FreeMASTER
RUN-TIME DEBUGGING AND VISUALIZATION TOOL

The user-friendly FreeMASTER real-time debug monitor and data visualization tool enables runtime configuration and tuning of embedded software for use in a broad range of automotive and industrial applications.

NXP's FreeMASTER offers developers real-time data visualization and control capabilities during embedded application development. FreeMASTER supports non-intrusive variable monitoring on a running system, requiring minimal changes to the application in development.

FreeMASTER tool supports custom data visualization using HTML or JavaScript. It also supports oscilloscope-like displays and a standard text format for visualizing data from multiple variables. Developers can employ an arbitrary collection of user-defined instrumentation gauges, dials, knobs, and sliders to create custom visual dashboards as complex or elegant as desired.

FreeMASTER Lite, a new lightweight service component of the FreeMASTER tool, leverages the JSON PRC protocol that can run on a Windows® or Linux® host PC and enables the implementation of custom UI applications running in a web browser (accessible from a local host PC, remote computer or mobile device).

FreeMASTER now integrates with S32 Design Studio IDE, Model-Based Design Toolbox (MBDT), MCUXpresso SDK, MCUXpresso IDE, and MCUXpresso ConfigTools. Code examples are included.

CAPABILITIES:

- Oscilloscope view: watch and/or chart the target application variables in real time at individual sampling rates in the oscilloscope view; use the high-speed recorder (on target) for rapid processing

- Real-time control: modify variables and send commands to hardware, including start/stop of variable monitoring

- Data visualization: enables the use of third-party instrumentation components inserted into the HTML code as embedded ActiveX or JavaScript objects; allows the creation of user-friendly displays of complex real-time dashboards with option for graphically programmed custom dashboards using Node RED

- Information management: visualization area supporting any HTML-/JavaScript-based content; developers can use it with the project tree navigation pane to present demos, product information, collateral or any project-related data

FEATURES:

- Graphical environment with easy-to-understand navigation

- Visualization of real-time data in the oscilloscope window and/or table view

- Acquisition of fast data changes using on-target recorder

- HTML-based description or navigation pages

- Support for HTML5 and rich graphical content

- JavaScript control over embedded applications

- Node-RED framework integration for graphical programming

- Wide range of serial and debug probe connectivity options

- Remote access to target system over network, including the Internet via FreeMASTER Remote Communication Server or FreeMASTER Lite service

- ActiveX & JSON-RPC APIs consumable from third-party applications

- Real-time access to application variables

- Automatic variable information extraction from application code (ELF/DWARF1/2/4, text-based map files, etc.)

- Support for integer, floating point and bit-field data types

- Several built-in transformations for real type variables

- Enumerated variable display support labels using a defined enumeration

- Demo mode with password protection support

- Loss-less streaming protocol for character or binary I/O using pipes
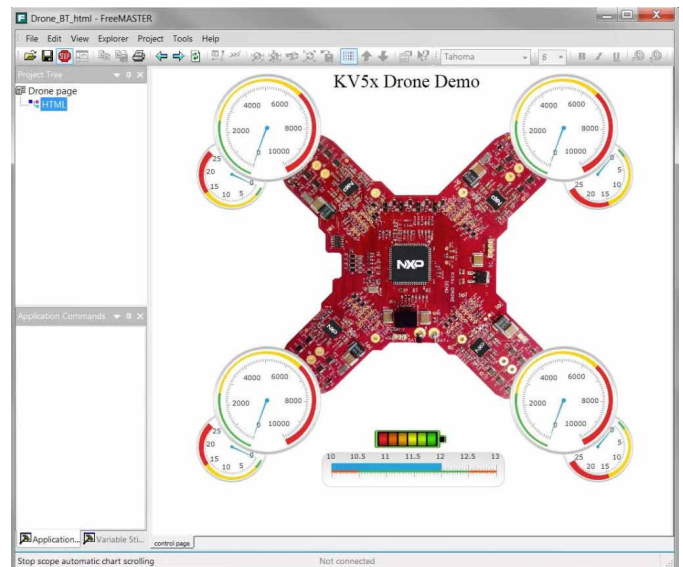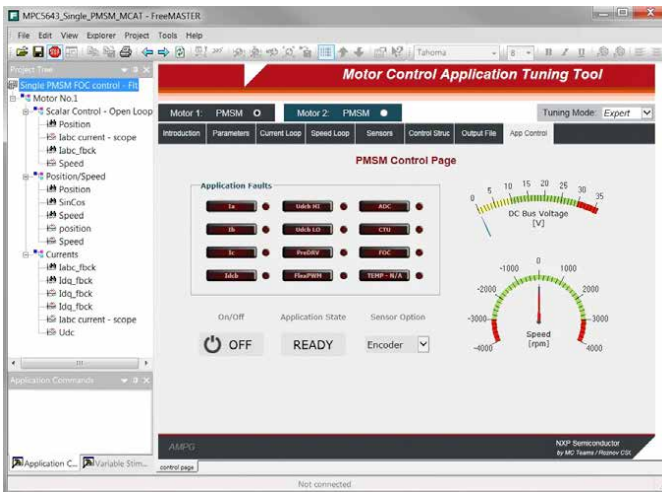
TARGET APPLICATIONS

- Real-time data visualization of any system output
- Prototyping complex data visualization HMIs
- Automated, script-based control of systems
- Motor control parameters display and tuning
- Sensor processing
- Wireless charging control and configuration UI
- Tuning of touch-sensing HMIs
- Drone control development
- Reliability monitoring data analysis and display
- Communication diagnostics and logging
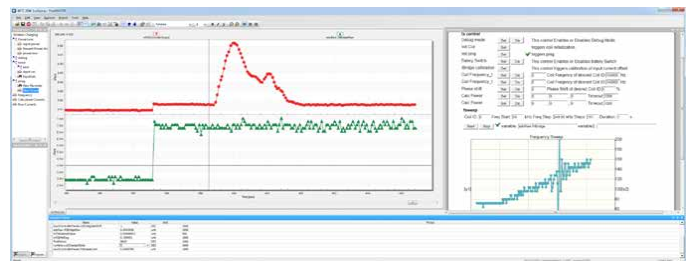
Both **Desktop FreeMASTER** and **FreeMASTER Lite** tools can connect to a target MCU board either directly over SWD/JTAG (no MCU driver needed) or over serial interfaces (UART, CAN, USB), TCP/UDP, or other physical communication interfaces.*

FreeMASTER enables third-party applications and custom scripts to connect and access the target board using higher-level protocols such as ActiveX and JSON-RPC.

With FreeMASTER, the target MCU application can be accessed while debugging and tuning its performance. It is also possible to use the target hardware in the simulation loop and test environments.

A powerful custom user interface may be created using HTML and JavaScript and displayed embedded in the FreeMASTER desktop application window or running remotely in a web browser.
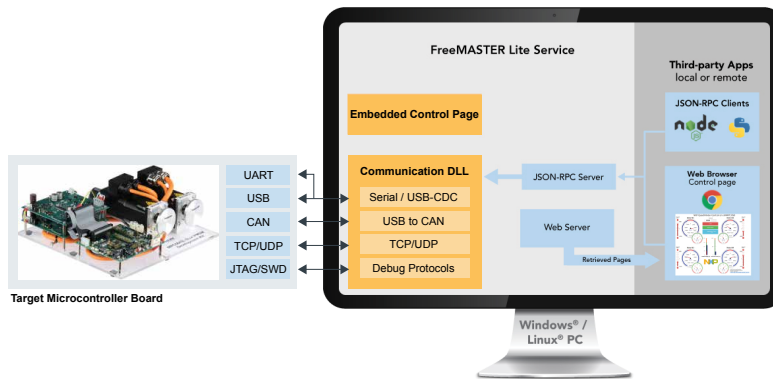
*Supported interfaces may vary between different NXP products. See Platform/Connection Support table

CONNECTIVITY OPTIONS FOR DESKTOP FreeMASTER
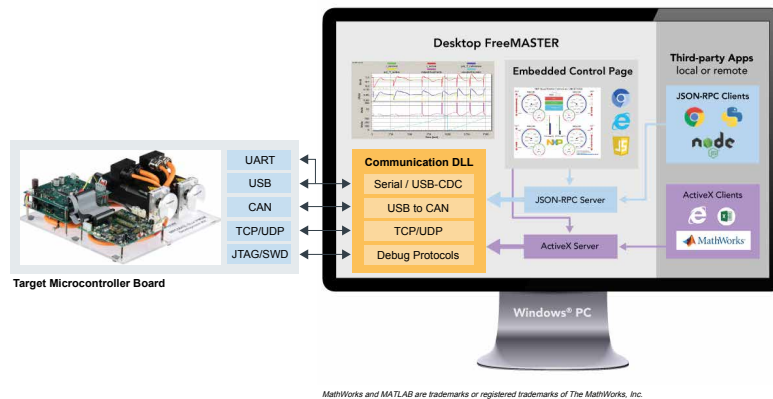
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CONNECTIVITY OPTIONS FOR FreeMASTER LITE

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PLATFORM AND CONNECTION SUPPORT

MCU families	No-Driver		Target Driver Required				
	SWD/JTAG/BDM	Packet-Driven BDM	Serial	CAN	USB	TCP/IP	SEGGER RTT**
S32G Processors for Vehicle Networking			√				
S32K3 MCUs for General Purpose	√	√	√				
S32K1 MCUs for General Purpose	√	√	√	√			
i.MX RT, Kinetis®, and LPC MCUs based on Cortex-M cores	√	√	√	√	√	√	√
MagniV® mixed-signal, S12 and S12X MCUs	√	√	√	√			
MPC5xxx MCUs based on Power Architecture®	√	√	√	√			
S08 MCUs	√	√	√	√			
DSC		EOnCE	√	√	√		
ColdFire® MCUs	√	√	√	√			

**SEGGER RTT available from version 3.1.3

www.nxp.com/FreeMASTER

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