Getting Started with the Freescale KV31F

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Overview

The FRDM-KV31F is a low-cost development tool for the Kinetis V series KV3x MCU family built on the ARM Cortex-M4 processor. The FRDM-KV31F hardware is form-factor compatible with the Arduino R3 pin layout, providing a broad range of expansion board options, including FRDM-MC-LVPMSM and FRDM-MC-LVBLDC for permanent magnet and brushless DC motor control.

The FRDM-KV31F platform features OpenSDA, the NXP open source hardware embedded serial and debug adapter running an open source bootloader. This circuit offers several options for serial communication, flash programming, and run-control debugging. The FRDM-KV31F is supported by a range of NXP and third-party development software.

The FRDM-KV31F is the first device in the Kinetis V portfolio to be enabled with Kinetis Motor Suite (KMS). Kinetis Motor Suite (KMS) is a software solution that enables the rapid configuration of motor drive systems, accelerates development of the final motor drive application whilst improving overall motor system performance due to its unique SpinTAC enabled speed controller. Tuning and optimization is carried out via a simple graphical user interface that enables a developer to easily identify their motor, tune that motor using just one control dial and build a state machine to control the various speed transitions of the motor. For more information go to nxp.com/kms.

Hardware

FRDM-KV31F-ND – MCU, ARM Cortex M4 Dev Board

Features

- KV31F512VLL12 MCU (ARM CortexM4 120 MHz, 512 KB flash, 96 KB SRAM, 2x 16-bit ADCs, 4x FlexTimers/PWM up to 20-ch. with quadrature decoder dedicated to motor and power control and 2x 12-bit DACs, 100 LQFP)
- Enabled with Kinetis Motor Suite, software solution that enables the rapid configuration of motor drive systems, and accelerates development of the final motor drive application, whilst improving overall motor system performance
- Six-axis sensor combining accelerometer and magnetometer (FXOS8700CQ)
- Tri-color user-controllable LEDs
- Two (2) user push-button switches for NMI interrupts and LLWU wake up (SW2/SW3)
- Thermistor sensor to measuring temperature
- Power selectable 3.3 V/1.8 V
- Motor control auxiliary connector
- Form factor compatible with Arduino R3 pin layout
- Flexible power supply options – USB or external source
- New, OpenSDA debug interface
    - Mass storage device flash programming interface (default) – no tool installation required to evaluate demo apps
    - MBED Debug interface provides run-control debugging and compatibility with IDE tools
    - CMSIS-DAP interface: new ARM standard for embedded debug interface

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Getting Started

NXP's Getting Started Guide to the KV31F

The link is to NXP's getting started guide to the KV31F. With the option of watching a series of videos or reading through the instructions, it covers the hardware setup, installation of the necessary software, initial connection, and setting up a comm port to interface with the example program. The "Getting Started Guide" provided by NXP is already quite good.

Alternative Guides and Additional Documents

Quick Start Guide for the Freescale Freedom Motor Control Development Platform

Freedom FRDM-KV31F Development Platform User's Guide

FREEDOM KV31F Schematic

Kinetis KV3x MCU Family Fact Sheet

Related articles

- Getting Started with the STM32L432 Nucleo-32 using Eclipse and the GNU ARM Toolchain
- Using the Seeed Grove 6 Axis Accelerometer/Gyroscope over I2C and Pin Interrupts with the Renesas DK-S124
- Getting Started with Kinetis Motor Suite
- Getting Started with the Freescale KV31F
- Using the Renesas ThreadX RTOS and Messaging Framework to Take Data from Multiple Sensors Using Multiple Threads