

# IEC61508 Certified Solution for RX Family **FUNCTIONAL SAFETY SOLUTION FOR INDUSTRIAL AUTOMATION**



IA Functional Safety  
Solution Info

Renesas RX Functional Safety solution provides core technology needed for IEC61508 SIL\* certification. The certified software kits and related reference hardware board and documents help to construct a certified functional safety system.

This solution significantly reduces the development burden on customers and contributes to the implementation of a safe working environment in factories with the ability to handle hazards even when the system functions fail.

\* SIL: Safety Integrity Level which is defined in the functional safety standard

## Target Applications

### Safety System For:

- AC Servo and Drive
- Remote IO
- Programmable Logic Controller
- Sensor and Actuator

## Expand Safety Software to RXv3 Core Family – Supporting more applications

### Benefits of Certified Safety Software

#### ■ User can focus on safety application development

- SIL3 System Software Kit and Self-test Software Kit will do all the diagnosis task of safety monitoring on MCU.
- SIL3 System Software Kit consists of dual MCU diagnosis, scheduler, partitioning function for redundant safety system.



SIL3 System Software Kit

### Benefits of Reference Hardware Board

#### ■ Jumpstart evaluation with RXv3 core family reference hardware board

- All boards include manual, circuit diagram, and parts list.
- MCU pins are connected to extension connector, single unit use for software development, and pseudo environment of functional safety configuration combining with pre-existing system.



RXv3 Reference Board

**NEW**

## Functional Safety Over EtherCAT (FSoE) Application Software Kit

for both RXv2 and RXv3 core family

### Benefits

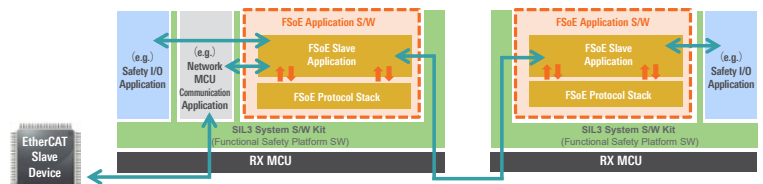
#### ■ Shorten Development Time with SIL3 Certified FSoE Protocol Stack

- ETG.5100 G<sup>®</sup> V1.2.0 compliant and IEC 61508 SIL3 certified
- Provided directly from Renesas

#### ■ Support All Functions Required for Safety Data Processing

- FSoE Slave network state management, safety data exchange process between dual MCU, and diagnostic process, in addition to FSoE stack process.
- Includes dedicated setting file to easily set different safety data and parameter per product.

### Safety IO System Configuration with FSoE Application Software Kit




#### FSoE Application Software Kit Contents

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| <ol style="list-style-type: none"> <li>1. FSoE Application Software</li> <li>2. Safety Manual</li> <li>3. User Guide</li> <li>4. IEC61508 Certified Document (certificate, test report)</li> </ol> | <p><b>IEC61508 SIL3<br/>Certified by<br/>TÜV Rheinland</b></p> | <ol style="list-style-type: none"> <li>5. Sample: Network MCU Communication Application</li> <li>6. Software Development Handbook</li> </ol> |
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# FUNCTIONAL SAFETY SOLUTION FOR INDUSTRIAL AUTOMATION

## Software Kits and Design Tools


### FSoE Application Software Kit **NEW**

Device	Corresponding Compiler	Part Number	Note
RXv2 core RXv3 core	CC-RX V3.01.00	RTK0EF0080F21001SJ	<b>FSoE Software Content</b> <ol style="list-style-type: none"> <li>FSoE Application Software</li> <li>Safety Manual</li> <li>User Guide</li> <li>IEC61508 Certified Document</li> <li>Sample: Network MCU Communication Application</li> <li>Software Development Handbook</li> </ol> 
	IAR-EWRX V4.14.2*	RTK0EF0081F21001SJ	

### SIL3 System Software Kit **NEW for RXv3 Core**

Device	Corresponding Compiler	Full Kit Part Number	Evaluation Kit Part Number	Note
RXv2 core RXv3 core	CC-RX V3.01.00	RTK0EF0061F22002SJ	RTK0EF0061F32002SJ	<b>Full Kit</b> <ul style="list-style-type: none"> <li>IEC61508 Certified Software</li> <li>Software Kit Content                             <ol style="list-style-type: none"> <li>Functional Safety Platform Software</li> <li>Safety Manual</li> <li>User Guide</li> <li>IEC61508 certified document</li> <li>Software Development Handbook</li> <li>Configuration Tool and manual</li> </ol> </li> </ul>  <b>Evaluation Kit</b> <ul style="list-style-type: none"> <li>Software Kit Content                             <ol style="list-style-type: none"> <li>Functional Safety Platform Software</li> <li>User Guide</li> <li>Software Developer's Handbook</li> <li>Configuration Tool and Manual</li> <li>PC Tool for Information Output Application</li> </ol> </li> </ul>
	IAR-EWRX V4.14.2*	RTK0EF0062F22002SJ	RTK0EF0062F32002SJ	

### Self-Test Software Kit **NEW for RXv3 Core**

Device	Corresponding Compiler	Part Number	Note
RXv1 core	CC-RX V2.03.00	RTK0EF0059F31001SJ	<ul style="list-style-type: none"> <li>IEC61508 Certified Software</li> <li>Software Kit Content                             <ol style="list-style-type: none"> <li>Self-diagnostics Software Library</li> <li>Safety Manual</li> <li>User Guide</li> <li>IEC61508 Certified Document</li> </ol> </li> </ul> 
	IAR-EWRX V3.10.5*	RTK0EF0060F31001SJ	
RXv2 core RXv3 core	CC-RX V3.01.00	RTK0EF0054F37002SJ	
	IAR-EWRX V4.14.2*	RTK0EF0055F37002SJ	
	CC-RX V3.01.00	RTK0EF0054F36002SJ	
	IAR-EWRX V4.14.2*	RTK0EF0055F36002SJ	
	CC-RX V3.01.00	RTK0EF0054F32002SJ	
	IAR-EWRX V4.14.2*	RTK0EF0055F32002SJ	

‡1: Compatible with RX111, RX113, and RX130

‡2: Compatible with RX71M, RX72M, RX72N, and RX72T

\*Please contact IAR Systems for more details.

‡3: Compatible with RX651/RX65N, RX64M, RX66N, and RX66T

‡4: Compatible with RX24U, RX24T, RX230/RX231, RX23T, RX23W, and RX23E-A

### Reference Documents

Category	Part Number	Note
Complete document set	RTK0EF0005Z21001ZJ	20 documents + 6 excel files

### Reference Hardware Board **NEW for RXv3 Core**

Category	Part Number	Note
RX72N-RX72N mounted (RXv3)	RTK0EF0058D02001BJ	<ul style="list-style-type: none"> <li>Content                             <ol style="list-style-type: none"> <li>Dual MCU configuration evaluation board</li> <li>Manual, circuit diagram, and parts list</li> </ol> </li> </ul>
RX71M-RX651 mounted (RXv2)	RTK0EF0058D01001BJ	
RX111-RX111 mounted (RXv1)	RTK0EF0011D01001BJ	

### Compiler and Certification Kit

C/C++ Compiler Package for RX Family	Note
V2.03.00 (IEC61508 certified version)	Recommended for RXv1 core
V3.01.00 (IEC61508 certified version)	Recommended for RXv2 core and RXv3 core

Compiler Certification Kit	Part Number	Note
CC-RX compiler certification kit	RTCRX0000TC02ZNR	For CC-RX V2.03.00
	RTCRX0000TC03ZNR	For CC-RX V3.01.00

Note: All the above, except the reference hardware board, require a license agreement beforehand.

For more information, please visit us at [www.renesas.com/industrial-functional-safety](http://www.renesas.com/industrial-functional-safety)