Thank you for choosing Mikroe!

We present you the ultimate solution for embedded development. Elegant on the surface, yet extremely powerful on the inside, we have designed it to inspire outstanding achievements. And now, it’s all yours.

Enjoy premium.
Table of contents

Introduction 4
1. Board features 5
2. Key microcontroller features 6
3. Connecting and powering up the board 7
4. Programming the microcontroller 8
   4.1 Programming with on-board J-Link OB debug probe 8
   4.2 Programming with external programmer 8
5. RTC battery 9
6. LEDs and buttons 10
7. Click boards™ 11
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™. RA41 Clicker board can be powered over a USB Type-C cable.

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

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® 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.
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.
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].
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.
DISCLAIMER

All the products owned by MikroElektronika are protected by copyright law and international copyright treaty. Therefore, this manual is to be treated as any other copyright material. No part of this manual, including product and software described herein, must be reproduced, stored in a retrieval system, translated or transmitted in any form or by any means, without the prior written permission of MikroElektronika. The manual PDF edition can be printed for private or local use, but not for distribution. Any modification of this manual is prohibited.

MikroElektronika provides this manual ‘as is’ without warranty of any kind, either expressed or implied, including, but not limited to, the implied warranties or conditions of merchantability or fitness for a particular purpose.

MikroElektronika shall assume no responsibility or liability for any errors, omissions and inaccuracies that may appear in this manual. In no event shall MikroElektronika, its directors, officers, employees or distributors be liable for any indirect, specific, incidental or consequential damages (including damages for loss of business profits and business information, business interruption or any other pecuniary loss) arising out of the use of this manual or product, even if MikroElektronika has been advised of the possibility of such damages. MikroElektronika reserves the right to change information contained in this manual at any time without prior notice, if necessary.

HIGH RISK ACTIVITIES

The products of MikroElektronika are not fault – tolerant nor designed, manufactured or intended for use or resale as on – line control equipment in hazardous environments requiring fail – safe performance, such as in the operation of nuclear facilities, aircraft navigation or communication systems, air traffic control, direct life support machines or weapons systems in which the failure of Software could lead directly to death, personal injury or severe physical or environmental damage (‘High Risk Activities’). MikroElektronika and its suppliers specifically disclaim any expressed or implied warranty of fitness for High Risk Activities.

TRADEMARKS

The MikroElektronika name and logo, the MikroElektronika logo, mikroC, mikroBasic, mikroPascal, mikroProg, mikromedia, Fusion, Click boards™ and mikroBUS™ are trademarks of MikroElektronika. All other trademarks mentioned herein are property of their respective companies.

All other product and corporate names appearing in this manual may or may not be registered trademarks or copyrights of their respective companies, and are only used for identification or explanation and to the owners’ benefit, with no intent to infringe.

Copyright © MikroElektronika, 2020, All Rights Reserved.
If you want to learn more about our products, please visit our website at www.mikroe.com.
If you are experiencing some problems with any of our products or just need additional information, please place your ticket at www.mikroe.com/support.
If you have any questions, comments or business proposals, do not hesitate to contact us at office@mikroe.com.