

Magic Board

M258 - LCD + Touch

Joy of innovation
nuvoTon



Magic Board – First-time Use

Remove the battery isolation tab to begin your “Magic” journey.



Scrolling Marquee Mode



Toggle between displaying names, dates, or patterns.



Enter Game Mode – Tetris.

Game Mode (Tetris)



Move the block left or right.



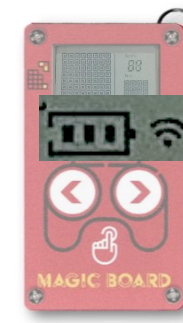
Rotate the block

Power Down Mode



Press and hold the left arrow key for 5 seconds to power on/off or enter Scrolling Marquee Mode.

Debug Mode

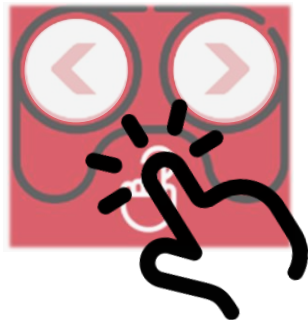


Press and hold the right arrow key for 5 seconds until the WIFI icon shows up.

Magic Board - Features

Touch Key

- ✓ **3 capacitive touch keys**
- ✓ Provide algorithms (**IIR**, **Debounce**, **Baseline tracking**) to improve anti-interference capabilities
- ✓ High touch sensitivity and high-noise immunity



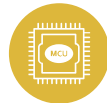
HTN-LCD

- ✓ **8 COM x 24 SEG**
- ✓ LCD controller **built-in DH1/DH2 capacitance** and **charge pump** features to support V_{LCD}
- ✓ Built-in bias voltage generator
 - Save V1/V2/V3 capacitance
- ✓ Display remain in power down mode
- ✓ Supports **NuTool-LCDView** to configure LCD

Magic Board – MCU Introduction



NuMicro® M258 Series



System

- Arm® Cortex®-M23 core
- Runs up to 48 MHz
- 64 KB ~ 256 KB Flash Memory, 32 KB SRAM
- Operating voltage: 1.75V ~ 5.5V



Analog

- 8 COM x 44 SEG, 6 COM x 46 SEG, 4 COM x 48 SEG LCD driver (3V ~ 5V LCD)
 - OP buffer mode for large size panel
 - Charge pump for battery device
- Up to 16-channel capacitive touch key



Peripherals

- 2 sets of USCI (UART, I²C, SPI)
- Up to 4 sets of UART
- 2 sets of I²C
- 2 sets of SPI/ I²S
- 1 set of ISO 7816-3
- RTC independent power source (V_{BAT})
- Crystal-less USB 2.0 FS Device



Security

- Crypto Engine
 - AES-128, AES-196, AES-256

| Magic Board – Block Diagram

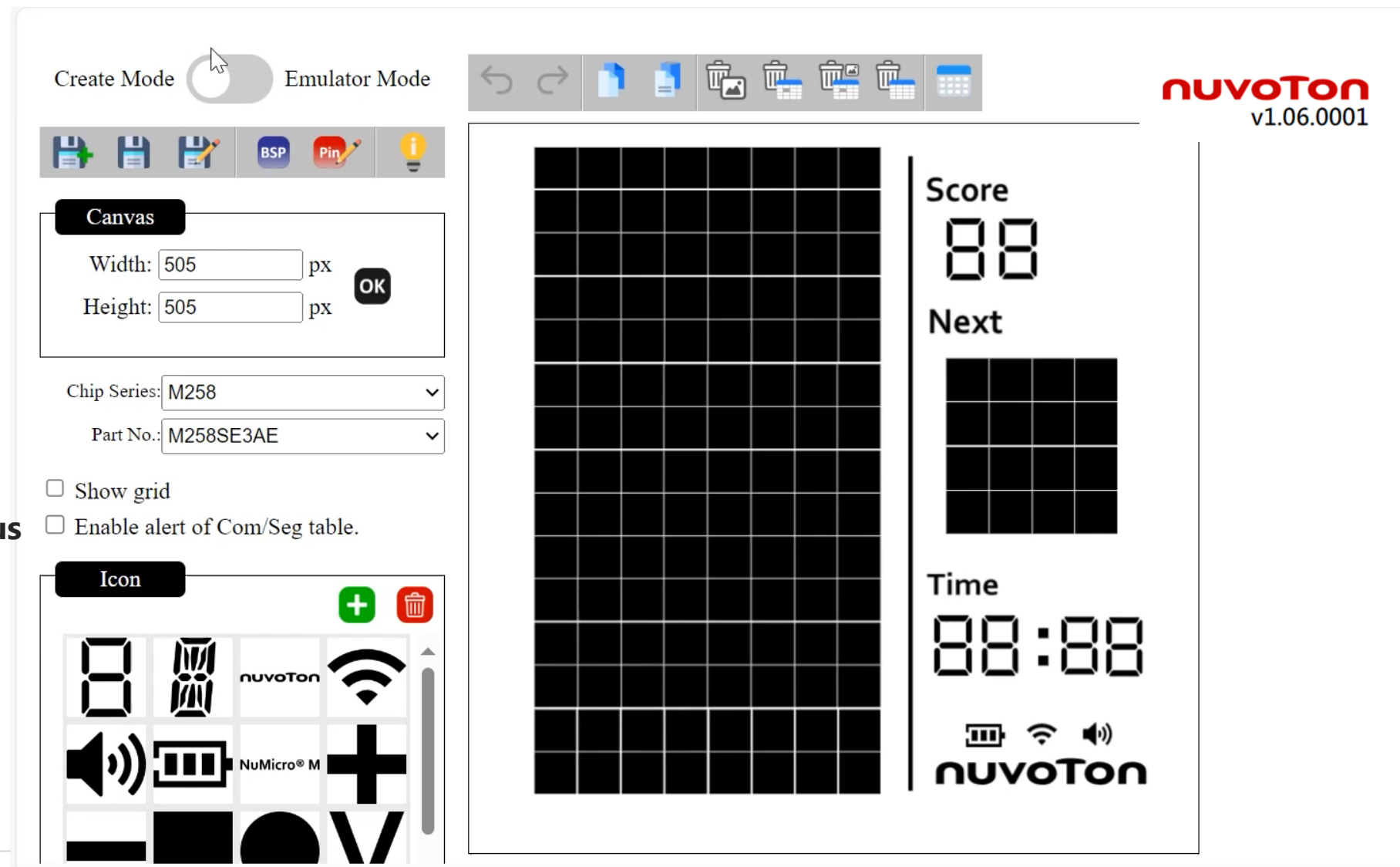


LCDView

- More Magic

Generates LCD function
configuration code

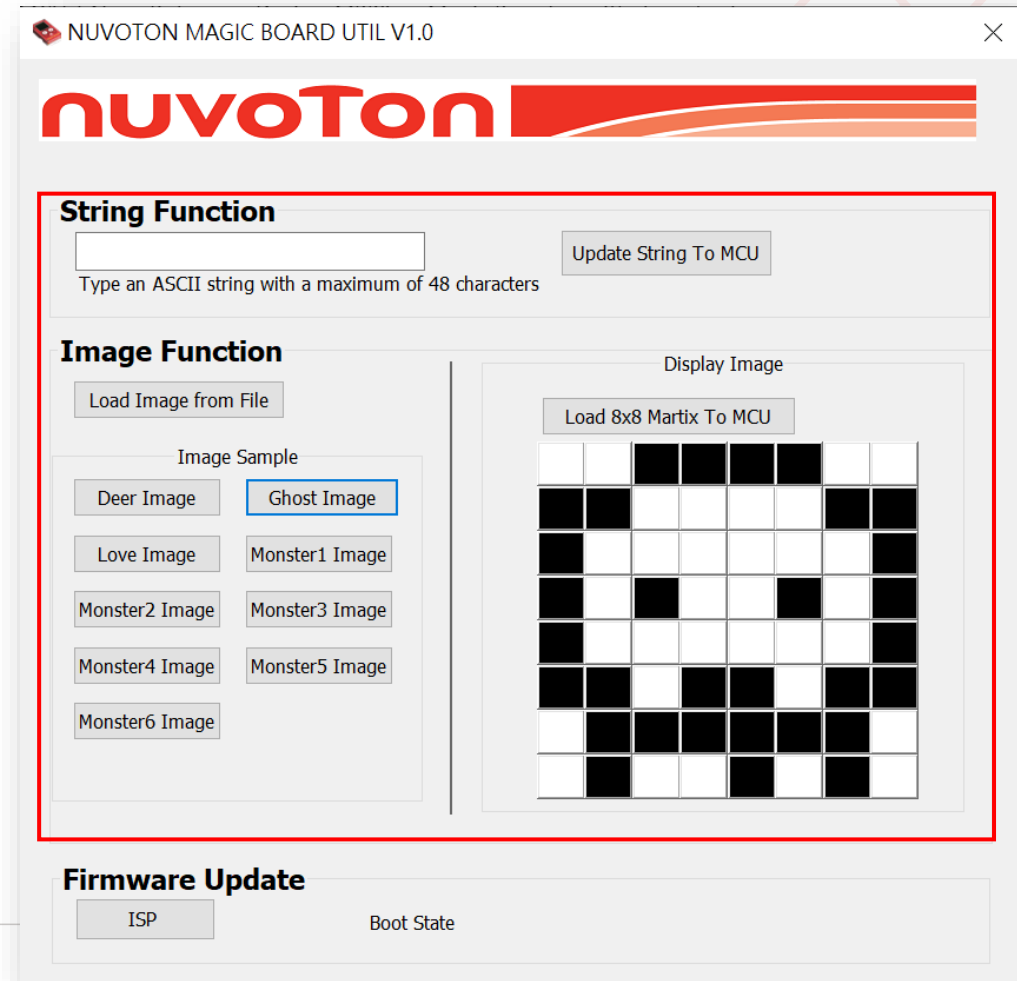
Gets real-time emulator
COM/SEG status & Touch Key status
without a real LCD device



| Unleash Magic – Change String & Picture

- How to perform the magic (renaming and changing pixel art) on your Magic Board?

1. Connect the Magic Board to the PC using a Type-C cable.
2. Download the “NUVOTON MAGIC BOARD UTIL” tool from Github.
3. Open the tool and click “Update String To MCU” and “Load Image” respectively.



| Unleash Magic – Update Firmware Program

- How to create and enact the magic (new program) on your Magic Board?

1. Connect the Magic Board to the PC using a Type-C cable.
2. Download the “NUVOTON MAGIC BOARD UTIL” tool from Github.
3. Open the tool and click “ISP” to choose the target bin file.

