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DS28E50 Evaluation Kit

Evaluates: DS28E50

General Description

The DS28E50 evaluation system (EV system) provides the hardware and software necessary to exercise the features of the DS28E50. The EV system consists of five DS28E50 devices in a 6-pin TDFN package, a DS9121BQ+ evaluation TDFN socket board, and a DS9481P-300# USB-to-I²C/1-Wire[®] adapter. The evaluation software runs under Windows[®] 10 and Windows 7 operating systems. It provides a handy user interface to exercise the features of the DS28E50. Note that the evaluation software described herein is the light version that is downloadable from Maxim's website. To request the full developer version, click the link at the top of the page.

Benefits and Features

- Demonstrates the Features of the DS28E50 DeepCover[®] SHA3 1-Wire Authenticator
- 1-Wire Communication Is Logged to Aid Firmware Designers Understanding of DS28E50
- 1-Wire/I²C USB Adapter Creates a Virtual COM Port on Any PC
- Fully Compliant with USB Specification v2.0
- Software Runs on Windows 10 and Windows 7.
- Convenient On-Board Test Points, TDFN Socket

EV Kit Contents

QTY	DESCRIPTION
5	DS28E50 DeepCover SHA3 1-Wire Authenticator (6-pin TDFN)
1	DS9121BQ+ Socket Board (6-pin TDFN)
1	DS9481P-300# USB to 1W/I ² C Adapter
1	USB Type-A to Micro-USB Type-B Cable

Quick Start

Required Equipment

This section includes a list of recommended equipment and instructions on how to set up the Windows-based PC for the evaluation software.

- DS9481P-300# USB to 1-Wire/I²C adapter (included)
- DS9121BQ+ TDFN socket board (included)
- DS28E50Q+ (five devices included)
- USB Type A to Micro-USB Type B cable (included)
- PC with a Windows 10 or Windows 7 operating system and a spare USB 2.0 or higher port
- Download DS28E50 EV kit software (light version) or request full DS28E50 EV kit developer software.

Note: In the following sections, software-related items are identified by **bolding**. Text in bold refers to items directly from the EV kit software. Text in **bold and underlined** refers to items from the Windows operating system.

Ordering Information appears at end of data sheet.

1-Wire is a registered trademark of Maxim Integrated Products, Inc.

Windows is a registered trademark and registered service mark of Microsoft Corporation.

DeepCover is a registered trademark of Maxim Integrated Products, Inc.

Hardware Setup and Driver Installation Quick Start

The following steps were performed on a Windows 10 PC to set up the DS28E50 EV kit hardware/software:

- 1) Obtain and unpack the [DS28E50EVkitLite.zip](#) file, or the latest version.
- 2) Unplug any Maxim adapters before installing software.

- 3) The DS9481P-300# driver is required to communicate through the USB through a virtual COM port. If the DS9481 device driver is not installed:
 - a) Open folder **DS9481_driver_installer** ([Figure 1](#)).
 - b) Run **dpinst.exe** ([Figure 2](#)).
 - c) Click **Next** on the Device Driver Installation Wizard window ([Figure 3](#)).
 - d) Click **Finish** on the Device Driver Installation Wizard window ([Figure 4](#)).
- 4) Plug in the DS9481 adapter.

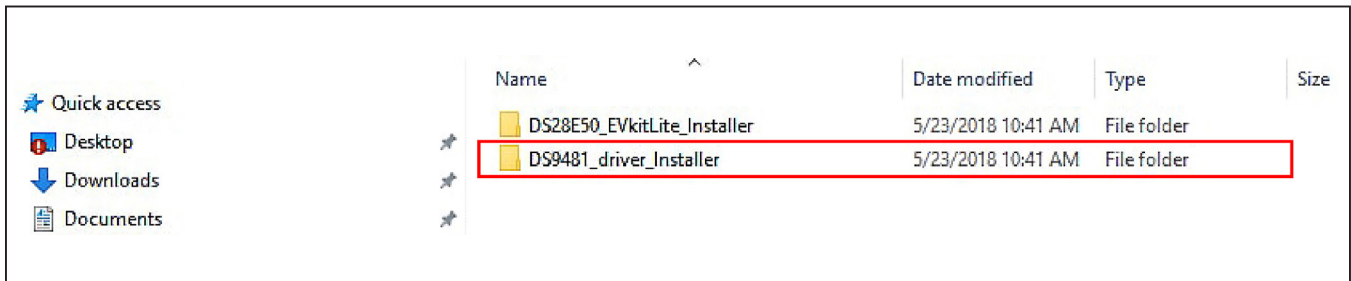
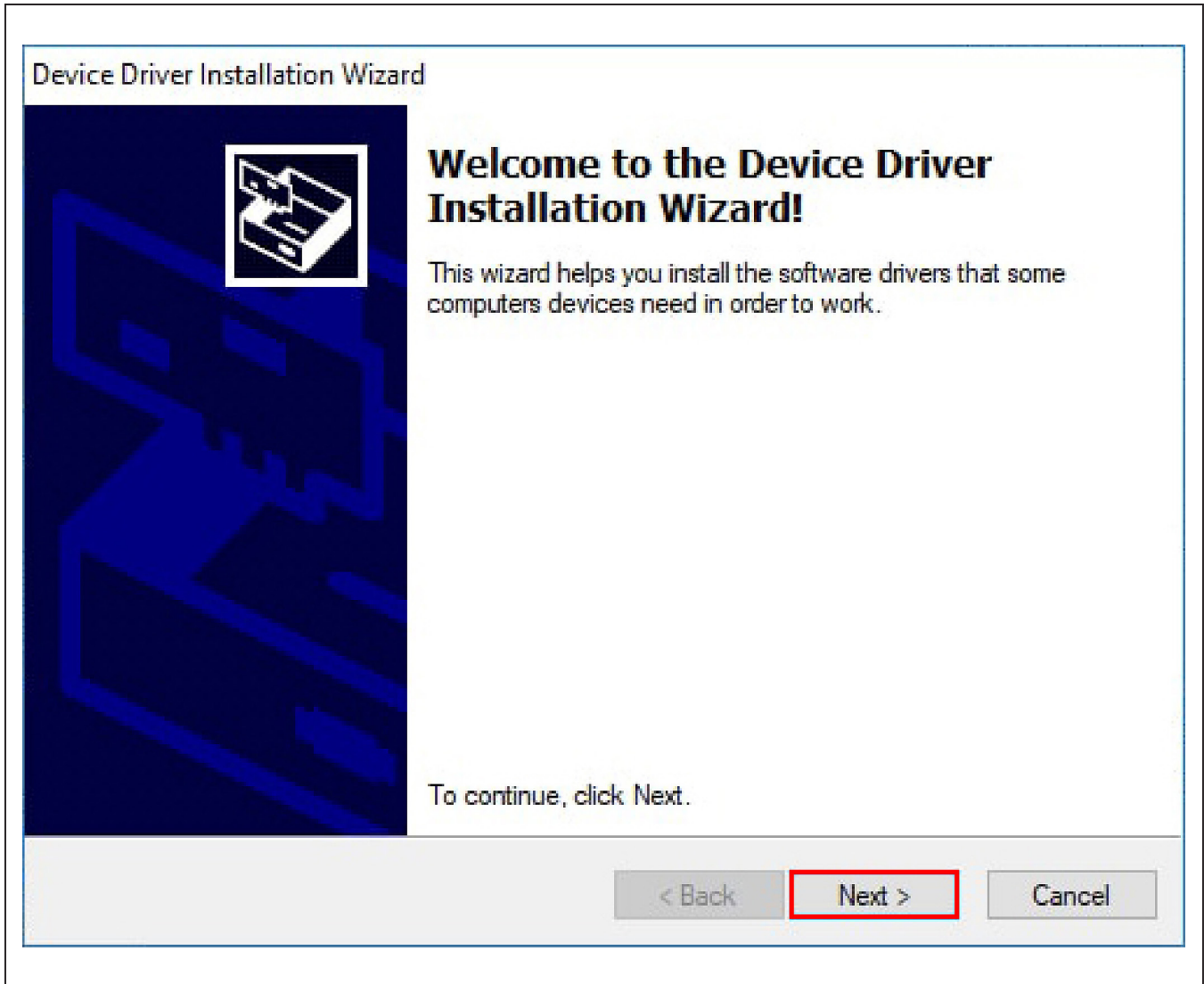


Figure 1. File Viewer with DS28E50 Installer and DS9481 Device Driver Installer



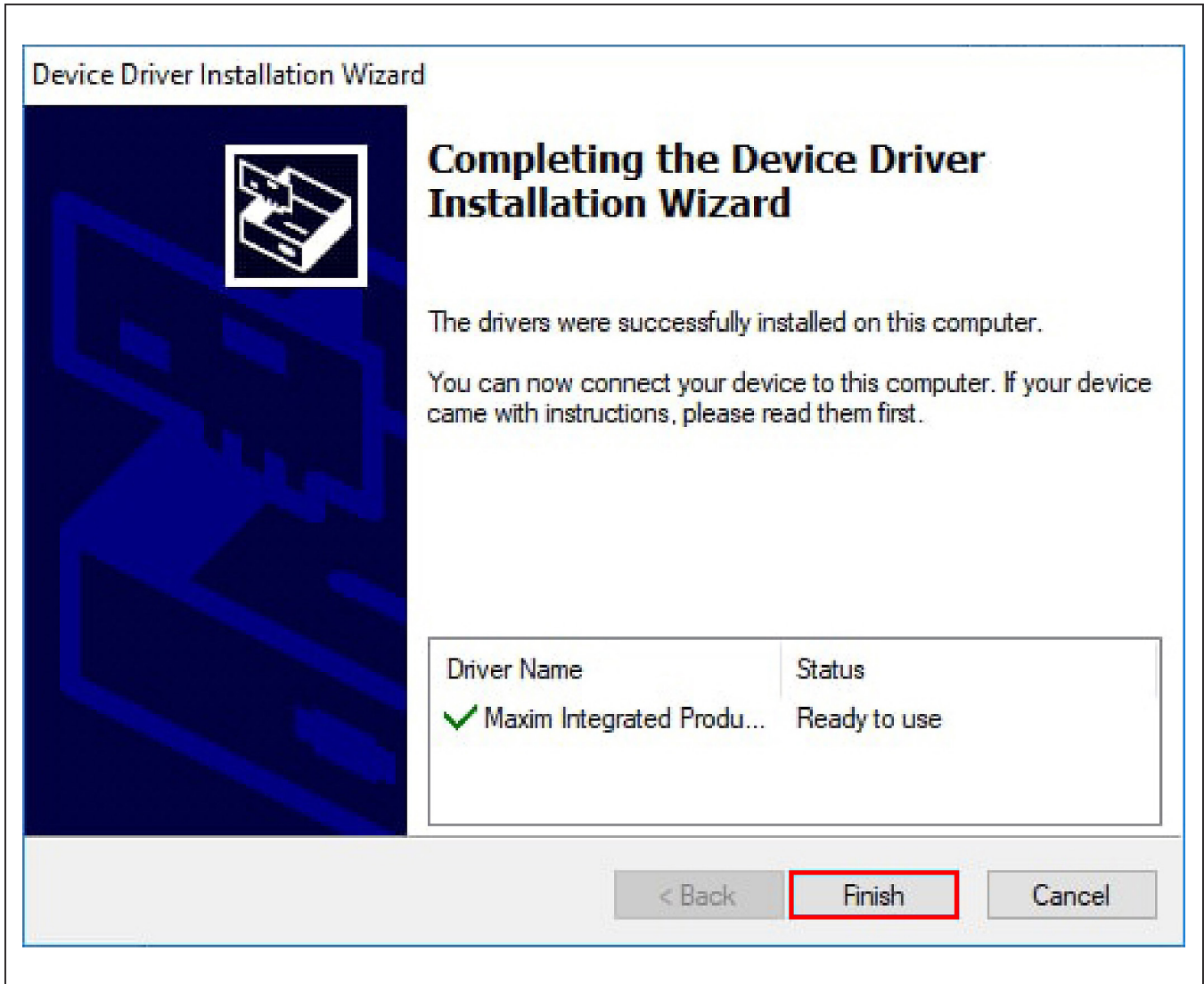
Figure 2. File Viewer with DS9481 Device Driver Installation File

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Figure 3. DS9481 Device Driver Installation Wizard



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Figure 4. DS9481 Device Driver Installation Finished

- 5) Go back to the DS28E50_EVKit_Software folder and open the **DS28E50_EVKitLite_Installer** folder and run **DS28E50GUISetupV01.exe** (Figure 5).
- 6) The software license agreement opens. Read through the terms and select **Agree** and click **OK** to install the software (Figure 6).

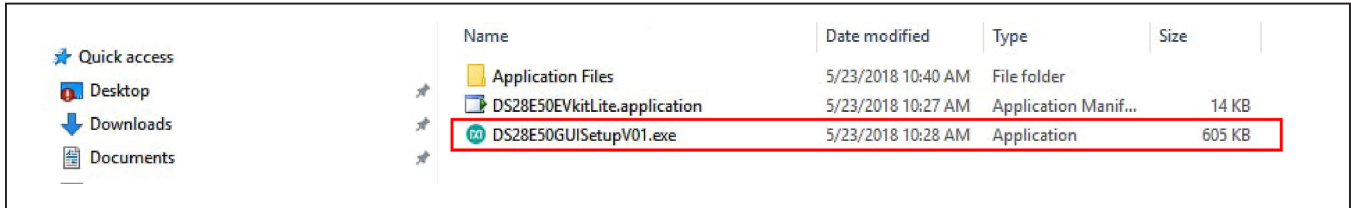


Figure 5. DS28E50 EV Kit Installer File

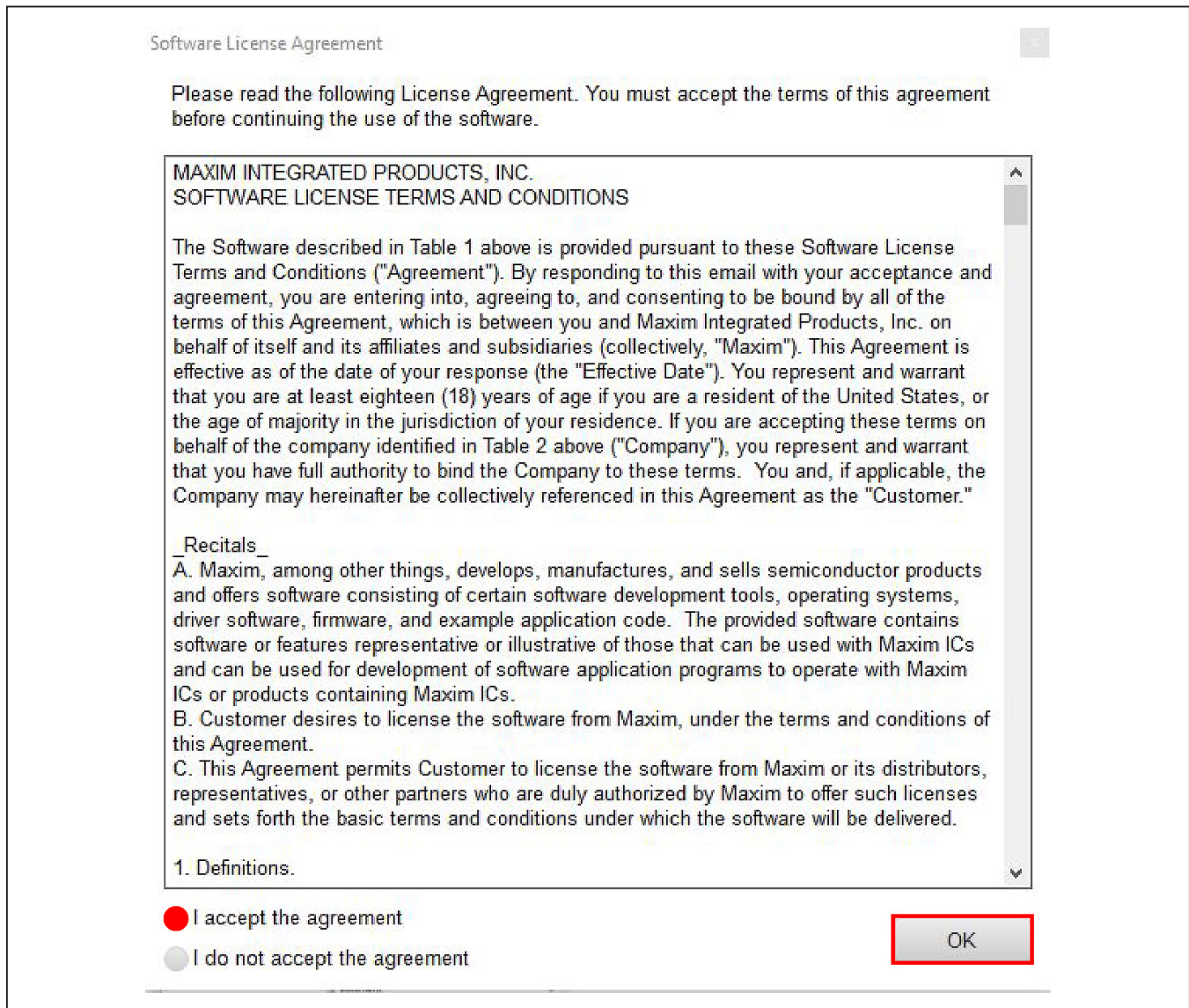


Figure 6. DS28E50 EV Kit Software License Agreement

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7) Go to the Windows Start menu and click on **DS28E50EVkitLite.exe** to launch the DS28E50 EV kit program (Figure 7).

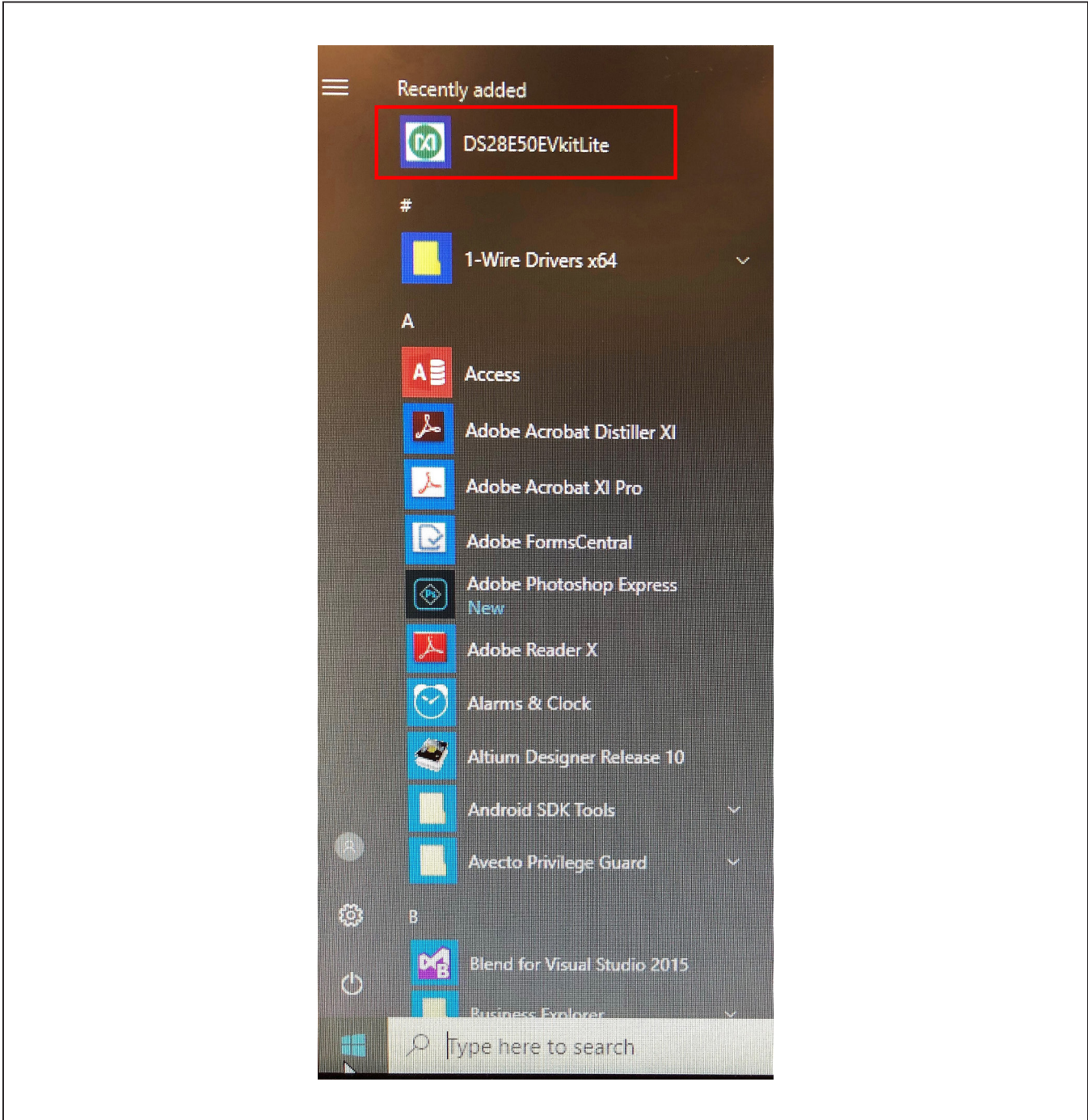
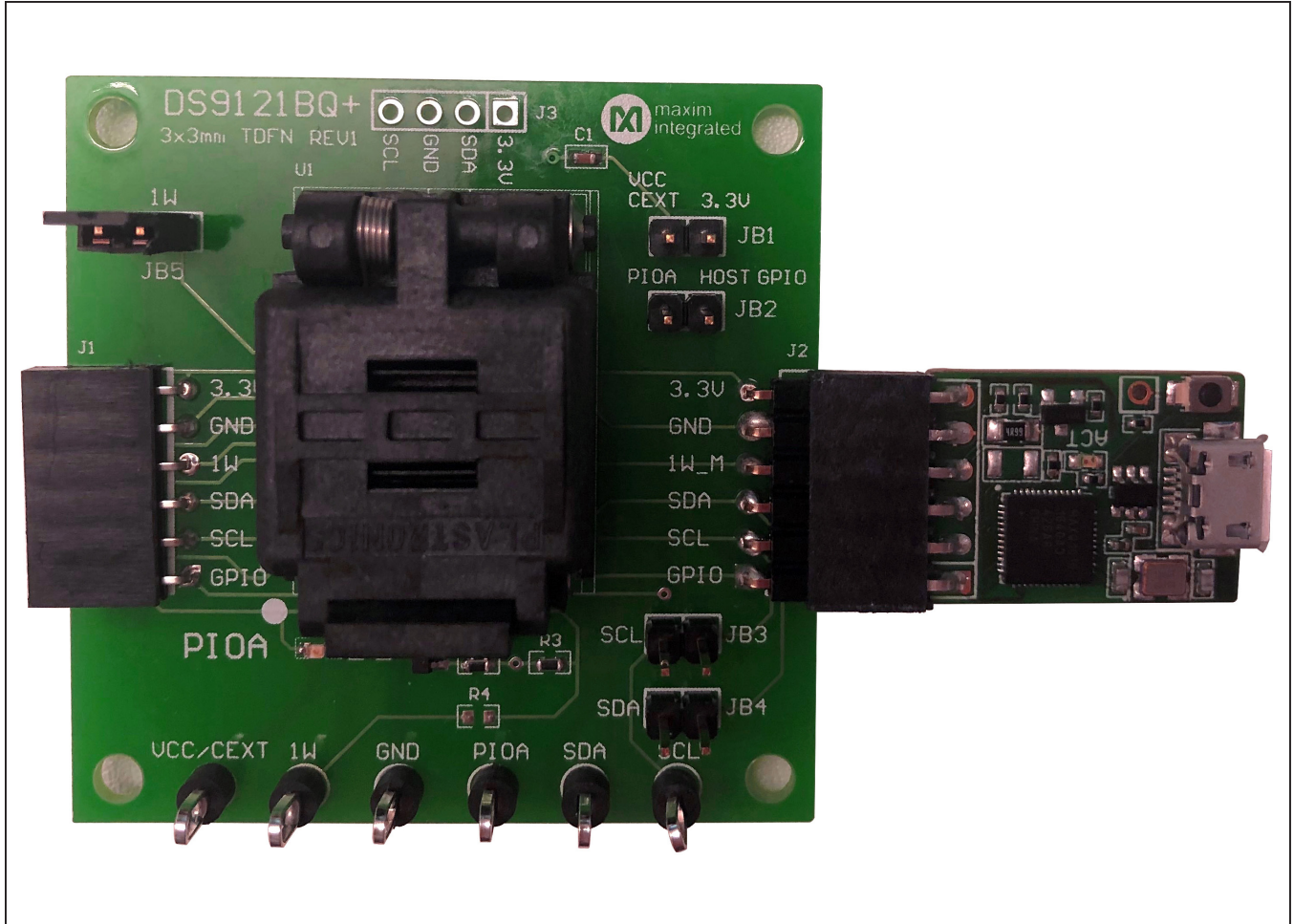
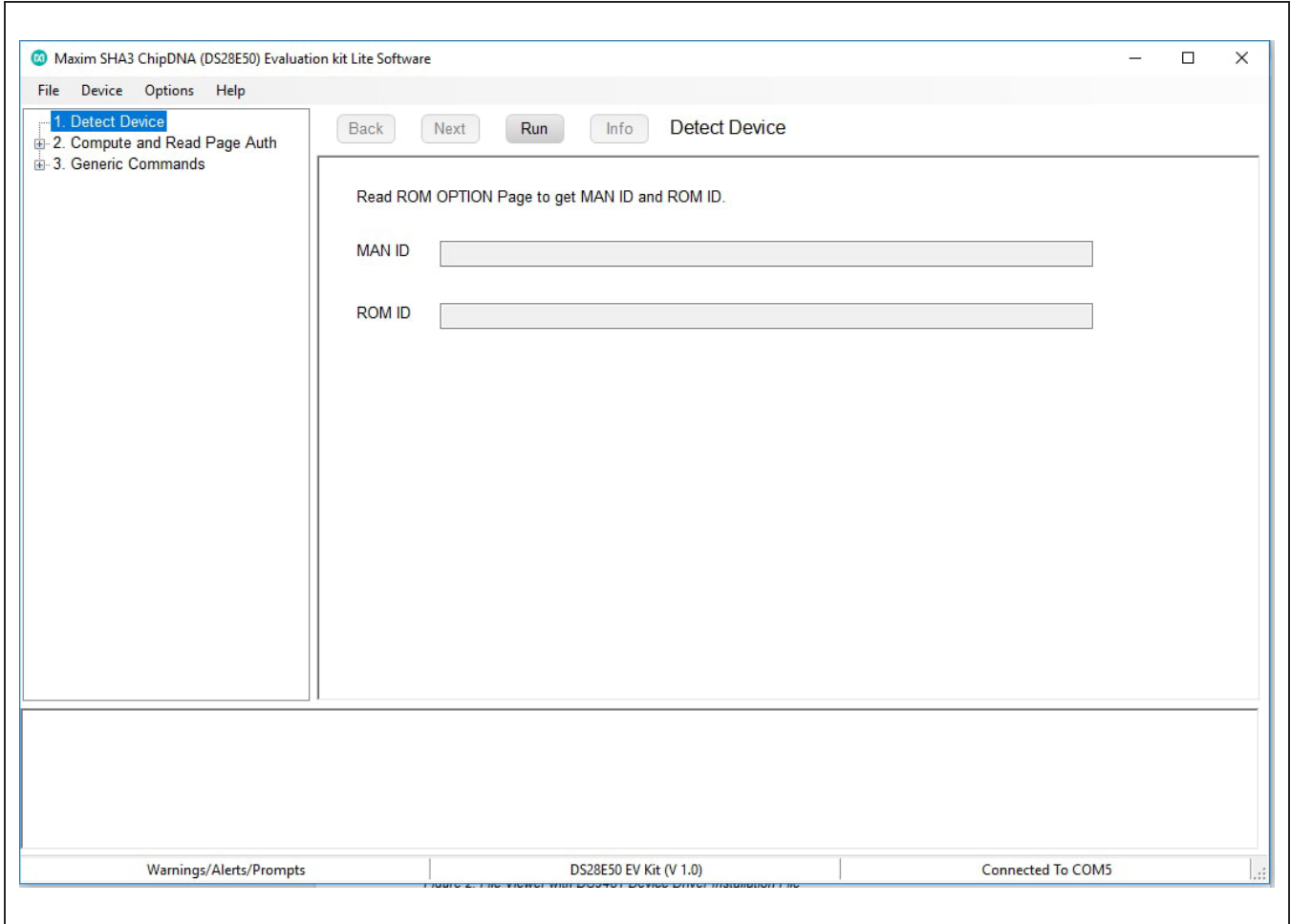


Figure 7. DS28E50 EV Kit Software Program File in Windows Start Menu



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Figure 9. DS9481 Connected to DS28E50



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Figure 10. DS28E50 Main Program Screen

EV Kit Supported Functions

The DS28E50 EV kit program is designed as a usage example. The GUI displays all the I2C and 1-Wire sequences for each step performed to assist the firmware engineer. See [Table 1](#) for descriptions of the functions in the GUI. The EV kit program is designed to demonstrate

typical use case examples of the DS28E50. The GUI displays all the I2C and 1-Wire sequences for each step performed to assist with end application firmware development. See [Table 1](#) for descriptions of the limited functions provided in the light version of the EV kit GUI. To request the full developer version of the program, click the link at the top of page 1.

Table 1. GUI Setup and Usage Flows Supported

FLOW*	DESCRIPTION
Detect Device	Reads page 7 to get ROMID and MANID.
Compute and Read Page Authentication	Creates authentication response based on given challenge. Results in a SHA-3 signature. CRPA sequence can be done on pages 0-5. Use in field to do an authentication with HMAC for a read page(s) of memory.
Read Status	Read page protections set on each page.
Read Memory	Read any page of memory without RP or EPH protection set.
Write Memory	Write data to any page (0-8) without WP, APH, or EPH protection set.
Set Protection	Set page protection. One-time operation for each protection area.
Read RNG	Compute and read random data from the true random number generator.

*Software supports all flows in Table 1

Ordering Information

PART	TYPE
DS28E50EVKIT#	EV Kit

#Denotes a RoHS-compliant device that may include lead(Pb) that is exempt under the RoHS requirements.

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DS28E50 EV Kit Bill of Materials

Designator	Qty	Description	Manufacturer	Part No.
J1	1	CONN FEMALE 6POS .100" R/A GOLD	Sullins Connector Solutions	PPPC061LGBN-RC
J2	1	CONN HEADER 6 POS RA 2.54	Würth Electronics Inc.	61300611021
TP1-TP6	6	TEST POINT PC MULTI PURPOSE BLK	Keystone Electronics	5011
U1	1	SOCKET+, IC TDFN, 3MM, 3x2, CLAMSHELL	PLASTRONICS	06QN10T23030
C1	1	CAP CER 0.47UF 16V X7R 0603	KEMET	C0603C474K4RACTU
D1	1	LED GREEN CLEAR 0603 SMD	Dialight	5988081107F
JB1-JB5	5	CONN HEADER 2 POS 2.54	Würth Electronics Inc.	61300211121
Q1	1	MOSFET N-CH 50V 200MA SOT-23	ON Semiconductor	BSS138LT1G
R1, R3	2	RES SMD 10K OHM 0.1% 1/10W 0603	Bourns Inc.	CRT0603-BY-10R0ELF
R2	1	RES SMD, 3.3K OHM, 1%, 0603	Yageo	RC0402JR-071K5L

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Revision History

REVISION NUMBER	REVISION DATE	DESCRIPTION	PAGES CHANGED
0	8/18	Initial release	—

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For pricing, delivery, and ordering information, please visit Maxim Integrated's online storefront at <https://www.maximintegrated.com/en/storefront/storefront.html>.

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