# Release Notes

## MCE Software Package

**MCE Software V1.03.01 for IMC101T-F048**
**iMOTION ™ Platform Turnkey Software**

## Summary

| | |
|---|---|
| **Product Name** | MCE_IMC101T-F048_V1.03.01.zip |
| **Release Version** | V1.03.01 |
| **Type Of Release** | Release Candidate |
| **Name of the Supplier** | Infineon Technologies |
| **Mode of Release** | Infineon Server (http://www.infineon.com/iMOTION) |
| **Date of Release** | 2020-04-16 |
| **Previous Versions** | - V1.02.01 - |

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# 1 Released Items

This chapter lists the artifacts, 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**

- Interface: Scripting based configurable UART driver
- Motor Control: Motor peak current tracking for single shunt configuration when phase shift window is set to zero
- Analog Hall: ArcTan based rotor angle estimation added
- Motor Control: Duty Control scheme has been removed. Duty control mode can be realized using scripting function
- System: CPU Internal oscillator calibration at runtime based on internal temperature sensor
- Motor Control: Hall sensor support : 3/2 Digital hall and 2 Analog hall
- Motor Control: Low noise phase shift PWM for single shunt motor current measurement
- System: IEC/UL60730-1 ClassB support
- Scripting: Scripting language support
- Sensorless FOC control: High performance sensorless Field Oriented Control (FOC) of Permanent Magnet Synchronous Motor.
- Sensorless FOC control: Angle sensing for initial rotor angle detection.
- Sensorless FOC control: Startup schemes: Parking, Open loop and Catch-Spin free running motor.
- Motor Control: Single shunt or leg shunt motor current sensing.
- Motor Control: Support 3ph and 2ph PWM modulation.

## 1.1 Artifacts

This release V1.03.01 consists of the following artifacts:

| Artifact | Description |
|---|---|
| IMC101T_F048_A_V1.03.01.ldf | Encrypted binary file for IMC101T-F048 device. |
| IMC101T_V1.03.01.irc | MCEDesigner project file. MCEDesigner tool is used to program binary file and control parameter configuration. |
| IMC101T-F048_Parameter.txt | Sample parameter file, generated from MCEWizard. |
| IMC101T-F048_V1.03.01_Default.map | Default MCEDesigner map file, to reset the Design_ID value |
| iMOTION_Software_License_Agreement.pdf | License agreement document. |
| IMC101T-F048_V1.03.01_ReleaseNotes.pdf | This release note. |
| Readme.txt | Readme file brief description of how to use tools. |

## 1.2 Test Environment

The MCE software was tested, using the following environment.

- Control Board: EVAL-M1-101T

- Power Board: Eval-M1-05-65D
- 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 V1.03.01. Please refer to the ***revision history*** for previous versions.

### Features

- Interface: Scripting based configurable UART driver
- Motor Control: Motor peak current tracking for single shunt configuration when phase shift window is set to zero
- Analog Hall: ArcTan based rotor angle estimation added
- Motor Control: Duty Control scheme has been removed. Duty control mode can be realized using scripting function
- System: CPU Internal oscillator calibration at runtime based on internal temperature sensor

### Enhancements

- Hall Support: PLL based rotor angle estimation for hall sensor has been added.
- Scripting: Read and write rate of user GPIO via scripting has been changed from 10ms to 1ms.
- Scripting: Access rate of user analog input via scripting has been changed from 10ms to 1ms
- Motor Control: Control input (Frequency/duty cycle) values are accessed from scripting

### Bug Fixes

- Interface: User UART command3 issue fixed. Command #3 set motor start command if TargetSpeed value is non zero value and set motor stop command if TargetSpeed value is zero.
- Motor Control: IPM motor control, Id reference value. generation issue has been fixed. Id reference value is generated based on “AngDel” parameter value.
- Motor Control: Over modulation issue for leg shunt configuration has been fixed.
- Motor Control: Unwanted active vector PWM after BTS charge has been fixed.

## 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.

- Sensorless FOC: Limited up to 150% rated speed field weakening and requires further tuning for higher operation
- FOC: 2Phase modulation only Type3 is supported
- Hall Support: Analog Hall is not supported for leg shunt configuration
- Analog Hall: Only 2 Analog Hall interface is supported
- Control Input: Control Input via Frequency or Duty control input is not supported in case of Hall sensor or Hybrid mode
- FOC: Angle sensing startup method can't be used when Low noise phase shift PWM for single shunt motor current measurement is enbled

# 2 Supported Tools and Packages

The following items are compatible with the current release.

## 2.1 Tools

| Tool | Description |
|---|---|
| MCEWizard (V2.3.0.0) | MCEWizard is an interactive design tool that calculates control IC parameters in digital counts based on the system specifications expressed in engineering units. |
| MCEDesigner (V2.3.0.0) | MCEDesigner is the drive evaluation software that communicates with the digital IC and allows on the fly tuning of drive parameters. |

# 3 Revision History

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

## 3.1 Revision V1.02.01

### Features

- Motor Control: Hall sensor support : 3/2 Digital hall and 2 Analog hall
- Motor Control: Low noise phase shift PWM for single shunt motor current measurement

### Enhancements

- Interface: Lock/unlock mechanism to update STATIC parameters from MCEDesigner
- System: CPU load peak value capture function

### Bug Fixes

- Motor Control: Sensorless FOC: Flux estimator angle compensation problem has been fixed. No need to double the "ATanTau" parameter for those who had manually adjusted it before.

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