

Model 2110 5¹/₂ Digit Multimeter

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Firmware Upgrade Instructions

Introduction

This document provides information to update the Model 2110 5¹/₂ Digit Multimeter (DMM) firmware.

Getting started

The firmware update requires the following hardware, software, and firmware:

Hardware requirements

- A computer with the Microsoft[®] Windows[®] operating system.
- The USB cable shipped with the Model 2110. If this cable is not available, use a cable with a USB Type B connector on one end and a USB Type A on the other end.

You must use a USB cable to update the firmware. You cannot use a GPIB cable.

Software requirements

The computer that you use to install the firmware update must have the Model 2110 device driver installed. The USB device driver may be obtained by installing NI-VISA[™], which is included in the the Keithley I/O layer. The Keithley I/O layer may be obtained from the product CD or the Keithley Website.

If you are not sure if the USB driver has been installed on the computer, connect the Model 2110 with the USB cable. If the operating system displays an error message indicating that no driver has been found, the USB driver is not installed and you will have to install NI-VISA.

Firmware requirements

For the latest drivers, Keithley I/O layer, and firmware, see the <u>Keithley Instruments website</u> (*http://www.keithley.com*).

Viewing the system version

The following figure shows how the system version indicates the firmware version for each one of the three processors on the Model 2110.

Figure 1: System version



Use one of the methods described in the following paragraphs to see which version of firmware is on the instrument you are planning to update.

To use the front panel:

- 1. Press the SHIFT and CONFIG (MENU) keys to display the MENU options.
- 2. Use the ► and < keys to display SYSTEM, and then press the ENTER key.
- 3. Use the ► and < keys to display SYSTEM VER, and then press the ENTER key. The instrument displays the firmware version.

For example, if the measurement panel-processor firmware is at version 1.01, the I/O processor firmware at version 00, and the front-panel processor firmware at version 00, the display will show:

SYSTEM VER

1.01-00-00

To use SCPI commands:

Use the following command to send an identification query to the Model 2110.

*IDN?

If you want more information about this query, refer to the Model 2110 Reference manual. The following figure shows the results of an identification query indicating that the firmware version is 1.01-00-00.

 NOTE

 The exact format of query results display is dependent on the tool you use to send the *IDN? query.

Figure 2: Command Control

| Command Control | × |
|--|---|
| | |
| MODEL 2110-USBTMC-1373723 💌 | |
| Send String : | |
| *IDN? | • |
| Query Write Read | |
| String Received : | |
| KEITHLEY INSTRUMENTS INC., MODEL 2110,1373723,01.01-00-00 | 4 |
| | - |
| Exit | |

Establishing communication

To establish communications:

- 1. Turn the Model 2110 off.
- 2. Connect the USB cable between a USB port on the computer and the USB connector on the Model 2110.
- 3. Turn the Model 2110 on.

NOTE

If more than one Model 2110 is connected to the computer, the software updates the first Model 2110 it finds. The best practice is to turn off all Model 2110 instruments connected to the computer except the one you want to update.

If you see the following error message or a similar message, it indicates that you are trying to update the firmware without installing USB drivers. Refer to <u>Getting started</u> (on page 1) in this document for information about getting a copy of NI-VISA[™]. Make sure NI-VISA is installed before you continue with step 4.





4. Close any programs, such as KI-Tool, that communicate with the Model 2110.

Now you are ready to install the firmware update.

Installing the firmware update

To install the firmware update:

- 1. If you do not have a copy of the firmware update, download it from the <u>Keithley Instruments website</u> (*http://www.keithley.com*).
- 2. Browse to the DMM_update.exe file on your computer. If the file is zipped, extract it as shown in the following figure. If you are extracting the file, follow the prompts before proceeding with step 3.

| 🕌 C:\Temporary | | |
|---------------------------|--|---|
| Computer - Window | ws7_OS (C:) | Search Temporary |
| Organize 🔻 演 Open 🔻 Burn | New folder | III 🕶 🗖 🔞 |
| 🗐 Recent Places | Name ^ | Date modified Type |
| 🚢 Windows7_OS (C) | | |
| 🚹 Keithley 3700 Reference | 0004-2110-FW-MAIN-CF-1.02.2p | Open |
| | | Open in new window |
| 🥞 Libraries | | Extract All |
| Documents | | Select Left Folder for Compare |
| J Music | | 🛄 Scan with Microsoft Forefront Endpoint Protection |
| Pictures V | • | 🚰 Edit with Notepad++ |
| | | Open with |
| 0004-2110-FW-MAIN-CF | 1.02.zip Date modified: 1/24/2013 2:39 F | Restore previous versions |
| Compressed (zipped) Folde | r Size: 358 KB | Send to |

Figure 4: Extract All

3. When the following window appears, select the executable file (for example, DMM_update.exe), right-click, and then click **Open**.

Figure 5: Open

| 🔒 C:\Temporary\0004-2110-FW-M/ | AIN-CF-1.02\KI2110-FWR-PAK | (_RE-0102 |
|--------------------------------------|---|---|
| | | |
| Organize 🔻 🖬 Open Burn Nev | v folder | III 🔻 🗔 🔞 |
| ★ Favorites | Name * | Date modified Type |
| Desktop | Real DMM_update.exe | 11/15/2012 3:30 PM Application |
| Downloads | Firmware Upgrade Instructi KI2110_01.02.pak | Run as administrator Troubleshoot compatibility |
| Windows7_OS (C) | | Select Left File for Compare Scan with Microsoft Forefront Endpoint Protection |
| | • | Edit with Notepad++ |
| DMM_update.exe Date r Application | nodified: 11/15/2012 3:30 PM Size: 48.0 KB | Pin to Taskbar Pin to Start Menu Restore previous versions |

4. If the following dialog box appears, click **Yes**.

Figure 6: User Account Control dialog box

| \left User Accoun | t Control | | × |
|--|--|----------|---------|
| Do you want to allow the following program from an unknown publisher to make changes to this computer? | | | unknown |
| Program Publishe File origi | name: DMM_update.exe r: Unknown n: Hard drive on this | computer | |
| Show det | ails | Yes | No |
| Change when these notifications appear | | | |

5. When the DMM update_x.xx dialog box appears, click **Select**.

Figure 7: DMM update_x.xx dialog box

| DMM update_1.02T | × |
|--|---|
| | r |
| Please click "select" button and find the file you want to update. | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| Select Exit | |
| | |

6. When the Open dialog box appears, select the firmware update file and click **Open**.

Figure 8: Open dialog box

| 🏟 Open | | × |
|---|---------------------------------|---|
| Look in: 🔑 KI2110-FWR-PAK_RE-0102 | - 🖬 📩 🖃 | |
| Name 🔺 | → Date modified → Type → | |
| KI2110_01.02.pak | 1/22/2013 1:57 PM PAK File | |
| | | |
| | | |
| | | |
| | | |
| • | | ŀ |
| File name: KI2110_01.02.pak | Open | |
| Files of type: DMM Update Files (*.pak) | ▼ Cancel | |

7. When the Confirm Upgrade Details dialog box appears, click Yes.

| Vait for the Confirm Update Details dialog to display. Do not click buttons on windows that may b |
|---|
| isible behind this dialog box. |

NOTE

Figure 9: Confirm Upgrade Details dialog box

| Confirm Upgrade Details | \times |
|---|----------|
| DMM: KEITHLEY INSTRUMENTS INC.,MODEL 2110 Serial Number: 1373723 Firmware Version: T1.01-00-00-10 | |
| Would you like to update this DMM to Firmware Version 01.02-00-00? | |
| Yes No | |

After you click **Yes**, the Model 2110 front-panel display will show information about the update: The information will be similar to the following information:

```
UPDATE MODE
WDL - 01
```

8. When the following dialog box appears, the update is complete. Click **Exit**.

Figure 10: DMM update_x.xx dialog box

| DMM update_1.02T | × |
|--|---|
| KEITHLEY INSTRUMENTS INC., MODEL 2110, 1311135, WDL.01 | |
| USB0::0x05E6::0x2110::1311135::INSTR | |
| The first file load complete. | |
| The second file load complete. meter update finish. | |
| Please restart the meter. | |
| | |
| | |
| | |
| Select Exit | |
| | |

- 9. Turn off the instrument, and then turn it on again.
- 10.Use one of the methods described in <u>Viewing the system version</u> (on page 1) to verify that the system version has increased. For example, send an *IDN? query, as shown in the following figure.

| Comn | nand Control | × |
|------|--|----------|
| | | |
| | MODEL 2110-USBTMC-1373723 🔽 | |
| | Send String : | |
| | *IDN? | • |
| | Query Write Read | |
| | String Received : | _ |
| | KEITHLEY INSTRUMENTS INC., MODEL 2110,1373723,01.02-00-00 | 4 |
| | | Y |
| | Exit | |

Figure 11: *IDN? query

This completes the firmware update for one Model 2110. If you have multiple instruments, restart the procedure at step 3.