Oracle® Java ME Embedded

Release Notes for the Reference Platform (Freescale FRDM-K64F)

Release 8.2 Developer Preview

E55006-03

September 2015

This document provides release information for Oracle Java ME Embedded Release 8.2 Developer Preview for the Reference Platform (Freescale FRDM-K64F).

It contains the following sections:

Introduction

The Oracle Java ME Embedded software is a ready-to-run software image for use with the Freescale FRDM-K64F board.

The Oracle Java ME Embedded software is an optimized platform stack for small embedded devices, which includes the following:

- Connected Limited Device Configuration (CLDC) HotSpot Implementation (Java Virtual Machine)
- Java ME Embedded Profile (MEEP)

What's Supported in This Release

The following hardware is supported in Oracle Java ME Embedded Release 8.2 for the Reference Platform (Freescale FRDM-K64F):

- Target board: Freescale FRDM-K64F with on-chip memory only: 256 KB RAM, 1 MB Flash.

The following features are included in the Oracle Java ME Embedded software:

- Operating system/native platform: mbed
- CLDC 8 with SVM support only
- MEEP 8 - minimal profile set
- Device I/O API version 1.1:

    - GPIO
    - UART
    - I2C
    - DAC/ADC
    - SPI
    - Pulse Counter
    - PWM
    - Onboard LEDs
    - Accelerometer
    - Magnetometer
- Command-line interface
- Developer agent
- Output/logging through USB/serial
- Flash file system on an SD card

This release also offers support for the following optional packages:

- System Configuration API
- Generic Connection Framework `javax.microedition.io` package with the following supported network protocols:
    - HTTP, HTTPS
    - Socket, SecureSocket
    - TLSv1.1

Access points functionality is not implemented in the current release.

Because the FRDM-K64F board has 3.3v logic while many Arduino shields require 5v logic, the FRDM-K64F board may not be compatible with some Arduino 5v shields from an electrical perspective.

Usage Notes

The Oracle Java ME Embedded Release 8.2 software consists of binary files and a directory structure that needs to be downloaded to a Freescale FRDM-K64F board.

Oracle Java ME Embedded Getting Started Guide for Freescale FRDM-K64F describes how to download the binary file to the board, how to connect to the board from the development host computer, and how to install and run IMlets on the board.

Observe the following important notes before running the Oracle Java ME Embedded software on the board:

- The CPU and Memory Profiler are not supported in this release.
- The Java debugger is not supported in this release.
- The Network monitor is not supported in this release.
- The appropriate SSL server certificates should be installed into the device to enable SSL and HTTPS connections.

Installation and Runtime Security Guidelines

The Oracle Java ME Embedded Developer Preview 8.2 software installation requires an execution model that ensures certain networked resources available. These required resources might include, but are not limited to, a variety of communication capabilities between the product's installed components.

It is important to note that the product's installation and runtime system is fundamentally a developer system that is not specifically designed to guard against malicious attacks from outside intruders. Given this, the product's architecture can present an insecure operating environment to the installation file system and its runtime environment, during execution. For this reason, it is critically important to observe the precautions outlined in the following security guidelines when installing and running the software.

Note: The security-related functionality of a final developed application for release into the field is supported by the available components of the Oracle Java ME Embedded software stack incorporated by the developer into the application. The security precautions required by applications in the field are beyond the scope of these recommendations, but must be observed by the application developer.

To maintain optimum network security, the software package can be installed and run in a *closed* network operating environment; the software system that is not connected directly to the Internet or to a company intranet environment that could introduce unwanted exposure to malicious intrusion. This is the ideal secure operating environment whenever the application under development does not require an Internet connection.

When the application under development requires an Internet connection, you must conform to the guidelines highlighted in Protecting Operating Environment From Malicious Intrusion.

Protecting Operating Environment From Malicious Intrusion

If the operating environment is open to network access, you must observe the following precautions to protect valuable resources from malicious intrusion:

- Locate the development environment behind a secure firewall that strictly limits unauthorized network access to its file system and services. Limit access privileges to those that are required for development while allowing all the bidirectional local network communications that are necessary for the application's functionality. The firewall configuration must support these requirements to run the software while also addressing them from a security standpoint.
- Follow the principle of least privilege by assigning the minimum set of system access permissions required for installation and execution of the software.
- Do not store any sensitive information on the same file system that hosts the installation.
- Ensure that the operating system patches are up-to-date on host machines in the development environment.

Handling Security Certificate Precautions

The Oracle Java ME Embedded software distribution bundle contains security certificates that are needed for testing during development of products for final release to customers. Some of these certificates are self-signed security certificates generated by Oracle that are mapped to privileged security domains. IMlets or MIDlets signed by these certificates get high privileges to access restricted APIs; these certificates present a security vulnerability if they are released to end users on a customer's device. Other certificates issued by universally recognized certificate authorities (CAs) are used only for signature verification and they do not present a vulnerability.

After final testing of the product is completed and the product is being prepared for release to end users, you must remove self-signed security certificates that present a security vulnerability.

Developer Agent Precautions

The CLI is incorporated in the Developer Agent, which communicates with a device through an unsecured protocol. The Developer Agent is a Java SE application that can be reverse engineered to tamper with or to get information about the communication protocol, which might be used by an untrusted entity to manipulate the device. If you decide to implement the Developer Agent in a product deployment, it is your responsibility to incorporate adequate security measures around the Developer Agent communication channel. This channel uses TCP port 2201 on the K64F board for the communication.

Known Bugs

On some versions of Freescale FRDM-K64F boards I2C lines are swapped while on others not. For more details, see http://www.freescale.com/files/32bit/doc/errata/FRDMK64F_ERRATA.pdf.

For generic bugs in this release of the Oracle Java ME SDK that might affect the Freescale FRDM-K64F platform, see *Oracle Java ME Software Development Kit Release Notes*.

The following are known bugs in this release of the Oracle Java ME Embedded software:

- After the `PulseCounter` was started and then stopped, a call to `startCounting()` throws an `IOException`.
- The `DeviceManager.register()` throws `UnsupportedOperationException`.
- FRDM-K64F board does not support UART flow control mode modification. An attempt to call `UART.setFlowControl` and `UART.getFlowControl` results in `UnsupportedOperationException`.
- UART: Parity!=NONE is not supported.

  Wrong data is received in the `read()` method if parity does not equal to 0.
- An application which intensively uses the `System.out` and `System.err` streams can cause VM stalls up to a condition when VM resets with a watchdog.

  It is recommended that the application never outputs more than ~2k of symbols per second into these streams.

- The CLDC TCK test `io/SocketConnection/index.html#GetAccessPoint` fails with `java.io.IOException`.

Product Documentation

The following documentation is included with this release of the Oracle Java ME Embedded software. See http://docs.oracle.com/javame/.

Application	Title	Format
All (this document)	*Release Notes*	HTML PDF ePub Mobi
Demonstrates how to install and run the Oracle Java ME Embedded software on the Freescale FRDM-K64F platform.	*Getting Started Guide for the Reference Platform (Freescale FRDM-K64F)*	HTML PDF ePub Mobi

Documentation Accessibility

For information about Oracle's commitment to accessibility, visit the Oracle Accessibility Program website at http://www.oracle.com/pls/topic/lookup?ctx=acc&id=docacc.

Access to Oracle Support

Oracle customers that have purchased support have access to electronic support through My Oracle Support. For information, visit http://www.oracle.com/pls/topic/lookup?ctx=acc&id=info or visit http://www.oracle.com/pls/topic/lookup?ctx=acc&id=trs if you are hearing impaired.

Oracle Java ME Embedded Release Notes for the Reference Platform (Freescale FRDM-K64F), Release 8.2 Developer Preview
E55006-03