TI Spins Motors

![Texas Instruments]

Read Me First
Piccolo Motor Control Kits
InstaSPIN-FOC, InstaSPIN-MOTION, & MotorWare

Version 1.0.6   *Motor Solutions*

Overview

This Read Me First document acts as a guide book for your evaluation of an InstaSPIN enabled Piccolo controllers paired with various three phase inverter hardware.

Supports:

- Piccolo InstaSPIN enabled controllers
    - TMDSCNCD28069MISO Piccolo F28069M (ROM) controlCARD
        - Includes on-card XDS100v2 JTAG (isolated)
    - TMDSCNCD28054MISO Piccolo F28054M (ROM) controlCARD
        - Includes on-card XDS100v2 JTAG (isolated)
    - TMDSCNCD28027F Piccolo F28027F (ROM) controlCARD
        - No on-card JTAG
            - For use with DRV83x kits you must use an external emulator
            - For use with HVMTR kit you may use the on-inverter XDS100v1 or an external emulator
        - Recommended External Emulators
            - XDS100v2, XDS200, XDS220 ISO, XDS510, XDS510 ISO
- 3-phase Inverters
    - **Be sure to follow the hardware quick start guide for proper configuration of the inverter board**
        - **…docs\boards\drive\KIT_rev#\docs\qsg_hw_KIT_rev#.pdf**
    - Low Voltage / Low Current: DRV8312_REVD
        - PN: DRV8312-69M-KIT
        - Also ships as the inverter board in other kit configurations such as DRV8312-C2-KIT and DK-LM4F-DRV8312
    - Low Voltage / High Current: DRV8301_REVD
        - PN: DRV8301-69M-KIT
        - Also ships as the inverter board in other kit configurations such as DRV8301-HC-C2-KIT and DRV8301-RM48-KIT
    - High Voltage: hvmtrkit_r1p1 [Yellow PCB with black enclosure]
        - PN: TMDSHVMTRINSPIN
        - Also ships as the inverter board in TMDSHVMTRPFCKIT
        - Do NOT use TMDX or TMDSHVMTRKIT5X [Yellow PCB with light grey enclosure] with CNCD28069MISO, 54MISO, 28027F

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Revision History:

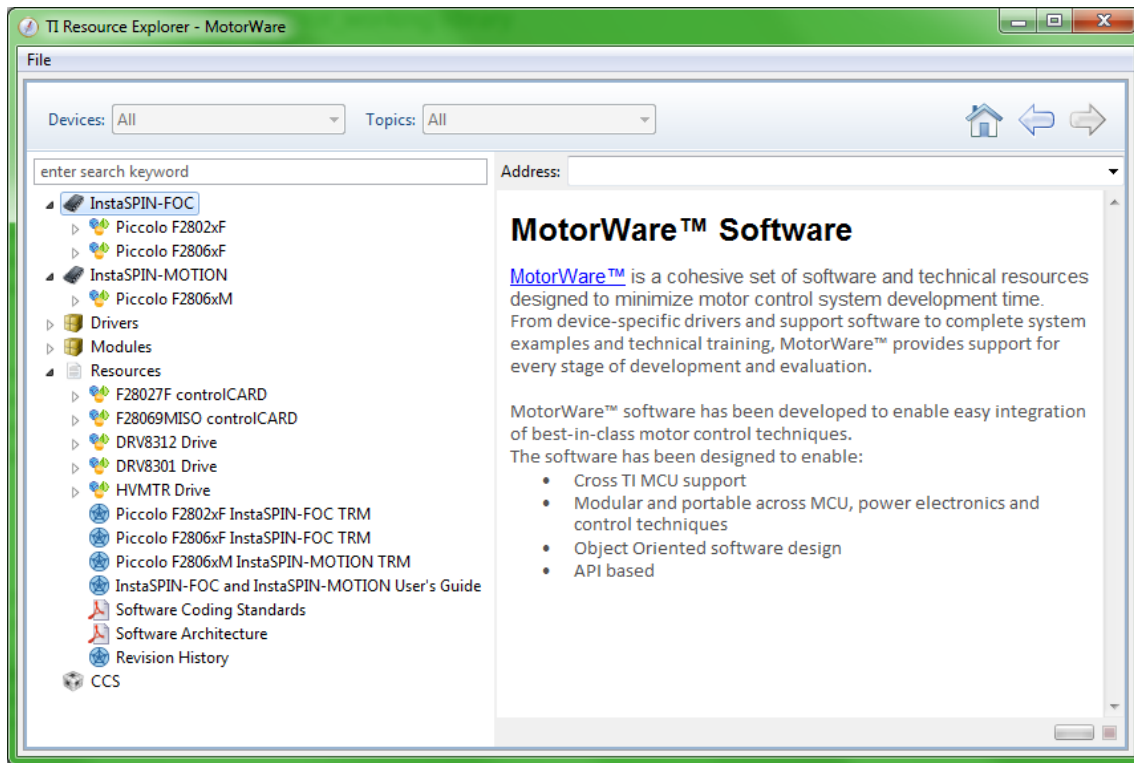| 1.0.6	May 21, 2014	Updated for F2805x release
1.0.5	August 8, 2013	Added comment to page 1 that the HW QSG should be followed
1.0.4	July 11, 2013	Updated for TMDSCNCD28027F support
1.0.3	April 10, 2013	Added updated for InstaSPIN-MOTION
1.0.2	March 21, 2013	Added Revision History
1.0.1	February 26, 2013	First release

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Path to Success:

1. Always use the latest version of the contents for these kits
   a. http://www.ti.com/tool/motorkitscncd69miso
      i. Contents: Read Me First, GUI Quick Start Guide, GUI Installer for F28069M
2. Evaluate with the standalone GUI and TMDSCNCD28069MISO
   a. Follow User's Guide qsg_gui_instaspin_motion.pdf
      i. Note that the MOTION GUI is a superset and includes all the same functionality as the FOC GUI. It is recommended to use the InstaSPIN-MOTION GUI.
   b. The standalone GUI is only supported by the 28069MISO controlCARD
      i. This GUI gives the capability to evaluate most of the core functions of InstaSPIN-FOC and InstaSPIN-MOTION
         1. Motor ID
         2. Torque Control: Automatic and manual current loop tuning
         3. Speed Control: Manual PI or SpinTAC tuning
         4. Trajectory Curves: Ramp (Trapezoidal), s-curve, st-curve
         5. Motions: A to B, Staircase, Agitate/Reversals
         6. PWM Modulation Schemes
         7. Field Control: Weakening, Boosting, PowerWarp
      ii. Notes
         1. Not all possible functionality is demonstrated through use of the GUI.
         2. Not all performance capability is enabled by the use of the GUI.
            a. Performance is maximized only by customer specific hardware that most ideally addresses the required voltage and current of their motor system.
            b. You will want to select PWM, control, and estimator frequencies that work best for your motor type, efficiency goals, ands system performance trade-offs.
         3. The intention of this GUI is to demonstrate and evaluate general capability for a broad amount of applications, on specific hardware that is widely available from TI, with the intention of giving confidence for a more thorough evaluation.
3. Download and always use latest version of MotorWare
   a. www.ti.com/tool/motorware
   b. MotorWare contains all of the modules, drivers, example Code Composer Studio based InstaSPIN projects, and associated documentation
   c. It can be easily browsed by running MotorWare.exe from the installation directory

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d. Read the solution documentation:
  i. Technical Reference Manual
      1. F2806xF InstaSPIN-FOC (SRPUHI9)
      2. F2806xM InstaSPIN-MOTION (SRPUHJ0)
      3. F2805xF InstaSPIN-FOC (SRPUHW0)
      4. F2805xM InstaSPIN-MOTION (SRPUHW1)
      5. F2802xF InstaSPIN-FOC (SPRUHP4)
  ii. InstaSPIN-FOC & InstaSPIN-MOTION User's Guide (SPRUHJ1)
4. Install CCSv5.5 or CCSv6.0 from DVD included in kits
    a. Or download latest from http://processors.wiki.ti.com/index.php/Download_CCS
5. Follow the proj_lab## examples from MotorWare and the User's Guide to test with
    a. TI controlCARDs / LaunchPads and Inverters
    b. On your own control and inverter hardware to adapt and modify