SILICON LABS

tech t▶lks

WELCOME
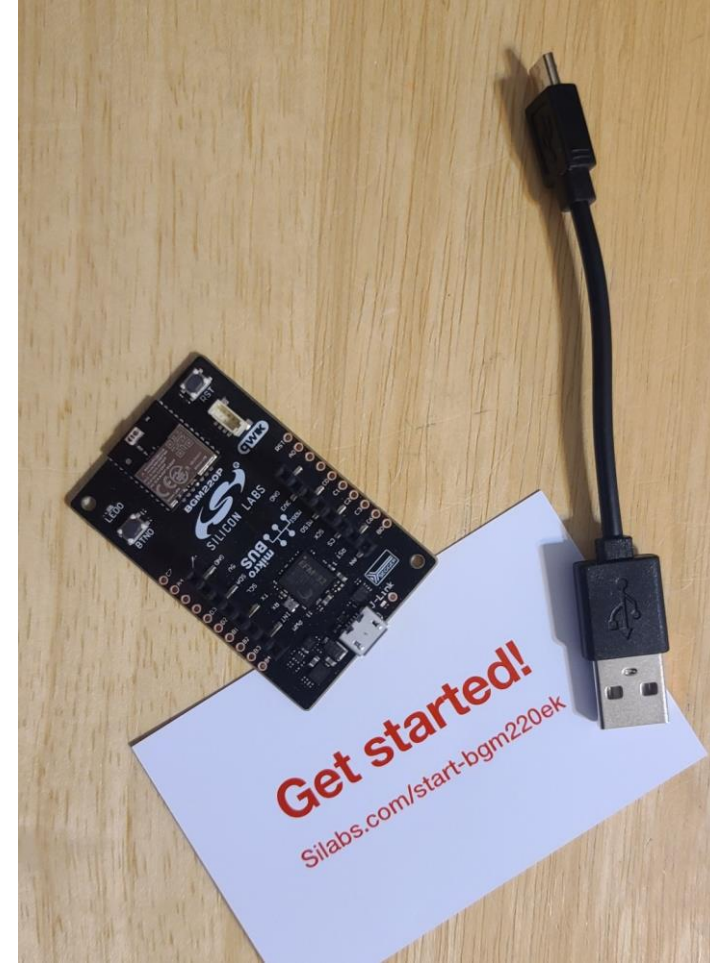
Unboxing the BGM220 Explorer Kit
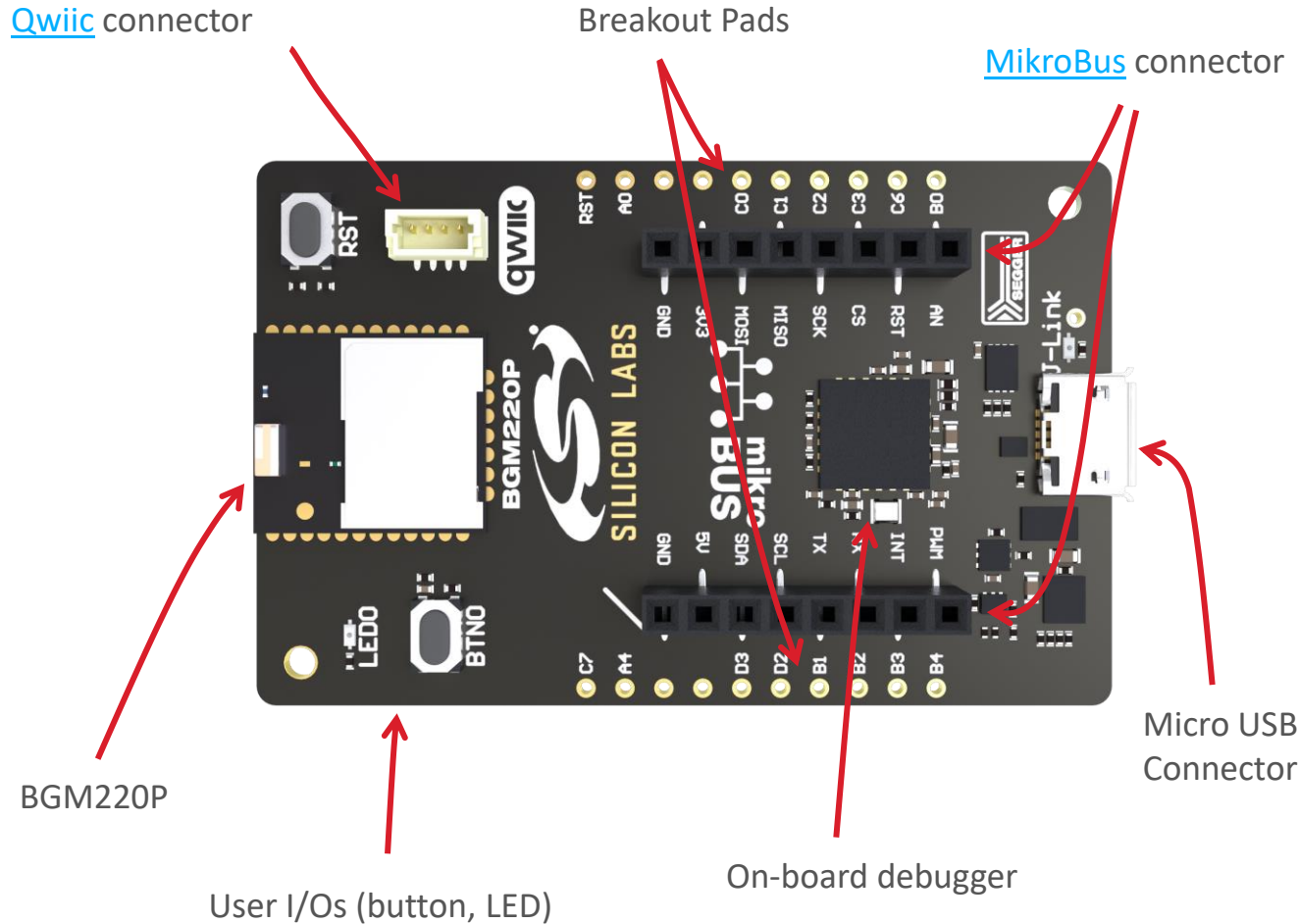
John Scaletta

Agenda

- Introduce BGM220 Explorer Kit (BGM220-EK4314A)

- Rapid Prototyping Eco Systems

- BGM220 EK Documentation and Tools

- Demonstration

- Q & A

~~Unboxing~~ -> Unbagging

 Silicon Labs Confidential

BGM220 Explorer Kit – Features Overview

Simplified features but endless possibilities

Qwiic connector

Breakout Pads

MikroBus connector

BGM220P

User I/Os (button, LED)

On-board debugger

Micro USB Connector

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

IoT Rapid Prototyping
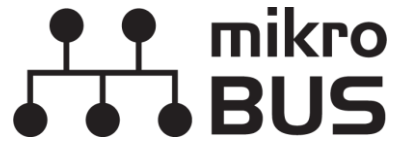
Focusing on simple periperal expansions

- 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
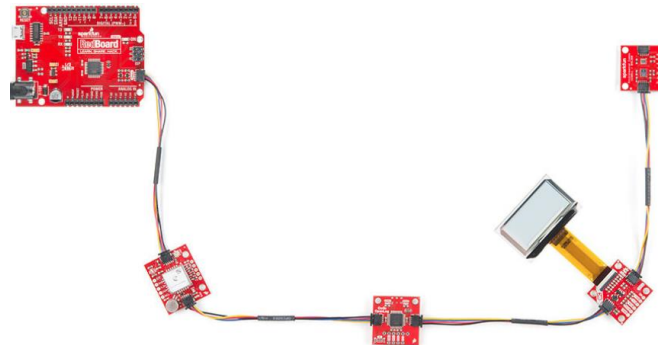
Rapid Prototyping System Comparisons

	mikroBUS Click MIKROE	STEMMA adafruit	STEMMA QT adafruit	Grove Seeed Studio	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	https://www.mikroe.com/click-boards	https://learn.adafruit.com/introducing-adafruit-stemma-qt/what-is-stemma	https://learn.adafruit.com/introducing-adafruit-stemma-qt/what-is-stemma-qt	https://www.seeedstudio.com/grove.html	https://www.sparkfun.com/qwiic	https://www.dfrobot.com/topic-282.html

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
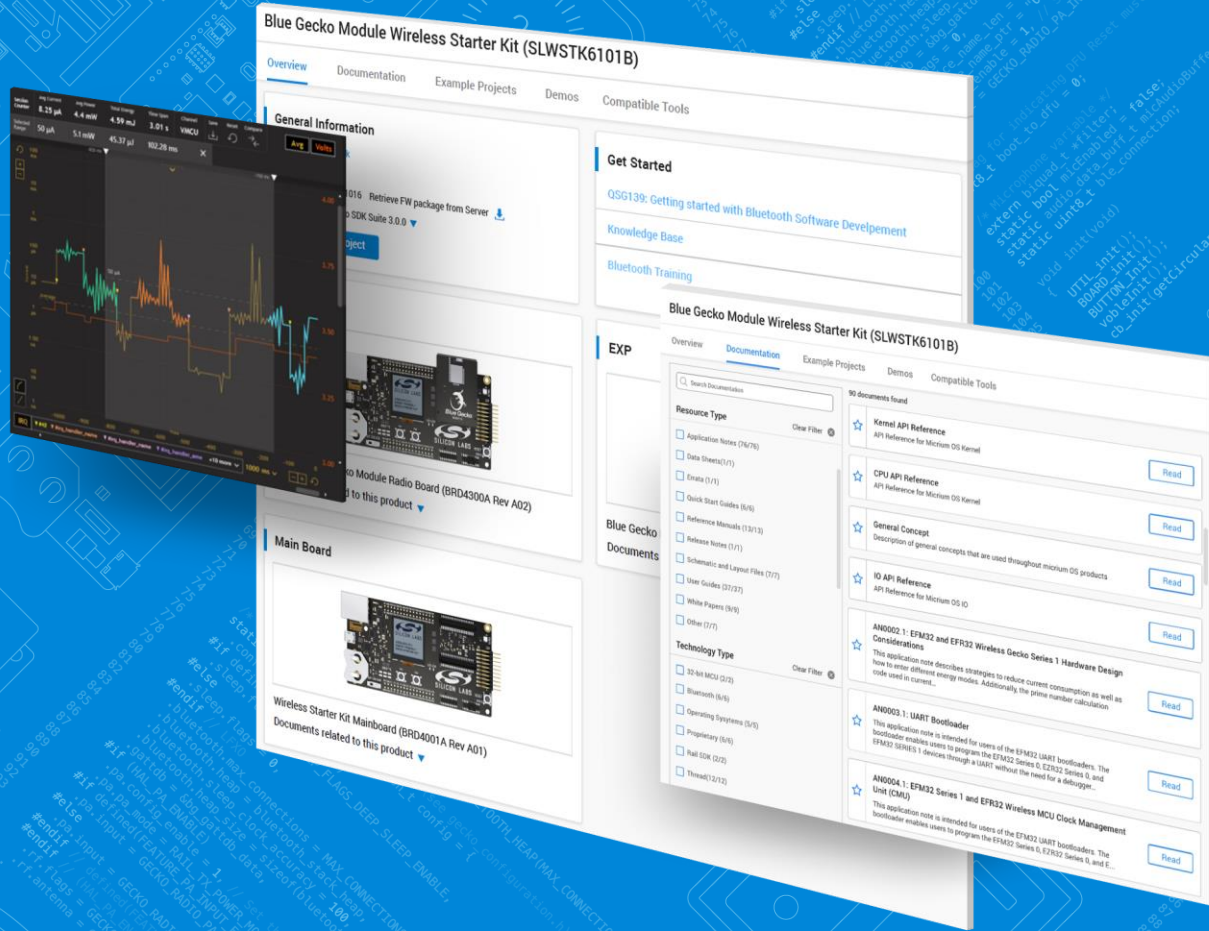
Simplified Developer Experience

- **Simplicity Studio 5**
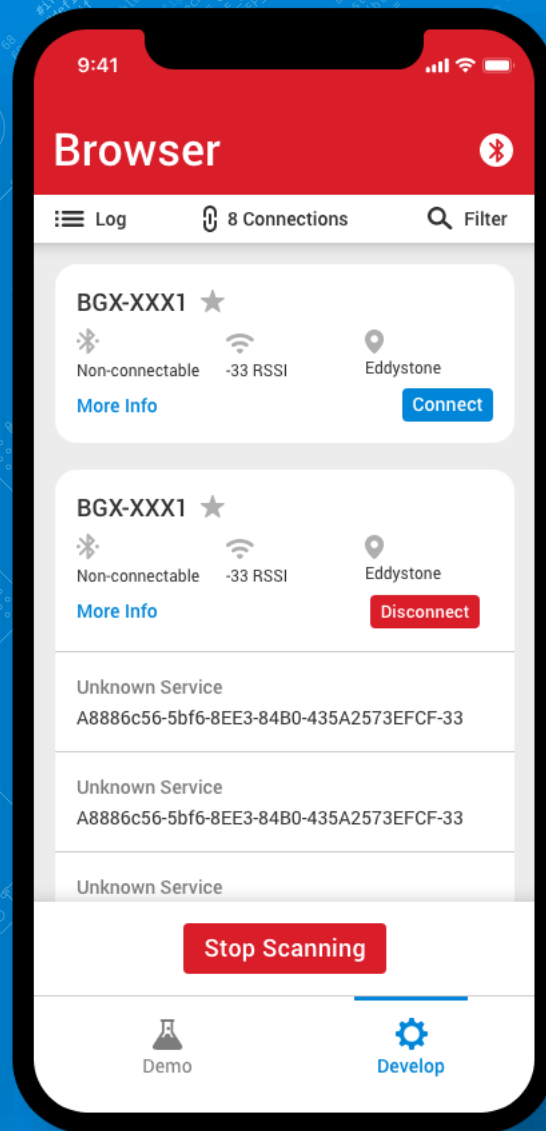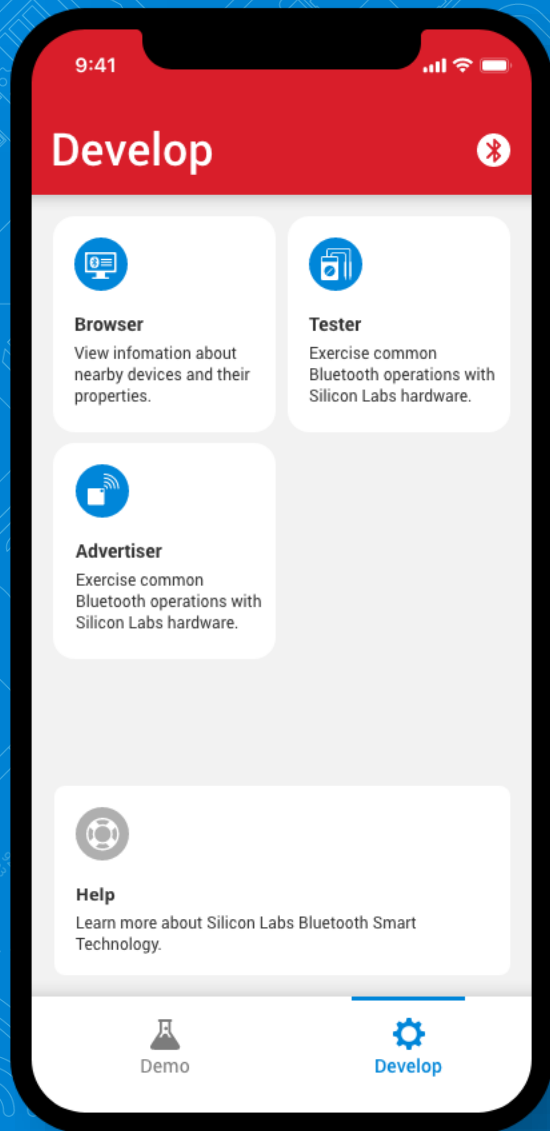 - **Interface**
    - Fresh, new & simplified
    - Intuitive out-of-the-box experience
    - Fast access to developer resources
    - Linux, Mac & Windows
  - **Tools**
    - Configuration utilities
    - Compiler
    - Error & validation
    - IDE & command line support
    - Graphical hardware configurator
    - Energy Profiler – visual energy analysis
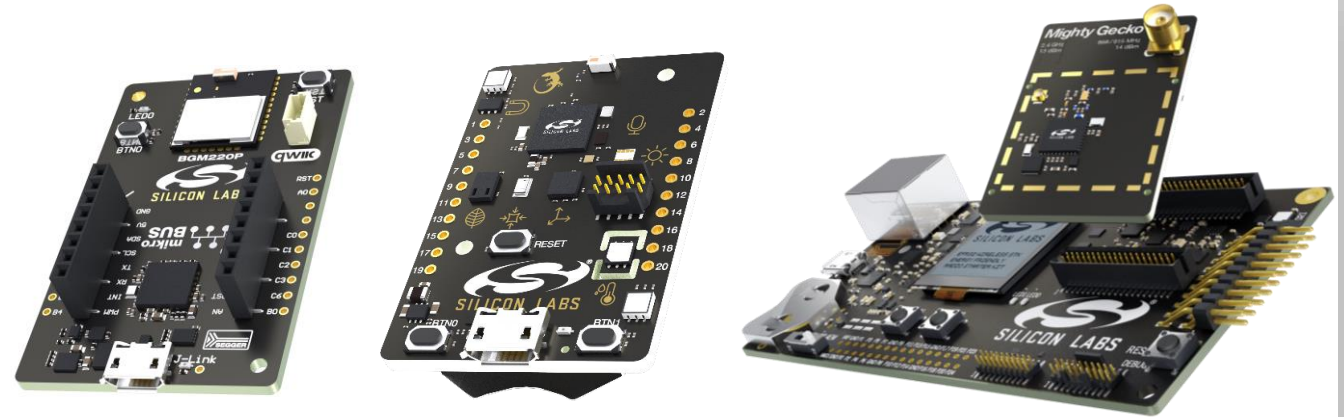   - Network Analyzer – packet capture & decode

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	✓	✓	✓
Pushbutton s & 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)	–	–	✓
3rd Party Hardware addons	✓	–	–

Explorer Kit

- Lowest price point
- On-board debugger and signal breakouts
- Minimal on-board features
- 3rd part hardware support
- New Category

Dev Kit

- Single device development board
- On-board debugger and signal breakouts
- On-board sensors
- Impressive out-of-the-box demos
- Evolution from Thunderboard

Pro Kit

- Modular development platform
- Advanced development use cases
- Energy profiling and external device debug
- Ethernet for large network test
- Designed to maximize reuse of EFR32 devices
- Evolution from WSTK

✓ Supported   ✓ Optional or not mounted   – Not Supported   NDA Required
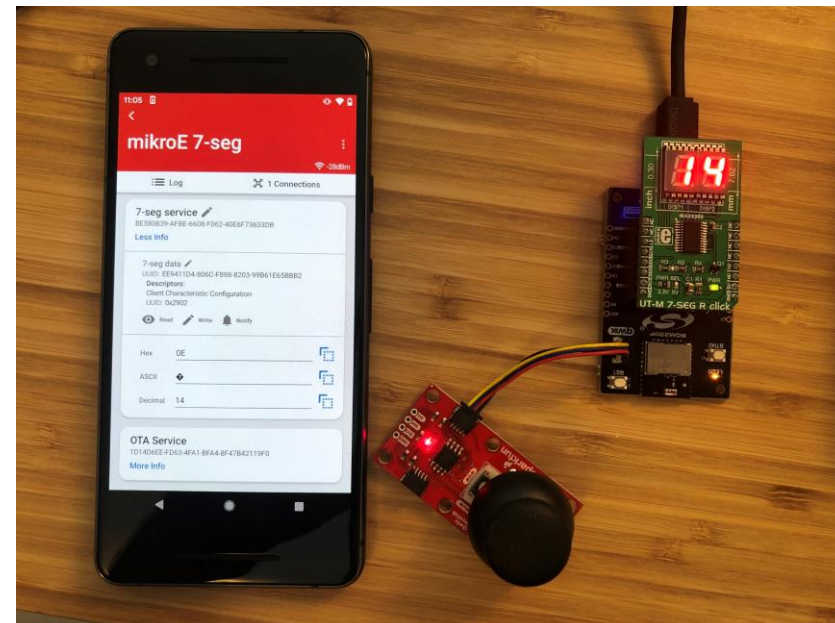
MikroE - Silabs Click Shield

- **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

- Walk through docs.silabs.com, Github and Simplicity Studio 5

- Demo 1) Pressure Sensor – Precompiled Image

- Demo 2) Joystick and 7 Segment Display – Import Project

Reference Links:

- BGM220 Explorer Kit: https://www.silabs.com/development-tools/wireless/bluetooth/bgm220-explorer-kit

- BGM220P Module: https://www.silabs.com/wireless/bluetooth/efr32bg22-series-2-modules

- EK User Guide: https://www.silabs.com/documents/public/user-guides/ug465-brd4314a.pdf

- EK Getting Started Guide: https://docs.silabs.com/bluetooth/latest/general/getting-started#getting-started-with-bgm220-explorer-kitGitHub Repository

- Simplicity Studio 5: https://www.silabs.com/developers/simplicity-studio

- Tech Talks – On Demand: https://www.silabs.com/about-us/events/wireless-connectivity-tech-talks-2021

- BLE Workshop Series – On Demand: https://www.silabs.com/about-us/events/bluetooth-workshop-series

THANK YOU