

IO-Link Device Stack Library

Introduction

This document provides instructions for how to evaluate the IO-Link Device Stack Library using the EK-RA2E1 evaluation board and the RH4Z2502-PMOD adapter. It guides users through the procedures to set up the hardware and software to enable evaluation of the library.

Contents

1. Prerequisites	1
2. Procedures	2
2.1 Hardware Setup	2
2.2 Programming Setup	2
2.3 IO-Link Evaluation Setup	2
3. Revision History	3

1. Prerequisites

The hardware and software components listed in the following tables are required.

Table 1. Required Hardware Components

Hardware Component	Source	Comment
EK-RA2E1 Evaluation Board	Order on Renesas website	https://www.renesas.com/ek-ra2e1
RH4Z2502-PMOD Adapter	Order on Renesas website	https://www.renesas.com/rh4z2502-pmod
IO-Link Master Gateway + IO-Link Cable	Third-party hardware	Standard commercial IO-Link Master Gateway

Table 2. Required Software Components

Software Component	Source	Comment
IO-Link Device Stack Library Software Package	Download on Renesas website <i>IOLinkDeviceLibrary.zip</i> file	https://renesas.com/rh4z2502
Microsoft Visual Studio Code	Download on Microsoft website	Free download
IO-Link Master Gateway Interface Tool	Third-party software	Complementary to IO-Link Master Gateway hardware

2. Procedures

2.1 Hardware Setup

Complete the following steps to set up the hardware for programming:

1. Unpack the EK-RA2E1 evaluation board.
2. Unpack the RH4Z2502-PMOD adapter. Ensure JP4 is placed and ensure JP2 is placed on either the “LDO” or “NPN” position.
3. Connect the RH4Z2502-PMOD adapter to the EK-RA2E1 board using its PMOD2 Interface (J25).
4. Connect the EK-RA2E1 board to the PC via the DEBUG1 interface (J10), using the USB cable included with the kit.

Note: Leave the USB connection during entire programming/debugging process. Remove for evaluation via IO-Link.

5. Connect the IO-Link Master Gateway to the RH4Z2502-PMOD adapter using an IO-Link cable with M12 connectors.

6. Connect the IO-Link Master Gateway to the PC using the specific gateway interface.

Note: Do not use the IO-Link connection (power / data) while using the debug USB connection.

2.2 Programming Setup

Complete the following steps to start programming:

1. Extract the IO-Link Device Stack Library Software Package *IOLinkDeviceLibrary.zip* file.
2. Open the readme.md file from the package located at *IOLinkDeviceLibrary\prj* and follow the manual's instructions for using the software and programming the kit.

Note: If the project code remains unmodified, a default demonstrator version will be built and flashed. This demonstrator implements a controllable 3-Segment Tower Light using the three onboard LEDs of the EK-RA2E1 board.

2.3 IO-Link Evaluation Setup

Complete the following steps to enable evaluation via IO-Link:

1. After flashing the EK-RA2E1 board, disconnect the USB cable.
2. If the unmodified demonstrator version of the Software Library was used:
 - a. Open the IO-Link Master Gateway interface tool and import the IODD for the 3-SegmentTowerLight demonstrator located at *IOLinkDeviceLibrary\IODD.zip*.
Note: Depending on the interface tool, extraction of the IODD.zip may be needed.
 - b. Connect to the IO-Link device and control the LEDs of the demonstrator via the IO-Link Process Data Out. For Process Data byte assignment, see Table 3.
 - c. User control button S1 on the EK-RA2E1 board is linked to Process Data In of the demonstrator. Pressing this button changes the value of Process Data Item named SW1.

Table 3: Process Data Out Byte Structure

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Reserved	Reserved	Reserved	Mode		LED3	LED2	LED1
-	-	-	0	0	0: Deactivated	0: Deactivated	0: Deactivated
			Permanently On		1: Activated	1: Activated	1: Activated
			0	1			
			Blinking Slow				
			1	0			
			Blinking Fast				
			1	1			
			Flashing				

3. Revision History

Revision	Date	Description
1.00	Jul 21, 2026	Initial release.