


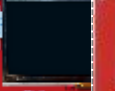

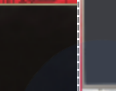




## GUI Solution

With the rise of the Internet of Things and Industry 4.0, market demand for HMI continues to grow. Nuvoton offers the platform which is a comprehensive MCU/MPU solutions along with embedded GUI software from SEGGER to fulfill various production and design needs.

The GUI platform offers a graphical user interface (GUI) solution to help users to create a powerful and stunning graphics for the embedded system. The GUI platform can be implemented on HMI for industrial, machines, and appliances, etc. Users can select the different NuMicro® MCU/MPU series to build their GUI solutions. When selecting the N9H MPU series for emWin platform, it supports up to 1024x768 (24-bit) resolution of a display; selecting the M487 series, it supports up to 480 x 272 resolution; and using the M032 series, it will support up to 320x240 resolution of a display.

Recommend LCD Resolution	< 320x240	< 320x240	< 480x272	< 480x272	320x240 ~ 800x480	800x480 ~ 1024x768	800x480 ~ 1024x768	1280x720 ~ 1920x1080	
Part Number	M032 Series	M2354 Series	M480 Series	M460 Series	N9H20 Series	N9H26 Series	N9H30 Series	MA35D1 Series	
Core Type	Cortex-M0	Cortex-M23	Cortex-M4	Cortex-M4	Arm9	Arm9	Arm9	Dual Cortex-A35 + M4	
Frequency	72 MHz	96 MHz	192 MHz	200 MHz	200 MHz	240 MHz	300 MHz	800 MHz/ 180 MHz	
Flash Size	512 KB	1024 KB	256 KB/ 512 KB/ 2 MB	1024 KB	External Flash	External Flash	External Flash	External Flash	
RAM Size	96 KB	256 KB	96 KB/ 160 KB	512 KB	2 MB/ 8 MB/ 32 MB	64 MB	64 MB/ 128 MB	128 MB/ 256 MB/ 512 MB	
LCM Interface	RGB(16/24bit)	-	-	-	-	√	√	√	√
	i80(8/16bit)	√	√	√	√	√	√	√	√
	SPI	√	√	√	√	√	√	√	√
Video Codec	-	-	-	-	JPEG	JPEG/H.264	JPEG	JPEG decoder H.264 decoder	
2D Graphic Engine	-	-	-	-	√	√	√	√	
Build-in Resistive touch ADC	-	-	-	-	√	√	√	√	
Audio	I <sup>2</sup> S	I <sup>2</sup> S	I <sup>2</sup> S	I <sup>2</sup> S	Stereo DAC/I <sup>2</sup> S	Stereo DAC/I <sup>2</sup> S	I <sup>2</sup> S	I <sup>2</sup> S	
Support OS	Non-OS FreeRTOS	Non-OS FreeRTOS	Non-OS FreeRTOS	Non-OS FreeRTOS	Non-OS FreeRTOS	Non-OS FreeRTOS	Non-OS FreeRTOS Linux	Linux 5.4	

				RT-Thread	RT-Thread	Linux 2.6.35	Linux 2.6.35	3.10 RT-Thread	
Support GUI Library	emWin	<a href="#">✓</a>	<a href="#">✓</a>	<a href="#">✓</a>	<a href="#">✓</a>	<a href="#">✓</a>	<a href="#">✓</a>	<a href="#">✓</a>	<a href="#">✓</a>
	LVGL		-	<a href="#">✓</a>	<a href="#">✓</a>			<a href="#">✓</a>	<a href="#">✓</a>
	Qt	-	-	-	-	-	-	<a href="#">✓</a> 4.8.5	<a href="#">✓</a> 5.14.1
NuMaker Boards	Part No.								
		<a href="#">NuMaker-HMI-M032</a>	<a href="#">NuMaker-HMI-M2354</a>	<a href="#">NuMaker-HMI-M487</a>	<a href="#">NuMaker-HMI-M467</a>	<a href="#">NuMaker-HMI-N9H20</a>	<a href="#">NuMaker-HMI-N9H26</a>	<a href="#">NuMaker-HMI-N9H30</a>	<a href="#">NuMaker-HMI-MA35D1-S1</a>
	User Manual	<a href="#">User manual</a>	<a href="#">User manual</a>	<a href="#">User manual</a>	<a href="#">User manual</a>	<a href="#">User manual</a>	<a href="#">User manual</a>	<a href="#">User manual</a>	<a href="#">User manual</a>
	Hardware	<a href="#">Schematic</a>	<a href="#">Schematic</a>	<a href="#">Schematic</a>	<a href="#">Schematic</a>	<a href="#">Schematic</a>	<a href="#">Schematic</a>	<a href="#">Schematic</a>	<a href="#">Schematic</a>
	Software	<a href="#">BSP</a>	<a href="#">BSP</a>	<a href="#">BSP</a>	<a href="#">BSP</a>	<a href="#">BSP</a>	<a href="#">BSP</a>	<a href="#">BSP</a>	<a href="#">BSP</a>
參考設計樣板	-	-	Samrt Plug	-	<a href="#">Elevator display template</a>	<a href="#">Refrigerator display template</a>	<a href="#">Vehicle meter template</a>	<a href="#">Color thermostat template</a>	-
					<a href="#">Recipe player template</a>	<a href="#">WiFi Color thermostat template</a>	<a href="#">Motorcycle Dashboard</a>		