Get Started: Application Development on STMicroelectronics 32L4R9IDISCOVERY

1. Prerequisites

Hardware

- A 32L4R9IDISCOVERY Discovery kit

Software

- MicroEJ SDK 5.4.1 or higher (https://developer.microej.com/get-started/)
- A PC with Windows XP or later
- A Java™ Runtime Environment 8 is needed on your host computer for running MICROEJ SDK. Download Java™ Runtime Environments
- IAR Embedded Workbench 8.3
- ST Link Utility 4.5.0 or higher.
- ST-LINK USB drivers: Download.

2. Configuration

Hardware

- All tests of this getting started have been done on the STMicroelectronics 32L4R9IDISCOVERY Discovery Kit.
- Connect the board to the PC using a USB 2.0 cable (Type-B Micro to Type-A) on connector `CN13`.
- Standard output traces can be read through a UART link (over USB). Configuration of the UART is: `115200 bps, 8N1, no handshake`.

Software

- Open ST Link Utility.
- Check that you can connect to the board, using `Target` > `Connect`.
- Update the on-board ST-Link firmware of your device if needed (`ST-LINK` > `firmware update`).
- Select `External Loader` > `Add External Loader`.
- In the list, check the item `MX25LM51245G_STM32L4R9I-DISCO` and select `Validate`.

3. Activate your License

MICROEJ SDK requires to be activated. Before going further, an evaluation license is required.

Get your UID

- Download the platform sources for the STMicroelectronics 32L4R9IDISCOVERY board. Download on the Developer Repository.

- Unzip the archive in the folder of your choice.
- Start MICROEJ SDK.
- Select a workspace. If you are not familiar with Eclipse workspaces, select the default one and press OK.
- Select the MicroEJ repository where to import MicroEJ architectures from. If you are not familiar with MicroEJ repositories, select the default one and press OK.
- Wait until MicroEJ Repository is initialized.
- Select `File` > `Import` > `MicroEJ` > `Architectures` and click on `Next`.
- Select and browse the previously unarchived folder for MicroEJ Architecture files (select the directory `platformArchitecture` and import everything).
- Follow the installation process.
- Select the `Window` > `Preferences` > `MicroEJ` > `Architectures` menu.
- Click on one of the available architectures and press `Get UID`.
- Copy the UID. It will be needed when requesting a license.

Generate Your Activation Key

- Go to license.microej.com.
- Click on `Create a new account` link.
- Create your account with a valid email address. You will receive a confirmation email a few minutes after. Click on the confirmation link in the email and login with your new account.
- Click on `Activate a License`.
- Set Product P/N: to `9PEVNLDBU6IJ`.
- Set UID: to the UID you generated before.
- Click on `Activate`.
- The license is being activated. You should receive your activation key by email in less than 5 minutes. If not, please contact mailto:support@microej.com.
- Once received by email, save the attached zip file that contains your activation key.

Activate MICROEJ SDK

- Go back to MICROEJ SDK.
- Select the `Window` > `Preferences` > `MicroEJ` menu.
- Press `Add...`.
- Browse the previously downloaded activation key archive file.
- Press `OK`. A new license is successfully installed.
- Go to `Architectures` sub-menu and check that all architectures are now activated (green check).
- Your MICROEJ SDK is successfully activated. Proceed to the next step.

4. Install the MicroEJ Platform

Import MicroEJ Platform Reference Implementation Sources

- Click on `File` > `Import...` > `General` > `Existing Projects into Workspace`.
- Click on `Next`.
- Check the radio button `Select archive file`.
- Select the `STM32L4R9DISCO-Z2J6G-platformSource.zip` zip file with the `Browse` button (it is located in the directory `platformSource`).
- New items appear in the list. Select all items and click on `Finish`.

The MicroEJ Platform Reference Implementation sources are now imported in the current workspace.

Build the MicroEJ Platform

- Open the file `STM32L4R9DISCO.platform` located in the project `STM32L4R9DISCO-configuration`.
- Click on `Build Platform`.
- After successful build, the platform is built into the workspace and ready to use.

5. Import the Wearable Demo Sources

- Click on `File` > `Import...` > `General` > `Existing Projects into Workspace`.
- Click on `Next`.
- Check the radio button `Select archive file`.
- Click `Browse`, ans select the file `com.microej.demo.watch.zip` located in the same directory as this README file.
- In the list of projects, select item `com.microej.demo.watch` and click on `Finish`.

The Wearable Demo sources are now imported in the workspace.

6. Run the Demo on the Virtual Device

- Right-click on the project `com.microej.demo.watch`.
- Select `Run as` > `MicroEJ Application`
- In the dialog, select the Run Configuration `(Simulator) com.microej.demo.watch Main`
- It should launch the simulation displaying the Front Panel (simulated device on PC).

Please refer to the README.md file of the `com.microej.demo.watch` project for more details about the watch application.

7. Run the Demo on Your Board

Build the MicroEJ Application

- Right-click on the project `com.microej.demo.watch`.
- Select `Run as` > `MicroEJ Application`.
- In the dialog, select the Run Configuration `(Device) com.microej.demo.watch Main`.
- It should display the following in the Console:

```
============== [ Initialization Stage ] ==============
============== [ Converting fonts ] ==============
============== [ Converting images ] ==============
============== [ Launching SOAR ] ==============
============== [ Launching Link ] ==============
============== [ Deployment ] ==============
The MicroEJ application (microejapp.o) has been deployed to: 'path\to\STM32L4R9DISCO-bsp\Projects\32L4R9IDISCOVERY\MicroEJ\platform\lib'.
============== [ Completed Successfully ] ==============

SUCCESS
```

The MicroEJ application `microejapp.o` (native object code) is now built and can be compiled and linked against the BSP C files, using IAR toolchain.

Build the MicroEJ Firmware

- Open IAR Embedded Workbench 8.3.
- Select `File` > `Open Workspace...`.
- Browse to the file `STM32L4R9DISCO-bsp\Projects\32L4R9IDISCOVERY\MicroEJ\EWARM\Project.eww`, and select `Open`.
- Select `File` > `Make` or type `F7` to compile and link the project files.

The MicroEJ Firmware (`Project.out`) is now built and located in the directory `STM32L4R9DISCO-bsp\Projects\32L4R9IDISCOVERY\MicroEJ\EWARM\STM32L4R9I-Discovery\Exe\`.

Program the Board

- In MicroEJ SDK, select `Run` > `Run Configurations...`.
- Open the Run Configuration `MicroEJ Tool` > `Program with STLink`.
- Select the `Configuration` tab.
- Check that the path to the MicroEJ Firmware file (`Project.out`).
- Check that the path to the ST-Link Utility executable.
- When the configuration is correct, click `Run`.

The tool will now use ST-Link Utility to program the board from MicroEJ SDK. It will output the following in the Console.

```
-------------------------------------------------------------------
/!\ This tool requires STM32 ST-Link Utility v4.5.0 or higher /!\
-------------------------------------------------------------------

================ [ FLASH ] ================
Internal flash programming...
.....................................
Flash programming completed successfully.
================ [ RESET ] ================
Board reset completed successfully.
================ [ FLASH ] ================
External flash programming...
.....................................
.....................................
.....................................
.....................................
.....................................
.....................................
```

```
Flash programming completed successfully.
=============== [ RESET ] ===============
Board reset completed successfully.

SUCCESS
```

The Wearable Demo should now be running on your 32L4R9IDISCOVERY Discovery Kit!

Troubleshooting

At step 7 ("Run the Demo on Your Board"), if you experience the following error:

```
1 : SOAR ERROR
    [M65] - License check failed [Licenses file not found].
```

This means that the evaluation license is not properly activated. Please run step 3 ("Activate your License") again. You may also read our documentation for more details.