

APPLICATION NOTE



SCA11H FIRMWARE UPDATE METHODS

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1 Overview

SCA11H (BSN, BCG Sensor Node) firmwares can be upgraded using three different methods:

1. Upgrade via configuration web page
2. Upgrade via HTTP API
3. Upgrade via cloud server

Firmware files:

| Target | Binary file name | Description |
|--------------------|------------------------|---------------------------------|
| SCA10H + SCA11H | BCG_Sensor_X.X.X.X.txt | BCG algorithm firmware* |
| SCA11H | TypeAAF_APP_FW.bin | Main firmware* |
| SCA11H | TypeAAF_DCT_FW.bin | Data control table (DCT) |
| SCA11H | TypeAAF_Web_FW.bin | File system (FS) |
| SCA11H | TypeAAF_All_FW.bin | BSN firmwares (main + DCT + FS) |

*This firmware can be used when updating via cloud server

2 Upgrade via configuration web page

Set BSN to configuration mode. Instructions can be found in APP 2077 SCA11H Installation Guide.

To upgrade firmware via configuration web page, follow next steps:

1. Go to System Info tab in the configuration web page
2. Click Management
3. If updating BSN firmwares: click "Choose file" (depends on OS language) and after choosing valid FW file click "Upgrade BSN firmware image". Reboot device.
4. If updating BCG algorithm firmware: click "Choose file" (depends on OS language) and after choosing valid FW file click "Upgrade BCG firmware image". Reboot device.

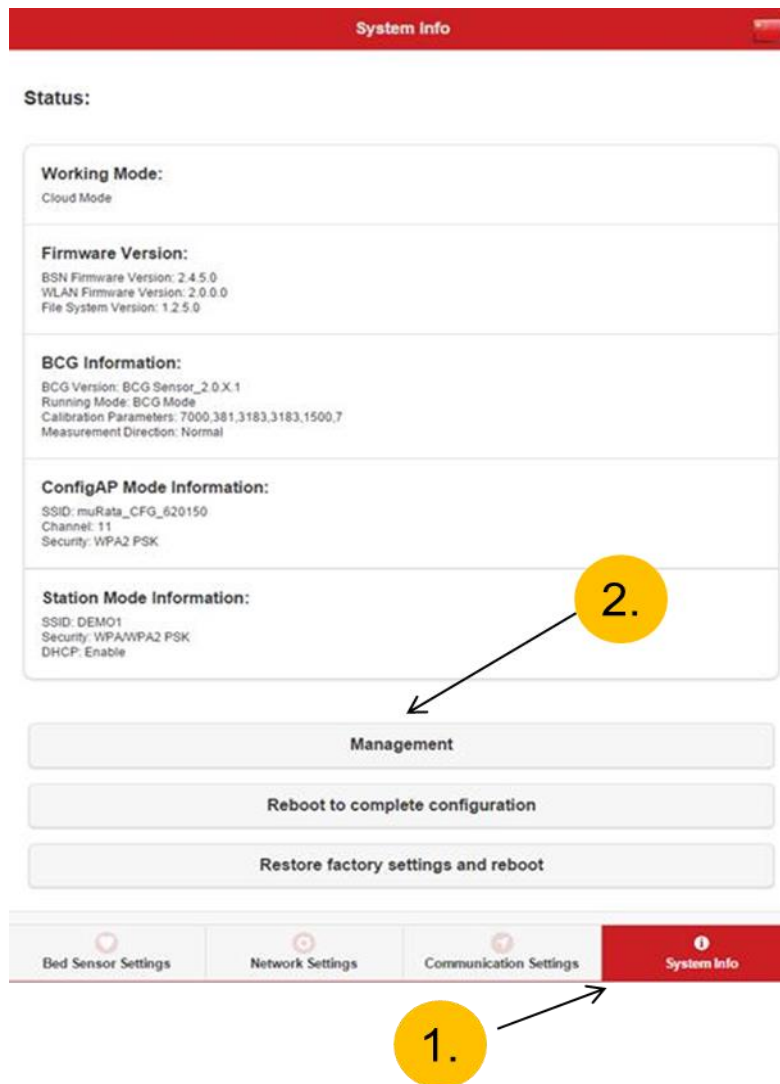


Figure 1 System info tab

The screenshot displays a web interface for device management. At the top, there is a red navigation bar with a 'Back' button. Below this, the 'Access Authentication' section shows the username 'admin' and a 'Change Password' button. The 'Automatic Firmware Upgrade' section has a checked option 'Enable automatic firmware upgrade (recommended)' and 'Cancel' and 'Apply' buttons. The 'BSN Firmware Upgrade' section is circled in red and contains a 'Choose BSN firmware image' label, a 'Choose File' button, and an 'Upgrade BSN firmware image' button. A yellow circle with the number '3.' points to the 'Apply' button in the 'Automatic Firmware Upgrade' section and the 'Upgrade BSN firmware image' button. The 'BCG Firmware Upgrade' section is also circled in red and contains a 'Choose BCG firmware image' label, a 'Choose File' button, and an 'Upgrade BCG firmware image' button. A yellow circle with the number '4.' points to the 'Apply' button in the 'Automatic Firmware Upgrade' section and the 'Upgrade BCG firmware image' button. The 'WLAN Country Code' section shows 'Channels 1-11 US, Canada, Mexico, etc.' and 'Cancel' and 'Apply' buttons. At the bottom, there is a navigation bar with 'Bed Sensor Settings', 'Network Settings', 'Communication Settings', and 'System Info' (highlighted in red).

Figure 2 Management page - BSN and BCG Firmware Upgrade

3 Upgrade via HTTP API

Firmware can be upgraded via HTTP API. More information can be found in “SCA11H Hostless WLAN HTTP API Specification” sections “System Upgrade Firmware” and “BCG Upgrade Firmware”.

This chapter contains Python 3.5 examples to upgrade BCG and BSN firmware. If device is in configuration mode, use URL 'http://192.168.253.1'. In local/cloud mode, use device IP.

```
import urllib.request
import base64

username = 'admin'
password = 'admin'

ip = 'http://192.168.253.1'
path = ''
headers = {'Authorization': 'Basic ' +
base64.b64encode((username + ':' + password).encode('utf-8')).decode()}

print("Opening firmware file...")
f = open('BCG_Sensor_3.0.0.0.txt','rb')
fwData = f.read()

print("Uploading firmware. Please wait...")
path = '/bcg/fwupd'
request = urllib.request.Request(ip+path, fwData, headers)
result = urllib.request.urlopen(request)
response = result.read().decode('utf-8')
print("Result: %s" %(response))

print("Rebooting the device...")
path = '/sys/cmd'
cmd = '{"cmd": "reboot"}'.encode('utf-8')
request = urllib.request.Request(ip+path, cmd, headers)
result = urllib.request.urlopen(request)

print("Disconnected")
```

Figure 3 BCG algorithm firmware example

```
import urllib.request
import base64

username = 'admin'
password = 'admin'

ip = 'http://192.168.253.1'
path = ''
headers = {'Authorization': 'Basic ' +
base64.b64encode((username + ':' + password).encode('utf-8')).decode()}

print("Opening firmware file...")
f = open('TypeAAF_All_FW.bin','rb')
fwData = f.read()

print("Uploading firmware. Please wait...")
path = '/sys/fwupd'
request = urllib.request.Request(ip+path, fwData, headers)
result = urllib.request.urlopen(request)
response = result.read().decode('utf-8')
print("Result: %s" %(response))

print("Rebooting the device...")
path = '/sys/cmd'
cmd = '{"cmd": "reboot"}'.encode('utf-8')
request = urllib.request.Request(ip+path, cmd, headers)
result = urllib.request.urlopen(request)

print("Disconnected")
```

Figure 4 BSN main firmware example

4 Upgrade via cloud server

BSN supports automatic firmware upgrade via cloud server. Figure 5 presents the principle of firmware upgrade. More information can be found in “SCA11H cloud server interface specification” section “Firmware upgrade”.

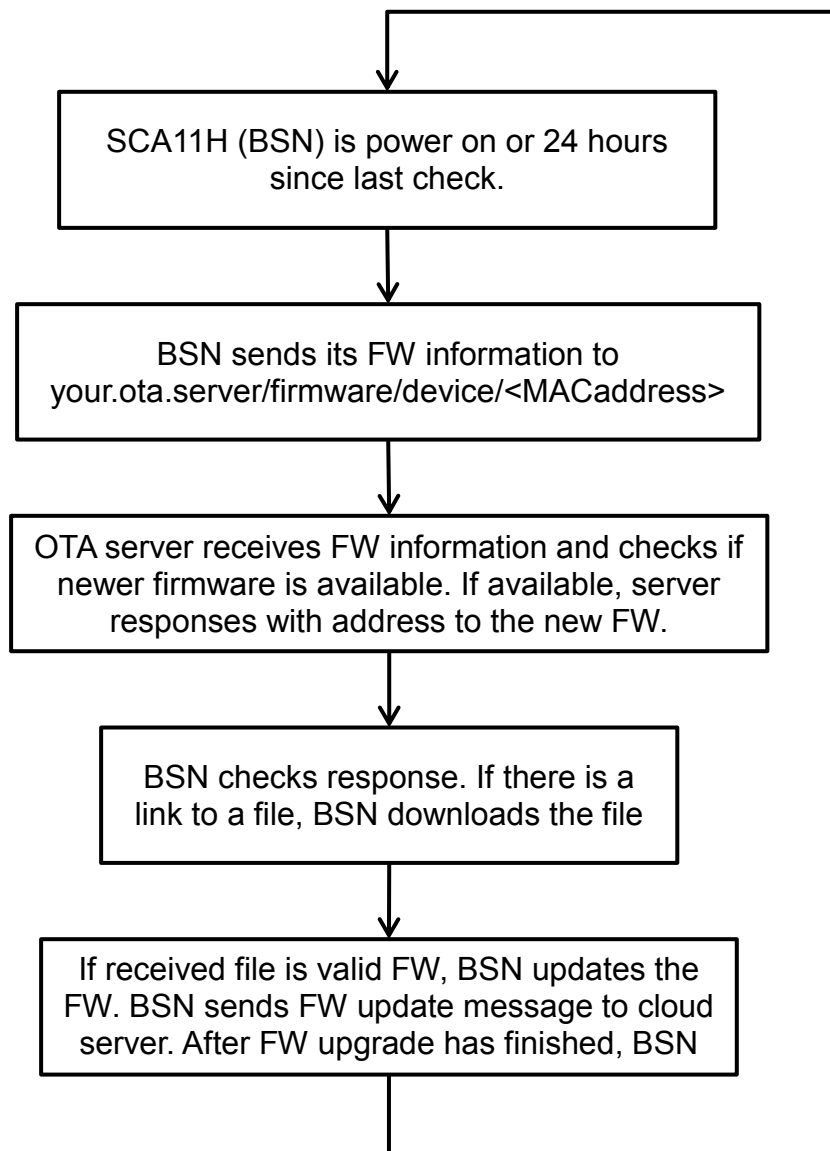


Figure 5 Firmware upgrade flow chart

Enabling automatic FW upgrade via configuration web page:

1. Go to System Info tab in the configuration web page
2. Click Management
3. Click "Enable automatic firmware upgrade (recommended)"
4. Configure your own OTA server URL, username and password

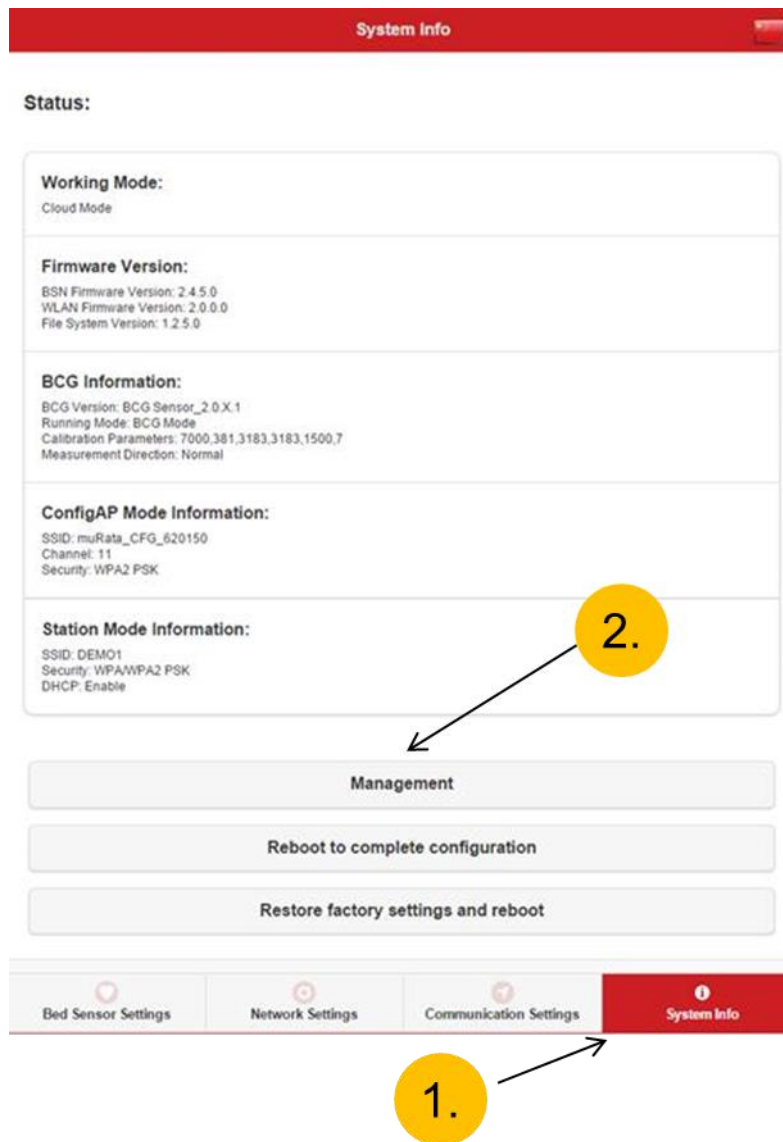


Figure 6 System info tab

Access Authentication:
Username: admin
Change Password

Automatic Firmware Upgrade:
 Enable automatic firmware upgrade (recommended) **3.**
OTA Server URL: your.ota.server **4.**
OTA Server Username: user
Change Password
Cancel Apply

BSN Firmware Upgrade:
Choose BSN firmware image
Choose File No file chosen
Upgrade BSN firmware image

BCG Firmware Upgrade:
Choose BCG firmware image
Choose File No file chosen
Upgrade BCG firmware image

WLAN Country Code:
Channels 1-11 US, Canada, Mexico, etc.
Cancel Apply

Bed Sensor Settings Network Settings Communication Settings **System Info**

Figure 7 Management page - OTA server settings

5 Change Control

| Rev. | Date | Change Description |
|------|-----------|--------------------|
| 1 | 17-May-16 | First version. |
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