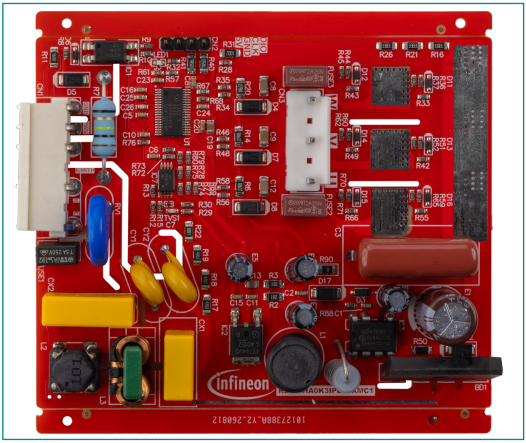
QUICK START GUIDE

XMC1302 Cost-optimized Capless Motor Control Kit

REF-MHA0K6IPD60XMC1

Kit contents

1. XMC1302 cost-optimized capless cotor control kit
2. Quick start guide





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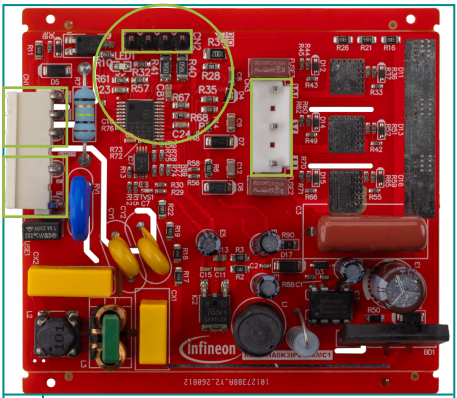
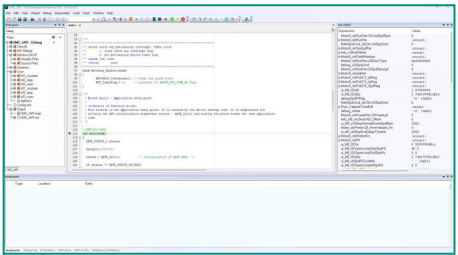


1 Connect the J-Link with CN2, compressor U,V,W with CN3, and AC

Before you start

Ensure the following:

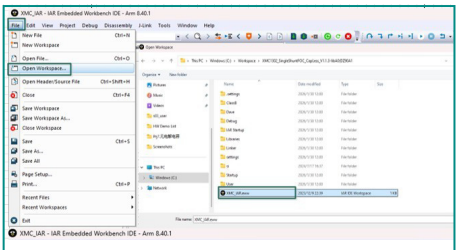
1. AC power supply at 176-265 V_{RMS} capable of providing 1.5 A of peak current.
2. A PMSM motor that supports a maximum power output of 300 W. The recommended compressor part to evaluate this kit is VMH1113Y R600a hermetic compressor.
3. The IAR Embedded Workbench for Arm® (v8.40.1), was downloaded from IAR Workbench installer package.
4. Segger J-Link (v9) or later version.



2 IAR Embedded Workbench for Arm®

Hardware connections

1. Connect the compressor phase line the motor phase connector (CN3). Ensure that the U, V, W signals connect to the compressor in clockwise order.
2. Connect the AC supply, earth from the grid to the AC input connector (CN1_A).
3. Connect the external PWM source to the CN1_B connector (it is used to control compressor speed; it is optional and it can be replaced through IAR live debug mode).
4. Connect the J-Link SWD interface to the J-Link debugger connector (CN2) connector.

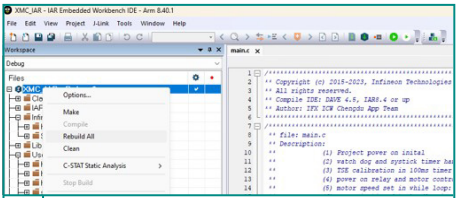


3 Open project

Getting start: Open project

Do the following to get started with the kit:

1. Open the project folder: XMC1302_SingleShuntFOC_CapLess_V1.1.3-libA0 (DZ90A1)
2. Open IAR Embedded Workbench IDE.
3. From the File menu, click **Open Workspace** to open the project (see Figure 3).



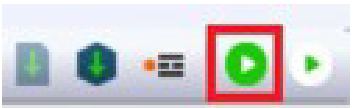
4 Compile project

Compile project

Two methods to compile the IAR project are:

Method 1: Right-click on the project in the **workspace** window in the tool and use the Make or Rebuild all options.

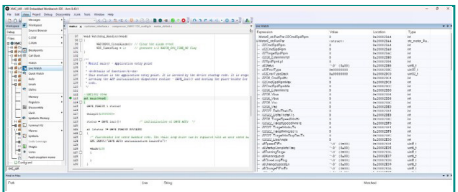
Method 2: Click **Make button** on the toolbar, as shown in Figure 4.



5 Online debug

Online debug

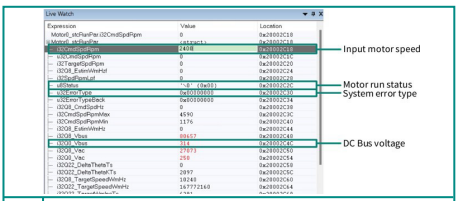
For online debugging, click the highlighted button shown in Figure 5 .



6 live watch windows

live watch windows

After downloading the project, navigate to **View > Live Watch**. In the Live Watch window, add the **Motor0_stcRunPar** structure and expand it. Set a non-zero value in the first variable to start the motor, as shown in Figure 6.

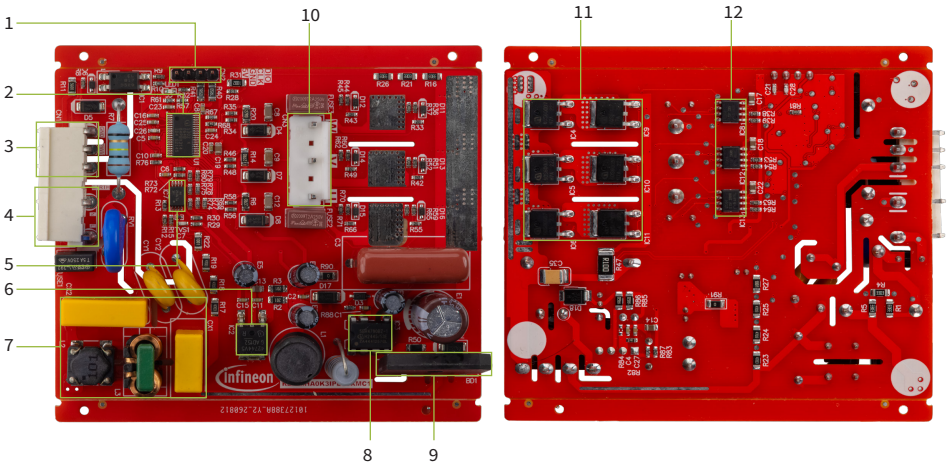


7 Run motor

Run motor

In the IAR live watch window, watch the variable **Motor0_stcRunPar.u32ErrorType** is '0', set the speed to run the motor. When the motor is running, the motor speed status is automatically changed.

REF-MHA0K6IPD60XMC1 top and bottom board details



1 J-LINK debugger connector (CN2)
2 XMC 1302 Microcontroller (U1)
3 Speed control port using PWM frequency input (CN1)
4 AC input connector (CN1_A)
5 Operational amplifier (IC7)
6 OPTIREG™ LDO for 5V DC supply (IC2)
7 Input filter (CX1, CX2, L2, L3)
8 CoolSET™ AC-DC fixed frequency regulator (IC3)
9 Rectifier bridge (BD1)
10 Motor phase connector (CN3)
11 6x CoolMOS™ PFD7 MOSFETs on the bottom layer (IC4, IC5, IC6, IC9, IC10, IC11)
12 EiceDRIVER™ gate driver (IC8, IC12, IC13)

See the kit guide available at www.infineon.com/REF_MHA0K6IPD60XMC1 for more details.

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