

# Simplifying the Creation of Stunning GUIs

Introducing Embedded Wizard in the MCUXpresso SDK

MARCH 31, 2020



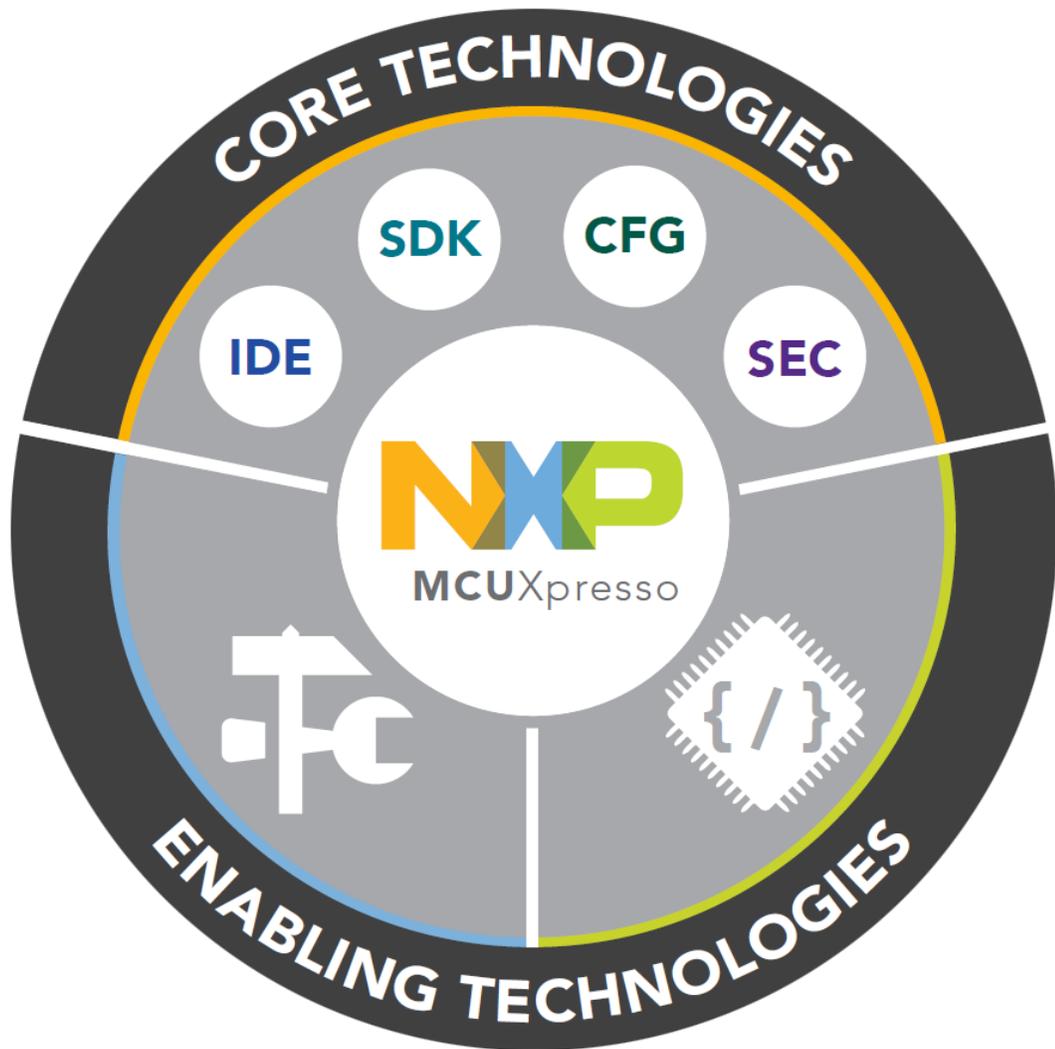
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## THE MCUXPRESSO ECOSYSTEM



- > **Core Technologies from NXP**
  - MCUXpresso IDE
  - MCUXpresso SDK
  - MCUXpresso Config Tools
  - MCUXpresso Secure Provisioning Tool
- > **Enabling Software Technologies**
  - Run time software libraries and middleware
  - Enable customers to focus on differentiation
  - From NXP and partners
- > **Enabling Tools Technologies**
  - Partner IDEs
  - Debug Probes
  - Development Boards
  - From NXP and partners

# MCUXPRESSO SDK

## SOFTWARE FRAMEWORK AND DRIVERS



### Architecture:

- CMSIS-CORE compatible
- Single driver for each peripheral
- Transactional APIs w/ optional DMA support for communication peripherals

### Integrated RTOS:

- Amazon FreeRTOS
- RTOS-native driver wrappers

### Enabling Technologies:

- Wired and wireless connectivity
- Graphics/HMI
- Motor Control
- ML/AI
- Cloud connectivity
- Storage
- ...and more

### Reference Software:

- Peripheral driver usage examples
- Application demos
- FreeRTOS usage demos
- IoT connectivity examples

### License:

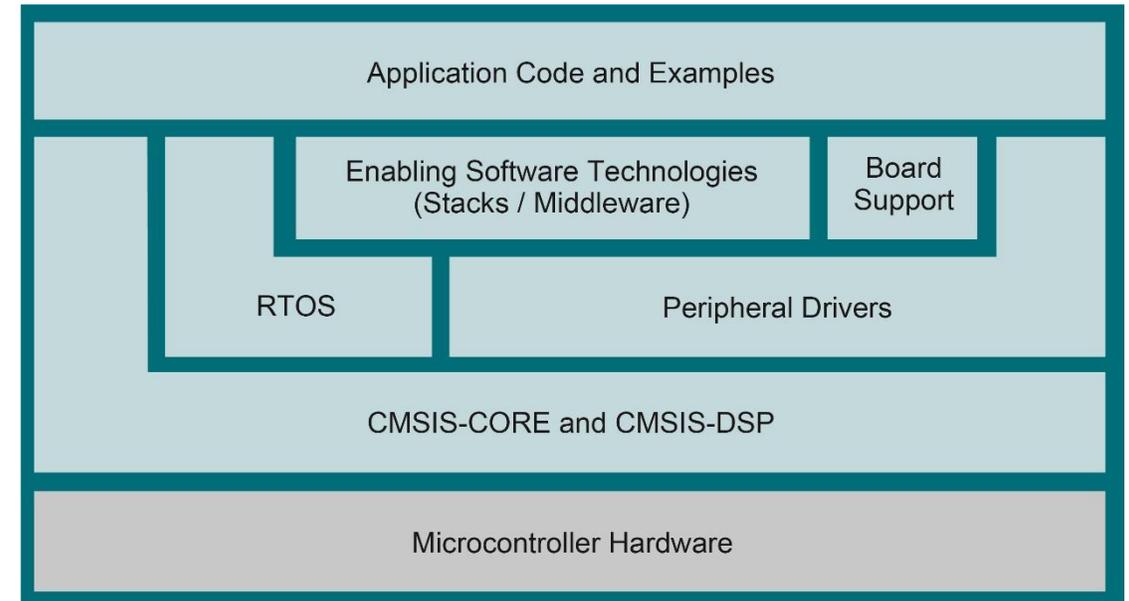
- BSD 3-clause for startup, drivers, USB stack
- All code Black Duck scanned

### Toolchains:

- MCUXpresso IDE
- IAR®, ARM® Keil®, GCC w/ Cmake

### Quality:

- Production-grade software
- MISRA 2004 compliance
- Checked with Coverity® static analysis tools



# EMBEDDED WIZARD IS NOW AVAILABLE IN THE MCUXPRESSO SDK



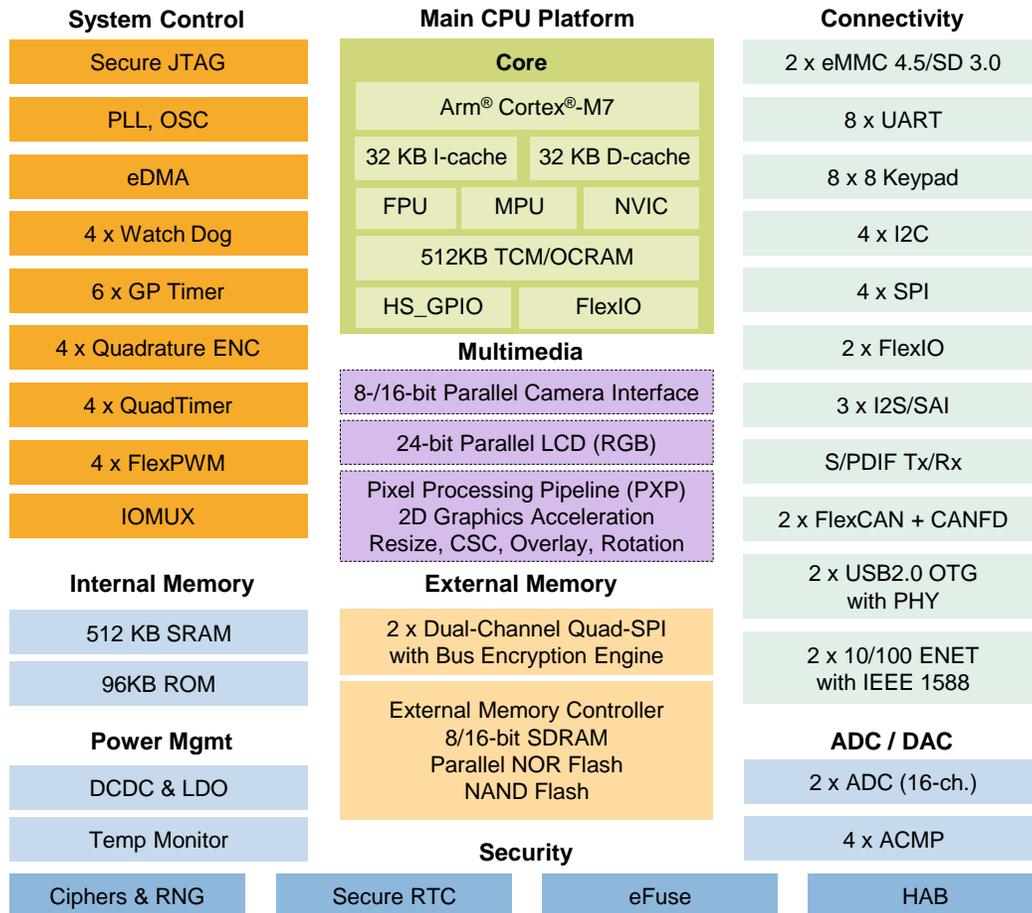
NXP has partnered with TARA Systems to offer Embedded Wizard as an **Enabling Software Technology**. Fully integrated example projects are available in the MCUXpresso SDK for supported devices.

The screenshot shows the NXP MCUXpresso SDK Builder interface. The main section is titled 'SDK Builder' and contains a table of components. The 'Embedded Wizard GUI' component is highlighted with a blue box. The table has columns for Name, Category, Description, and Dependencies.

Name	Category	Description	Dependencies
elQ	Middleware	elQ machine learning SDK containing the ARM CMSIS-NN library (neural network ker... (more)	
<input checked="" type="checkbox"/> Embedded Wizard GUI	Middleware	Embedded Wizard GUI	
emWin	Middleware	emWin graphics library	
FatFS	Middleware	FAT File System stack	
FreeMASTER	Middleware	FreeMASTER run-time debugging tool	
Google IoT	Middleware	Google Cloud IoT Device SDK for Embedded C	Amazon FreeRTOS, mbedtls, lwIP, wif_wiced
ISSDK	Middleware	IoT Sensing SDK (ISSDK) provides sensor drivers and	

- Use the MCUXpresso SDK Builder to include Embedded Wizard libraries and example projects in your SDK
  - Support for i.MX RT1050, i.MX RT106x and LPC54628
  - All examples are based on bare metal
- Download Embedded Wizard Studio to go beyond the examples and create your own GUI application
- Seamlessly transition to licensed product from evaluation version

# i.MX RT1060 MCU BLOCK DIAGRAM



 Available on certain product families

## Specifications

- Package: MAPBGA196 | 10x10mm<sup>2</sup>, 0.65mm pitch (130 GPIOs)
- Temp / Qual: -40 to 105°C (Tj) Industrial / 0 to 95°C (Tj) Consumer

## High Performance Real Time system

- **Cortex-M7 up to 600MHz**, 50% faster than any other existing M7 products
- 20ns interrupt latency, a **TRUE Real time processor**
- 512KB SRAM + 512KB TCM/OCRAM

## Rich Peripheral

- Motor Control: Flex PWM X 4, Quad Timer X 4, ENC X 4
- 2x USB, 2x SDIO, 2x CAN + 1x CANFD, 2x ENET with 1588, 8xUART, 4x SPI, 4X I2C
- **8/16-bit CSI interface and 8/16/24-bit LCD interface**
- **PXP 2D Graphics Acceleration**
- 2x Quad-SPI interface, with Bus Encryption Engine
- Audio interface: 3x SAI/ SPDIF RX & TX/ 1x ESAI

## Security

- TRNG&PRNG(NIST SP 800-90 Certified)
- 128-AES cryptography
- Bus Encryption Engine: Protect QSPI Flash Content

## Ease of Use

- **MCUXpresso with SDK**
- FreeRTOS

## Low BOM Cost

- Competitive Price
- Fully integrated PMIC with DC-DC
- Low cost package, 10x10 BGA with 0.65mm Pitch
- SDRAM interface

# MCUXpresso Software and Tools

UNIFIED SUITE OF  
TOOLS FOR EASY  
DEVELOPMENT  
WITH NXP MCUs



## MCUXPRESSO SOFTWARE AND TOOLS ADDITIONAL WEB RESOURCES



MCUXpresso Software and Tools Overview Page:  
<https://www.nxp.com/mcuxpresso>

MCUXpresso Software and Tools Community Site:  
<https://community.nxp.com/community/mcuxpresso>



[Website /  
Community](#)



[Website /  
Community](#)



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Support devices

[Supported Devices Table \(Community Doc\)](#)

Graphics overview

[GUIs on NXP Microcontrollers](#)

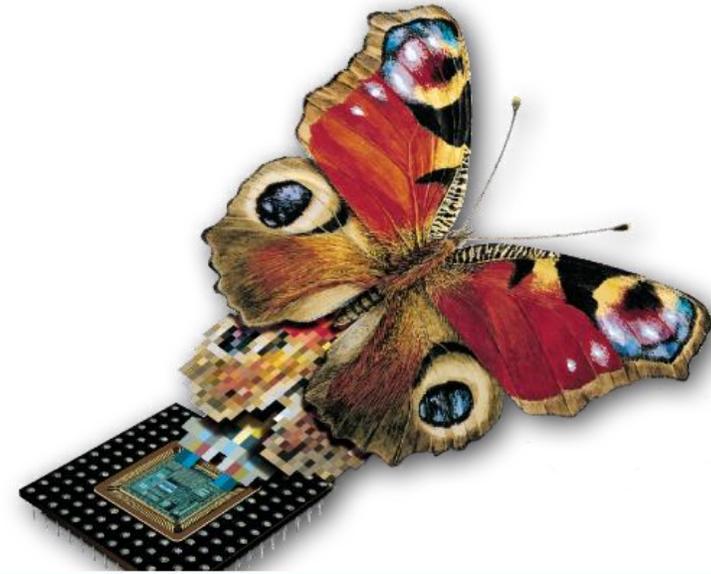




Have you heard of Embedded Wizard?

# Who we are

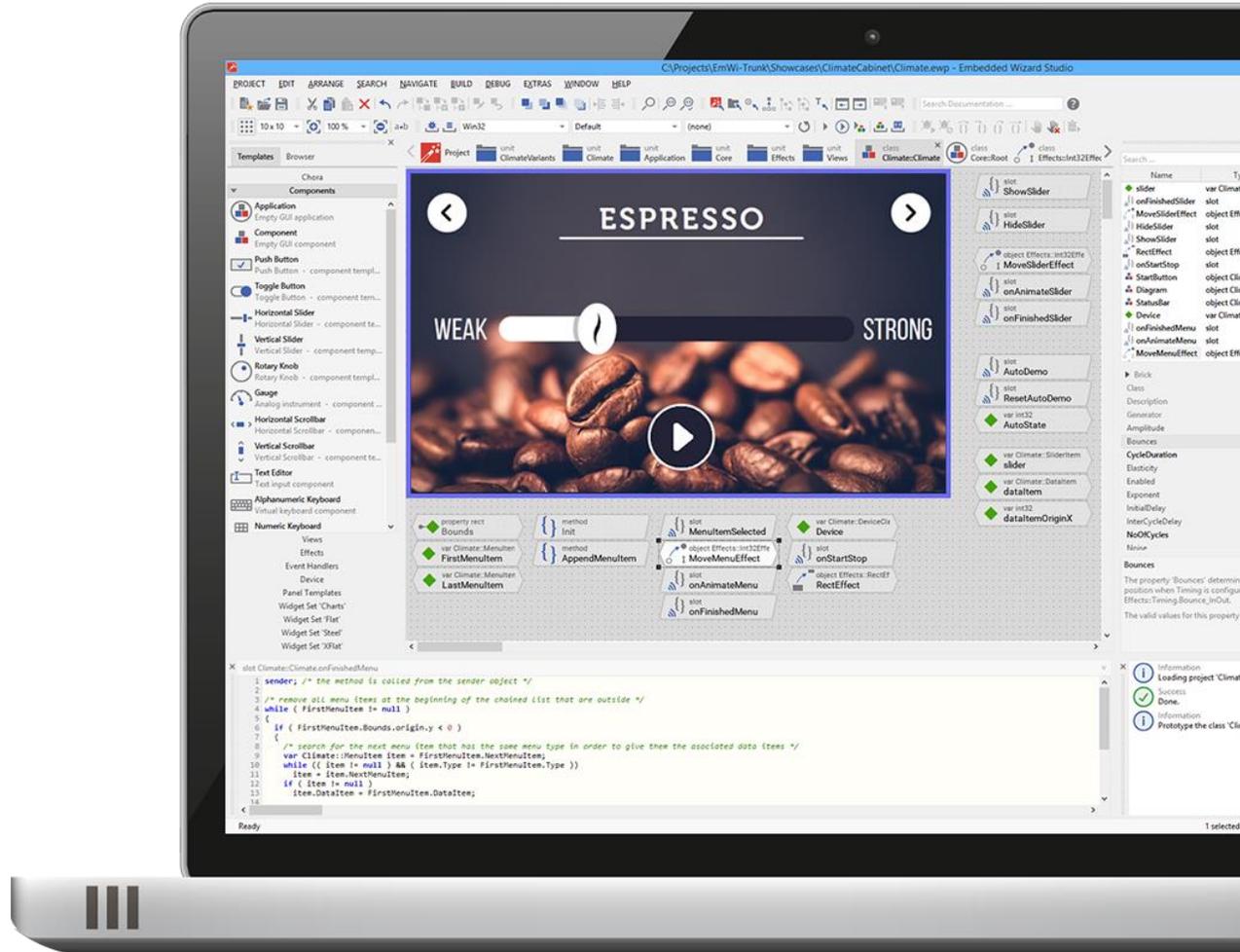
- TARA Systems founded in 1990 in Munich, Germany
- Privately owned limited company
- Started in the domain of Consumer Electronics
- Strong engineering background in embedded systems
- 2 business units
  - Software for Consumer Electronics
  - GUI Solutions



TARA Systems

# What is Embedded Wizard?

- Embedded Wizard is TARA's own and independent GUI solution
- GUI development and instant prototyping tool
- Follows a code generation model – not just a pure graphics library or runtime interpreter
- MCU and MPU type target hardware
- Evolved over 25 years
- No external dependencies, open source or other 3<sup>rd</sup> party stacks
- Customers worldwide, >100 Mio. devices deployed using Embedded Wizard technology



# Benefits for NXP MCUs



Full-featured **IDE** to develop HMIs



Utilizing various available GPUs, like **Pixel Processing Pipeline** or **VGLite**, to achieve high FPS with low CPU load



State-of-the-art GUIs with **high-performance** animations and transitions



Generation of **pure ANSI C** source code with no further dependencies



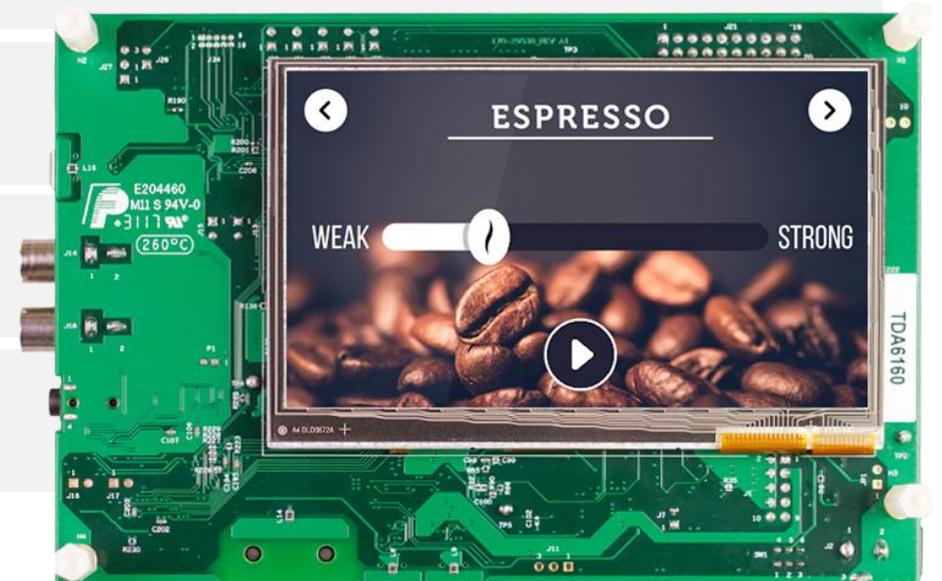
Very **low** RAM and flash **footprint**



HMIs run on **bare metal** or with **any** (RT)OS

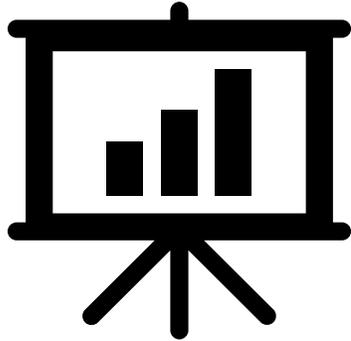


**Reasonable** business model - no royalty fees per device!





# Live Demo – Getting Started with Embedded Wizard



Have you developed an embedded GUI before?

# Missing Link: Download Resources

## From TARA Systems

- Showcases and demos  
[www.embedded-wizard.de/demo](http://www.embedded-wizard.de/demo)
- Free Edition  
[www.embedded-wizard.de/download](http://www.embedded-wizard.de/download)
- Online knowledge base  
[doc.embedded-wizard.de](http://doc.embedded-wizard.de)
- Open community support forum  
[ask.embedded-wizard.de](http://ask.embedded-wizard.de)

## From NXP

- MCUXpresso Software and Tools  
[www.nxp.com/mcuxpresso](http://www.nxp.com/mcuxpresso)
- MCUXpresso SDK  
[www.nxp.com/mcuxpresso/sdk](http://www.nxp.com/mcuxpresso/sdk)
- MCU Developer Resources  
[www.nxp.com/design/microcontrollers-developer-resources:MCUDEV](http://www.nxp.com/design/microcontrollers-developer-resources:MCUDEV)



Thank you!



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