



# WELCOME

Unboxing the BG220 Explorer Kit

Young Noh

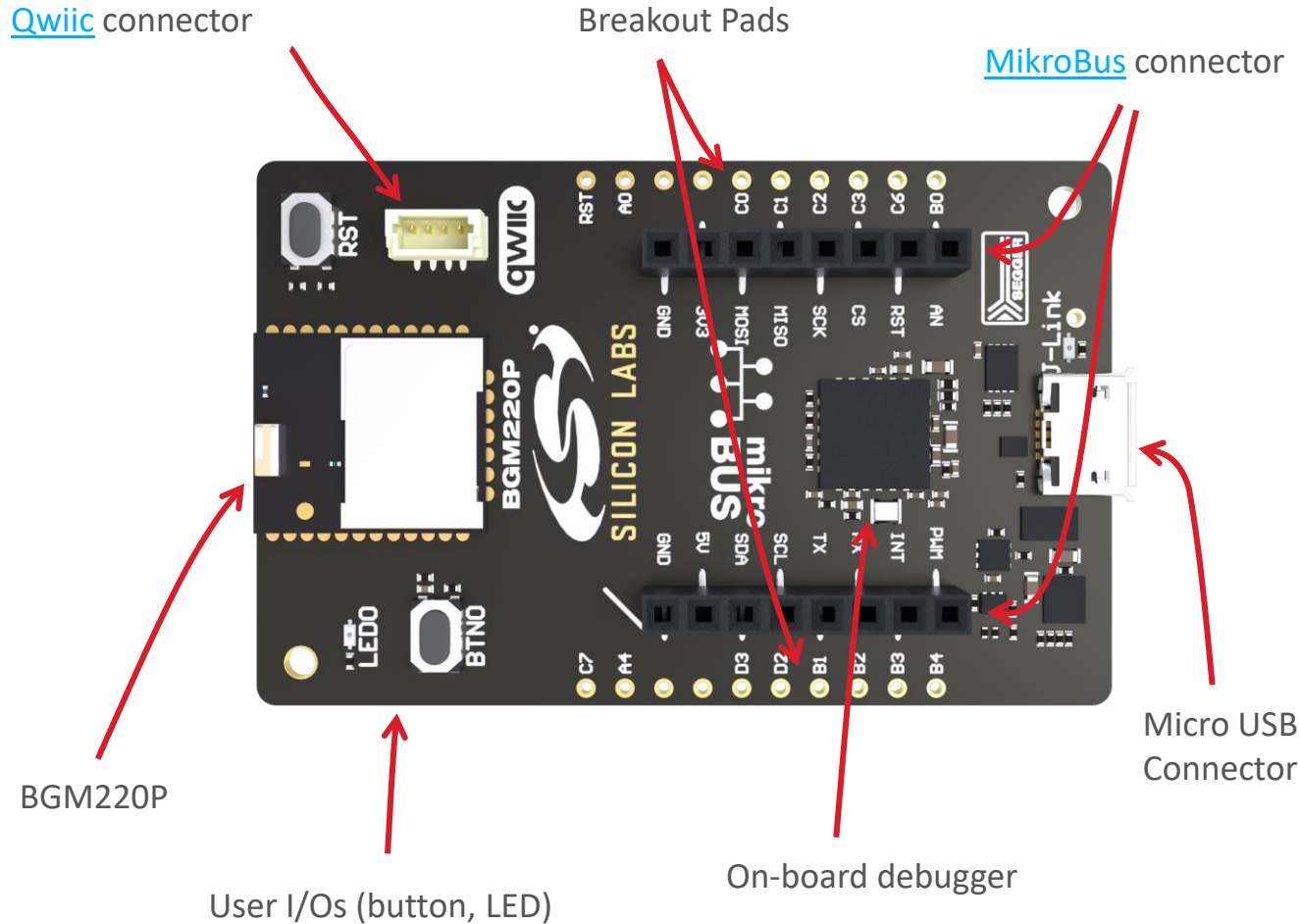


# Agenda

- Introduce BGM220 Explorer Kit (BGM220-EK4314A)
- Rapid Prototyping Eco Systems
- BGM220 EK Documentation and Tools
- Demonstration
- Q & A

# BGM220 Explorer Kit – Features Overview

## Simplified features but endless possibilities



## Features

- BGM220P module
  - ARM Cortex M33 – 76.8MHz, 512kB Flash, 32kB RAM
  - Bluetooth 5.2, 1.4uA EM2 with Full RAM Retention
- On-board debugger
  - USB for power and communication
  - J-Link, VCOM (with hardware flow control), PTI
  - Seamless DX experience in SS
- Simple user I/O for basic peripheral usage
  - Reset button, 1 user button, 1 user LED
- Standard HW expansion connectors
  - Rapid prototyping with off-the-shelf boards
  - mikroBus and qwiic (compatible with Groove and Stemma QT)
- Breakout pads for additional hardware customization
  - Aligned with breadboard dimensions
- Kit contains USB cable

# BGM220 Bluetooth Modules



## BGM220S - SiP

- 6 x 6 mm
- Up to +6 dBm TX
- Up to 25x GPIO
- Built-in antenna and RF Pin
- With or without RF shield



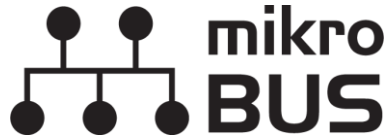
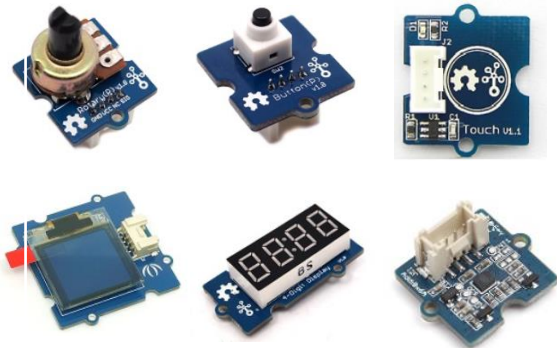
## BGM220P - PCB

- 13 x 15mm
- Up to +8 dBm TX
- Up to 25x GPIO
- Built-in antenna
- With or without built-in LFXO

## Module Features

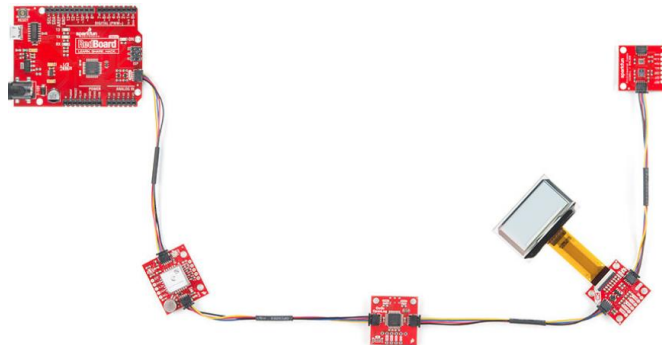
- Built-in high-performance antennas simplify RF design
- Compact SiP modules for minaturized IoT design
- Integrated DC-DC, XTALs and passives
- Extended temperature rating up to 105°C
- Regulatory certifications for major global markets
  - CE, FCC/ISED, MIC and Telec
- Bluetooth 5.2 certified
  - Dynamic power control operational performance

# IoT Rapid Prototyping



## Focusing on simple peripheral expansions

- 3rd party ecosystems (shields, hats, click-boards) allows development based on off-the-shelf expansion hardware
- Widely used for quick prototyping, especially within hobbyist and maker communities
- MikroE (mikroBUS), Seed Studios (Grove), SparkFun (Qwiic) and adafruit(STEMMA/STEMMA QT) offer a wide variety of small and modular options for IoT end nodes, which typically revolve around sensors, UI and actuators
- Grove, qwiic and STEMMA QT are pin compatible
  - One connector can support multiple ecosystems
  - Only requires adapter [cable](#) or [board](#)
- MikroE alone offers
  - **250** sensor boards
  - **40** display and LED boards
  - ...all with 3.3V input voltage support



# Rapid Prototyping System Comparisons

Controller/Device	mikroBUS Click MIKROE	STEMMA adafruit	STEMMA QT adafruit	Grove Seeed	Qwiic SparkFun	Gravity DFRobot
Connection	Proprietary mikroBUS Socket (16 Pin)	JST PH 3 or 4 Pin (2.0mm pitch)	JST SH 4 Pin (1.0mm pitch)	Proprietary 4 Pin (2.0mm pitch)	JST SH 4 Pin (1.0mm pitch)	JST PH 3 or 4 Pin (2.0mm pitch)
Power Supply Rails	3-5V DC	3-5V DC	3-5V DC	3-5VDC	3V DC	3-5V DC
GPIO Voltage	3-5V DC	3-5V DC	3-5V DC	3-5V DC	3V DC	3-5V DC
Supported Interfaces	I2C/SPI/UART/ Analog/Digital/PWM	I2C only on 4 pin. Analog/Digital/PWM on 3 pin.	I2C only	I2C/Analog/Digital/PWM on 4 pin	I2C only	I2C or UART on 4 pin. Analog/Digital/PWM on 3 pin.
Website	<a href="https://www.mikroe.com/click-boards">https://www.mikroe.com/click-boards</a>	<a href="https://learn.adafruit.com/introducing-adafruit-stemma-qt/what-is-stemma">https://learn.adafruit.com/introducing-adafruit-stemma-qt/what-is-stemma</a>	<a href="https://learn.adafruit.com/introducing-adafruit-stemma-qt/what-is-stemma-qt">https://learn.adafruit.com/introducing-adafruit-stemma-qt/what-is-stemma-qt</a>	<a href="https://www.seeedstudio.com/grove.html">https://www.seeedstudio.com/grove.html</a>	<a href="https://www.sparkfun.com/qwiic">https://www.sparkfun.com/qwiic</a>	<a href="https://www.dfrobot.com/topic-282.html">https://www.dfrobot.com/topic-282.html</a>

# BGM220 Explorer Kit – Collateral

- User Guide: <https://www.silabs.com/documents/public/user-guides/ug465-brd4314a.pdf>
- Getting Started Guide: <https://docs.silabs.com/bluetooth/latest/general/getting-started#getting-started-with-bgm220-explorer-kit>
  - Porting Code from mikroSDK and Arduino
- [GitHub Repository](#)
  - Available Now: [Barometer](#), [HRM](#), and [I2C Accelerometer](#)
  - Coming in the next 2-3 weeks: OLED Display, 7 Segment Display + Joystick
  - Coming in the next 2 Months: Contactless Temperature Sensor, Combo Environment Sensor, and SPI Accelerometer

# Simplified Developer Experience

- [Simplicity Studio 5](#)

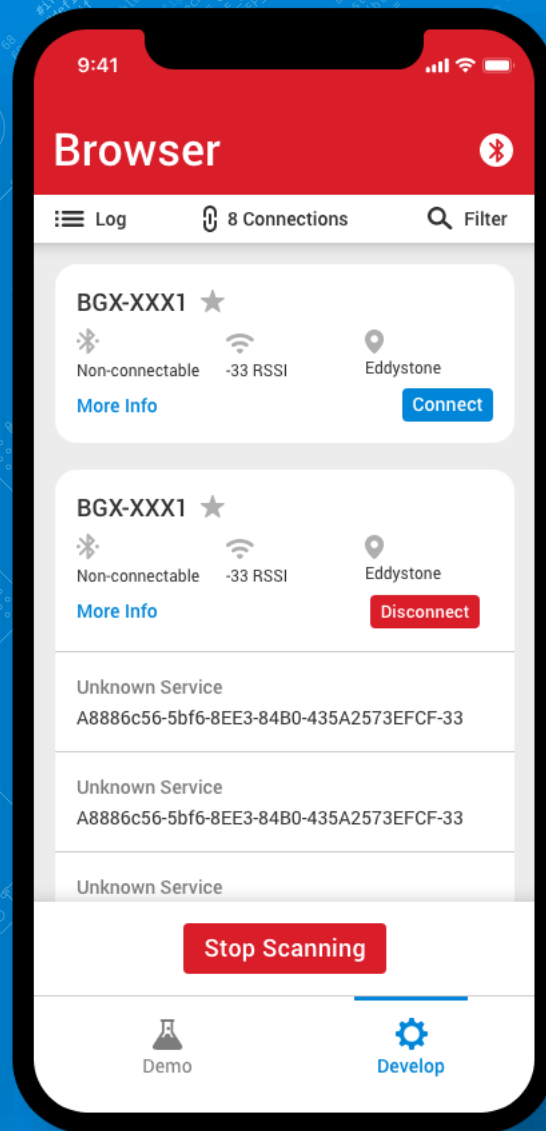
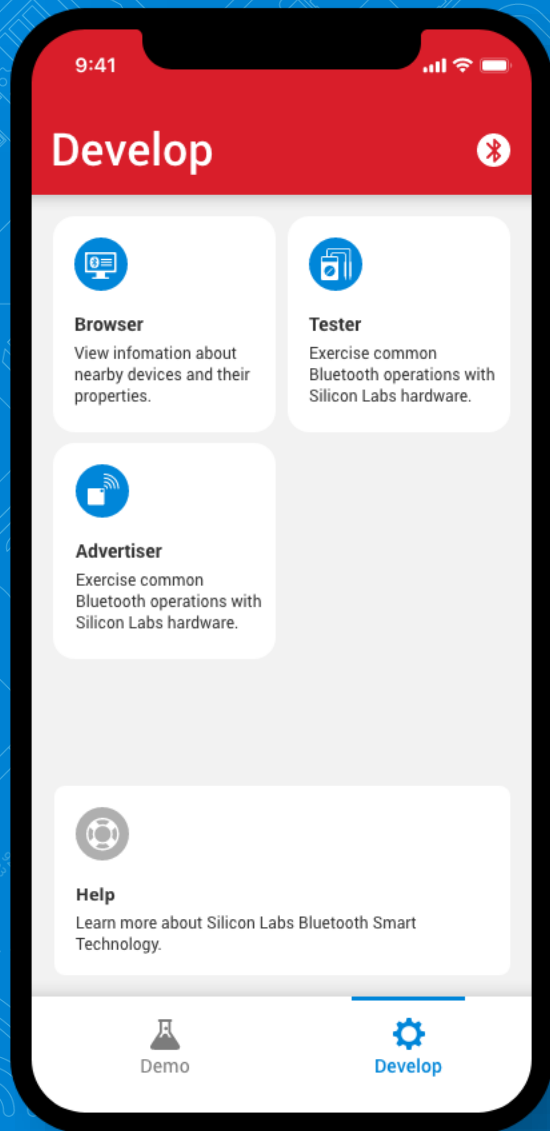
- **Interface**

- Fresh, new & simplified
    - Intuitive out-of-the-box experience
    - Fast access to developer resources
    - Linux, Mac & Windows

- **Tools**

- Configuration utilities
    - Compiler
    - Error & validation
    - IDE & command line support
    - Graphical hardware configurator
    - Energy Profiler – visual energy analysis
    - Network Analyzer – packet capture & decode



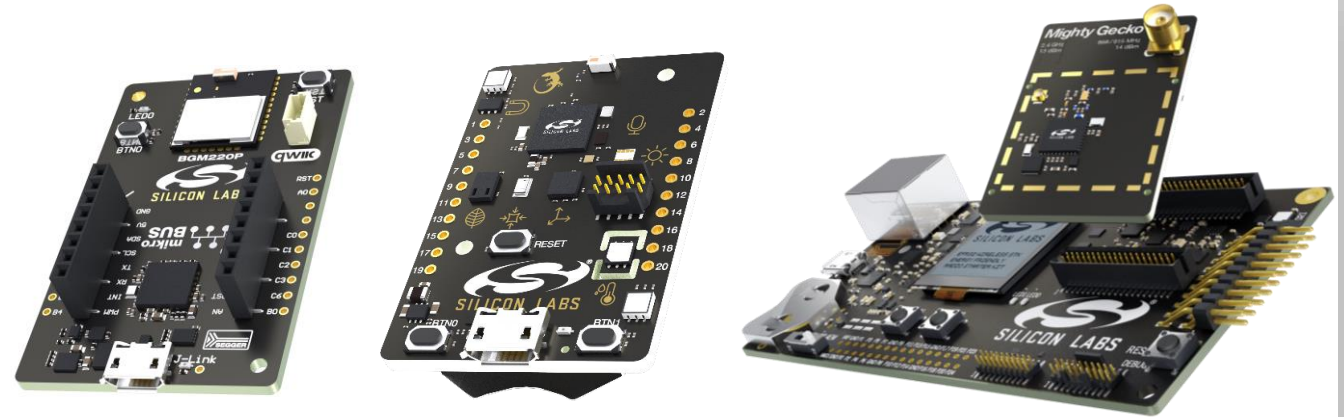


# Enhanced Development with EFR Connect

- **Redesigned and simplified developer app**
  - Redesigned UI to forefront key BLE device metrics
  - App-delivered tools support BLE code development
  - Improved stability and reliability
- **Developer-focused features**
  - Simultaneous connections for broader visibility
  - Log and export BLE activity
  - Powerful filtering options to identify devices
  - Save custom UUID to better organize a GATT
- **Try it today**
  - Replaces Silicon Labs Blue Gecko mobile app
  - Available on [iOS](#) and [Android](#)
  - Source code available on [GitHub](#) ([Android](#), [iOS](#))

# IoT Hardware Development Tools – Feature Comparison

	Explorer Kit	Dev Kit	Pro Kit
Debug Speed	1.6MHz	1.6MHz	8MHz
Debug USB	Full Speed	Full Speed	High Speed
Packet Trace Interface (PTI)	✓	✓	✓ 2x
Breakout Pads	✓	✓	✓
Pushbuttons & User LEDs	✓	✓	✓
Virtual COM	✓	✓	✓
Coin cell battery holder	–	✓	✓
On-board Sensors	–	✓	✓
Battery Pack Connector	–	✓	✓
Radio Board Connectors	–	–	✓
EXP Connector	–	–	✓
Display	–	–	✓
Debug OUT	–	–	EFM8/32, EFR32, EZR32
Debug Ethernet	–	–	100 Mbit/s
Energy Monitor (AEM)	–	–	✓
3 <sup>rd</sup> Party Hardware addons	✓	–	–



Explorer Kit	Dev Kit	Pro Kit
<ul style="list-style-type: none"> <li>Lowest price point</li> <li>On-board debugger and signal breakouts</li> <li>Minimal on-board features</li> <li>3<sup>rd</sup> part hardware support</li> <li>New Category</li> </ul>	<ul style="list-style-type: none"> <li>Single device development board</li> <li>On-board debugger and signal breakouts</li> <li>On-board sensors</li> <li>Impressive out-of-the-box demos</li> <li>Evolution from Thunderboard</li> </ul>	<ul style="list-style-type: none"> <li>Modular development platform</li> <li>Advanced development use cases</li> <li>Energy profiling and external device debug</li> <li>Ethernet for large network test</li> <li>Designed to maximize reuse of EFR32 devices</li> <li>Evolution from WSTK</li> </ul>

# MikroE - Silabs Click Shield

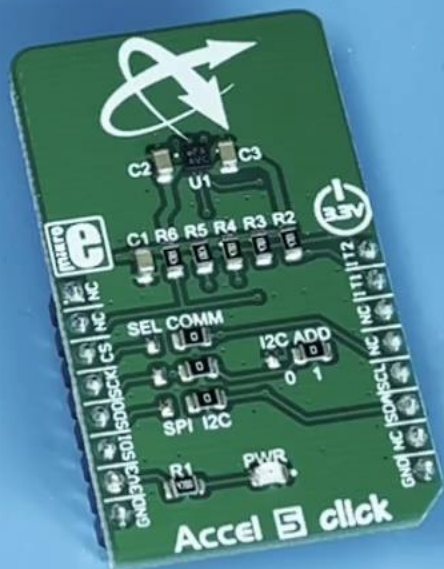


- Works with Silabs Development Boards:
  - WSTK – Wireless Starter Kit or Pro Kit
  - MCU Development Boards
  - Thunderboard or Dev Kit
- <https://www.mikroe.com/silabs-click-shield>
- Part Number: MIKROE-4464



# Demonstration

- BGM220 Explorer Kit and mikroE Click boards
- [docs.silabs.com](https://docs.silabs.com) walkthrough
- Introduction to Silicon Labs Application Example Repository on GitHub
- Importing and demonstrating “Explorer Kit Bluetooth accelerometer example using I2C bus BMA400 accelerometer”
- Quick walkthrough of the source code of “Explorer Kit Bluetooth accelerometer example using I2C bus BMA400 accelerometer”





tech **t▶lks**

# Q&A



Facebook	Twitter	Community
		



# THANK YOU

Recording and slides will be posted to:  
[www.silabs.com/training](http://www.silabs.com/training)