Release Notes

MCE Software Package

MCE Software V5.04.01.6 for IMD111T-F040
iMOTION ™ Platform Turnkey Software

Summary

Product Name	MCE_IMD111T-F040_V5.04.01.6.ldf
Release Version	V5.04.01.6.1913
Type Of Release	Release
Name of the Supplier	Infineon Technologies
Mode of Release	iMOTION Solution Designer package
Date of Release	2025-05-09
Previous Versions	- V5.04.00.6 - V5.04.00.5 - V5.03.00 - V5.02.00 - V5.01.01 - V5.01.00 -

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1 Released Items

This chapter lists the atrifacts, the items of the test package and the test environment. It also presents the changes in the current version, the limitations and deviations as well as the known issues.

The iMOTION2.0 MCE addressing 3-phase Permanent Magnet Synchronous Motor (PMSM) control using Sensorless/Hall sensor based Field Oriented Control (FOC) schemes. This software is primarily targeted for end applications of industrial/consumer drives, pumps, and compressors.

List of Features

- Scripting: Support function calls and variables arrays
- System: UL60730-1 Class B functional safety support
- Scripting: Access to script variables via parameter handler
- System: UL60730-1 Class B functional safety support
- Scripting: Scripting language based I2C interface and TRIAC control support has been added
- Motor Control: High performance sensorless Field Oriented Control (FOC) of Permanent Magnet Synchronous Motor.
- Motor Control: Startup schemes:Angle sensing for initial rotor angle detection., Parking, Open loop and Catch-Spin free running motor.
- Motor Control: Single shunt (Phase shift scheme and Low noise phase shift scheme) or leg shunt (2 phase and 3 phase)motor current sensing.
- Motor Control: Support 3ph and 2ph PWM modulation.
- Motor Control: Hall sensor support : 3/2 Digital hall and 2 Analog hall
- Scripting: Scripting language support includes data storage feature, configurable UART driver and IR interface
- System: MCE supports standby mode of operation to reduce power consumption

1.1 Artifacts

This release V5.04.01.6 consists of the following artifacts:

Artifact	Description
IMD111T_F040_A_V5.04.01.6.ldf	Encrypted binary file for IMD111T-F040 device. (Firmware Version: V5.04.01.6.1913)

1.2 Test Environment

The MCE software was tested, using the following environment.

- Application Board: EVAL-IMD111T-A
- Motor Specification: 8Pole, 0.4A R=38.5ohm, Lq= 196mH, Ld=196mH, Ke= 36V, 2730 RPM

1.3 Changes and Enhancements

The following items have been changed in release V5.04.01.6. Please refer to the revision history for previous versions.

Features

- Scripting: Support function calls and variables arrays

1.4 Limitations and Deviations

This section lists features that are missing or were incompletely implemented in the current release, but may be provided in future releases.

- Scripting: Start script debugger when CPU load more than 80% triggers execution fault.
- Scripting: NEC or NEC_ext IR interface is not supported in Standby mode.
- Scripting: While using Configurable UART, it is required to disable user UART interface in Config Wizard if same UART port is used.
- Scripting: Scripting plug-ins (I2C Interface, TRIAC, IR interface, Configurable UART) won't work properly, if script debugger is started when system in standby mode.
- Scripting: Scripting: Execution fault gets trigged while using I2C interface when CPU load is more than 90%.
- Interface: It is not possible to read or write higher 2 bytes of a 32-bit parameter or variable via User UART interface.
- System: When load different parameter set via user UART interface, wrong Class B failsafe (when Class B is enabled) has been triggered often.

2 Supported Tools and Packages

The following items are compatible with the current release.

2.1 Tools

Tool	Description
iMOTION Solution Designer (V1.03.03)	iMOTION Solution Designer is an interactive design tool that calculates control IC parameters in digital counts based on the system specificationsexpressed in engineering units.

3 Revision History

This chapter lists the changes and enhancements of the previous releases.

3.1 Revision V5.04.00.6

Features

- System: UL60730-1 Class B functional safety support

3.2 Revision V5.04.00.5

Features

- Scripting: Access to script variables via parameter handler

Enhancements

- Interface: Access to upper 16 bits of 32 bit registers via user mode UART

Bug Fixes

- Scripting: Fixed “APP_Scripting.Command = 0xAE51” can not reset controller
- Motor Control: Fixed Not enough torque after angle sensing

3.3 Revision V5.03.00

Features

- System: UL60730-1 Class B functional safety support

Enhancements

- Motor Control: Position Counter variable has been added in FB_HALL. This variable is updated every HALL event, incremented with CW direction, or decremented with CCW direction.

Bug Fixes

- System: Fixed user UART clear Fault command (0x1) issue. (Fault was not cleared)
- System: Fixed user UART motor control command (0x3) issue. (Motor was not started while setting negative Target Speed value).

3.4 Revision V5.02.00

Features

- Scripting: Scripting language based I2C interface and TRIAC control support has been added

Enhancements

- System: Scripting based controller reset support has been added. Controller reset can be performed by setting “APP_Scripting.Command = 0xAE51” from script Task0 or Task1 function. Controller reset can’t be performed via user UART interface.
- Motor Control: Zero vector (clamps all the low-side switches of the inverter) request command has been added. Zero vector PWM can be applied by setting “APP_MOTOR0.ZeroVectorBrake =1”.
- Motor Control: Hall status flag “FB_HALL.HallStatus“ has been added.

Bug Fixes

- Motor Control: Fixed reporting of false over temperature fault in Standby state.
- Interface: Fixed User UART interface to enable write of a negative value to a signed parameter/variable.

3.5 Revision V5.01.01

Enhancements

- System: Monitoring of background task execution (UART interface, Control input and script Task1) has been added. If any of the background tasks are not executed at least once every 60s period, then the MCE triggers execution fault.
- System: User can configure bit 6 of “SysTaskConfig” parameter (by default this bit value is not set) to perform controller reset if any of the background tasks are not executed at least once every 60s.

Bug Fixes

- System: Fixed blocking of background task (UART interface, Control input and script Task1), if executing for more than 149 days of continuous operation of MCE without power cycle.
- Interface: Fixed handling of wrong command ID in User UART interface. UART message with wrong command is ignored and no response for this message.
- Motor Control: Fixed gate kill fault when angle sensing is enabled.
- System: Fixed catch at startup pulse timing (155us), this pulse is used to switch the MCE from application mode to config mode during bootup time.

3.6 Revision V5.01.00

Features

- Motor Control: High performance sensorless Field Oriented Control (FOC) of Permanent Magnet Synchronous Motor.
- Motor Control: Startup schemes:Angle sensing for initial rotor angle detection., Parking, Open loop and Catch-Spin free running motor.
- Motor Control: Single shunt (Phase shift scheme and Low noise phase shift scheme) or leg shunt (2 phase and 3 phase)motor current sensing.
- Motor Control: Support 3ph and 2ph PWM modulation.
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- Scripting: Scripting language support includes data storage feature, configurable UART driver and IR interface
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