> <li>• Daintree Product id = 0x10AD</li> </ul>
<b>Commissioning</b>	<ul style="list-style-type: none"> <li>• Extended PAN id = 0x0050c27710000000</li> <li>• Channels = 0x07FFF800 // all channel # Preferred Channels = 11, 14, 15, 19, 20, 24, 25</li> <li>• In Clusters # Commissioning # Basic</li> <li>• Out Cluster # Basic</li> <li>• Functionality: During network join the LED D1 is flashed until it is joined to a network or is flashing slower if join failed. Reset to default settings is done by pressing (or holding down) button S1 during joining and the LED is on for 3 sec if reset has been done. When forming a new network, or scanning to join a network, the devices scans the channels using the Preferred Channels before scanning the rest of the channels in order to avoid the most commonly used WiFi channels and to improve the user experience during installation.</li> </ul>
<b>ZDO Optional features</b>	<ul style="list-style-type: none"> <li>• Mgmt_Lqi_rsp</li> <li>• Mgmt_Leave_rsp</li> <li>• Mgmt_Permit_Joining_rsp</li> </ul>

## Locating node firmware used for flashing from TI's Flash Programmer

Firmware for Locating Nodes used for flashing from TI's Flash Programmer:

- [Locating Reference Node firmware for flashing from TI's Flash Programmer](#)
- [Locating Blind Node firmware for flashing from TI's Flash Programmer](#)

See "Notes" on page 3 to find out more about Locating and OAD.

### Locating Reference Node firmware for flashing from TI's Flash Programmer

There are two firmware files provided:

- TI-2430-ZBv2sp1-R-LocRef-OAD\_20080612r5.hex
- TI-2430-ZBv2sp1-R-LocRef-OAD\_20080612r6.hex

The table below shows the features and settings for these files, most of which are common. Any variations are highlighted in **red** for easy identification.

<b>Locating Reference Node</b>	<ul style="list-style-type: none"> <li>• Security = None</li> <li>• Hardware = TI Battery boards with CC2430 or CC2431</li> </ul>
<b>Over the Air Download(OAD)</b>	<ul style="list-style-type: none"> <li>• Daintree Image version = <ul style="list-style-type: none"> <li>○ <b>Ox0005</b> for TI-2430-ZBv2sp1-R-LocRef-OAD_20080612r5.hex</li> <li>○ <b>Ox0006</b> for TI-2430-ZBv2sp1-R-LocRef-OAD_20080612r6.hex</li> </ul> </li> <li>• Daintree Manufacturer id = 0x103A</li> <li>• Daintree Product id = 0x00AD</li> </ul>
<b>Commissioning</b>	<ul style="list-style-type: none"> <li>• Extended PAN id = 0050c27710000000</li> <li>• Channels = 0x07FFF800 // all channel # Preferred Channels = 11, 14, 15, 19, 20, 24, 25</li> <li>• In Clusters # Commissioning # Basic</li> <li>• Out Cluster # Basic</li> <li>• Functionality: During network join the LED D1 is flashed until it is joined to a network or is flashing slower if join failed. Reset to default settings is done by pressing (or holding down) button S1 during joining and the LED is on for 3 sec if reset has been done. When forming a new network, or scanning to join a network, the devices scans the channels using the Preferred Channels before scanning the rest of the channels in order to avoid the most commonly used WiFi channels and to improve the user experience during installation.</li> </ul>
<b>ZDO Optional features</b>	<ul style="list-style-type: none"> <li>• Mgmt_Lqi_rsp</li> <li>• Mgmt_Leave_rsp</li> <li>• Mgmt_Permit_Joining_rsp</li> </ul>

## Locating Blind Node firmware for flashing from TI's Flash Programmer

There are two firmware files provided:

- TI-2431-ZBv2sp1-R-LocBlind-OAD\_20080612r5.hex
- TI-2431-ZBv2sp1-R-LocBlind-OAD\_20080612r6.hex

The table below shows the features and settings for these files, most of which are common. Any variations are highlighted in **red** for easy identification.

<b>Locating Blind Node</b>	<ul style="list-style-type: none"> <li>• Security = None</li> <li>• Hardware = TI Battery boards with CC2431</li> </ul>
<b>Over the Air Download(OAD)</b>	<ul style="list-style-type: none"> <li>• Daintree Image version = <ul style="list-style-type: none"> <li>○ <b>0x0005</b> for TI-2431-ZBv2sp1-R-LocBlind-OAD_20080612r5.hex</li> <li>○ <b>0x0006</b> for TI-2431-ZBv2sp1-R-LocBlind-OAD_20080612r6.hex</li> </ul> </li> <li>• Daintree Manufacturer id = 0x103A</li> <li>• Daintree Product id = 0x10AD</li> </ul>
<b>Commissioning</b>	<ul style="list-style-type: none"> <li>• Extended PAN id = 0x0050c27710000000</li> <li>• Channels = 0x07FFF800 // all channel # Preferred Channels = 11, 14, 15, 19, 20, 24, 25</li> <li>• In Clusters # Commissioning # Basic</li> <li>• Out Cluster # Basic</li> <li>• Functionality: During network join the LED D1 is flashed until it is joined to a network or is flashing slower if join failed. Reset to default settings is done by pressing (or holding down) button S1 during joining and the LED is on for 3 sec if reset has been done. When forming a new network, or scanning to join a network, the devices scans the channels using the Preferred Channels before scanning the rest of the channels in order to avoid the most commonly used WiFi channels and to improve the user experience during installation.</li> </ul>
<b>ZDO Optional features</b>	<ul style="list-style-type: none"> <li>• Mgmt_Lqi_rsp</li> <li>• Mgmt_Leave_rsp</li> <li>• Mgmt_Permit_Joining_rsp</li> </ul>

## Home Automation Light (with Groups included) used for flashing from TI's Flash Programmer

Firmware for Home Automation Light (with Groups Included) used for flashing from TI's Flash Programmer. (See "Notes" on page 3 to find out more about TI's Flash Programmer.)

There are two firmware files provided. Select the file to use based on whether routers are *coordinator-capable*:

- TI-2430-ZBv2sp1-R-HA-OnOffLight-20080612r4.hex (Router)
- TI-2430-ZBv2sp1-RC-HA-OnOffLight-20080808r6.hex (Coordinator-capable Router)

The table below shows the features and settings for these files, all of which are common between the two files.

<b>Home Automation Light</b>	<ul style="list-style-type: none"> <li>• Security = Network Layer</li> <li>• In Clusters <ul style="list-style-type: none"> <li># Groups</li> <li># ON/OFF</li> </ul> </li> <li>• Hardware = TI Battery boards with CC2430 or CC2431</li> <li>• Functionality: LED D1 is turned on and off.</li> </ul>
<b>Commissioning</b>	<ul style="list-style-type: none"> <li>• Extended PAN id = 0x0050c27710000000</li> <li>• Channels = 0x07FFF800 // all channel <ul style="list-style-type: none"> <li># Preferred Channels = 11, 14, 15, 19, 20, 24, 25</li> </ul> </li> <li>• In Clusters <ul style="list-style-type: none"> <li># Commissioning</li> <li># Basic</li> </ul> </li> <li>• Out Cluster <ul style="list-style-type: none"> <li># Basic</li> </ul> </li> <li>• Functionality: During network join the LED D1 is flashed until it is joined to a network or is flashing slower if join failed. Reset to default settings is done by pressing (or holding down) button S1 during joining and the LED is on for 3 sec if reset has been done.  <p>When forming a new network, or scanning to join a network, the devices scans the channels using the Preferred Channels before scanning the rest of the channels in order to avoid the most commonly used WiFi channels and to improve the user experience during installation.</p> </li> </ul>
<b>ZCL ON/OFF</b>	<ul style="list-style-type: none"> <li>• ON</li> <li>• OFF</li> <li>• TOGGLE</li> </ul>
<b>ZCL Groups</b>	<ul style="list-style-type: none"> <li>• Add</li> <li>• View</li> <li>• Get Membership</li> <li>• Remove</li> <li>• Remove All</li> <li>• Add If Identifying</li> </ul>

<b>ZDO Optional features</b>	<ul style="list-style-type: none"> <li>• NWK_addr_req</li> <li>• Mgmt_Lqi_rsp</li> <li>• Mgmt_Leave_rsp</li> <li>• Mgmt_Permit_Joining_rsp</li> </ul>
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## Home Automation Switch (with source bindings included) used for flashing from TI's Flash Programmer

Firmware for Home Automation Switch (with source bindings Included) used for flashing from TI's Flash Programmer. (See "Notes" on page 3 to find out more about TI's Flash Programmer.)

There are two firmware files provided. Select the file to use based on whether devices are *end devices* or *routers*:

- TI-2430-ZBv2sp1-ED-HA-OnOffSwitch-20080612r5.hex (End Device)
- TI-2430-ZBv2sp1-R-HA-OnOffSwitch-20080612r4.hex (Router)

The table below shows the features and settings for these files, most of which are common. Any variations are highlighted in **red** for easy identification.

<b>Home Automation Switch</b>	<ul style="list-style-type: none"> <li>• Security = Network Layer</li> <li>• <b>Receiver on when idle</b> (only for end devices: TI-2430-ZBv2sp1-ED-HA-OnOffSwitch-20080612r5.hex)</li> <li>• Out Cluster # ON/OFF</li> <li>• Hardware = TI Battery boards with CC2430 or CC2431</li> <li>• Source binding</li> <li>• Functionality: When pressing button S1 group toggle HA messages or unicast toggle HA messages are sent over the air. To toggle between groups and unicast messages hold button S1 until LED D1 is flashed.</li> </ul>
<b>Commissioning</b>	<ul style="list-style-type: none"> <li>• Extended PAN id = 0x0050c27710000000</li> <li>• Channels = 0x07FFF800 // all channel # Preferred Channels = 11, 14, 15, 19, 20, 24, 25</li> <li>• In Clusters # Commissioning # Basic</li> <li>• Out Cluster # Basic</li> <li>• Functionality: During network join the LED D1 is flashed until it is joined to a network or is flashing slower if join failed. Reset to default settings is done by pressing (or holding down) button S1 during joining and the LED is on for 3 sec if reset has been done. When forming a new network, or scanning to join a network, the devices scans the channels using the Preferred Channels before scanning the rest of the channels in order to avoid the most commonly used WiFi channels and to improve the user experience during installation.</li> </ul>

<p><b>ZCL ON/OFF</b></p>	<ul style="list-style-type: none"> <li>• ON</li> <li>• OFF</li> <li>• TOGGLE</li> </ul>
<p><b>ZDO Optional features</b></p>	<ul style="list-style-type: none"> <li>• Bind_req</li> <li>• Bind_rsp</li> <li>• Unbind_req</li> <li>• Unbind_rsp</li> <li>• NWK_addr_req</li> <li>• IEEE_addr_req</li> <li>• Mgmt_Bind_req</li> <li>• Mgmt_Lqi_rsp</li> <li>• Mgmt_Leave_rsp</li> <li>• Mgmt_Permit_Joining_rsp</li> </ul>