

RA4M1 CLICKER

USER MANUAL

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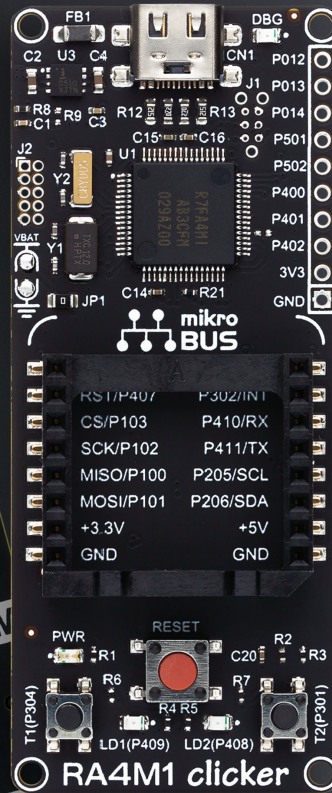
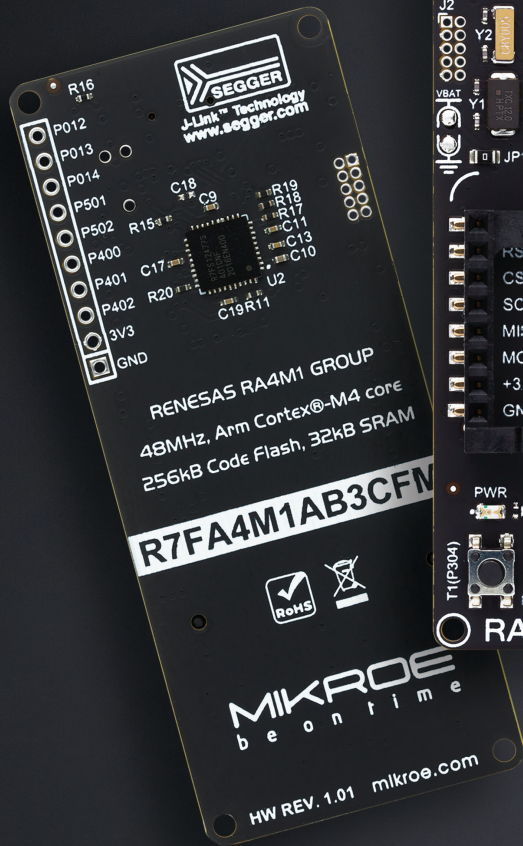
Time-saving embedded tools

“Renesas continuously looks for ways to help customers reduce their development effort, and one way we help is by having many of our RA MCU evaluation kits take advantage of Mikroë’s mikroBUS ecosystem. We are excited to collaborate with Mikroë to launch their first clicker board, based on the RA4M1 group of MCUs, to further broaden our market reach, said Daryl Khoo, Vice President, Product Marketing, IoT Platform Business Unit at Renesas. “Innovative developers can use our 32-bit RA Cortex-M MCUs with their choice of 1000+ Click boards™ to build a wide variety of embedded systems and IoT applications, and accelerate time to market.”

Daryl Khoo, Vice President, IoT Platform Business Division at Renesas

“The RA4M1 Clicker board is the first broad-based RA partner kit for Renesas RA microcontrollers. We’re very impressed with Mikroë’s professional, fast, and flawless execution producing high-quality deliverables on-time. The Mikroë mikroBUS connector is available on many new RA partner MCU kits. Innovative developers can now use our RA MCUs with a selection of 1000+ Click boards™ and implement a wide variety of embedded systems and IoT applications. I look forward to collaborating with Mikroë on many new exciting MCU evaluation kits.”

Tim Burgess, Senior Director, IoT Platform Business Division at Renesas



RA4M1 Clicker is a compact development board featuring a 32-bit R7FA4M1AB3CFM microcontroller, produced by Renesas.

With an on-board programmer/debugger, paired with one mikroBUS™ socket for Click boards™ connectivity, it represents a perfect solution for the rapid development of many different types of applications.

1. Board features

RA4M1 Clicker is an amazingly compact starter development board which brings the innovative mikroBUS™ socket to your favorite microcontroller. It features R7FA4M1AB3CFM, a 32-bit ARM® Cortex®-M4 microcontroller, two indication LEDs, two general purpose buttons, a reset button, a USB Type-C connector and a single mikroBUS™ socket. In addition to J-Link OB debug probe, a JTAG/SWD connector and pads for interfacing with external electronics are provided as well. One standardized mikroBUS™ host connectors, allows interfacing with the vast amount of Click boards™. RA4M1 Clicker board can be powered over a USB Type-C cable.

- | | | | |
|---|------------------------------|----|--------------------|
| 1 | USB Type-C | 8 | DBG LED |
| 2 | 3V3 LDO | 9 | Connection pads |
| 3 | 32.768kHz crystal oscillator | 10 | R7FA4M1AB3CFM MCU |
| 4 | JTAG/SWD connector | 11 | mikroBUS™ socket |
| 5 | RTC battery pads | 12 | Reset button |
| 6 | 12MHz crystal oscillator | 13 | Additional buttons |
| 7 | PWR indication LED | 14 | Additional LEDs |

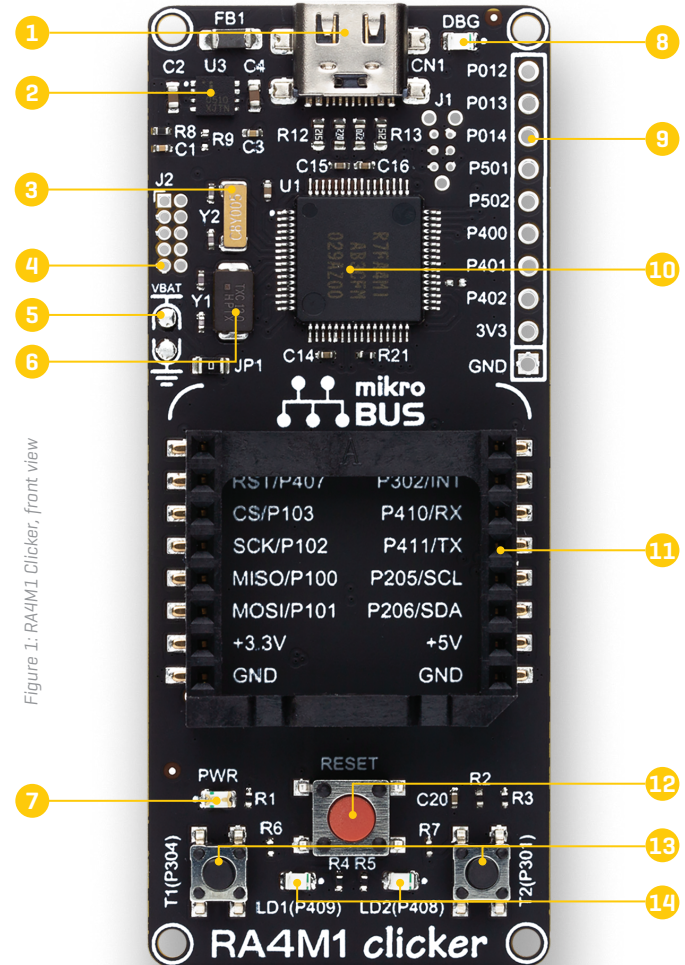


Figure 1: RA4M1 Clicker, front view

2. Key microcontroller features

RA4M1 Clicker development board comes with the **R7FA4M1AB3CFM** microcontroller.

R7FA4M1AB3CFM is a 32-bit Arm Cortex®-M4 core microcontroller, produced by Renesas. The MCU provides an optimal combination of low-power, high-performance core running up to 48 MHz with the following features:

- 256KB of Flash memory
- 32KB of SRAM
- 64 pin LQFP
- Operating frequency up to 48MHz MHz
- 14-bit ADC, 12-bit DAC
- USBFS, UART, RTC, SPI, I2C, CAN, etc.

For the complete list of MCU features, please refer to the **R7FA4M1AB3CFM [datasheet](#)**

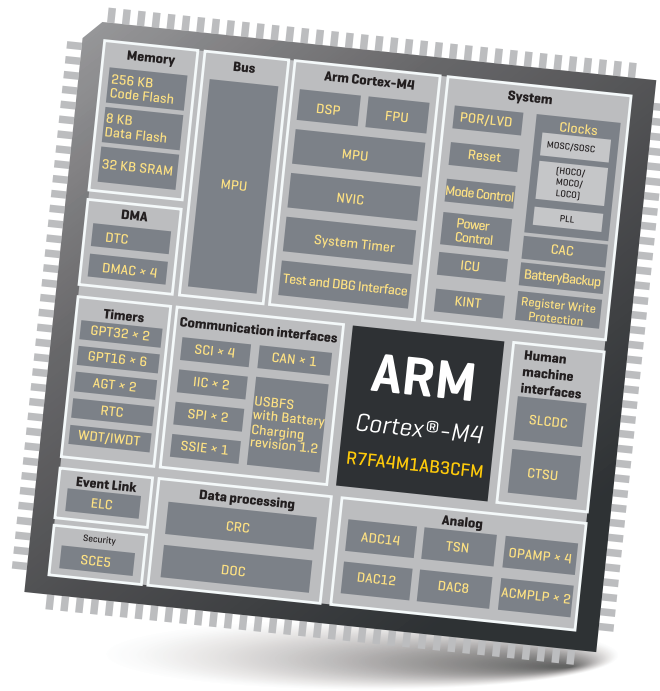


Figure 2: R7FA4M1AB3CFM MCU block schematic

3. Connecting and powering up the board

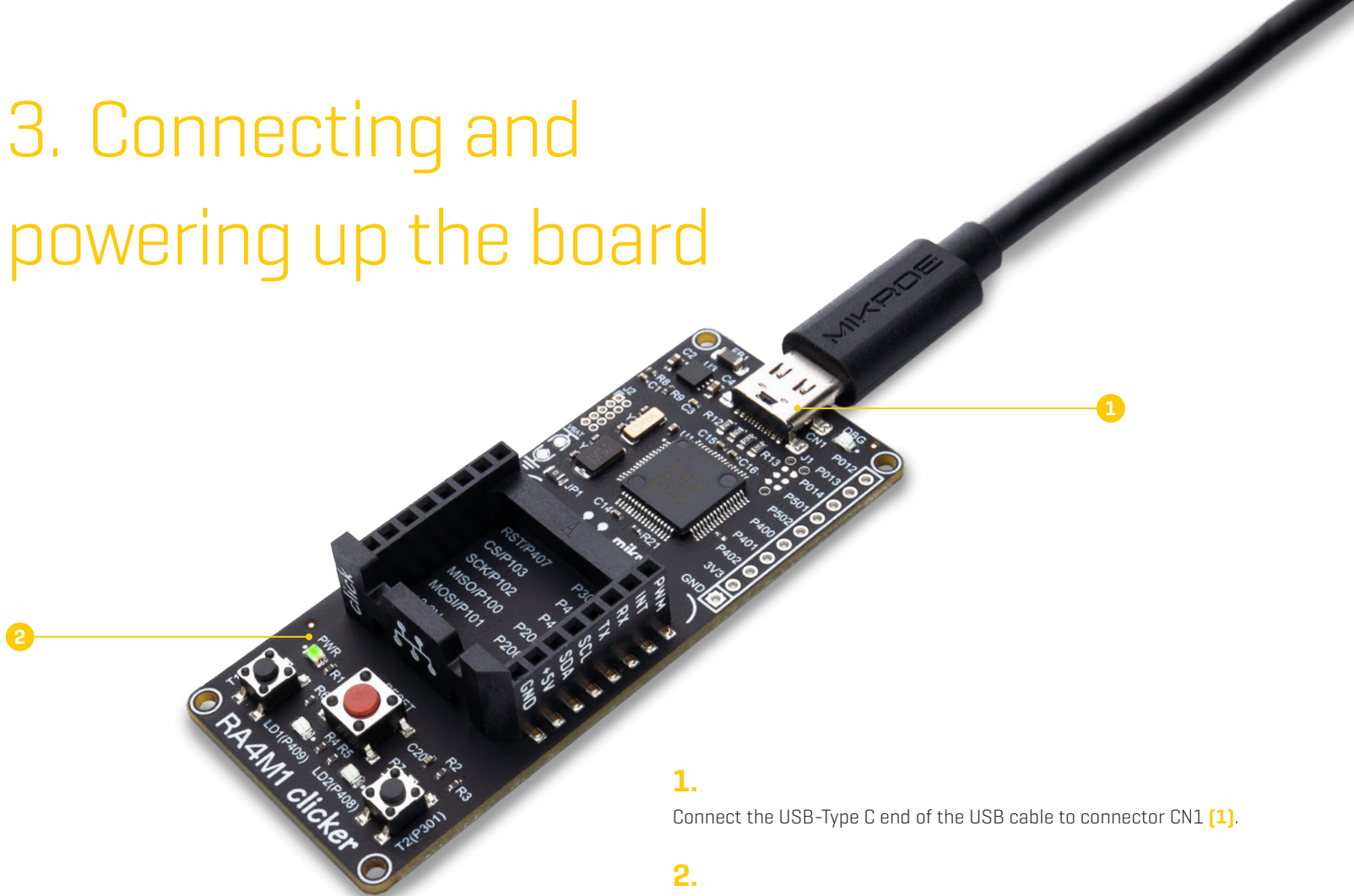


Figure 3: RA4M1 Clicker, connected

1. Connect the USB-Type C end of the USB cable to connector CN1 (1).
2. Connect the other end of this cable to the USB port of the host PC or a 5V power source. A LED indicator labeled as PWR (2) lights up solid green, indicating that the board is powered on.

4. Programming the microcontroller

The microcontroller can be programmed in two ways:

4.1 Programming with on-board J-Link OB debug probe

RA4M1 Clicker uses SEGGER J-Link® **[1]** as the onboard debugging interface. Make sure that the J-Link drivers are installed on the PC by checking for them in the Windows Device Manager. If J-Link drivers are installed on the PC and detected by the board, the LD4 [DBG] **blinks yellow** with a very small duty cycle that is barely noticeable. Otherwise, LD4 [DBG] blinks yellow prominently.

RA4M1 Clicker is compatible with **e² studio**, Integrated Development Environment by Renesas. Just download and install Renesas Flexible Software Package and e² studio development environment using the **FSP with e² studio installer**. For any software support you might need, your go-to source is **Renesas Support**

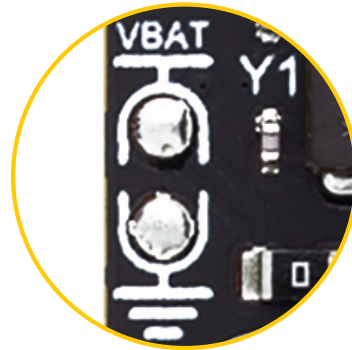
4.2 Programming with external programmer

The microcontroller can be programmed with external programmer and supported software. The external programmer is connected to the development board via 2x5 JTAG/SWD connector soldered on the J2 connector pads.



Figure 4: RA4M1 Clicker, back view

5. RTC battery



RA4M1 Clicker features RTC battery pads **[1]** for powering microcontroller's internal RTC module. Battery is used as an alternative source of power, so the RTC module can keep track of time while primary source of power is OFF or unavailable. In order to use this option it is necessary to connect (solder) external battery (voltage range from 1.6 to 3.6 V) and unsolder jumper JP1 **[2]**.

Make sure that orientation of the battery is correct (plus on VBAT and minus on GND pad), otherwise it won't work properly.

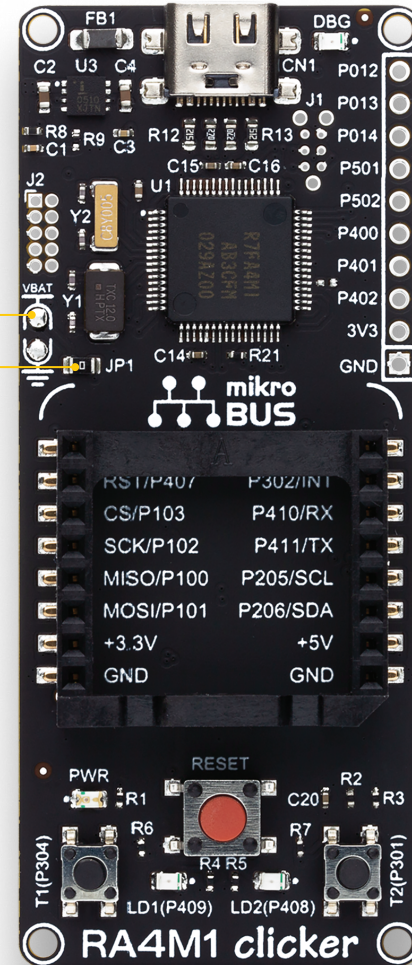


Figure 5: RA4M1 Clicker, front view

6. Buttons and LEDs

The board also contains a reset button **[1]** and a pair of buttons **[2]** and LEDs **[3]**.

Each of these additional peripherals are located in the bottom area of the board. Reset button is used to manually reset the microcontroller. Pressing the reset button will generate a low voltage level on microcontroller's reset pin.

LEDs can be used for visual indication of the logic state on two pins **[P408 and P409]**. An active LED indicates that a logic high [1] is present on the pin. Pressing any of these buttons can change the logic state of the microcontroller pins **[P301 and P304]** from logic high [1] to logic low [0].

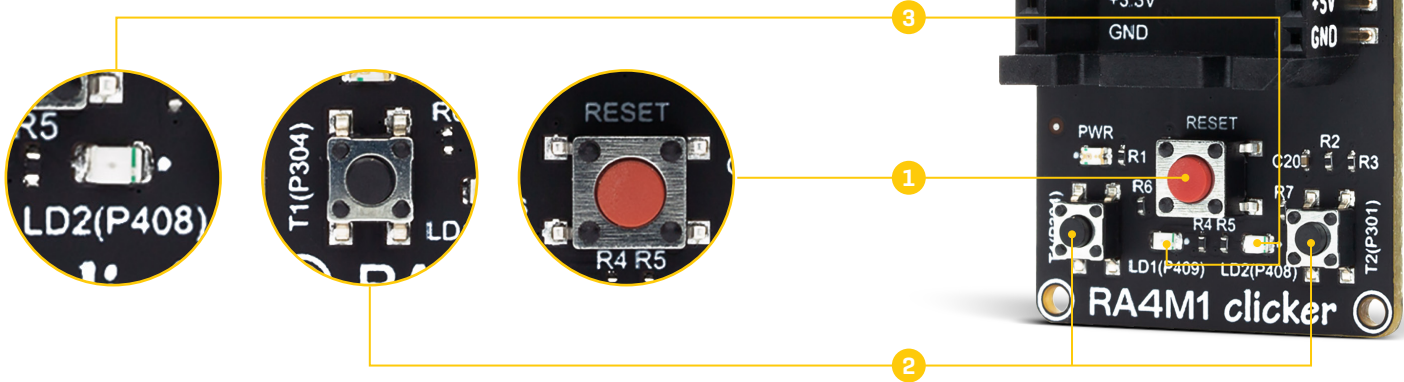


Figure 6: RA4M1 Clicker, side view

7. Click boards™

THE LARGEST ADD-ON BOARD COLLECTION IN THE WORLD.

Click boards™ are standardized add-on boards that carry a variety of different electronic devices. They are designed to perfectly fit the mikroBUS™ socket. Engineered to deliver the best performances for the used components, they save developers of testing and troubleshooting often associated with the prototyping phase. They enhance rapid development and accelerate time to market. These ready-to-use boards require no additional hardware configuration.

More information at www.mikroe.com/click

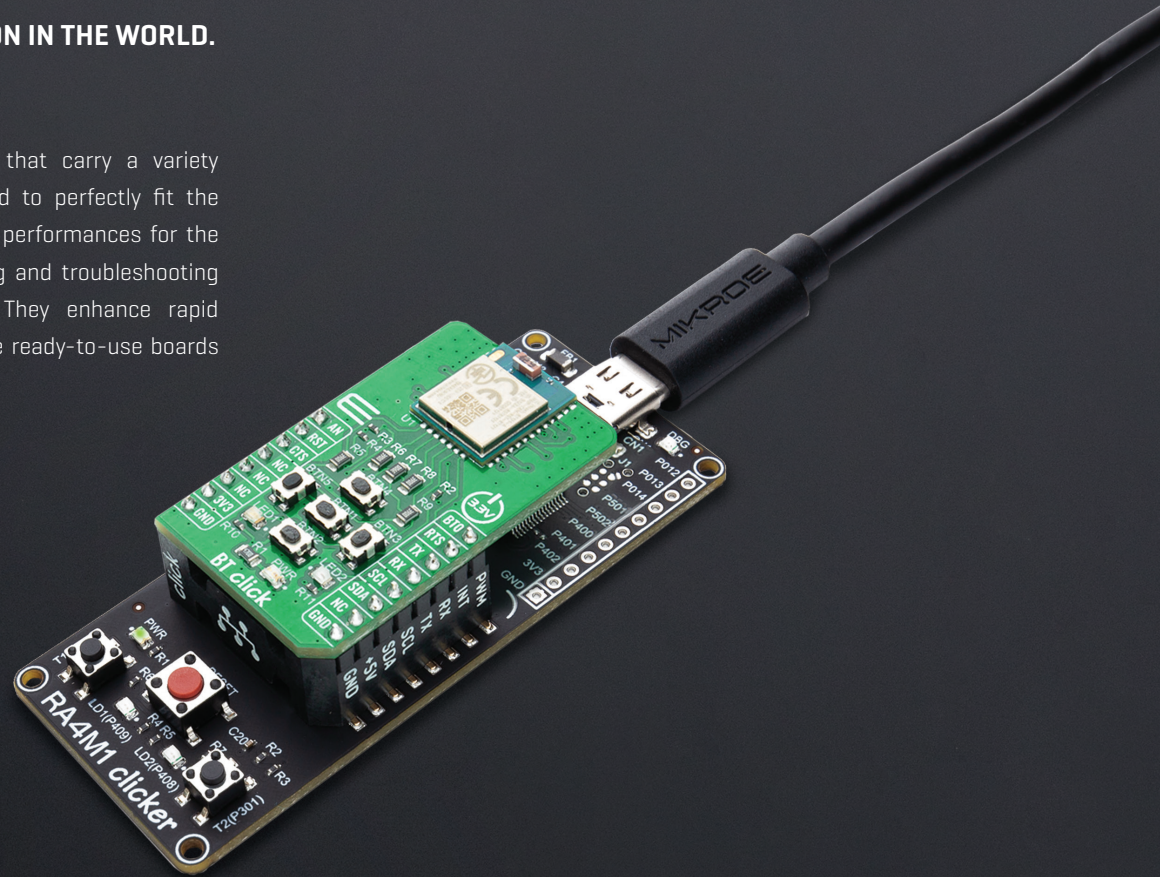
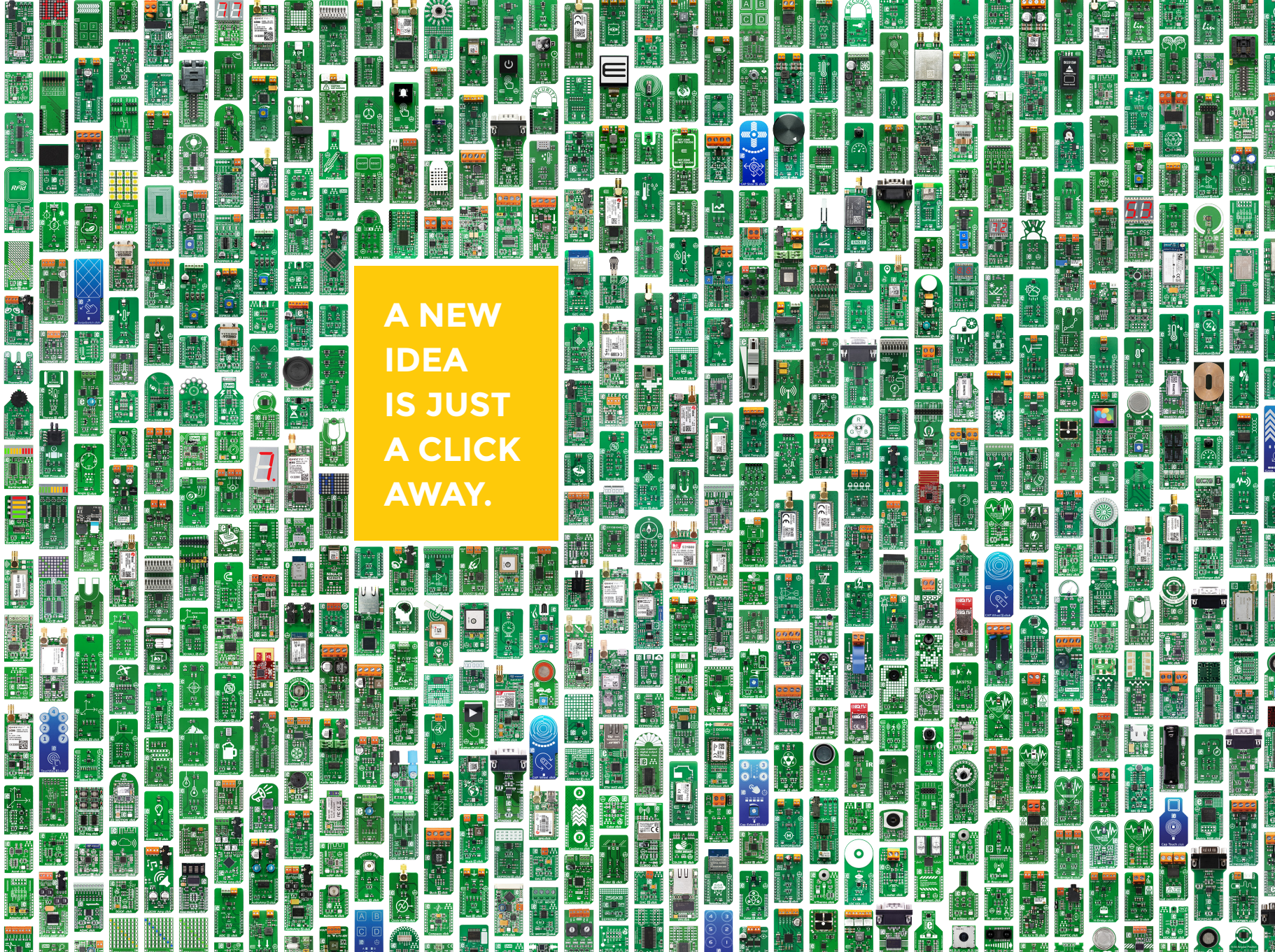


Figure 7: RA4M1 Clicker with BT click connected



A NEW
IDEA
IS JUST
A CLICK
AWAY.

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Time-saving embedded tools

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