EVBUM2497/D

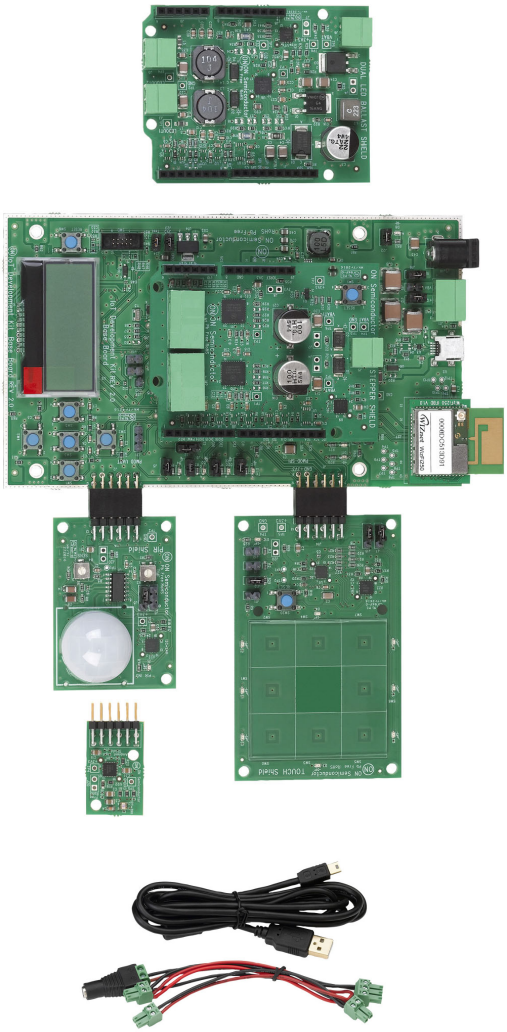
IoT Development Kit (IDK) Quick Start Guide

Getting Started with the IoT Development Kit from ON Semiconductor

ON Semiconductor®

www.onsemi.com

EVAL BOARD USER'S MANUAL



Available Shields

- IDK Baseboard
- Ambient Light Sensor (ALS) Shield
- Touch Shield, PIR Shield, Stepper Motor Shield
- LED Ballast Shield, Wi-Fi® Module
- BLDC Shield, PoE Shield, CAN Shield

Accessories

- Mini-USB Cable
- Cable Assembly

Tools Needed

- IDE Installer
- PC: Windows® PC with minimum 1 USB port, JRE/JDK version 8u101 or later installed. OS: Windows 7, 8 or 10.

Introduction

The IDK baseboard can be connected with different shields depending on the required IoT application. The IDK baseboard allows the user to create many types of IoT nodes and/or gateways depending on which shields are used with the baseboard. The IDK baseboard is configured by connecting the baseboard with the PC and USB cable and using accompanying PC software.

Software Installation

Programing/configuring the IDK requires the ON Semiconductor IDE software. The IDE should be installed on the PC before connecting the hardware to the PC. The Software Suite can be downloaded from www.onsemi.com.

Steps for installation of the IDE are mentioned on page 5 of this Quick Start guide.

Hardware Setup

After the IDE software is installed, hardware can be connected as shown in Figure 1. A single 12 V, 2 A power supply adapter powers the evaluation board (e.g. CUI INC, model SMI24−12....12 V/2 A or any other supporting V_{OUT} = 10−35 V). Jumper settings required for the correct operation of the baseboard and the shields are listed in subsequent sections in this document. The shield boards plug directly into the IDK baseboard. The PC connects to the IDK baseboard through a USB cable.

The shields are classified into two broad categories − PMOD & Arduino − based on the interface where the shields are connected to the baseboard. In addition, Arduino-type shields include "Powered" and "Non-Input Power" shields.

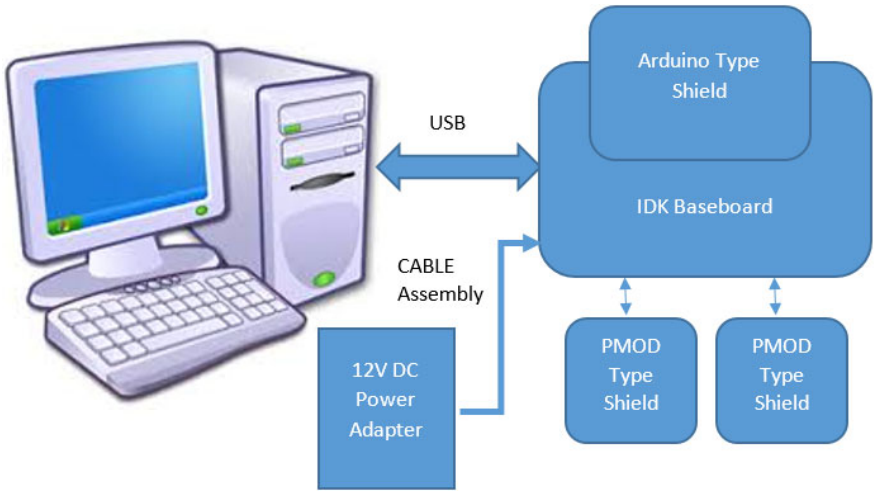


Figure 1. Hardware Setup

APPLICATIONS INFORMATION

Powering Up the IDK

The IDK baseboard can be powered up in stand-alone USB Mode.

Powered shields require additional power supply for its operation. No-Input power shields (e.g. PMOD-type shields) draw power from the baseboard itself.

PMOD type shields: ALS, PIR & Touch (does not require additional power supply).

Arduino powered shields: *Stepper Motor & LED Ballast shields are supplied from external power source.*

IDK Powering Modes

The IDK can be powered in 4 different ways:

1. USB: The IDK baseboard can be powered through USB Mode. Jumper setting: None.

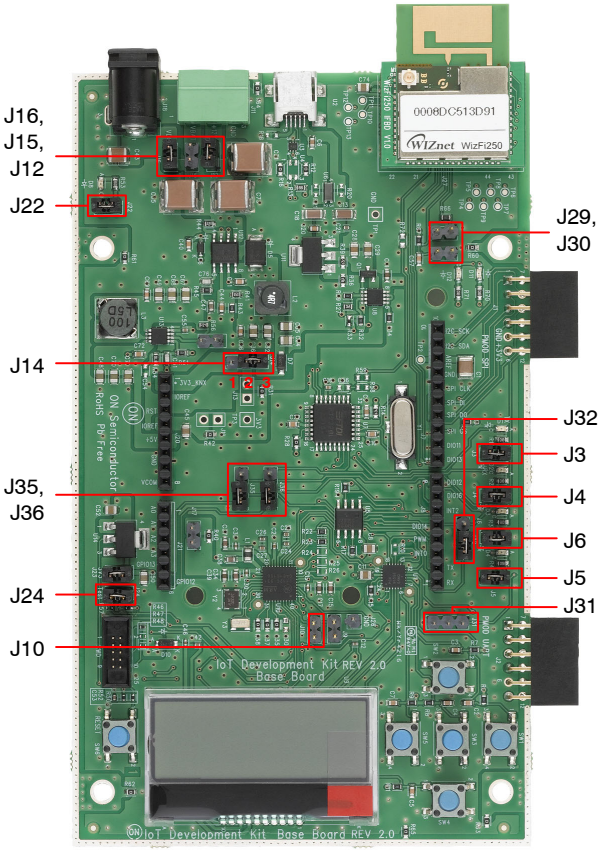
   CAUTION: In USB Mode, powered shields like Stepper motor, LED Ballast, etc. need to be connected to an external 12 V supply using the cable assembly provided with the IDK.

2. External 12 V DC power adapter supplied with the IDK: Wall power adapter can be connected to the DC jack J11. Jumper settings: J16:ON. J12: OFF & J15: OFF.
3. External 12 V DC through J11 Connector: 12 V can be provided from an external DC power supply through J11 Pin no.2 (+Ve) & J11 Pin No. 3 (−Ve). Jumper settings: J12: ON. J15: OFF & J16: OFF.
4. External 9−32 V DC through J11 Connector: 12 V can be provided from an external DC power supply through J11 Pin No.2 (+Ve) & J11 Pin No. 3 (−Ve). Jumper settings: J12: OFF, J15: ON & J16: OFF.

Jumper Settings

The default jumper settings are highlighted below for the IDK boards.

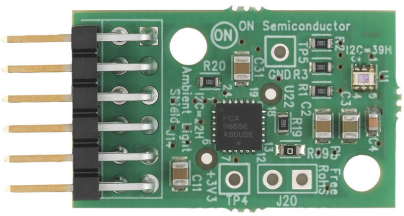
Baseboard Rev2.0



J32: Pins **2−3 to be shunted for Expander IO1_6 th pin as Wi-Fi Mod Chip select**
J31: Pins 1−2 to be shunted for HR pulse from HRM shield to DIO16
J31: Pins 2−3 to be shunted for DIO16 to Arduino connector.
J35, J36: Pins 1−2 to be shunted for expander IO pins to Arduino connectors
J35, J36: Pins 2−3 to be shunted for expander IO Pins to LEDs

Figure 2. Baseboard Rev 2.0

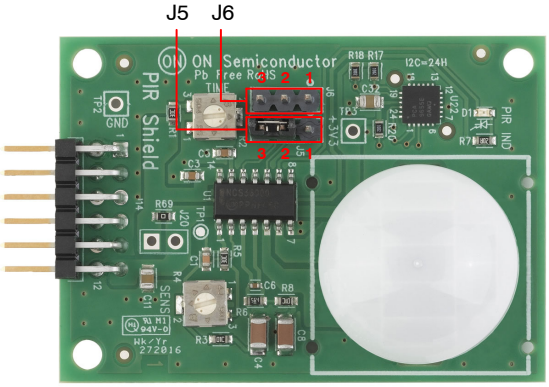
ALS



No Jumper settings needed

Figure 3. ALS

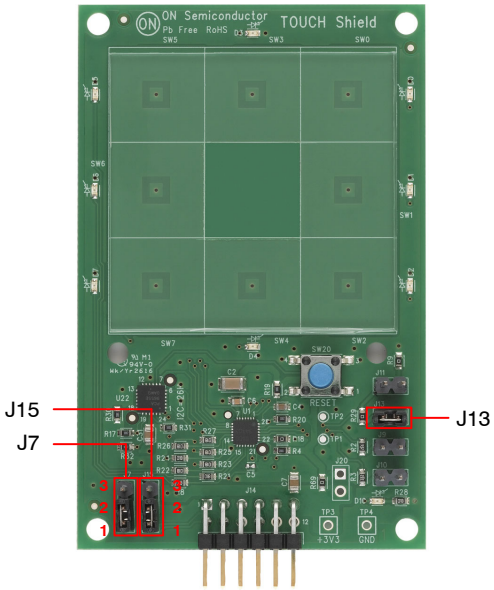
PIR



J6: 2−3 to be shunted
J5: 2−3 to be shunted

Figure 4. PIR

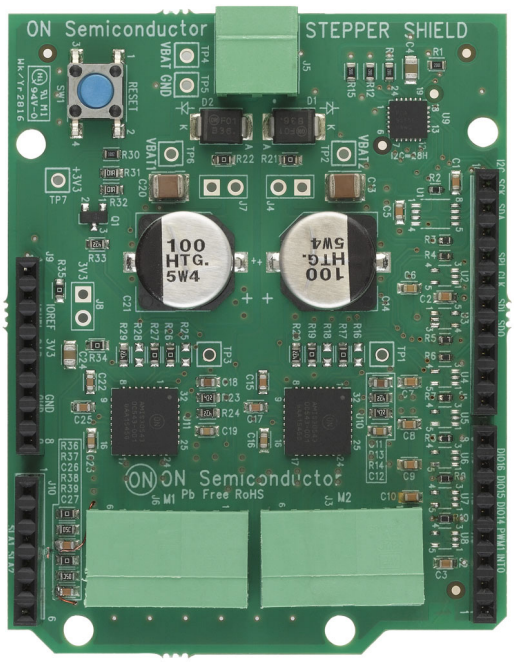
Touch



J7: 1−2 to be shunted for I²C Mode selection
J15: 1−2 to be shunted for I²C Mode selection
J13: 1−2 to be shunted

Figure 5. Touch

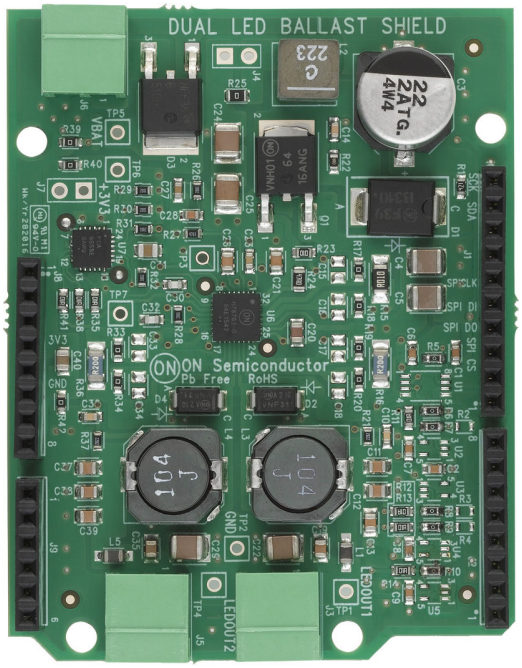
Stepper



No Jumper settings needed

Figure 6. Stepper

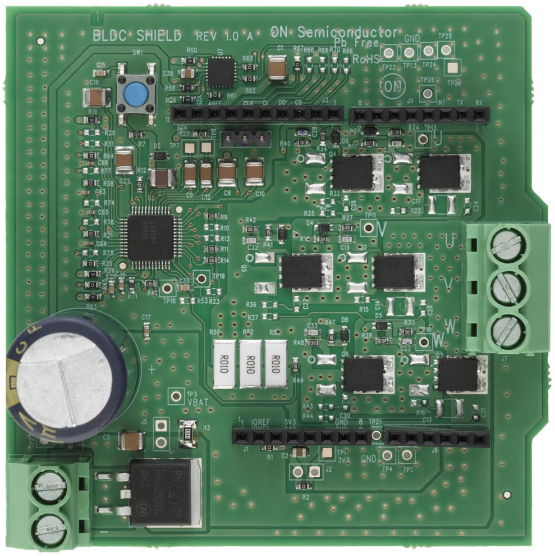
Ballast



No Jumper settings needed

Figure 7. Ballast

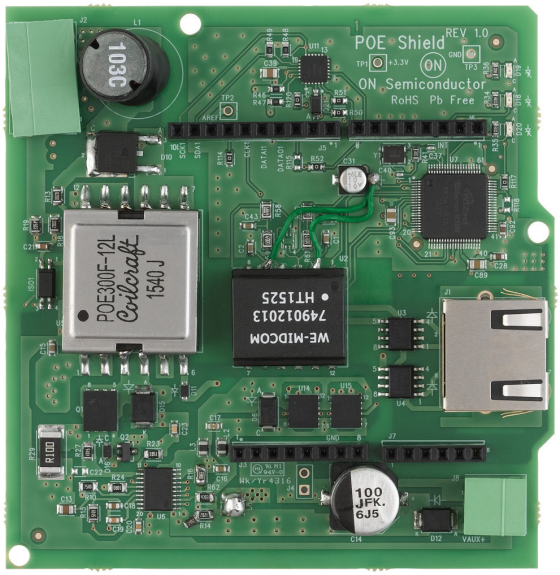
BLDC Shield



No Jumper settings needed

Figure 8. BLDC Shield

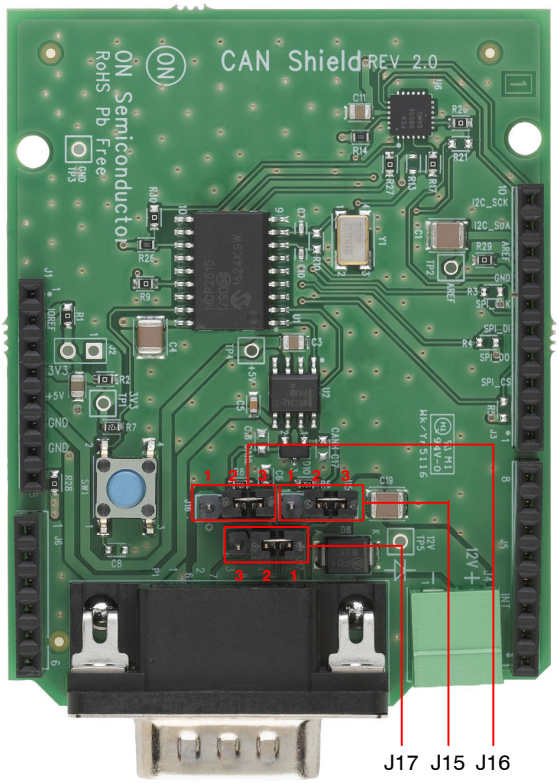
PoE Shield



No Jumper settings needed

Figure 9. PoE Shield

CAN Shield



CAN H – J15, CAN L – 16, GND – J17

Jumper Configuration for DB9 Pins		
	CAN	OBD II
CAN H	Pin 7	Pin 3
CAN L	Pin 2	Pin 5
GND	Pin 3	Pin 2

Figure 10. CAN Shield

SW INSTALLATION STEPS

Java Installation

JRE/JDK version 8u101 or above needs to be installed on the PC: http://www.oracle.com/technetwork/java/javase/downloads/jdk8−downloads−2133151.html

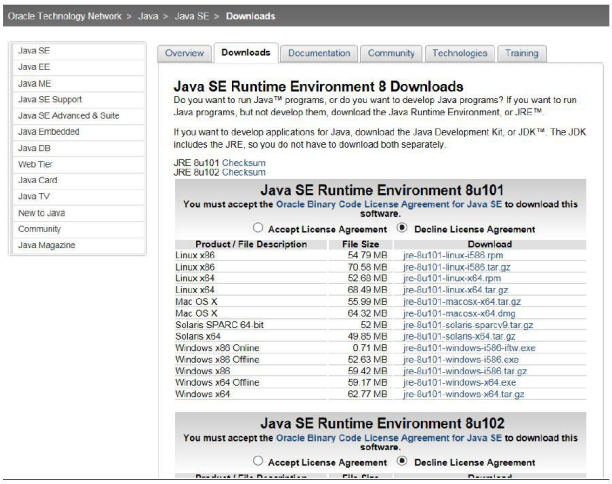


Figure 11. Java

GNUToolchain

The GNU cross compiler needs to be installed to compile the IDK application. Double click on the GNUToolchain.exe to install the cross compiler. *Internet connection is mandatory to install the cross compiler.*

Figure 12. GNU Toolchain Installation (1/5)

Select the “GNU Toolchain” checkbox and click Next.

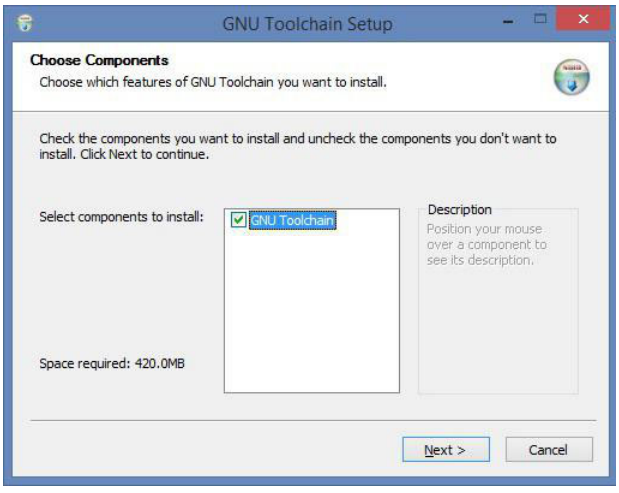


Figure 13. GNU Toolchain Installation (2/5)

Select Destination folder and click Next. *It is recommended to not change installation path.*

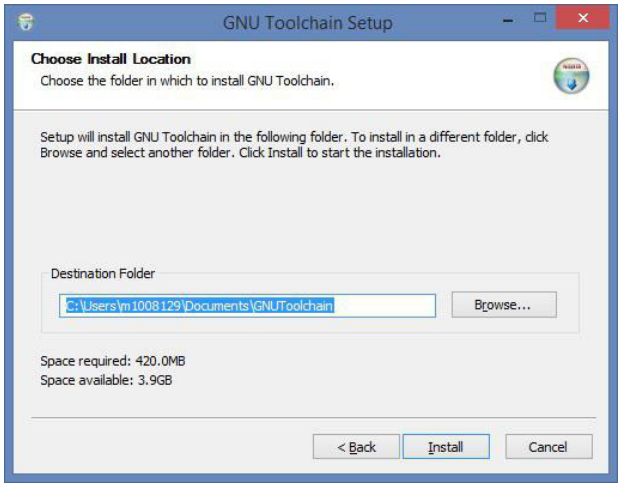


Figure 14. GNU Toolchain Installation (3/5)

Installer automatically downloads toolchain and installs.

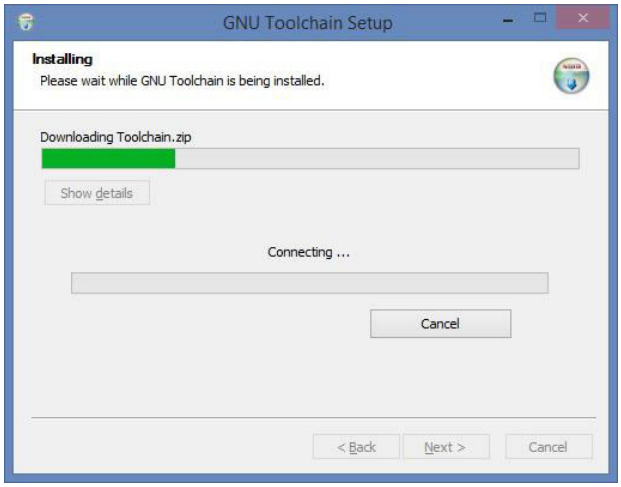


Figure 15. GNU Toolchain Installation (4/5)

GNU Tool chain installation complete.

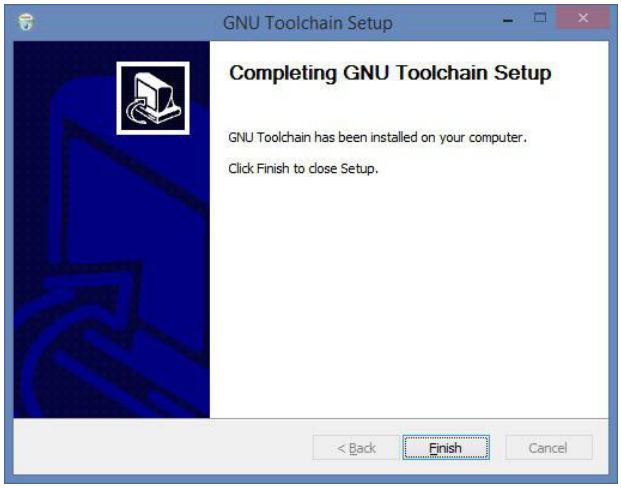


Figure 16. GNU Toolchain Installation (5/5)

IDK Installation

Double click on the installer downloaded from ON Semiconductor.

For 32 bit machines, install IDK Installer x86.exe. For 64 bit machines, install IDK Installer x86 64.exe

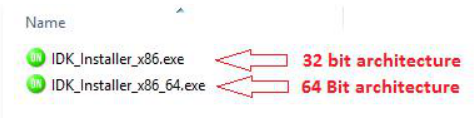


Figure 17. IDK Installation (1/5)

Read the license, check the box and click Next.

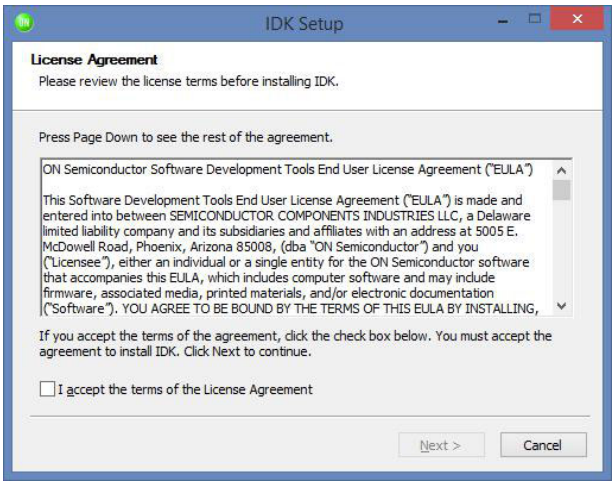


Figure 18. IDK Installation (2/5)

Choose the destination directory to install the IDK. *It is recommended to have IDK installed under C:\OnSemiconductor or D:\OnSemiconductor.*

If a previous workspace is being retained, then make sure that metadata folder inside Workspace directory is deleted.

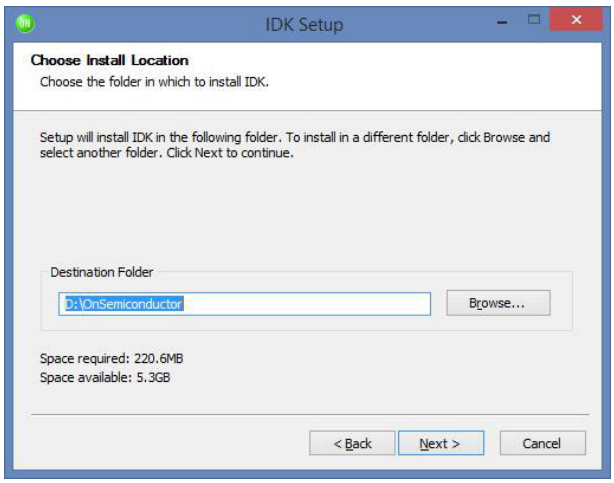


Figure 19. IDK Installation (3/5)

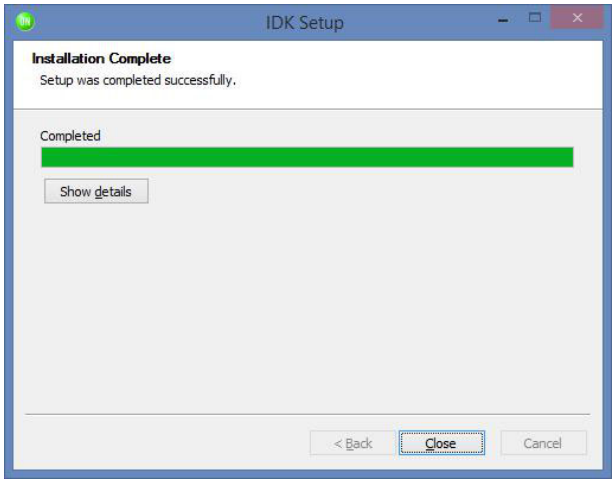


Figure 20. IDK Installation (4/5)

Once in is successfully installed, a shortcut will be created on the desktop.

Double click on the IDK shortcut on the desktop to launch the IDK IDE.

The ON Semiconductor splash screen will launch, followed by the Welcome Screen.

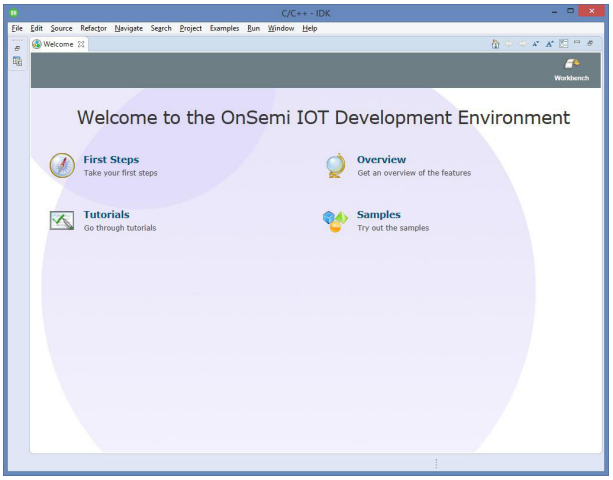


Figure 21. IDK Installation (5/5)

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