EVAL_DRIVE_3PH_PFD7
Getting started guide

September 2019

Agenda

1. Motor drive evaluation board
2. Hardware and software
3. Tools
4. Getting started
5. Resources

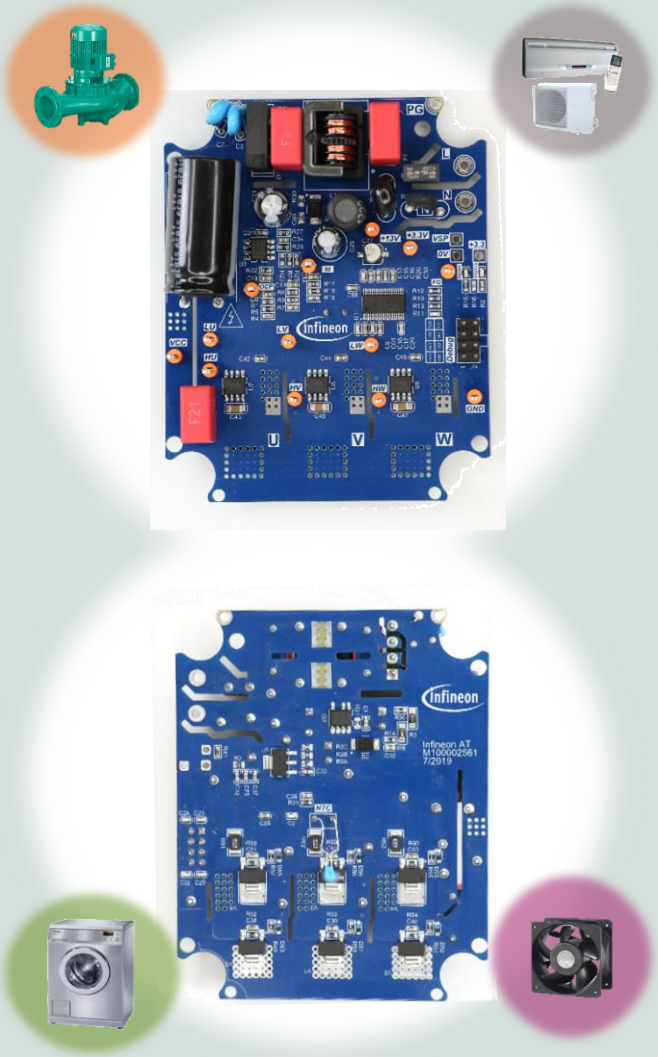
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Introduction



- **Compact 3-phase motor drive** system solution
- Designed for **sensorless** motor control
- **Spin your motor** with easy-to-use GUI for tuning of motor
- The hardware board and motor control software provides:
  - Sensorless control and direct & smooth startup using inductive sensing
  - 3 PH/ 2 PH modulation FOC
  - Over-current protection
  - Speed controlled using GUI

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Agenda

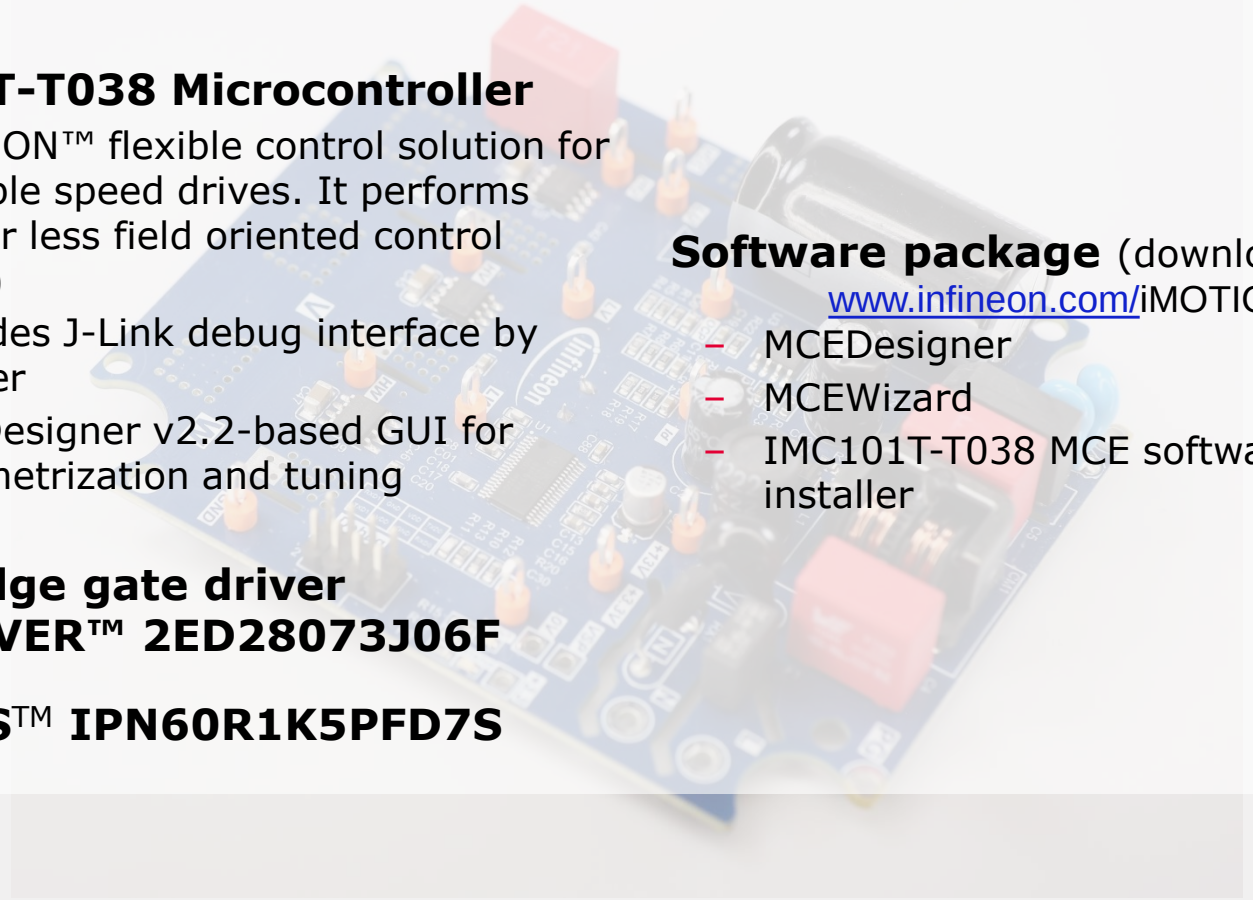
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System overview

Components

- **IMC101T-T038 Microcontroller**
  - iMOTION™ flexible control solution for variable speed drives. It performs sensor less field oriented control (FOC)
  - Includes J-Link debug interface by Segger
  - MCEDesigner v2.2-based GUI for parametrization and tuning
- **Half bridge gate driver EiceDRIVER™ 2ED28073J06F**
- **CoolMOS™ IPN60R1K5PFD7S**



Software package (downloadable from www.infineon.com/iMOTION™
- MCEDesigner
- MCEWizard
- IMC101T-T038 MCE software package installer

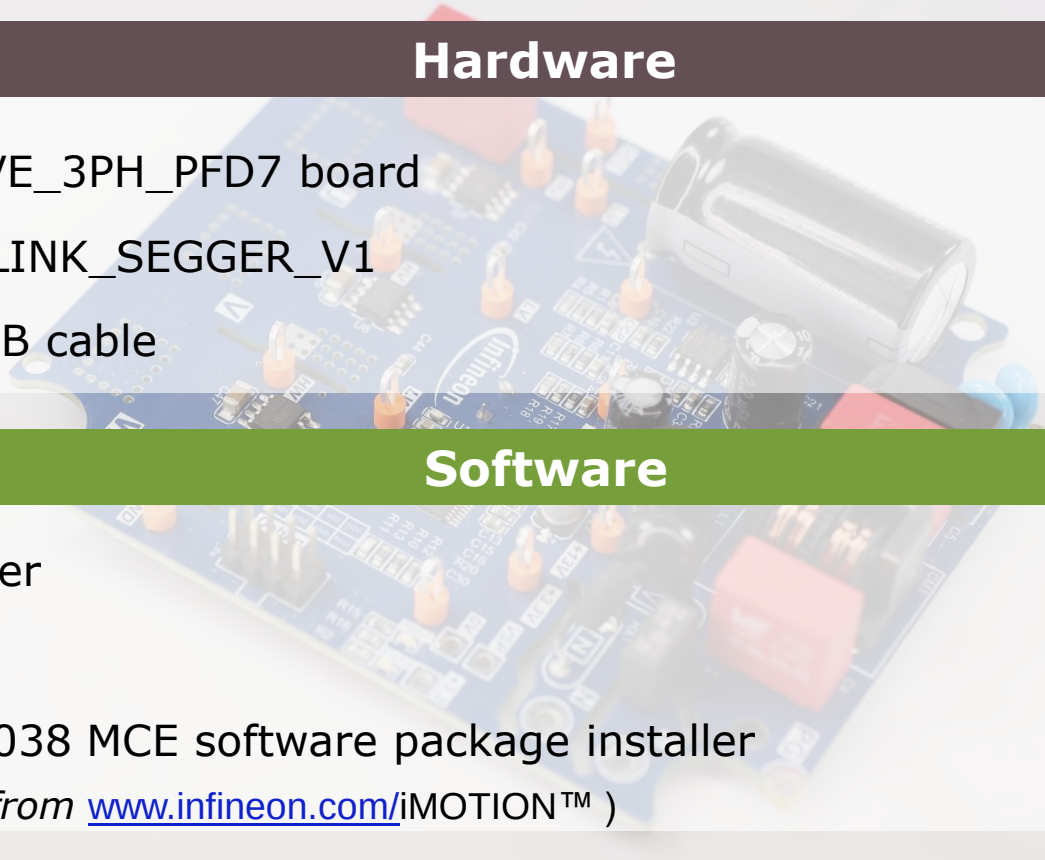
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System overview

For example the EVAL_DRIVE_3PH_PFD7 Kit consists of:

Hardware

- EVAL_DRIVE_3PH_PFD7 board
- KIT_XMC_LINK_SEGGER_V1
- Micro-B USB cable



Software

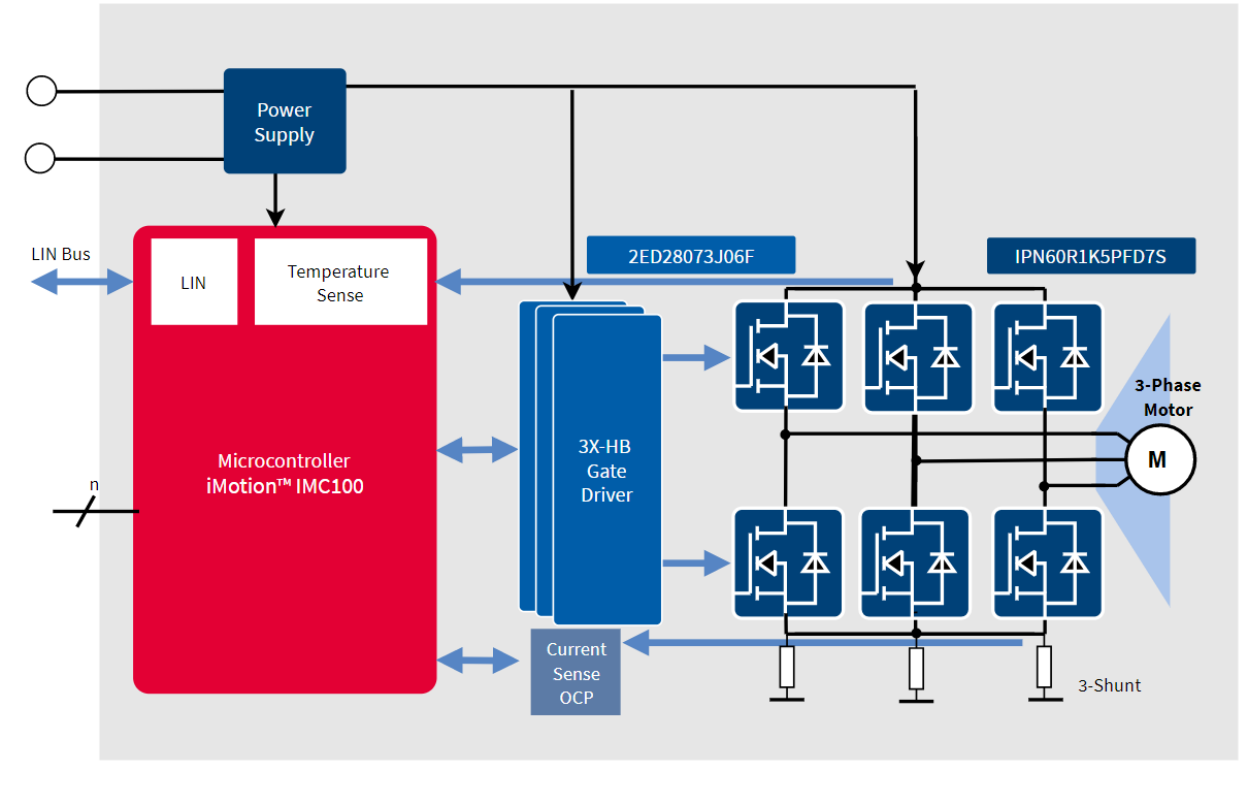
- MCEDesigner
- MCEWizard
- IMC101T-T038 MCE software package installer

(downloadable from www.infineon.com/iMOTION™)

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System overview

Block diagram description:

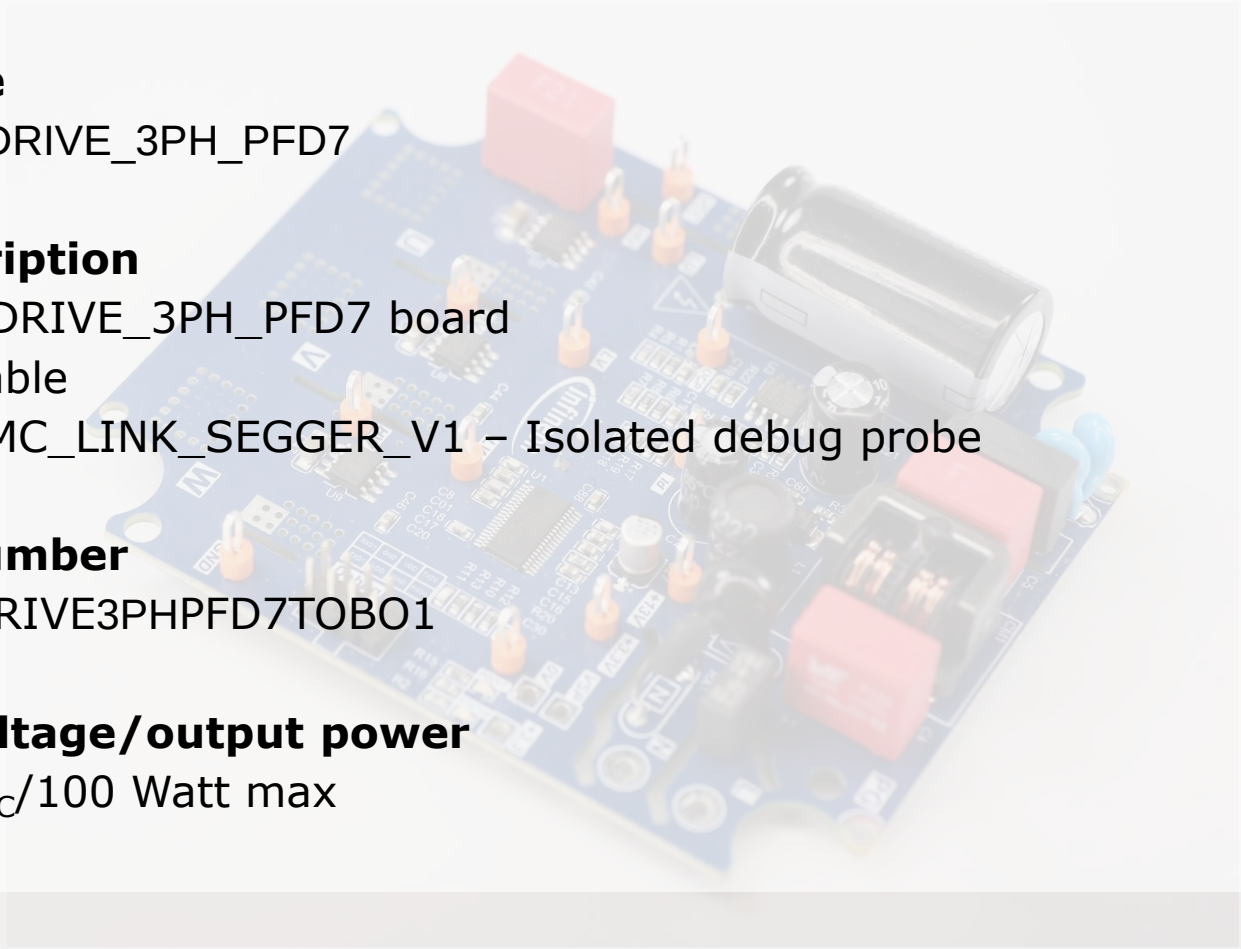


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Hardware overview

Hardware

- **Kit name**
  - EVAL_DRIVE_3PH_PFD7
- **Kit description**
  - EVAL_DRIVE_3PH_PFD7 board
  - USB cable
  - KIT_XMC_LINK_SEGGER_V1 – Isolated debug probe
- **Order number**
  - EVALDRIVE3PHPFD7TOBO1
- **Input voltage/output power**
  - 230 V_{AC}/100 Watt max

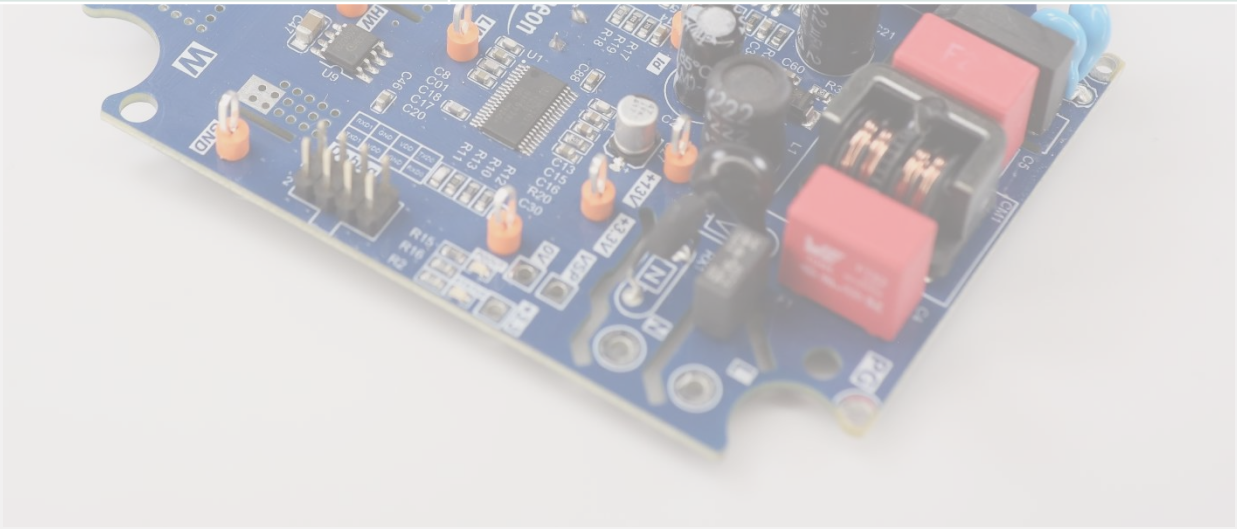


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Hardware overview

Infineon parts utilized on EVAL_DRIVE_3PH_PFD7 board:

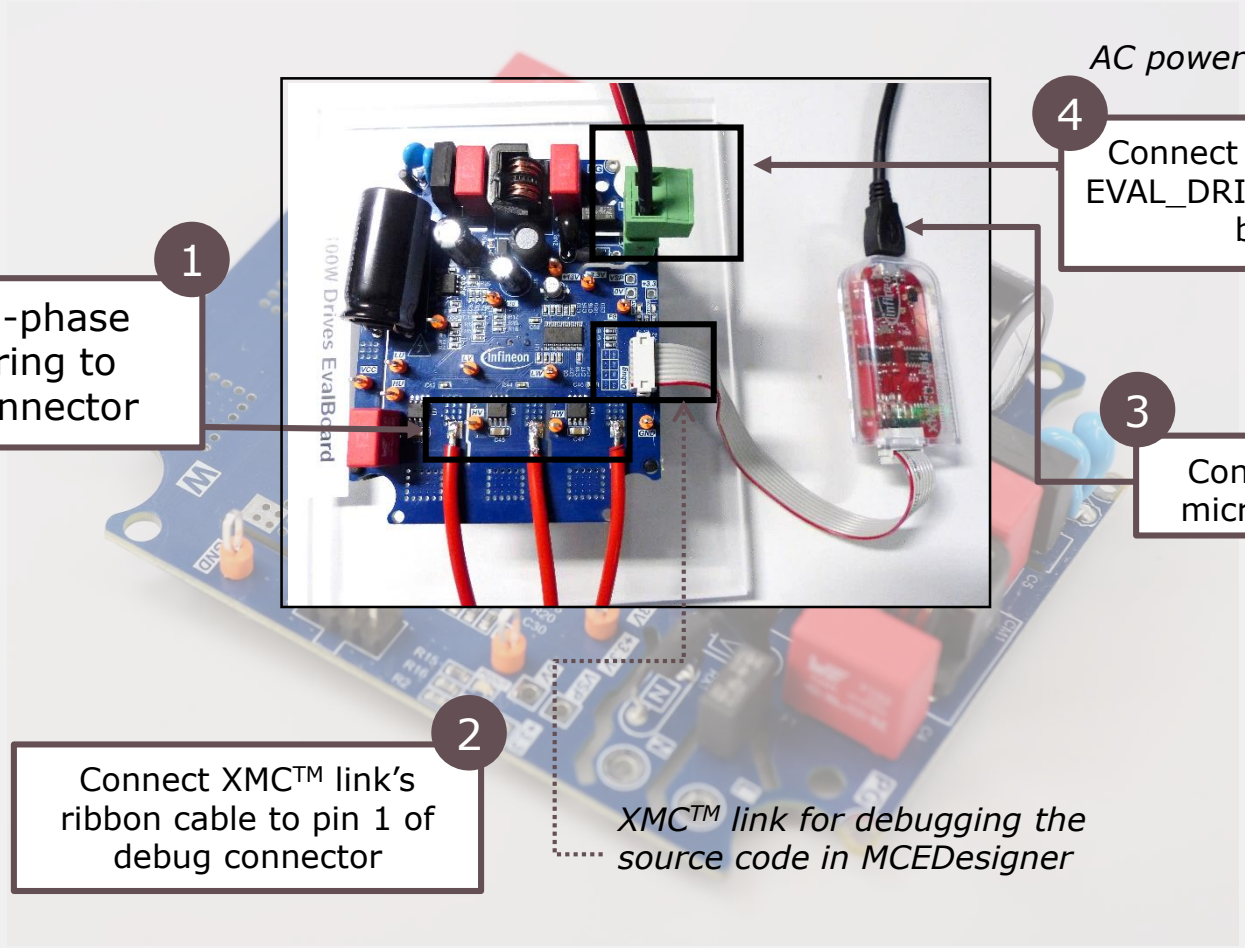
Infineon Parts	Order Number
IMC100 Microcontroller	IMC101T-T038
600 V half bridge gate driver	2ED28073J06F
600 V CoolMOS™	IPN60R1K5PFDS
3.3 V LDO regulator	IFX1117ME V33



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Hardware overview

To properly setup the board, follow these steps:



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Software setup



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iMOTION™ MCE_Wizard and MCE_Designer

Run the MCE_Wizard and MCE_Designer.exe files and follow the instructions.

Download Micrium µC/Probe™ for XMC™ installer package from:

www.infineon.com/ucprobeXMC™



Installation requirements:

- PC with Windows 7, Windows 8, Windows 10 – 32 bit & 64 bit
- RAM – 3 GB or more

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Agenda

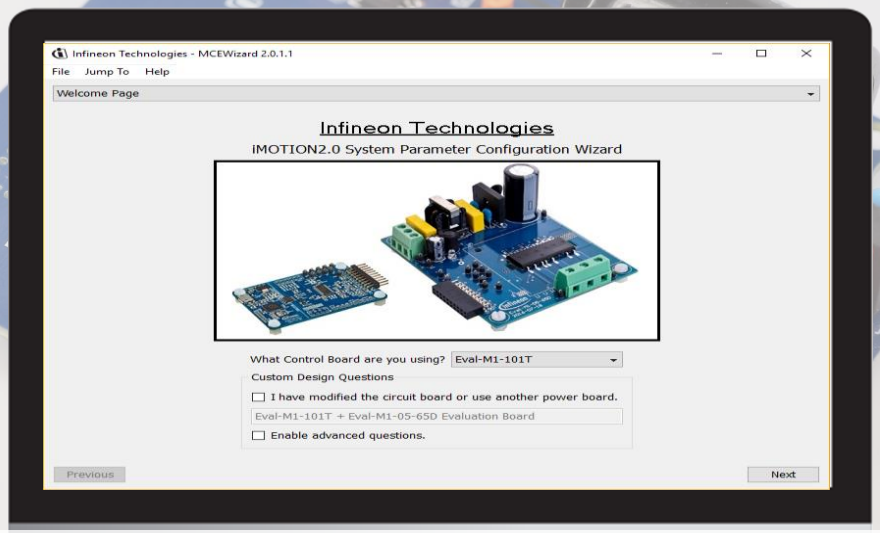
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MCE Wizard step by step

1. After installing the MCEWizard, the shortcut for MCEWizard appears on the Windows desktop.

2. Double click the shortcut to open the MCEWizard and configure the parameters for evaluation boards or motor.



If both "I have modified the circuit board" and "Enable advanced question" checkmarks are selected. Please refer to the User Manual of the corresponding power board for additional information.

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MCE Wizard step by step

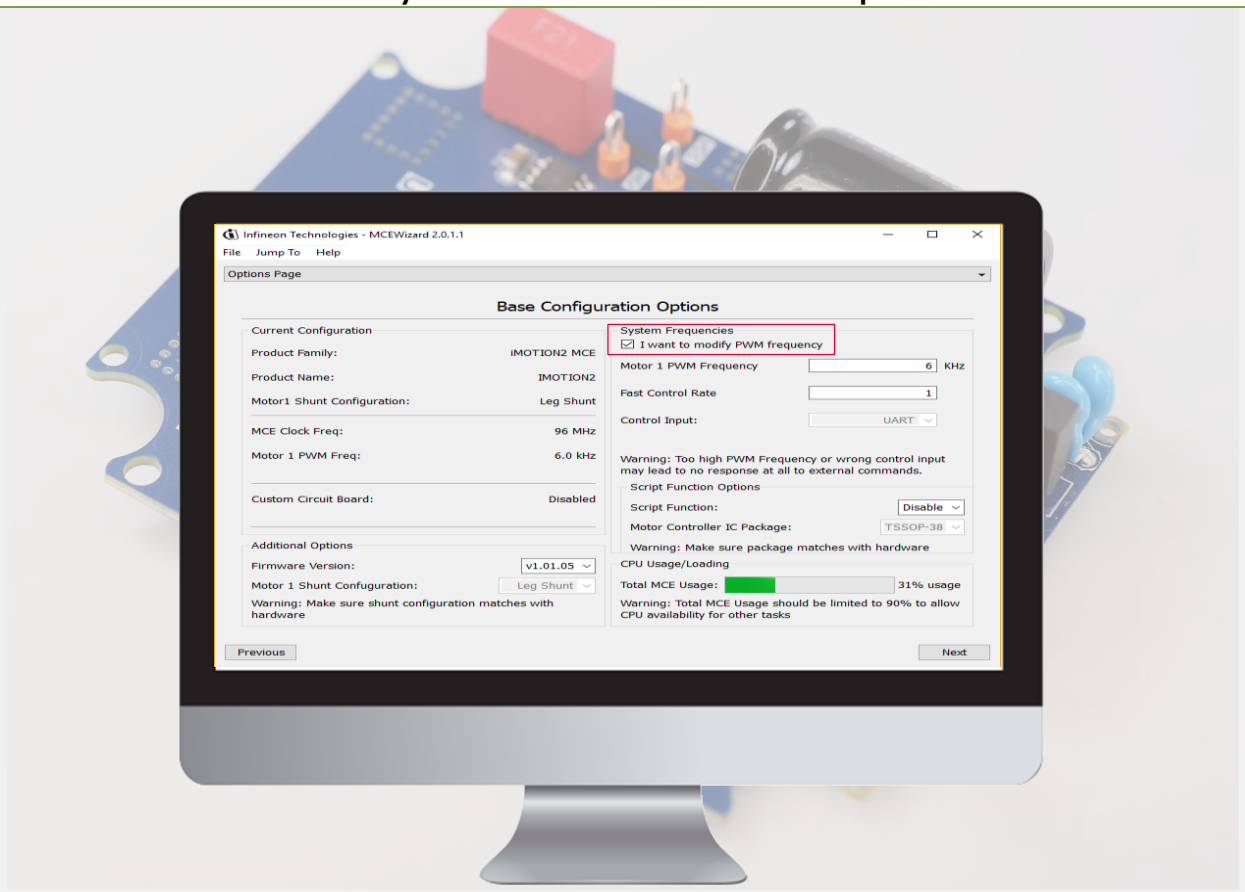
1. Select the control board, Eval-M1-101T start the MCEWizard system setup procedure by clicking the “Next” button in the right bottom corner.



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MCE Wizard step by step

1 Make sure that "I want to modify the PWM frequency" checkmark is selected to be able to modify the motor PWM freq.

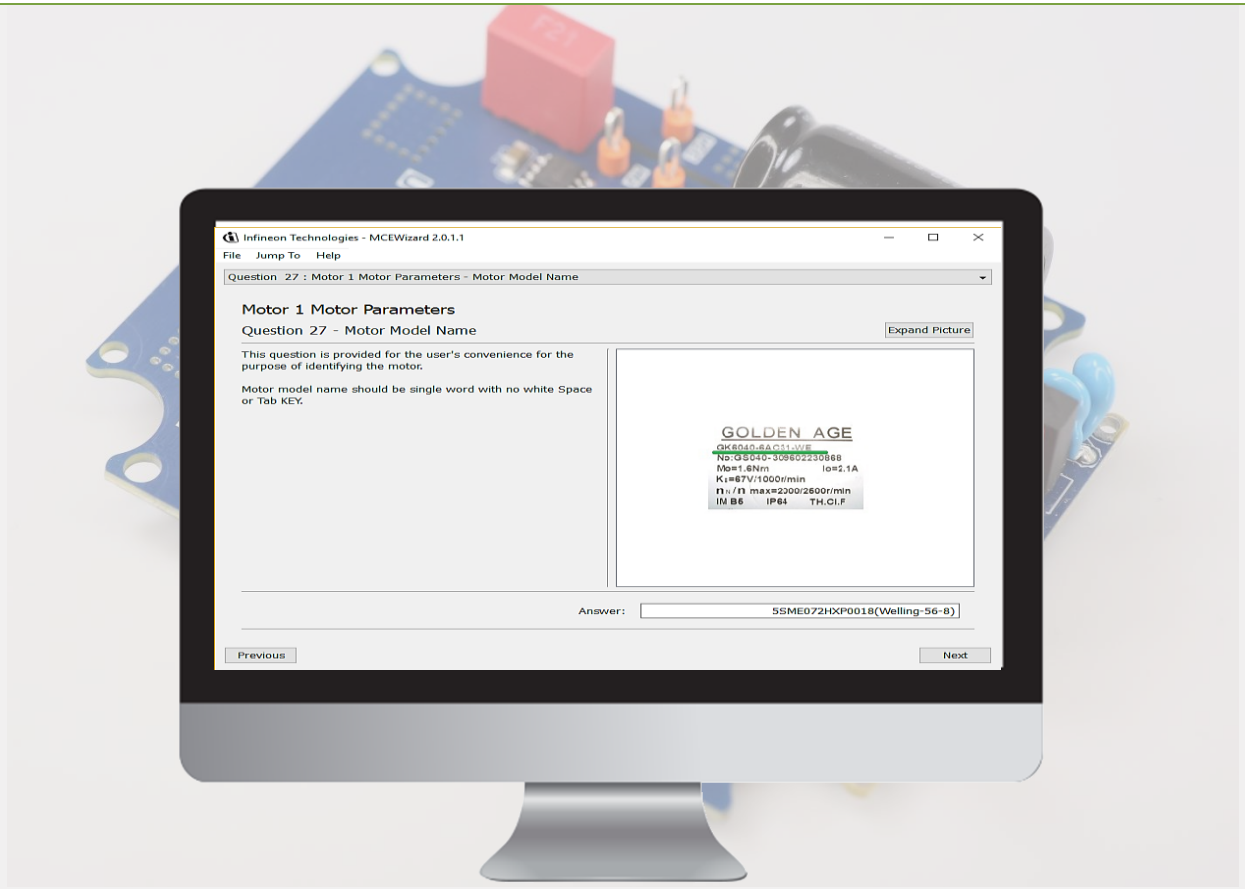


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MCE Wizard step by step

1

Please insert the motor model name.

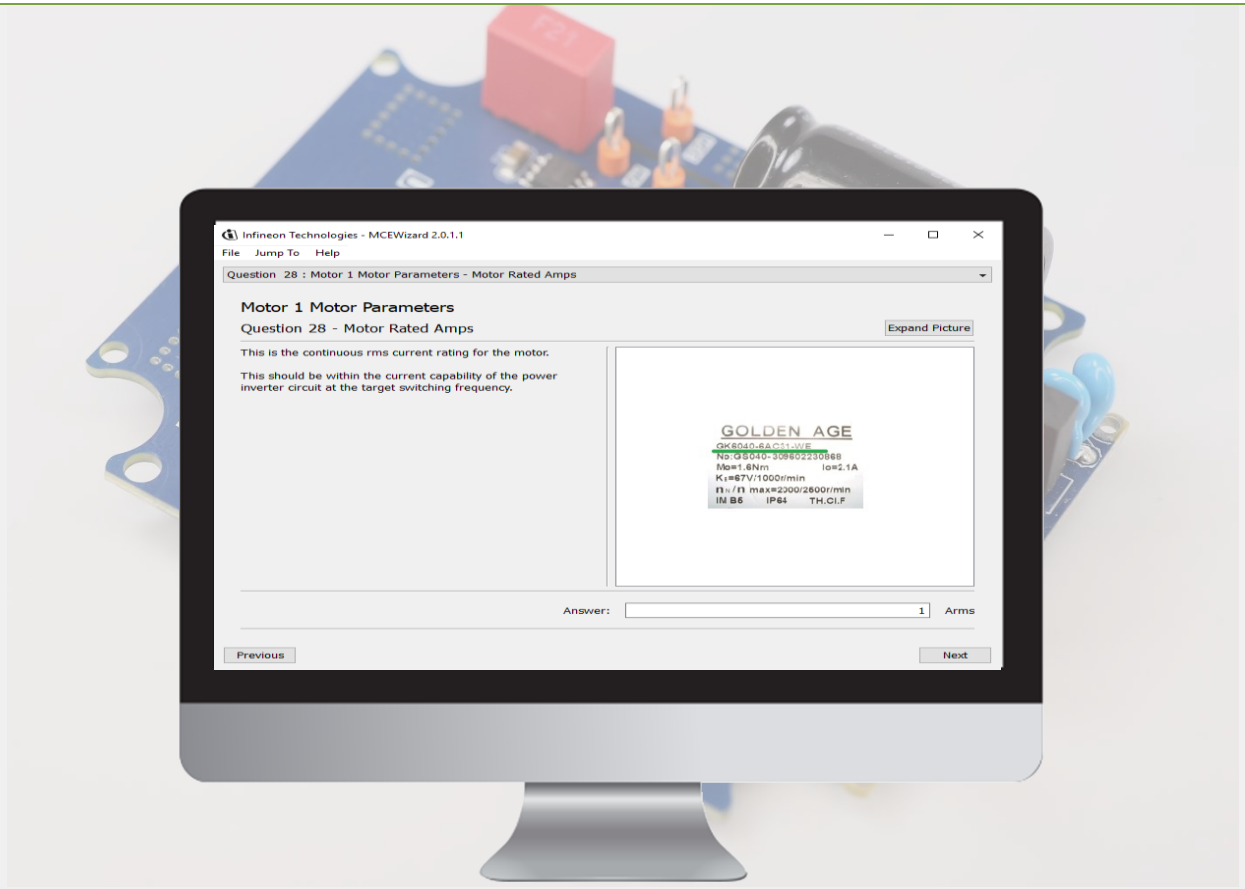


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MCE Wizard step by step

1

Please insert the motor rated continuous current.

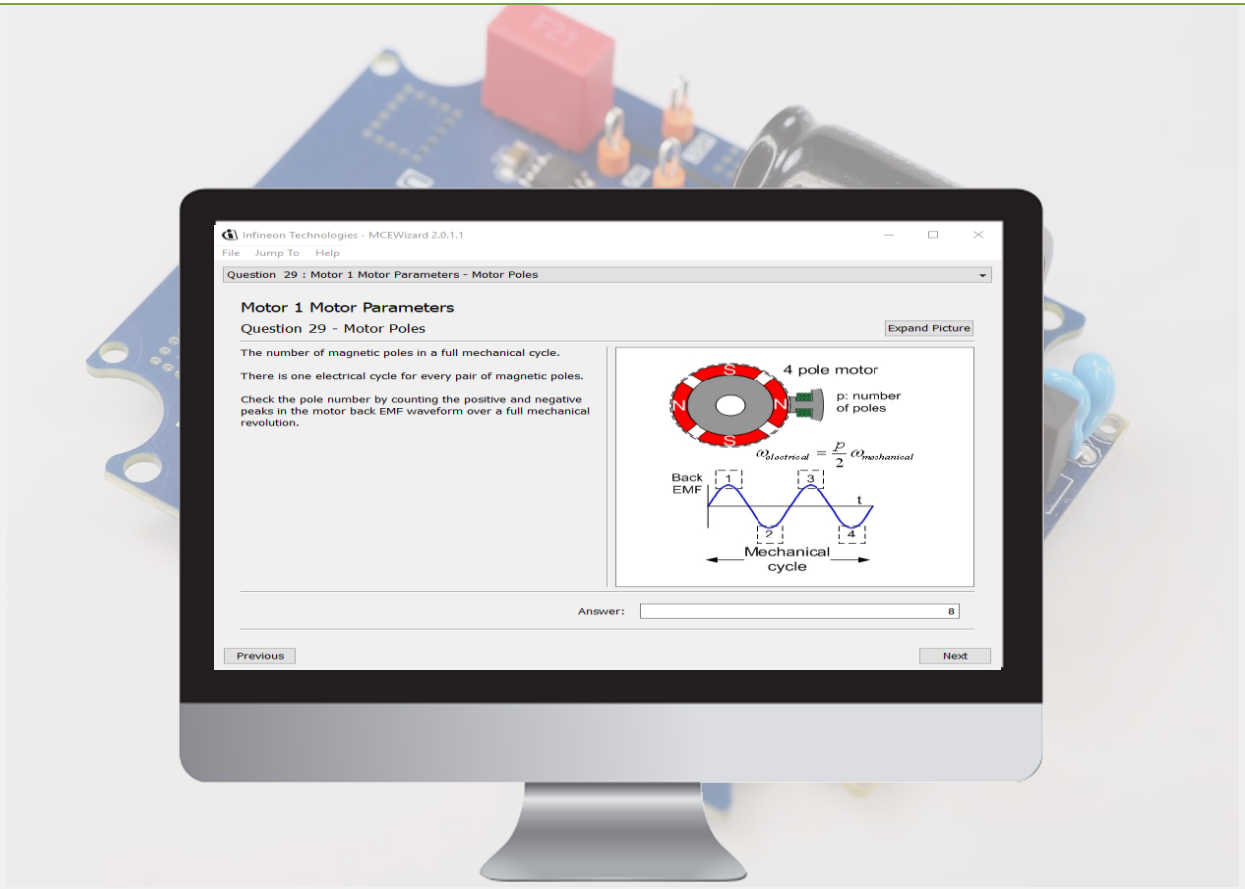


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MCE Wizard step by step

1

Please insert the motor number of magnetic poles.

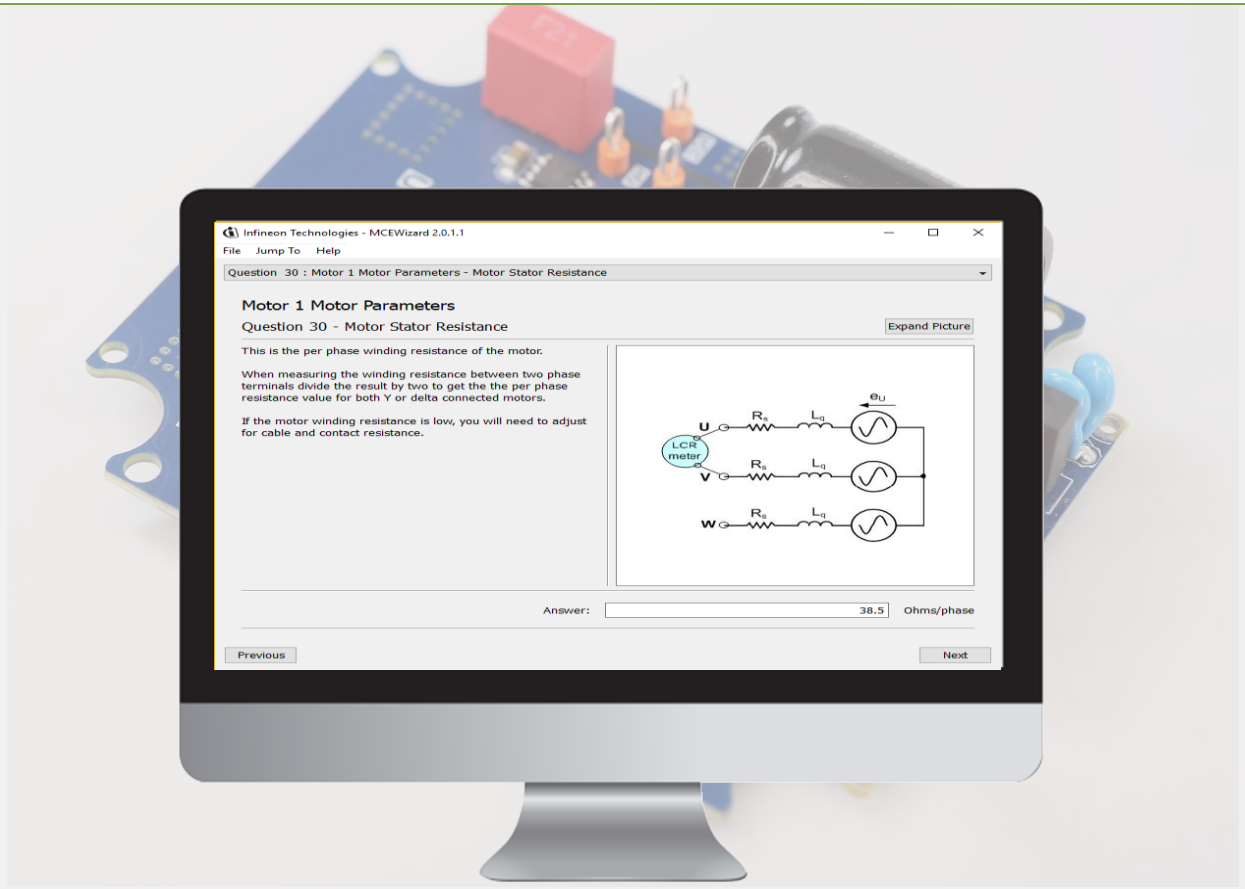


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MCE Wizard step by step

1

Please insert the motor phase winding resistance.

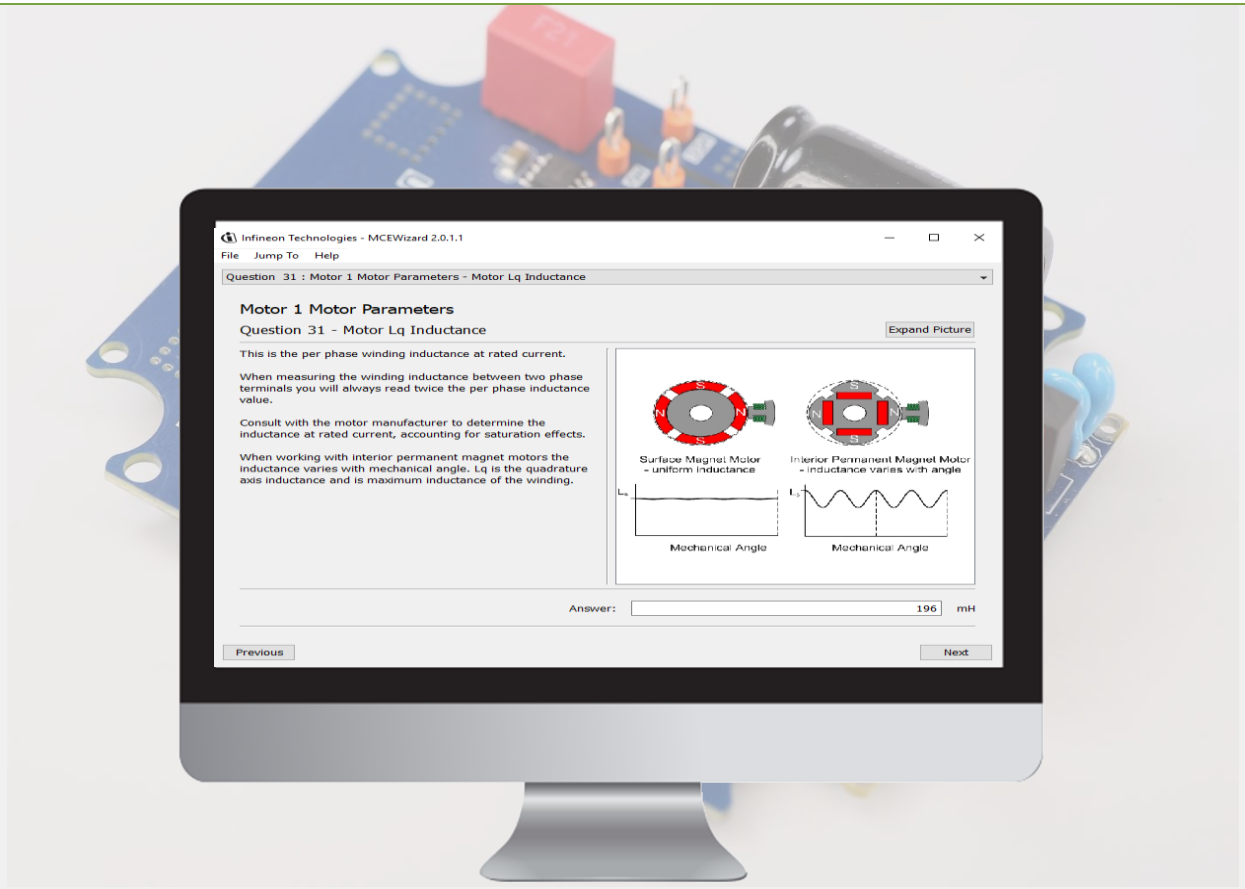


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MCE Wizard step by step

1

Please insert the motor phase winding inductance.

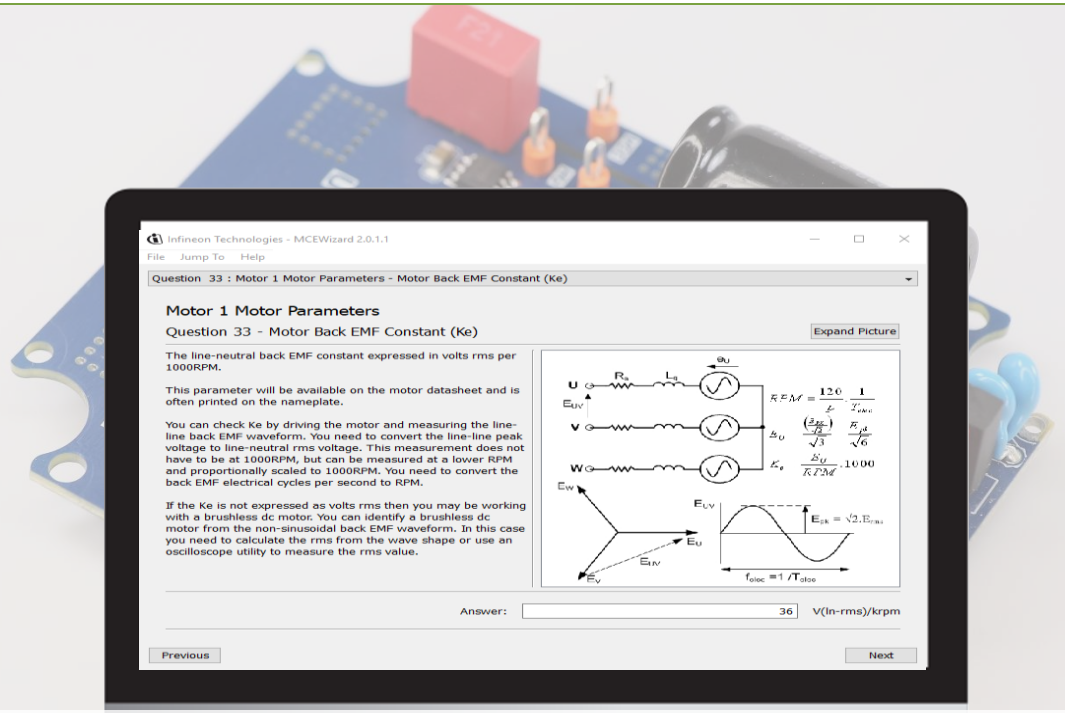


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MCE Wizard step by step

1

Please insert the motor back EMF constant (Ke).



for additional information on how to measure the back emf please follow the" How to measure motor parameters " document .

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MCE Wizard step by step

1

Please insert the motor maximum speed RPM.



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MCE Wizard step by step

1

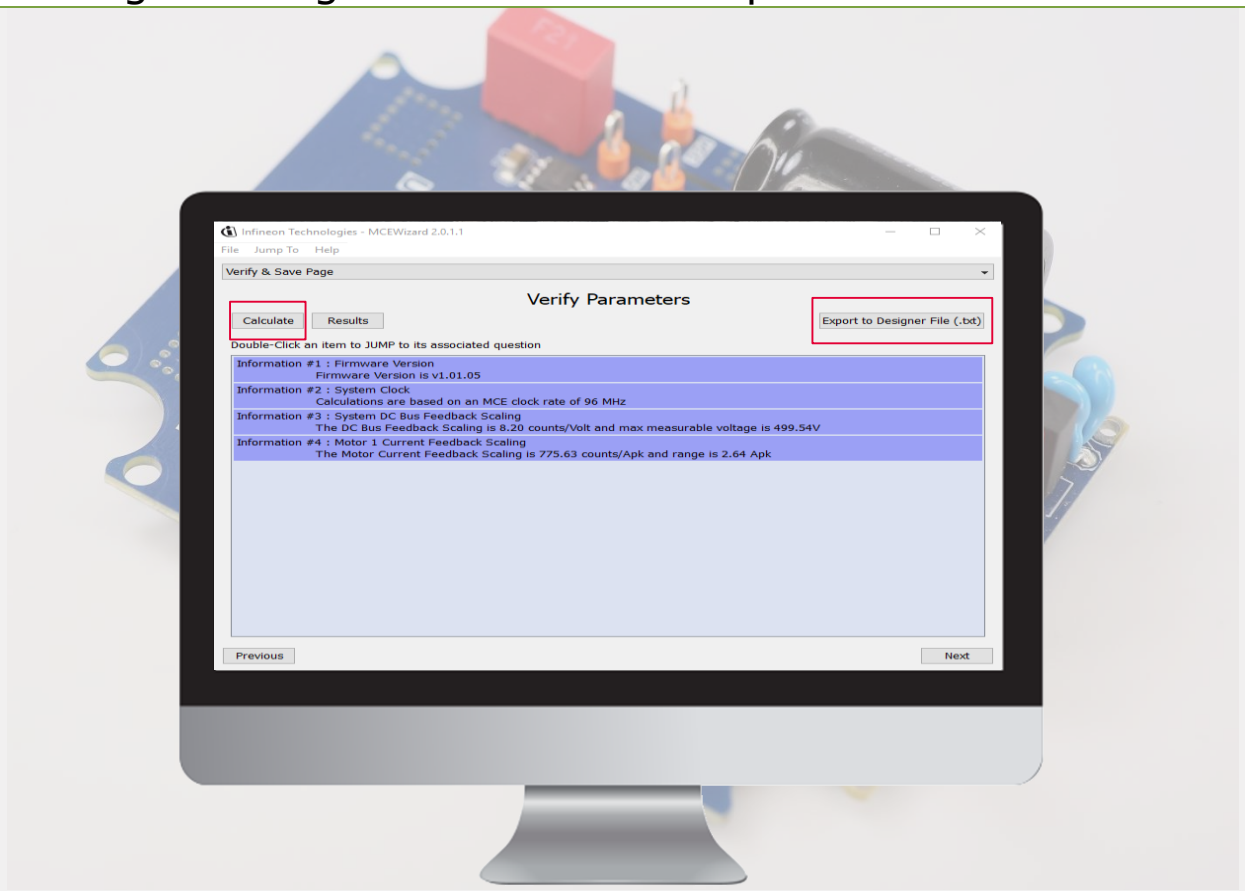
Please enable the inductive sensing for smooth motor startup.



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Generate the motor parameters file

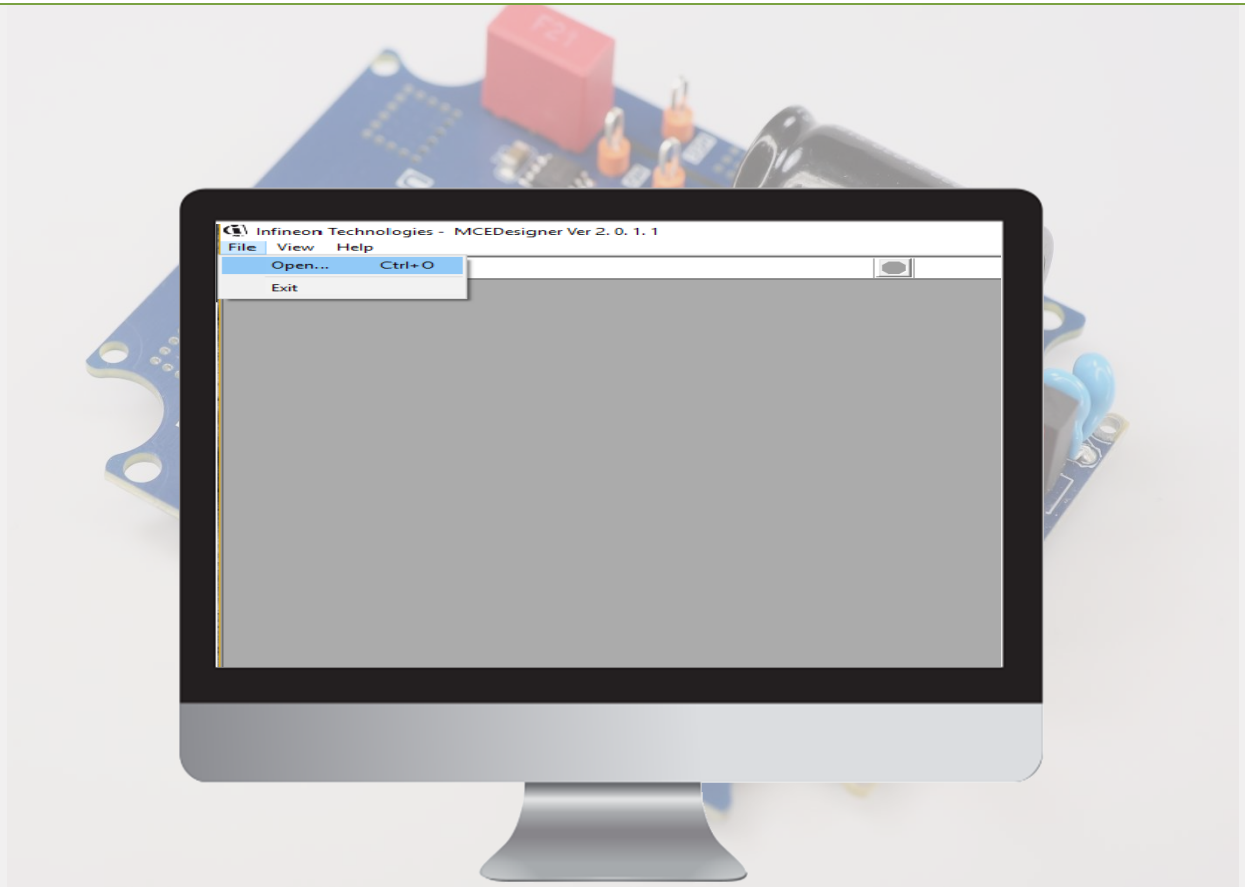
1. In the verify parameters window press “Calculate” and then press on “Export to Designer” to generate the motor parameter file.



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Load the m/c files

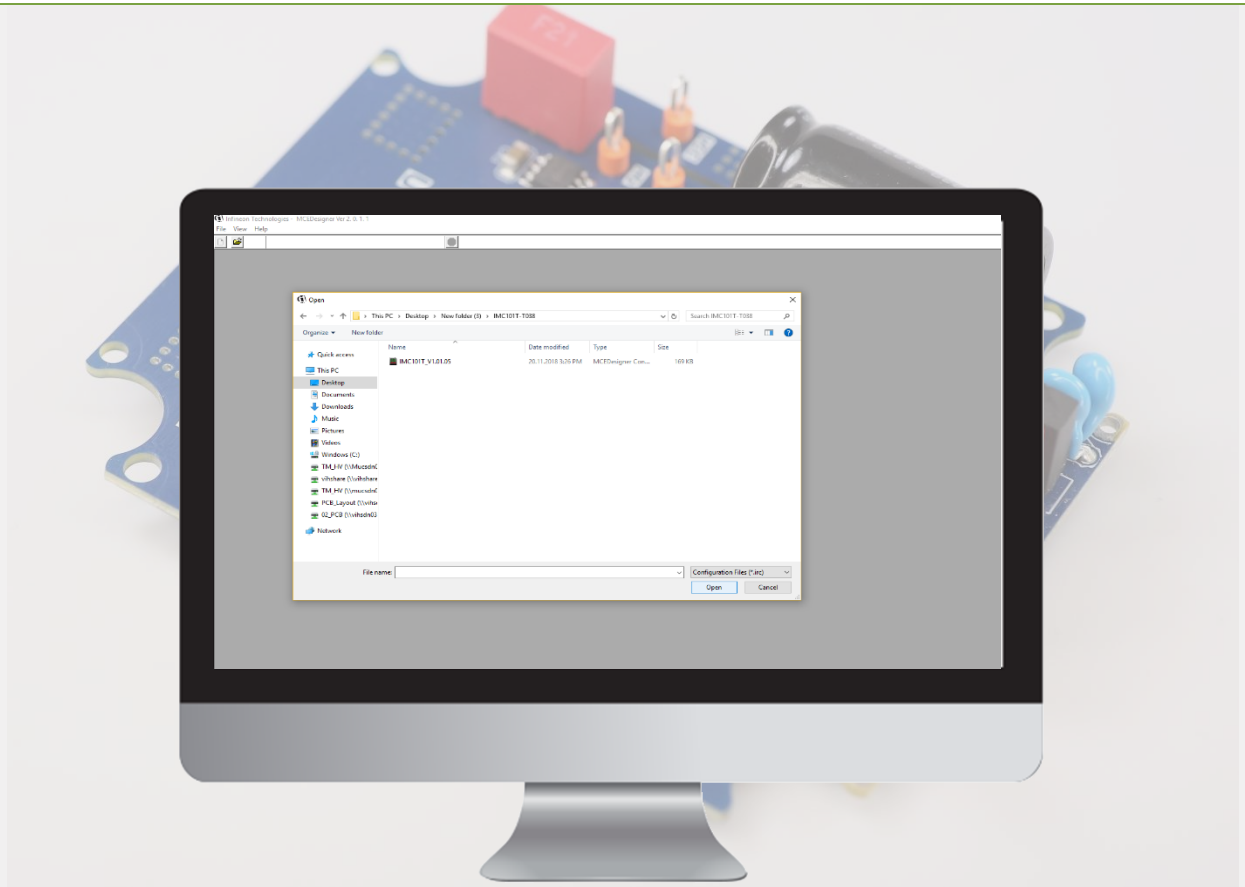
1. Open the “MCE Designer” go to File -> Open



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Load the m/c files

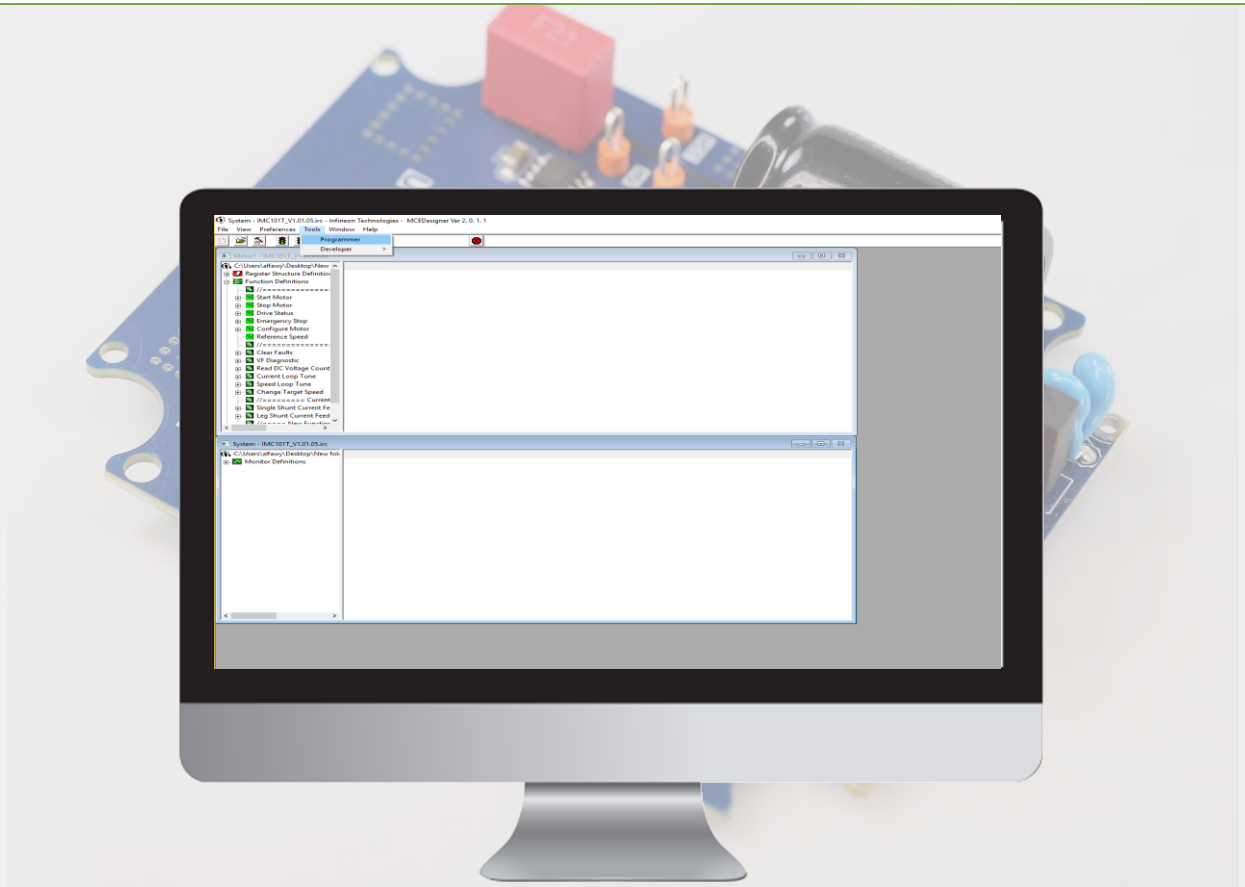
1. Go to Desktop-> IMC101T-T038 -> IMC101T_V1.01.05 and open



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Load the m/c files

1. Go to Tools -> Programmer



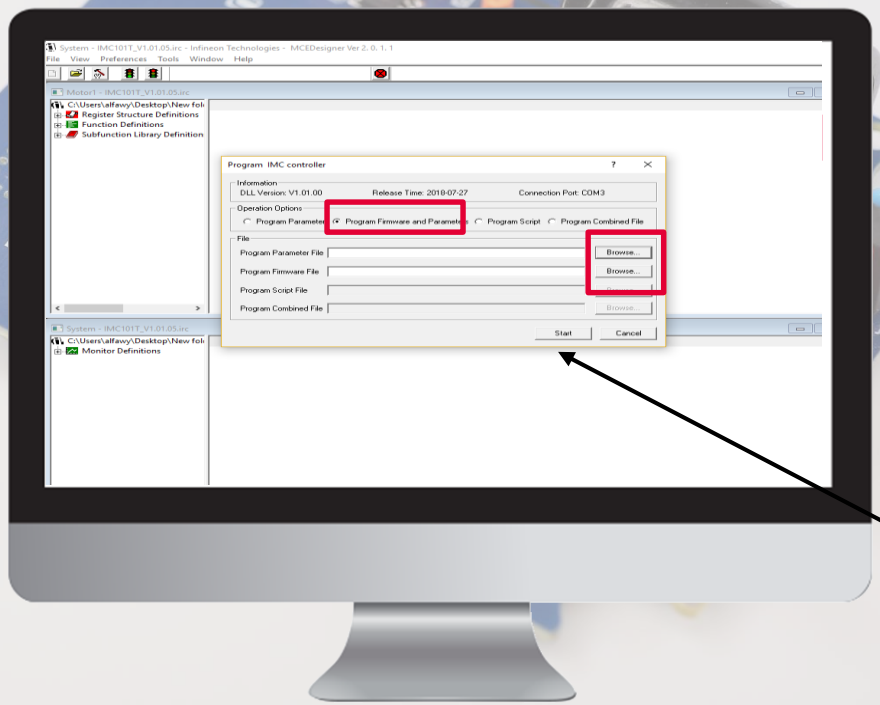
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Load the parameters

1

Chose “Program firmware and parameters” PFD7 test.txt and PFD7test

Chose for Parameter “PFD7 test.txt” and for firmware “PFD7 test.idf”

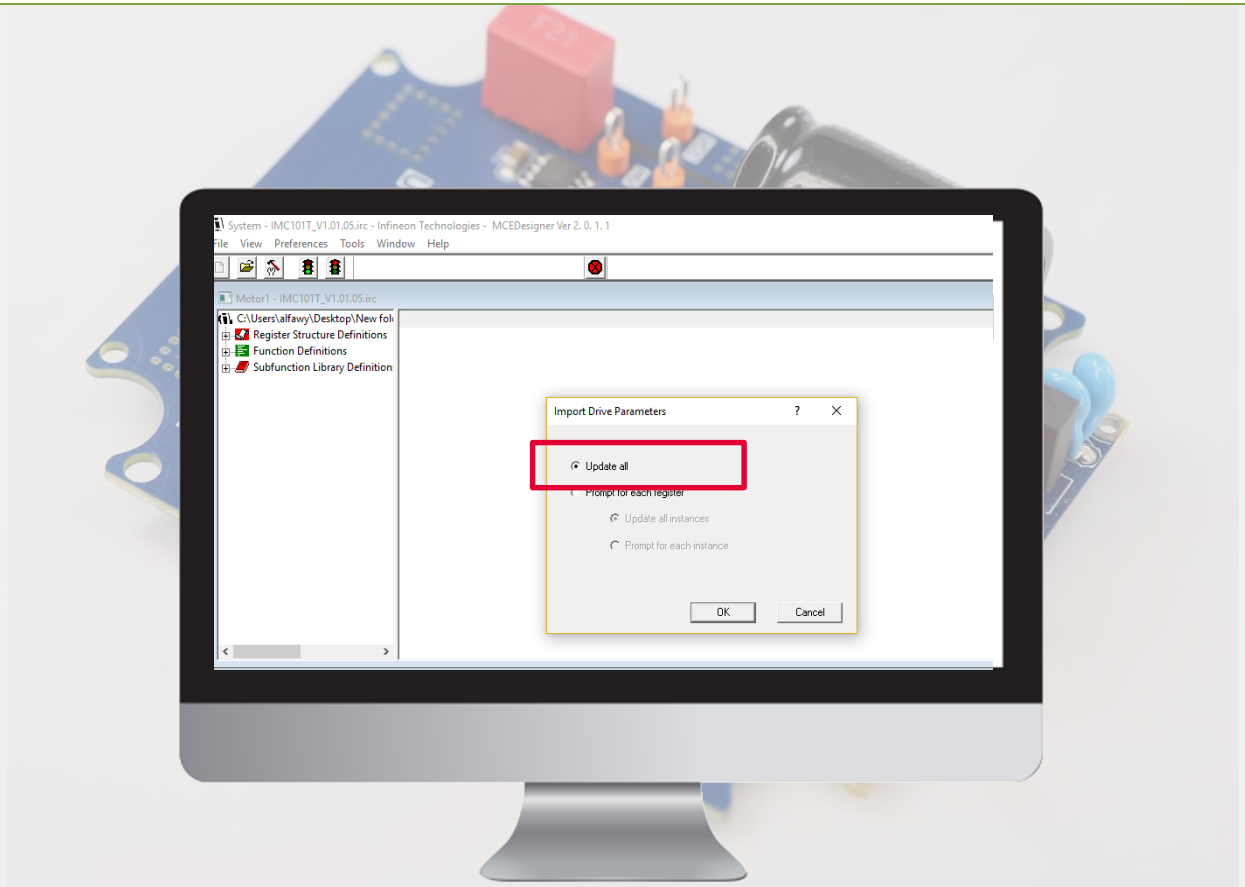


Press Start

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Load the parameters

1. Import drive parameters -> Select “Update all”



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Start the motor

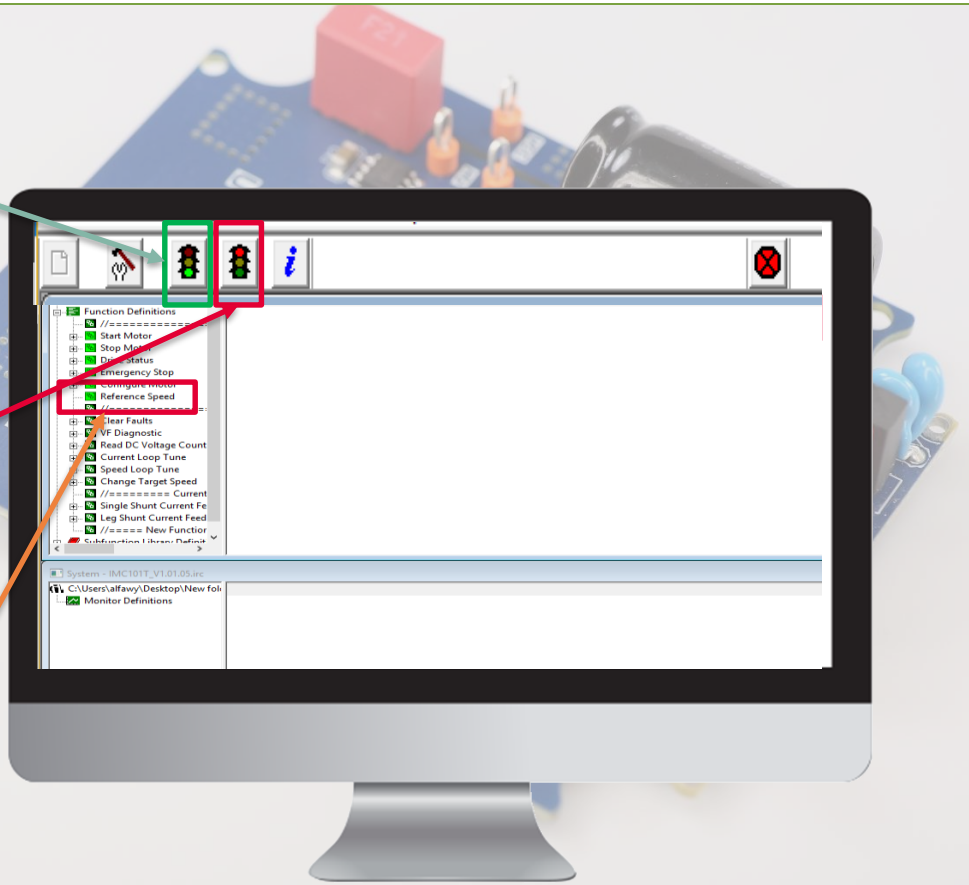
1

Motor now is ready to run

To start motor

To stop motor

Double click on Ref speed to change speed



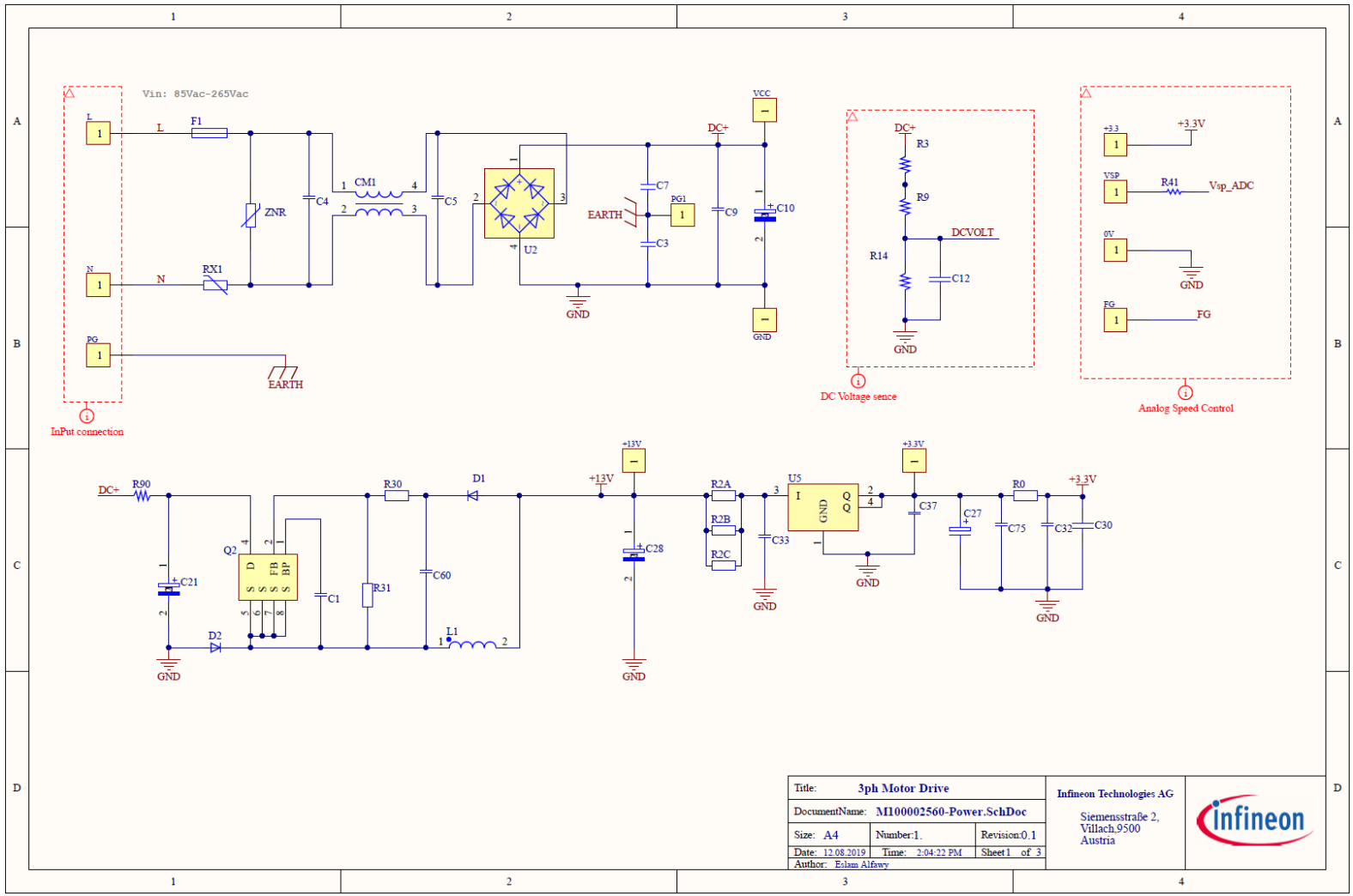
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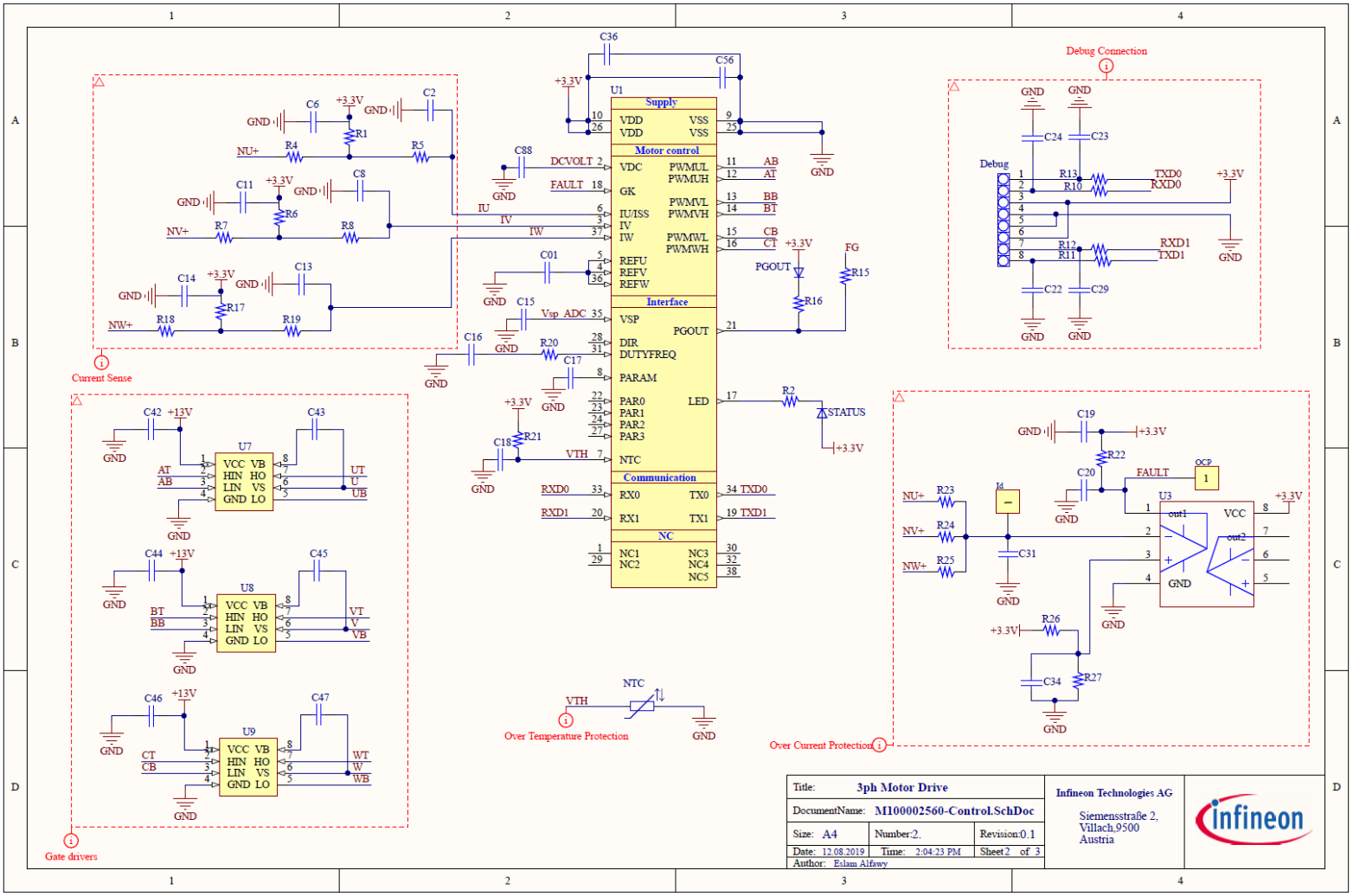
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Schematic of EVAL_DRIVE_3PH_PFD7 board



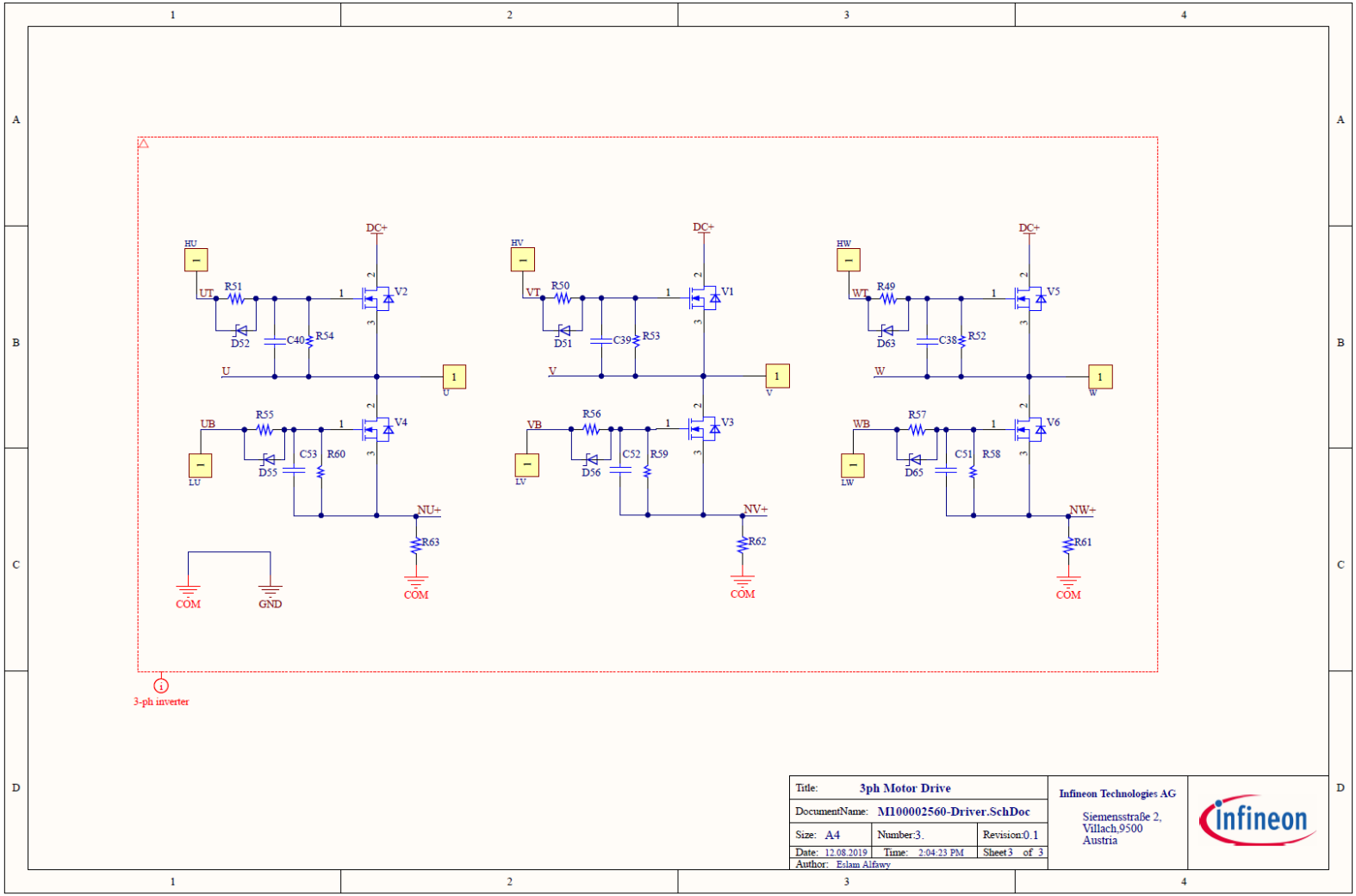
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Schematic of EVAL_DRIVE_3PH_PFD7 board



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Schematic of EVAL_DRIVE_3PH_PFD7 board



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