SC833F, SC832AF Open Source BLE 5.2 Sensors

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OpenSource with Market Ready Enclosure

SC833F wireless sensor and SC833AF beacon support Bluetooth 5.2, Thread, or Zigbee radio protocols. They are in market ready enclosure and pre-certified. OpenSource codes are available to expedite your firmware development.

- Supports BLE 5.1 directional finding
- Supports BLE 5.2, 802.15.4 radio protocols
- Supports BLE 5.0 long range or CODED-PHY.
- BC833F with AMS ENS 210 temperature and humidity sensor, and ST Micro LIS3DH 3-axis motion sensor.
- Preloaded with iBeacon and Eddystone

SE832AF-210 BLE 5 Sensor

SE832AF integrates BT832AF Bluetooth 5 module with AMS ENS210 temperature and humidity sensor. It is a low power, low cost, long range sensor.m

Miscellaneous

- Sensor size: 60x60x22 mm.
- Includes a wall mount bracket.

Development Kit

A Development Kit (DK) includes a 10-pin J-Link connector and cable. Loading program into a DK is much easier. We recommend using DKs for small volume deployment.

Nordic nRF52 Development Environment

Nordic nRF52 development environment is used to develop BT832AF, BT840F/X codes. Open source codes are available

http://www.fanstel.com/download-opensource/

Wireless Sensor Summaries

	SC833F	SC833AF
BLE module	BM833F	BM833AF
Radio protocols	Bluetooth, Thread, Zigbee	Bluetooth, Thread, Zigbee
Power supply	CR2032, not included	CR2032, not included
Temperature, humidity sensor	AMS ENS 210	None
Motion sensor	ST Micro LIS3DH	None
QDID		

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1. Introduction

SE840F Series wireless sensors Fanstel long range wireless module BT840F, BT840X, or BT832AF and an AMS ENS210 temperature and humidity sensors. All products are referred as SE840F Series in this user's manual.

SE840F integrates BT840F (nRF52840) module with 2300 meter range at 125 Kbps. SE840X integrates BT840X (nRF52840 + SKY66112 PA) with >4500 meter range at 125 Kbps.

SE832AF uses long range lost cost module, BT832AF. It supports Bluetooth 5 radio protocol but not Thread or Zigbee.

2. Hardware Description

The same host board design is used for all wireless sensors and development kits. Additional connector is installed. 10-pin J-Link cable is included for connection to a Nordic development Kit.

You can load codes into SE840F by using a Tag Connect cable.

You can download DK-SE840F development kit schematics from this webpage.

https://www.fanstel.com/download-opensource

SE840F, SE840X, and SE832AF use the same enclosure and host PCB. The only difference is Bluetooth 5 module installed. Sensor can be desk mounted. A wall mount bracket in included for wall mounting.

Additional external hardwire features:

- A battery compartment for 2 AAA batteries.
- Two user definable LED indicators, red and blue.
- A micro USB connector for powering sensor
- A push button for OTA DFU.

Size of gateway is 60x60x22mm.

SC833AF

SC833AF contains an nRF52811 BLE 5.1 module BT833AF with an integrated high performance PCB antenna. It is powered by a CR2032 battery (not included).

SC833F

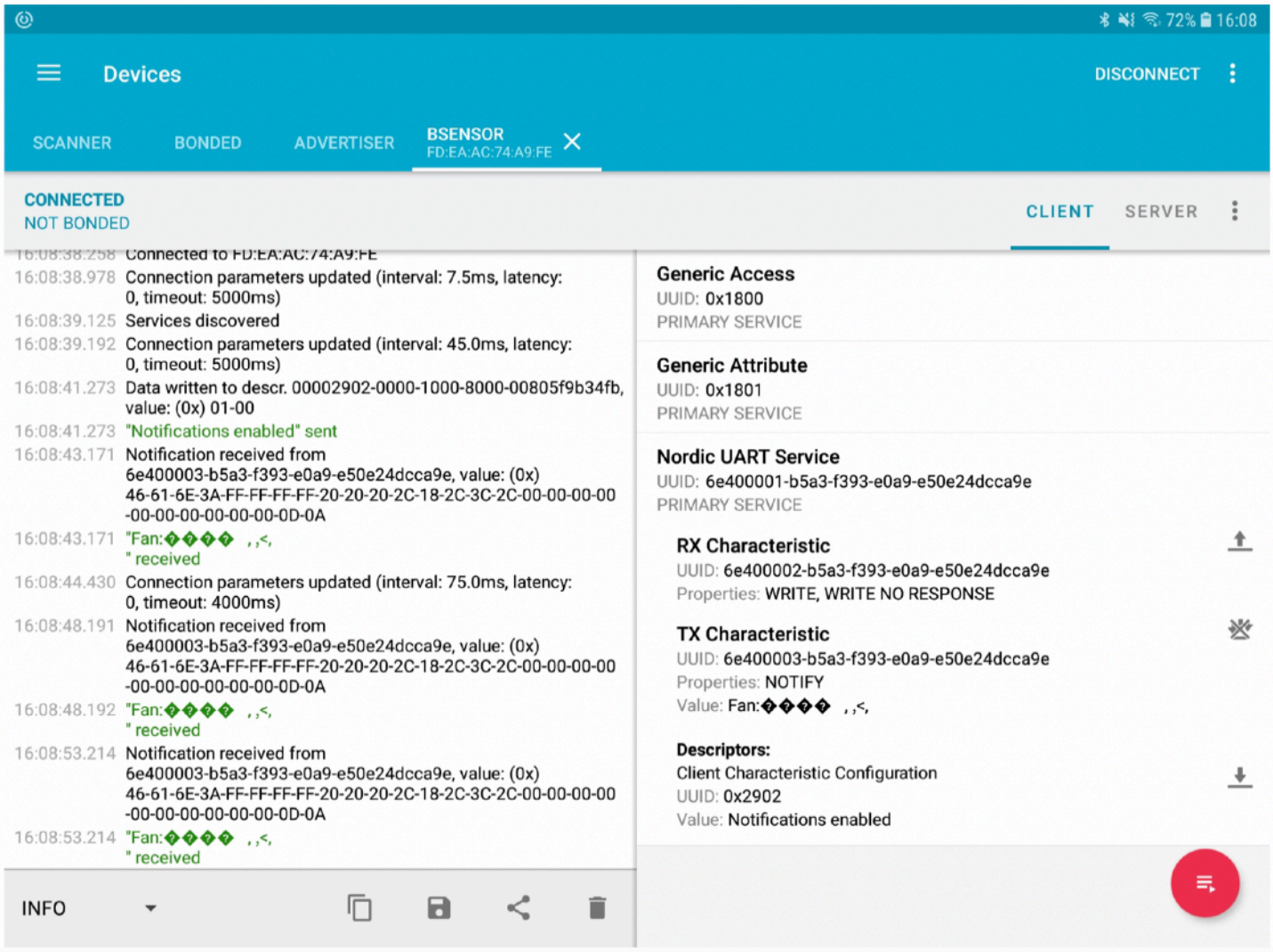
SC833F contains an nRF52833 BLE 5.1, Thread, Zigbee module BM833F and an AMS ENS210 temperature and humidity sensor, a ST Micro LIS3DH 3-axis motion sensor. It is powered by a CR2032 battery (not included).

3. Firmware Development and Testing

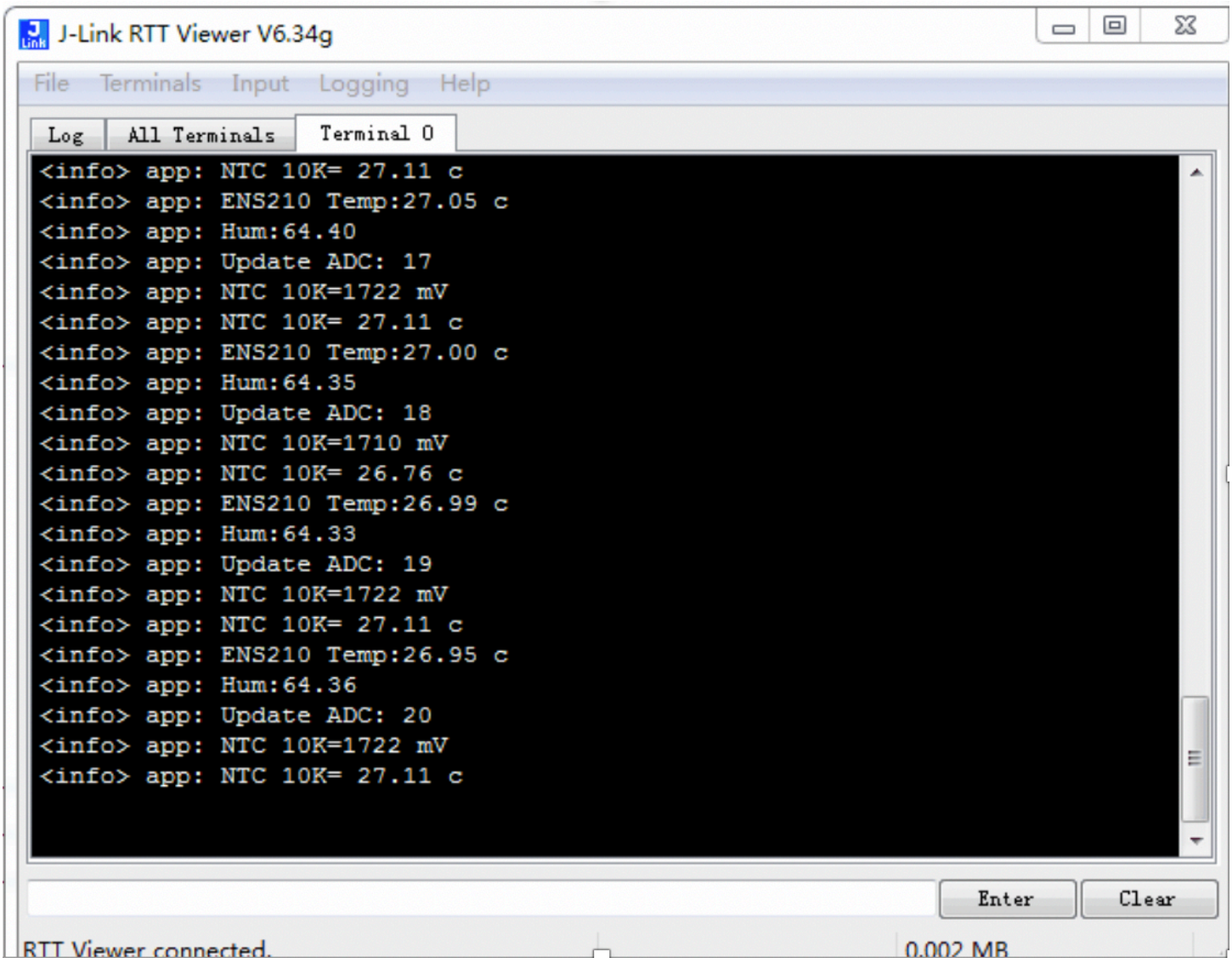
Preloaded Firmware

SE840F-210 included temperature and humidity sensor ENS210. The device is preloaded with ENS210 driver. After powering up, the device advertises name “Bsensor”.

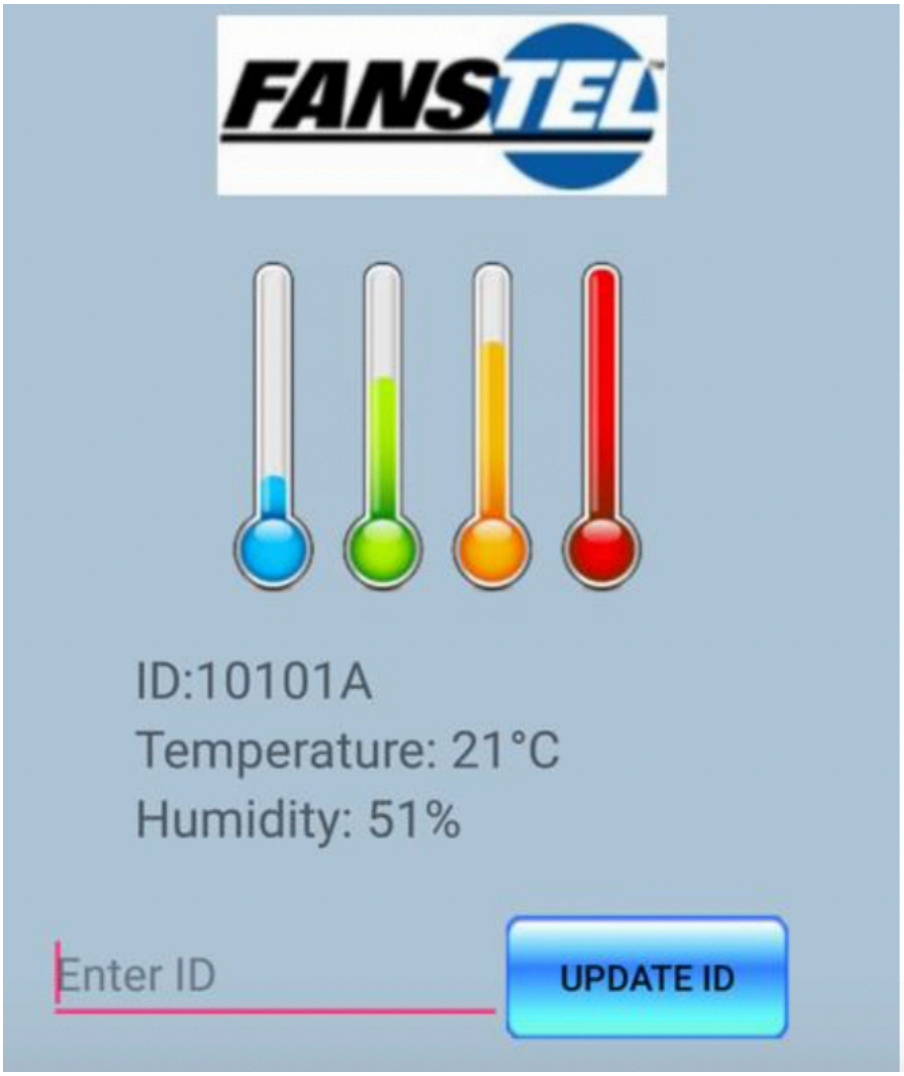
- Use nRF Connect APP with the device.
- The APP will receive sensor data every 5 seconds in HEX format.
- The following screenshot shows temperature is 24 degrees(byte 12, 0X18 = 24) and humidity is 60 (byte 14, 0X3C = 60).



SE840F-210 supports thermistor thermometer. Thermistor data are not sent out via the BLE.
User can check the data by RTT viewer.



When the sensor connected the Fanstel gateway BLG840F or BWG832F, BWG840F.
The gateway will upload the raw data to Fanstel MQTT server.
You can use your Android phone to check the data.



Please download the gateway user guide if you need the detail of sequences for setup gateway.

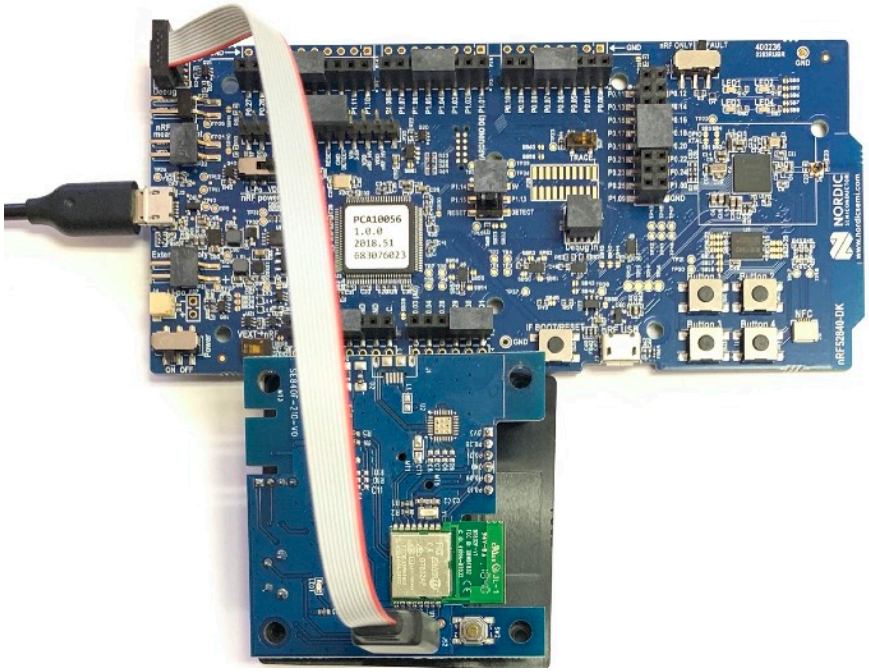
Set up for Programming DK-SE840F

10-pin J-Link connector is installed. 10-conductor J-Link cable I included. DK-SE840F can be connected to an nRF52840DK easily for programming.

Set up for Programming SE840F Sensor

To program BT840F/X module, connect **Debug out** of PCA10056 (nRF52840DK) to JS3 **(Debug in**) of DK-SE840F by a Tag Connect cable TC2050-IDC-NL-050-ALL.

You need to insert 2 AAA batteries into the battery compartment and make sure that sensor PCBA is not separated from bottom enclosure.



Nordic Development Environment

Nordic Semiconductor provides a complete range of hardware and software development tools for the nRF52 Series devices. nRF52 DK board is recommended for firmware development. Document and Software development tools can be downloaded by the following links.

Get start with Nordic chip and all online documents.

http://infocenter.nordicsemi.com/index.jsp?topic=/com.nordic.infocenter.nrf52/dita/nrf52/development/nrf52_dev_kit.html&cp=1_1

Nordic SDK with many example projects.

https://developer.nordicsemi.com/nRF5_SDK/

Nordic development zone. You can search or ask a question there.

https://devzone.nordicsemi.com/tutorials/b/getting-started/posts/development-with-gcc-and-eclipse

Programming the Nordic chip

Download and install Nrf5x-Command-Line Tools
https://www.nordicsemi.com/eng/nordic/Products/nRF52840/nRF5x-Command-Line-Tools-Win32/58850

Download and install nRF Connect

https://www.nordicsemi.com/?sc_itemid={B935528E-8BFA-42D9-8BB5-83E2A5E1FF5C}

Revision History

• Aug 2020, Ver. 0.50: Initial draft release

Contact Us

United States:

Fanstel Corp.
7466 E. Monte Cristo Ave. Scottsdale AZ 85260
Tel. 1 480-948-4928
Fax. 1-480-948-5459
Email: info@fanstel.com
Website: www.fanstel.com

Taiwan:

Fanstel Corp.
10F-10, 79 Xintai Wu Road
Xizhu, New Taipei City, Taiwan 22101
泛世公司
臺灣省新北市汐止區新臺五路79號10樓之10, 22101
Tel. 886-2-2698-9328
Fax. 886-2-2698-4813
Email: info@fanstel.com
Website: www.fanstel.com

China:

Fanstel Technologies Corp.
11 Jiale Street
Ping-Dih, Long-Gang, Shen Zhen, GD 518117
泛世康科技(深圳)有限公司
廣東省深圳市龍崗區坪地鎮佳樂街11號
Tel. 86-755-8409-0928
Fax. 86-755-8409-0973
QQ. 3076221086
Email: info@fanstel.com
Website: www.fanstel.com