

ZINIKO-70 Firmware update guide

WARNING: For rookie users only!

THERE IS A HIGH VOLTAGE ON THE CLOCK BOARD. TOUCHING HIGH VOLTAGE PARTS WHEN CLOCK IS ON, WILL MOST LIKELY KILL YOU. CONSIDER THIS.

High voltage components are only on the upper part of the PCB, lower side, where programming sockets are located, is completely safe.

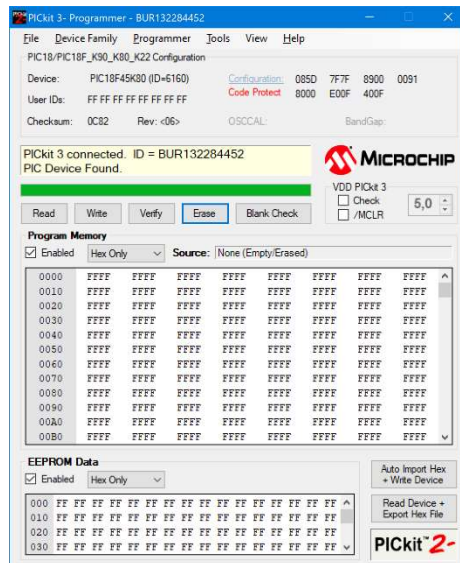
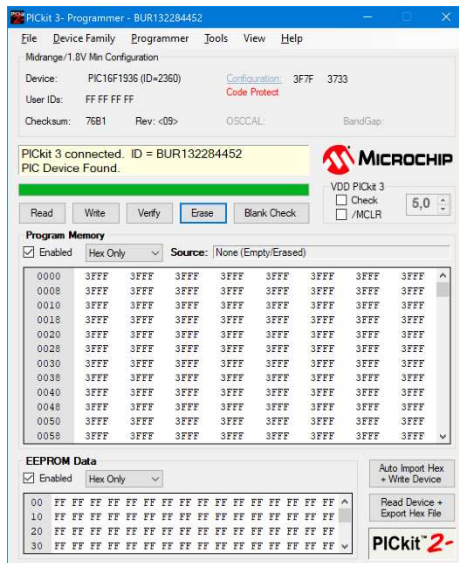
This is user guide for firmware update for ZINIKO-70 clock. Please, follow it with attention, because "I know this shit well" won't work in most cases, and errors might be made.

Required tools and software:

1. Firmware update cable (included with your clock)
2. PicKit 2 or PicKit 3 programmer
3. Computer running windows, with PicKit Minus software installed.

Firmware update steps are as follow:

1. Install Pickit minus software, please download it from this link: <http://kair.us/projects/pickitminus/index.html> and install on your computer.
2. Power on the clock, wait 5-10 seconds, connect wider end of the firmware update cable to the PicKit device. Please make check that red wire aligns with the socket pin, marked with triangle on PicKit board.
3. There are 7 pcs narrow 5 pin sockets on the board, six of them are horizontal and one is vertical. The horizontal ones are used to update "receiver" firmware and vertical one is for updating "main" firmware. For testing purposes, connect narrow end of firmware update cable to any of these sockets. Please take care that red wire aligns with the pin with "0" marking next to it. **Please note: Receiver firmware has to be uploaded to ALL modules, not to only one.**
4. After connections are made, launch the pickit minus software. Depending on the socket you've connected to, you will see one of these screens – left one for "receiver" and right screen for "transmitter"



You should see “PIC Device Found” in the status window of the software. If it says “no device is found” or “Unsupported part”, please re-check, whenever programmer cable is connected properly.

5. Open the firmware file via File/Open menu, and press “Write”. Firmware should be updated and main status window changing it’s color to green.

Please note, when changing the MCU type (Going from receiver to main or vice versa) once you plug the different MCU, you need to go to PicKit Minus menu/tools and select “Check communication” from there. If you won’t do so, there will be error during programming.

There are several firmware files provided, both for “receiver” and “main” modules:

Rtest.hex – this firmware file is for receiver testing

Mtest.hex – this firmware file is for main code testing

Eblock1.Hex – firmware update for eeprom block 1

Eblock2.Hex – firmware update for eeprom block 2

Receiver.hex – stock firmware for receiver parts

Main.hex – stock firmware for main part.

When you first received the board, you had to make sure that there was no damage to it during the transit, and for that, you need to flash “test” firmware to both receiver and main modules. The test firmware for receiver module sequentially lights up all segments in the tube at various brightness levels and with various transition effects, to ensure that everything is ok. Backlight LED colors are also sequentially changed thru red-green-blue and so on, to ensure that they also work correctly. After flashing this firmware,

please install tubes, apply power and check that all digits come on in proper sequence (0-1-2-3-4-5-6-7-8-9-C/F sign) and LEDs display all 3 colors. Also, ensure that separator dots are going on and off. To 100% ensure in proper operation of the clock, leave test firmware running for at least 1 hour. After ensuring that everything is OK with each tube (all digits come on, there are no too bright or too dark digits, etc.), please flash receiver.hex to the receiver modules. Please note, during the test process, tubes will update at random speed, out of sync, this is normal and does not mean any malfunction.

To test the main module, please flash mtest.hex into it and apply the power. After the launch, you will see two time displays on the built-in LCD screen:

GPS: 12:34:56

RTC: 12:34:56 (Actual time will be inaccurate, this test is just to ensure that chip works properly, not to display actual time)

The bottom one shows time from built-in RTC module and top one shows time from GPS or NTP module. Make sure that both numbers do update. Please note, that after applying the power, it might need several minutes for GPS or NTP signal to be synchronized, or if you're in a poor reception area, it might take a bit more. So, during synchronization period, you will see "Waiting for GPS" on the top line. This is completely normal, but for testing purposes, please move clock board near to window, to ensure that GPS module is working properly.

At the same time, you can press the 4 touch keys in any sequence. The bottom half of screen will correspondingly display "Left top key", "Right top key", "Left bottom key", "Right bottom key".

After you ensure that all buttons work properly and time is also decoded properly, you can proceed to the next step – EEPROM update. The EEPROM stores string data for the displayed messages and by default, provides communication with the user in English language. On demand, EEPROM updates can include other languages too.

EEPROM update is a bit different. After flashing the firmware Eblock1.hex, please re-apply power to the clock board. The LCD screen will say "Press right key to update". Please press any of the right keys, and EEPROM update will start, with address and status displayed on the screen. After successful update, "Eeprom block 1 update complete" will be displayed on the screen. Now please flash Eblock2.hex and repeat above procedures.

After eeprom update, you can flash the main.hex file to the main module of your clock, turn off power to the clock, power it again and you're good to go!