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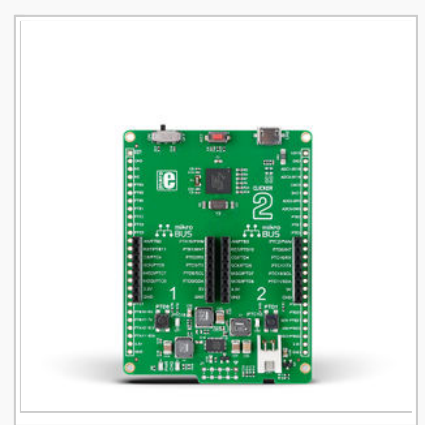
Clicker 2 for Kinetis

From MikroElektonika Documentation

clicker 2 for Kinetis is a compact dev. kit with two mikroBUS™ sockets for click board connectivity. You can use it to quickly build your own gadgets with unique functionalities and features. It carries the MK64FN1M0VDC12, a 32-bit ARM® Cortex®-M4 microcontroller, two indication LEDs, two general purpose buttons, a reset button, an on/off switch, a li-polymer battery connector, a USB Mini-B connector and two mikroBUS™ socket. A JTAG connector and a 2x26 pinout for interfacing with external electronics are also provided. The mikroBUS™ connector consists of two 1x8 female headers with SPI, I2C, UART, RST, PWM, Analog and Interrupt lines as well as 3.3V, 5V and GND power lines. clicker 2 for Kinetis board can be powered over a USB cable.
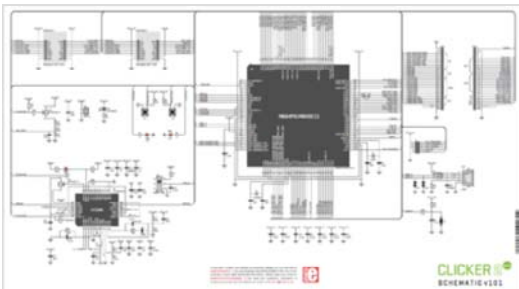
Contents

clicker 2 for Kinetis

**clicker 2 for Kinetis**

IC/Module	MK64FN1M0VDC12 (http://cache.nxp.com/files/microcontrollers/doc/data_sheet/K64P142M120SF5.pdf?fpsp=1&WT_TYPE=Data%20Sheets&WT_VENDOR=FREESCALE&WT_FILE_FORMAT=pdf&WT_ASSET=Documentation&fileExt=.pdf)
Interface	2 x mikroBUS™ sockets and 2x 26 pinout on board edges
Power supply	3.3V, 5V
Website	www.mikroe.com/kinetis/clicker-2 (http://www.mikroe.com/kinetis/clicker-2)

Schematic

Schematic also available as printable PDF (http://cdn-docs.mikroe.com/images/9/90/Clicker_2_for_Kinetis_v101_schematic.pdf)

What's onboard
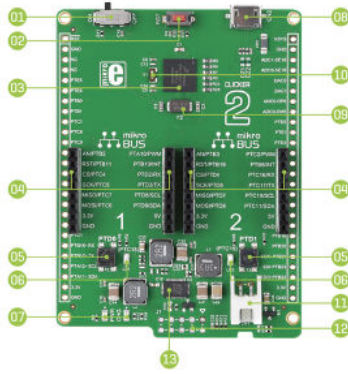
1. ON/OFF switch
2. Reset button
3. MK64FN1M0VDC12 MCU
4. mikroBUS™ sockets 1 and 2
5. Pushbuttons
6. Additional LEDs
7. Indication LEDs
8. Micro USB-B connector
9. 32.768 KHz Crystal
10. 12 KHz Crystal
11. Battery connector
12. JTAG programmer connector
13. LTC3568 USB power manager IC

Power supply

You can supply power to the board with a Micro USB cable. On-board voltage regulators provide the appropriate voltage levels to each component on the board. Power LED (GREEN) will indicate the presence of power supply. You can also power the board using a Li-Polymer battery, via on-board battery connector. On-board battery charger circuit enables you to charge the battery over USB connection. LED diode (RED) will indicate when battery is charging. Charging current is ~300mA and charging voltage is 4.2V DC.

MCU specs

The clicker 2 for Kinetis development tool comes with the MK64FN1M0VDC12 device. This 32-bit high performance microcontroller is rich with on-chip peripherals and features 1 MB of Flash and 256 KB of SRAM. It has integrated full speed USB 2.0. support.

- 120 MHz
- 1MB Flash
- Ethernet controller with MII and RMII interface
- USB full-/low-speed On-the-Go controller
- Controller Area Network (CAN) module
- 3x SPI, 3x I2C, 6x UART
- Secure Digital Host Controller (SDHC)
- I2S module
- Run power consumption down to 250 µA/MHz; Static power consumption down to 5.8 µA with full state retention and 5 µs wakeup.

Programming

The microcontroller can be programmed in two ways:

1) Using USB HID mikroBootloader, 2) Using external mikroProg™ for Kinetis programmer.

Programming with mikroBootloader

You can program the microcontroller with a bootloader which is preprogrammed by default.

To transfer .hex file from a PC to MCU you need bootloader software (mikroBootloader USB HID) which can be downloaded from:

www.mikroe.com/kinetis/clicker-2

After the mikroBootloader software is downloaded, unzip it to desired location and start it.

### step 1 – Connecting clicker 2 for Kinetis

To start, connect the USB cable, or if already connected press the Reset button on your clicker 2 for Kinetis. Click the Connect button within 5s to enter the bootloader mode, otherwise existing microcontroller program will execute.

step 2 – Browsing for .HEX file

Click the Browse for HEX button and from a pop-up window choose the .HEX file which will be uploaded to MCU memory.

step 3 – Selecting .HEX file
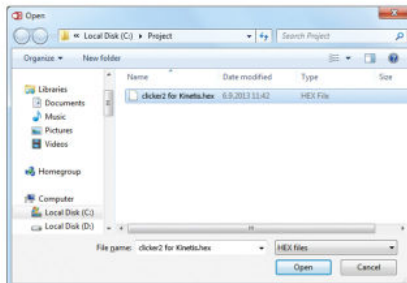
Select .HEX file using open dialog window.

Click the Open button.

step 4 – Uploading .HEX file

To start .HEX file bootloading click the Begin uploading button.
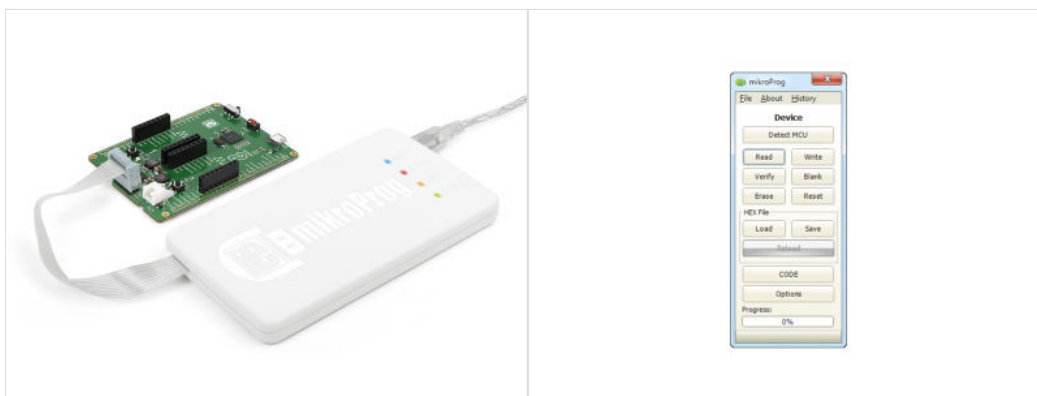
Progress bar enables you to monitor .HEX file uploading.

step 5 – Finish upload

Click OK button after the uploading process is finished. Press Reset button on clicker 2 for Kinetis board and wait for 5 seconds. Your program will run automatically.

Programming with mikroProg™ programmer

The microcontroller can be programmed with external mikroProg™ for Kinetis programmer and mikroProg Suite™ for ARM® software. The external programmer is connected to the development system via 2x5 JTAG connector.

mikroProg™ is a fast USB 2.0 programmer with hardware debugger support. Outstanding performance, easy operation and elegant design are its key features.

mikroProg Suite™ for ARM® has an intuitive interface and programming technology. First, download the software from MikroElektronika's webpage (http://www.mikroe.com/downloads/get/1809/mikroprog_suite_for_arm_v132.zip).

After downloading, extract the package and double click the executable setup file, to start the installation.

Click the Detect MCU button in order to recognize the device ID. Click the Read button to read the entire microcontroller memory. You can click the Save button to save it to the target HEX file.

If you want to write the HEX file into the microcontroller, first make sure to load the target HEX file using the Load button. Then click the Write button to begin programming. Click the Erase button to clear the microcontroller memory.

Buttons and LEDs
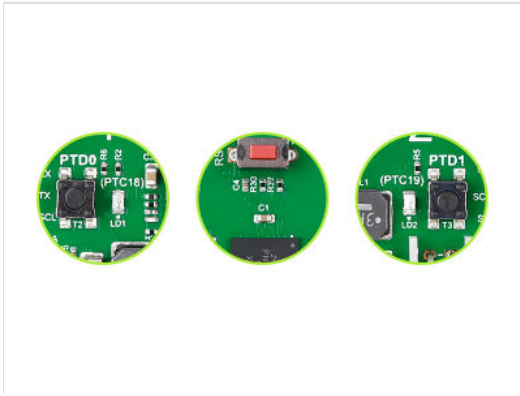
The board also contains a reset button and a pair of buttons and LEDs, as well as an ON/OFF switch. The Reset button is used to manually reset the microcontroller—it generates a low voltage level on the microcontroller's reset pin. LEDs can be used for visual indication of the logic state on two pins (PE12 and PE15). An active LED indicates that a logic high (1) is present on the pin. Pressing any of the two buttons can change the logic state of the microcontroller pins (PE0 and PA10) from logic high (1) to logic low (0). In addition to the onboard ON/OFF switch, two pads (EXT and PSW) allow you to connect your own external switch.

Power management and battery charger
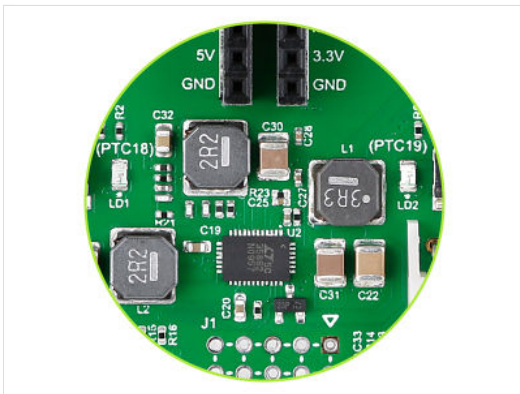
clicker 2 for Kinetis features LTC®3586-2, a highly integrated power management and battery charger IC that includes a current limited switching PowerPath manager. When you solder the onboard zero-ohm J1 jumper to the LDO position, the LTC®3586-2 will provide an independent, steady power supply to the MCUs RTC from the li-polymer battery or USB, even when the rest of the system is turned off (or reset). LTC®3586 also enables battery charging over a USB connection.

Oscillators
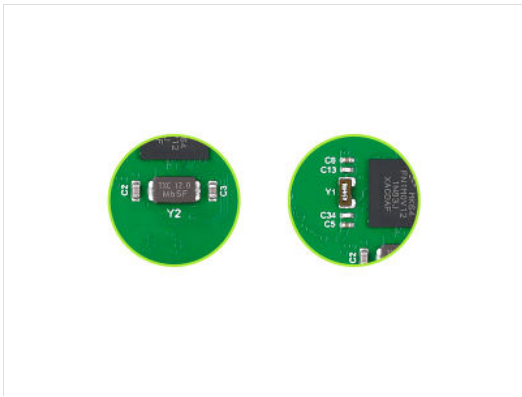
The MK64FN1M0VDC12 microcontroller is equipped with internal 1 kHz, 32 kHz, 4 MHz and 48 MHz references that provide a stable clock signal. Since the chips have an integrated PLL, this base frequency is suitable for further clock multiplication. The board also contains an additional 12MHz crystal oscillator, as well as a 32.768kHz one, which provides an external clock for the internal RTCC module.

USB connection

MK64FN1M0VDC12 microcontrollers has an integrated USB module, which enables you to implement USB communication functionality to your clicker 2 board. Connection with target USB host is done over a Micro USB connector which is positioned next to the battery connector.

mikroBUS™ pinouts

Having two mikroBUS™ sockets and an additional connection pad, clicker 2 for Kinetis utilizes all of the MK64FN1M0VDC12's I/Os. Each of the three UART outputs has its own separate connection pin (either on mikroBUS™ 1 or 2, or on the 2x26 connection pad). Of the two SPI lines, one is routed to mikroBUS™ 1; the other is shared between mikroBUS™ 2 and the pins on the connection pad. Same goes for the two available I2C lines.

Resources

- K64_120 Kinetis K64F data sheet (http://www.nxp.com/webapp/search.partparamdetail.framework?PART_NUMBER=MK64FN1M0VDC12)

- mikroProg Suite for ARM direct download (http://www.mikroe.com/downloads/get/1809/mikroprog_suite_for_arm_v132.zip)

- USB HID bootloader for clicker 2 for Kinetis (http://www.mikroe.com/kinetis/clicker-2/)

- Kinetis K64 overview on NXP.com (http://www.nxp.com/products/microcontrollers-and-processors/arm-processors/kinetis-cortex-m-mcus/k-series-performance-m4/k6x-ethernet/kinetis-k64-120-mhz-256kb-sram-microcontrollers-mcus-based-on-arm-cortex-m4-core:K64_120)

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