Renesas C compilers bring out the performance of Renesas original cores and provide powerful optimization facilities which contribute to greater efficiency in the development of embedded systems.

The evaluation editions of Renesas C compilers can be downloaded from the Renesas Web pages for the compilers (the URLs are listed above).

The C compilers provide a wide range of extended functionality (macro definitions, #pragma directives, and so on) to simplify the development of embedded systems. The extended functionality of a given compiler depends on the architecture of the MCU family and thus differs slightly from compiler to compiler.

### Extended Functionality for Embedded System Development

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<table>
<thead>
<tr>
<th>Joining the EEMBC*</th>
<th>Obtaining the highest score (1)</th>
<th>Obtaining the highest score (2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Renesas has joined the EEMBC* as a measure for further improving the performance of Renesas C compilers.</td>
<td>The combination of the RX66T (RXv3 core) and CC-RX V3.01 obtained the highest score for a single-core device on the CoreMark benchmark of the EEMBC.</td>
<td>The combination of the RL78/11D (R5F117GC) and CC-RL V1.08 obtained the highest score on the ULPMark (ULPMark -PP) benchmark of the EEMBC.</td>
</tr>
</tbody>
</table>

*Embedded Microprocessor Benchmark Consortium [https://www.eembc.org/memberinfo/memberlist.php](https://www.eembc.org/memberinfo/memberlist.php)

**Evaluation Editions: A Simple Way to Try the Compilers**

The evaluation editions of Renesas C compilers can be downloaded from the Renesas Web pages for the compilers (the URLs are listed above).

**During the evaluation period**: You can use the C compilers with no limitations on functionality.

The evaluation period expires 60 days after the first build following the initial installation of the evaluation edition.

**After the evaluation period**: You can continue to use the C compiler, although limitations apply to the functionality and the size of linkable object code. The functionality is limited to that of the standard edition and the size of linkable object code is limited as follows: 64 KB for CC-RL, 128 KB for CC-RX, and 256 KB for CC-RH.

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**#pragma directives**

The #pragma directives we provide to work with our C compilers simplify specifying the allocation of functions and data, the writing of functions to work as interrupt handlers, and other tasks required in the writing of embedded software.

**Optimization options**

Individual levels of and items for optimization can be specified. The volatile option is used to suppress optimization by the compilers to the extent that the order and number of times in access to external variables match the corresponding items in the source program.

**Defined macro names**

Macro names to allow reference to information on compilation are predefined.

**Using assembly language**

The compilers simplify calls of assembly language routines and reference to data in assembly code.
Professional Editions: Even Greater Efficiency and Quality of Development

See the table below for the features and the supported compilers. Refer to the application note for the professional editions for details of the features (using R20UT4026 as a search keyword).

<table>
<thead>
<tr>
<th>Features of the professional editions</th>
<th>CC-RL</th>
<th>CC-RX</th>
<th>CC-RH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Checking of source code against MISRA-C:2004/2012 rules</td>
<td>♦</td>
<td>♦</td>
<td>♦</td>
</tr>
<tr>
<td>Detection of stack smashing</td>
<td>♦</td>
<td>♦</td>
<td>♦</td>
</tr>
<tr>
<td>Enhanced security for dynamic memory management functions</td>
<td>♦</td>
<td>♦</td>
<td>♦</td>
</tr>
<tr>
<td>Detection of illicit indirect function calls</td>
<td>♦</td>
<td>♦</td>
<td>♦</td>
</tr>
<tr>
<td>Half-precision floating point</td>
<td>—</td>
<td>—</td>
<td>♦</td>
</tr>
<tr>
<td>Synchronization features in the updating of control registers</td>
<td>—</td>
<td>—</td>
<td>♦</td>
</tr>
</tbody>
</table>

Various Licenses Selectable to Suit Your Pattern of Development

You can choose the license that best suits your development needs from among the eight combinations of Renesas compiler license types shown at right.

The permanent licenses we provide impose no limit on the period of use, while annual licenses are valid for one year. The various combinations give you flexibility in terms of introducing licenses in response to changes in patterns of development.

Services and Products Related to Long-Term Use and Functional Safety

- **Compiler maintenance service**
  [https://www.renesas.com/compiler-maintenance](https://www.renesas.com/compiler-maintenance)

- **Compiler qualification service**
  [https://www.renesas.com/compiler-qualification](https://www.renesas.com/compiler-qualification)

- **IEC 61508 Certification Kit for RX Compilers**

Renesas offers a maintenance service for a specific compiler version. This is intended to provide a sense of ease to long-term users of the given compiler. This service incurs a charge.

Renesas offers a support service for certifying that development tools meet the requirements of ISO 26262, Road vehicles — Functional safety. This service incurs a charge.

This kit supports the certification of RX compilers as development tools that meet the requirements of the IEC 61508 functional safety standard.