LIN Slave Solutions

Target Applications
- Door systems
- Power mirrors
- Window lift
- Roof
- HVAC control
- Fan control
- Light control

More Options and Flexibility for the Low-Cost LIN Bus

Overview
Freescale Semiconductor’s HC908 family of microcontrollers (MCUs) provides a wide choice of pin-compatible options to help reduce costs and maximize development reuse. Freescale’s HC08 sets a standard for functionality versus cost in LIN applications.

These devices are automotive-qualified and include a range of enhanced peripherals to meet the requirements of LIN slave applications. Combined with unrivaled choice, HC908 is an ideal choice for LIN.

MCUs in this family use the enhanced HC908 central processor unit (CPU08) and are available with a variety of modules, memory sizes in Flash and ROM, and multiple package types.

All products are fully LIN 2.0 and J2602 compliant.

Features

<table>
<thead>
<tr>
<th>Features</th>
<th>Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Second-Generation Flash or Low-Cost ROM Memory Options</td>
<td></td>
</tr>
<tr>
<td>&gt; Embedded fully automotive Flash</td>
<td>&gt; Qualified for high temperatures, shock, vibrations and humidity as required by the automotive industry</td>
</tr>
<tr>
<td>&gt; Range of memory from 1 KB to 60 KB</td>
<td></td>
</tr>
<tr>
<td>&gt; 10K write/erase cycles at -40°C to +125°C</td>
<td></td>
</tr>
<tr>
<td>&gt; Low-cost ROM versions available—contact your sales representative</td>
<td>&gt; Cost-reduction path for high-volume stable programs</td>
</tr>
<tr>
<td>&gt; Ultra-fast programming: 64 bytes in 2 ms</td>
<td>&gt; Reduced production programming costs through ultra-fast programming at operating voltage</td>
</tr>
<tr>
<td>&gt; Flash block protection</td>
<td>&gt; Helps protect code from unauthorized reading and to guard against unintentional writing/erasing of user-programmable segments of code</td>
</tr>
<tr>
<td>&gt; Flash reprogrammable in circuit</td>
<td>&gt; Allows real-time Flash updates</td>
</tr>
</tbody>
</table>

Slave LIN Interface Controller (SLIC) Module

<table>
<thead>
<tr>
<th>Features</th>
<th>Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; Full LIN message buffering of identifier and eight data bytes</td>
<td></td>
</tr>
<tr>
<td>&gt; Automatic baud rate and LIN message frame synchronization</td>
<td></td>
</tr>
<tr>
<td>&gt; Automatic processing and verification of LIN header (SYNCH break and byte)</td>
<td></td>
</tr>
<tr>
<td>&gt; Automatic checksum calculation and verification with error reporting</td>
<td></td>
</tr>
<tr>
<td>&gt; Maximum of two interrupts per LIN message frame</td>
<td></td>
</tr>
<tr>
<td>&gt; Streamlined interrupt servicing through use of a state vector register</td>
<td></td>
</tr>
</tbody>
</table>

Oscillator Modules

<table>
<thead>
<tr>
<th>Oscillator Modules</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Variety of flexible oscillator modules across six LIN slave families:</td>
<td></td>
</tr>
<tr>
<td>&gt; Internal clock generator (ICG)</td>
<td>&gt; ICG requires no external circuitry</td>
</tr>
<tr>
<td>&gt; Clock generation module (CGM) with PLL</td>
<td>&gt; CGM has user-selectable clockout feature with divide by 1, 2, 4 and 8 of the crystal frequency</td>
</tr>
<tr>
<td>&gt; Internal RC (IRC) oscillator</td>
<td>&gt; IRC is a very cost-effective trimmable internal oscillator suitable for LIN-based applications</td>
</tr>
</tbody>
</table>
Freescale understands the critical importance that development tools play in the success of your microcontroller (MCU) design. That is why we provide a comprehensive selection of hardware and software development tools: Everything from high-quality, downloadable software to advanced emulators is available to speed your HC08 MCU-based design to market time.

These tools form a critical part of the complete system solution that makes it easy to use our products, a solution that includes silicon, software, development tools, reference designs and service, all in one package.

**HC08 Demonstration Boards (Order Number: DEM0908xxxxx)**

Freescale’s cost effective demo boards provide everything that a designer needs to develop and evaluate applications for the targeted HC08 MCU family.

- Integrated debugging and Flash programming capabilities
- RS-232 communication port(s)
- User I/O for developing application code
- MCU breakout headers for access to the MCU’s I/O and bus lines
- User manual and cables included

**HC08 Evaluation Boards (Order Number: M68EBV09xxxxx or EVB09xxxxxx)**

Advance application development platforms that allow designers to conduct detail evaluation of HC08 MCUs.

- Integrated debugging and Flash programming capabilities
- Demonstration code written in C
- User I/O for developing application code
- Quick start guide, user manual and cables included

**MONO8 MULTILINK (Order Number: USBMULTILINK08)**

The MONO8 Multilink is an easy-to-use, low-cost development tool for Freescale HC08 Flash MCUs. It provides in-circuit emulation, debugging and Flash programming through the HC08’s standard MONO8 serial debug/breakpoint interface.

- Universal development tool for all MONO8 HC08s
- Real-time, in-circuit emulation and debug
- Fast in-circuit Flash programming
- Autodetects baud rate and frequency
- Provides optional override clock to target
- Supports 2V to 5.5V HC08s
- Automatically cycles power for security checks (up to 125 mA)
- Standard MONO8, 16-pin target application interface
- CodeWarrior Development Studio for HC08(S), Special Edition included

**Cyclone Pro (Order Number: M68CYCLONEPRO)**

The Cyclone Pro is a stand-alone programmer with push buttons and LEDs to control operation, but also has all the capabilities of the MONO8 and BDM Multilink cables. Cyclone Pro is the universal in-circuit debugging, Flash programming, and real-time emulation development tool for Freescale HC08, HCOS8, HCS12, and HCS12 MCUs.

- Fast, in-circuit stand-alone programming
- Simple push button and LED user interface
- Host-based programming with scripting capability to execute a series of commands
- Automates programming of test routines, test execution, erase and final software programming
- Real-time, in-circuit emulation and debug
- Integrated BDM and MONO8 interfaces
- CodeWarrior Development Studio for HC08(S), HCS12 and HCS12, Special Edition included

**HC08 Programming Adapters (Order Number: M68CPA08xxxxxx)**

HC08 Programming Adapters are designed to work in conjunction with programmers that use the standard 16-pin MONO8 interface. The M68CPA08xxxxxx are ideal for programming engineering samples and small volumes of prototype MCUs.

- Standard 16-pin MONO8 header
- Package-specific ZIF sockets
- ZIF Socket breakout header
- CodeWarrior Development Studio for HC08(S), Special Edition included

**Third-Party Hardware and Software**

Freescale works closely with a broad range of companies to provide extensive development support from adapters to C compilers to real-time operating systems. The software and development tool selector guide (Order Number: SG1011) has a summary listing of these solutions along with contact information.

---

**Learn More:** For more information about Freescale’s LIN products and services, please visit us at [www.freescale.com/lin](http://www.freescale.com/lin).