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Software Release Notes & Installation Instructions

KTE Interactive V9.1 **Software Release Notes & Installation Instructions**

Important information

KTE Interactive 9.1 requires Microsoft Windows 7 running on your 4200-SCS. 4200 systems originally shipped from Keithley prior to February 2013 will not have Windows 7 installed and must be upgraded before installing *KTE Interactive 9.1*. This upgrade to Windows 7 **MUST** be performed by Keithley Instruments and cannot be done by the customer. Attempting to install Windows 7 yourself will render the system inoperative. Contact your Keithley sales representative for information on upgrading your 4200 system. *KTE Interactive 9.1* will **NOT** install on a 4200 running Windows XP or older operating systems. Note that *KTE Interactive 9.1* includes all of the fixes from KTEI 9.0 Service Pack 1 (SP1) and can be installed on top of KTEI 9.0 or 9.0-SP1.

KTE Interactive 8.2 Service Pack 4 is the final release supporting 4200 systems running Windows XP.

The 4200-SCS does not shut off automatically when you shut down the Windows 7 operating system. When you exit Windows, a message will be displayed informing you to wait until the screen goes blank and then shut off power. When you press any key to acknowledge the message, the 4200-SCS will complete the Windows shutdown and then the screen will go blank. It is then safe to shut off power to the 4200-SCS.

Introduction

This document provides supplemental information regarding the behavior of *KTE Interactive V9.1*. This information is grouped into six categories:

[New features / enhancements](#)

Summary of each significant new feature included in version 9.1 of the *KTE Interactive* software tools.

[Problem fixes](#)

Summary of each significant software/firmware bug fix included with *KTE Interactive V9.1*.

[Known problems](#)

Description of each significant known problem and ways to work around them

[Usage notes](#)

Helpful information describing how to optimize the performance of *KTE Interactive* and the Model 4200-SCS.

[Installation instructions](#)

Detailed instructions describing how to install all software components and help files

[Firmware flash upgrade instructions](#)

Describes how to upgrade your 4200-SCS card's firmware to be compatible with this software release and achieve maximum performance. Note that new firmware was released with KTEI V9.0 Service Pack 1 and is included with V9.1. Ensure that the latest firmware is installed on all instruments in the 4200-SCS system

[Approved third-party software](#)

List of third-part software applications that have been tested for compatibility with the 4200-SCS and *KTE Interactive V9.1* software.

Revision history

This document is periodically updated and distributed with releases and service packs to provide the most up to date information. This revision history is included below:

Date	Software Version	PA Version
3/6/2015	V9.1	PA-790T
6/9/2014	V9.0 SP 1	PA-895P
1/30/2013	V 9.0	PA-790S
10/21/2012	V 8.2 SP 3	PA-895M
5/29/2012	V 8.2 SP 2	PA-895L
3/14/2012	V 8.2 SP 1	PA-895K
12/9/2011	V 8.2	PA-790R
8/17/2011	V 8.1 SP 3	PA-895J
4/18/2011	V 8.1 SP 2	PA-895H
3/22/2011	V 8.1 SP 1	PA-895G
10/4/2010	V 8.1	PA-790P
6/9/2010	V 8.0	PA-790N

New features / enhancements

PR Number	Subsystem	Enhancement Description
PR53518	KITE	Added driver for Lake Shore Cryotronics Model 336 Temperature Controller and an associated KITE Project. Find the project "Lake_Shore_Temp_Controller" in the KITE Projects_Miscellaneous folder.
PR54621	KITE	Add application note and KITE project for Ultra-Fast Single Pulse. The application note can be found in the Complete Reference (Open Complete Reference from the 4200-SCS desktop, then click Application Notes in the left navigation bar. The Ultra-Fast Single Pulse link is under the Ultra-Fast I-V heading).
PR51201	KITE Subsite	Add feature to specify SMU power-on and power-off sequences when applying DC stress in the Subsite Setup Device Stress Properties dialog. These power-on and power-off orders will be used for transitions into and out of the stress phase as well as the Stress Measurements, if enabled. See PR54507 below for information when multiple SMUs are set to the same power-on or power-off order. This enhancement was first released in KTEI 9.0-SP1.

Problem fixes

PR Number	Subsystem	Symptom and Resolution
PR47840, PR47875, PR51980, PR51981, PR52057, PR53534, PR54060, PR54061, PR54621, PR54461	Help	<p>Updated various documents and links in the 4200-SCS Complete Reference: updated link to the 4200-PMU-PROBER-KIT, add Acronis software license to the third_party_licences folder, updated the 4200 System Version Table, updated the Visual Studio Installation Instructions (PA-1030), new version of the Keithley Low Level Measurements Handbook, added Ultra-Fast Single Pulse Application Note to the Application Notes page.</p> <p>Resolution: This issue has been corrected.</p>
PR47891, AR41436 / PR52719	UTM	<p>Older Graphical user interface for the switch matrix (matrixulib user library) was causing problems for certain configurations, with the crashing of KITE possible.</p> <p>Resolution: This older UI for matrixulib has been removed from the KTEI distribution.</p>
PR47892	UTM	<p>The graphical image at the center of the UTM GUI for the chargepumping user library did not look good.</p> <p>Resolution: This issue has been corrected.</p>
PR49614	KCON	<p>In KCON, performing a System Verify on a system with multiple 4225-PMU cards with old firmware would cause the first PMU card to be not recognized.</p> <p>Resolution: Problem has been resolved.</p>
AR40853 / PR51820	4225-RPM	<p>The 4225-RPM provides 4-wire (Kelvin) connections for the 4200 SMUs and 4210-CVU. The pathway for the SMU mode was not properly configured, so that higher current tests were not measured with a full 4-wire configuration. This required a hardware change to current production as well as corresponding change to KTEI components.</p> <p>Resolution: This issue has been addressed.</p>
AR41580 / PR53041	4210-CVU	<p>The performance of the 4210-CVU (Hardware Revision E4/5.04, or higher) requires updated factory cable length coefficients for more accurate results when using the CVU with 1.5 or 3m cabling.</p> <p>Resolution: This issue has been addressed.</p>
AR41841 / PR53996	KXCI	<p>In certain instances, it was possible for a KXCI test to be complete, but still cause an error message when attempting to retrieve data after the test. The error message was "ERROR: Command not valid during test execution. (-980)." When accessing KXCI via Ethernet and calling the SP command (or the Serial Poll status byte command via GPIB) within a loop to determine test complete status, use a 100 ms sleep or wait call with the SP status loop, positioned before the SP call.</p> <p>Resolution: This issue has been addressed.</p>

- PR54507** **KITE** When specifying the SMU power-on order in the subsite stress setup, allow for multiple SMUs on each order. The parameters are in Device Stress Properties dialog. This is an improvement to a previous enhancement, PR51201 / AR39842 (released with KTEI 9.0-SP1), as it simplifies the power-on setup, especially for multiple site configurations. When there are multiple SMUs at the same power-on order, the power-on order within a given order value cannot be specified.

Resolution: This issue has been addressed.
- AR42241 / PR54723** **UTM** If a UTM is written to conditionally post data to the sheet, and that conditional column of data is plotted, then any interruption to that column data will cause all graphed columns to stop being updated in real-time. The data will be only completely graphed at the end of the test. This is not the expected behavior for real-time graphing.

Resolution: This issue has been addressed.
- AR42819 / PR55539** **UTM GUI** Entering scientific notation for integer or long integer variables in the UTM GUI view were not properly handled. For example, entering “5e3” would result in “5” being passed to the user module.

Resolution: This issue has been addressed.

Known problems

PR Number	Subsystem	Problem Description
PR43820	KITE UTM	In certain conditions, using two SMUs on a two terminal test device may result in improper reporting of current compliance reached when sweeping through 0V. One work around is to avoid small voltage steps sizes near 0V. Another work around is to sweep current instead of voltage.
PR43874	KITE UTM	Sending commands to an overheated PMU or connected RPMs will return an error. Over temperature SMUs will also return an error. The work around is to properly handle the returned error codes (for example, stop the test) and wait until the affected PMU(s) cool down. While in the overheated condition, using KCON to update RPM connections is not recommended.
PR45081	KITE Install	Custom CVU cable compensation coefficients are not saved if KITE is uninstalled from the Start menu or Control Panel Add or Remove Programs. The work-around is to use the KITE Install CD or CD image, which will automatically save and restore any customer cable compensation values as part of the KITE upgrade process.
PR44846	KITE ITM	When a SMU test is interrupted by a Compliance event, any formulas in the Sheet are not updated.
PR45433	KITE ITM	When using 4225-RPMs, do not remove them while the system is powered and always run KCON “Update Preamp and RPM Configuration” after connecting or removing the RPMs from the system. Failure to follow these steps may result in equipment damage, the failure of a KITE test, or the crashing of KITE.

PR47037	4200-SCS	<p>When using an external monitor with resolution set to greater than 1024x768 and with Windows Aero Glass effects enabled, the external monitor may not display properly. It may be completely blank, or distorted, or Icons may be missing, etc.</p> <p>Workaround: Right-click the desktop and select "Personalize" on the pop-up menu. Once there, scroll the theme window down to "Installed Themes" and a select Keithley Basic theme. This will disable Aero, which will permit support for some higher resolution external displays.</p>
PR47345	KITE UTM GUI	<p>Depending on the test bitmap details, certain bitmap image elements may be distorted when viewing KITE on an external monitor or via Remote Desktop. The work-around is to adjust the size of the KITE window to avoid the distortion of the image.</p>
PR47548	KITE UTM	<p>Aborting a test immediately after clicking the Run button may leave the previous data in the sheet. The work around is to avoid pressing the Abort button immediately after pressing the Run button.</p>
PR47642, PR47603	KITE ITM	<p>Data or graphs of wider pulse waveforms, where Number of Pulses >1, may be incomplete. The 4225-PMU has a minimum sample rate of 1 kSa/s. If a test requires > 4096 samples, then the results shown in the sheet and graph will be incomplete. No error or warning is provided. This partial waveform behavior will only occur in a PMU Waveform Capture test where the Measure Mode is Discrete Pulses, the Number of Pulses > 1, and the pulse width is several msec or wider. The work around is to reduce the Number of Pulses or use the Average Pulses measure mode.</p>
PR47628	KITE ITM, UTM	<p>When using the 4225-RPM to switch between the SMU pathway and other instruments (Pulse or CVU), the SMU output signal may require additional settling time before the start of the next Pulse or CVU test. This situation is more likely when the SMU voltage is higher or the cable connected to the RPM output is longer. The work-around is to add an additional test after the SMU test, which adds a delay to allow to the SMU signal to fully settle before the next test begins. Add a UTM after each SMU test and choose the User Library "utilities_ulib" and the User Module "Delay_second". Enter a value of 1 for the day_sec parameter and save the project. When testing from the device level, ensure that the delay test after each SMU is enabled (checked). When switching the RPM within a UTM, add a delay of 500 ms or more after switching from the SMU mode to pulse or CVU mode.</p>
PR47683	KTE Interactive	<p>Norton Antivirus software incorrectly reports threats found in several KTE Interactive .dll files. This is a false positive. The Norton software may quarantine the files, which will prevent KTE Interactive from running. You can use the Norton tools to restore the quarantined files and mark them as safe and KTE Interactive software will run properly. Norton has been notified of the issue.</p>
PR47699	KTE Interactive	<p>Avast Antivirus software may display a warning when KTE Interactive software modules are executed the first time. Press the "Continue Execution" button on the warning dialog to resume execution. Avast has been notified of the issue.</p>
PR47792	KITE UTM	<p>When creating a user module controlling both a switch matrix and a 4225-RPM, ensure that all LPT conpin() commands are called before any rpm_config() commands.</p>

PR50312	KTEI, Windows	When creating a new Windows account, ensure that the type is Administrator. A standard Windows account will cause a TM.SYS driver error when starting KITE (Error dialog message "TM.SYS driver is not loaded"). If a Windows standard-level user was created, first log in to an Administrator-level account (for example, kiadmin) and change from a Standard-level account to an Administrator account. Note that each time a new Windows account is created, the "Initialize New User" utility must be run (in Start Menu under Keithley Instruments) before using any of the KTEI programs.
PR53996 / PR55475	KXCI	When controlling the 4200 via KXCI and determining when the test is complete using the Serial Poll for the GPIB Status Byte or the SP command from Ethernet, add a 100 ms delay before each serial poll command.
PR55442	KXCI	This issue is seen after upgrading KTEI, then accessing KXCI over GPIB using NI VISA layer and VISA Interactive Control (VISAIC). The problem can be seen in the KXCI status window, with commands being split between two rows in the window and a "-992" error. The only work around for this issue is to stop and restart KXCI. This behavior should be seen only the first time using KXCI after a KTEI upgrade.
PR55583	KITE	Creating a device name of "Dnnn," where "nnn" is an integer is a 1- to 3-digit integer, causes problems with KITE project operation. The work around is to use a different device name in the KITE project tree. If "Dnnn" is a desired device name format, try adding an underscore: "D_nnn".
PR55551	4200-SCS	<p>Early in the computer boot process, a message "MBR Error 3" may occur. This error comes from the Acronis True Image backup software. It does not affect the operation of Windows 7 or the 4200 KTEI software. But, this error does mean that the hard drive system recovery will not be available in the unlikely event a hard drive system restore is necessary. To work-around this error condition and ensure that the recovery image is available, create a Windows 7 System Repair Disc. To create a repair disc, a writable CD or DVD is required. To create a system repair disc, 1) Open Backup and Restore by clicking the Start button, clicking Control Panel, and then clicking Backup and Restore (on some systems, this Backup and Restore option may be under System and Maintenance). 2) In the left pane, click Create a system repair disc, and then follow the steps.</p> <p>To address the issue that causes the MBR Error, insert the Repair disc then reboot the 4200. At the System Recovery Options dialog, choose the first option, "Use Recovery Tools that can help fix..." On the next screen, System Recovery Options, choose the Command prompt and enter both commands below to remove the MBR error message.</p> <pre>Bootrec.exe /FixMbr Bootrec.exe /FixBoot</pre> <p>Remove the optical disk and restart. The MBR Error 3 message should not appear. Keep this System Repair Disc available in the event that a system restore is required.</p>

Usage notes

4225-RPM

Prior to using the 4225-RPM Remote Amplifier Switch Module to switch between IV, CV, and/or Pulse ITMs, be sure to connect all instrument cables to the RPM inputs and run the “Update Preamp and RPM connections” in the Tools menu of KCON (Run KCON after closing KITE). When using the 4225-RPM in UTMs, include the call to the LPT command rpm_config(). See Section 8 of the 4200-SCS Reference Manual for details.

4200-CVU and 4210-CVU

When using the new Custom Cable Length feature and O-S-L (open/short/load) simultaneously, you MUST run custom cable length FIRST, and THEN run O-S-L comp.

42x0 SMUs

Under certain rare conditions when running SMU current sweeps at very fast ramp rates, the SMU may report compliance unexpectedly. This may occur if the sweep ramps are too high or too fast.

There are 3 simple workarounds for this situation as follows:

- a) Use the LPT setmode command to turn off the compliance indicator value.

With this workaround, the reading will be returned as 105% of the present range.

- b) Use smaller sweep/ramp rates.
- c) Use fixed SMU ranges.

Keithley Default User Libraries

KTE Interactive 9.1 was compiled with Visual Studio 2013 C++. If your 4200-SCS has a different version of Visual Studio installed (see version list below) and you wish to change or debug (using the debug task feature described in Section 8 of the 4200-SCS Reference Manual) any of the user libraries listed below (see Default User Libraries table), you will need to recompile ALL modules in that user library, and then rebuild the user library. If you do not recompile all user modules, you will receive the following error: “LINK: fatal error LNK1207: incompatible PDB format in <your usrlib>; delete and rebuild.” Follow this message or use the provided the batch file reBuildKILibs.bat for this purpose. reBuildKILibs.bat will compile each and every module and build each and every user library listed in the Default User Libraries section above. reBuildKILibs.bat is located in C:\S4200\sys\bin. Versions of Visual Studio earlier than 2008 may install and operate properly, but are not supported.

Versions of Visual Studio supported by KTE Interactive 9.1:

Microsoft Visual Studio 2013 C++(used for compiling KTE INTERACTIVE 9.1 User Libraries)

Microsoft Visual Studio 2012 C++

Microsoft Visual Studio 2010 C++

Microsoft Visual Studio 2008 C++ (Must also install C#)

LPTLIB

1. If a voltage limit of greater than 20 volts is needed from an SMU set to force zero current, a measv call should be used to set the SMU to auto range to a higher range or set a higher voltage range with rangev.
2. If a current limit of greater than 10 milliamps is needed from a SMU set to force zero volts, a measi call should be used to set the SMU to auto range to a higher range or set a higher current range with rangei.

KULT

If you make changes to, or need to rebuild “ki82ulib”, please note that “ki82ulib” depends on “ki590ulib” and “winulib”. You must specify these dependencies in the “Options” “Library Dependencies” menu in KULT before building “ki82ulib.” The “Options” “Build Library” function will fail if the dependencies are not properly selected.

To use the debug task option (see Section 8 of the 4200-SCS Reference Manual for more information) on Microsoft Visual Studio 2010, first upgrade VS2010 to SP1.

KXCI

In KXCI System Mode, in both KI4200 emulation and HP4145 emulation, the following default current measurement ranges exist.

1. “Limited Auto – 1nA” is the default current measurement range for 4200 SMUs with Preamps.
2. “Limited Auto – 100nA” is the default current measurement range for 4200 SMUs without Preamps.

NOTE: If a different bottom range is needed, use the RG command to set the specified channel to a lower bottom range.

Example:

```
RG 1,1e-11
```

This will set SMU1 (with Preamp) to the “Limited Auto - 10pA” range.

KITE (KDF Files)

If you choose to run the S600/S400-based Keithley Summary Utility (KSU) on a 4200-SCS KDF, you MUST convert the KDF from a PC-based ASCII file to a UNIX-based ASCII file using a UNIX utility such as dos2unix before opening the 4200-SCS KDF file. Please refer to your KTE documentation that was supplied with your S600/S400 for further information on KSU.

Installation instructions

Note: KTE Interactive 9.1 is only for use on the Windows 7 operating system.

STEP 1. Archive your previous Default Project, Test, and Device Data (OPTIONAL)

WARNING: Installing *KTE Interactive 9.1* will overwrite all default KITE projects, devices, and tests as well as all default user libraries and prober drivers. If you have made changes to these components and do not want to lose these changes when KTE Interactive V9.1 is installed, copy these files to an alternate location before installation. To archive these components before installation, follow the steps listed after the tables below.

The following components will be upgraded when KTE Interactive V9.1 is installed.

NOTE: Any tests, devices, projects, and user libraries not specified in the lists below will remain UNCHANGED by this installation process.

Default KITE Projects - Located in C:\S4200\kiuser\Projects

[xx] denotes the number of tests in each project

* Denotes New Project or updated with KTEI V9.1

1) default [20] *	21) Demo-Default [7]	41) NanoDevices [16]
2) BJT-Default [3]	22) Demo-PulseIV [7]	42) chargepumping [8] *
3) CMOS-Default [6]	23) Demo-QPulseIV [9]	43) chargetrapping [1]
4) CVU_BJT [3]	24) Demo-SolarCell [14]	44) ivpgswitch [8]
5) CVU_Capacitor [2]	25) Flash-NAND [8]	45) ivpgswitch_340x [8]
6) CVU_highV [5] *	26) Flash-NOR [8]	46) PMU-DUT-Examples [7]
7) CVU_InterconnectCap [1]	27) Flash-Switch [11]	47) PMU-MOSFET [10]
8) CVU_ivcvswitch [4]	28) FlashDisturb-NAND [6]	48) PMU-Switch [10]
9) CVU_lifetime [3]	29) FlashDisturb-NOR [6]	49) PulseIV-Complete [11]
10) CVU_Mobilelon [7]	30) FlashDisturb-Switch [10]	50) QPulseIV-Complete [10]
11) CVU_MOScap [3]	31) FlashEndurance-NAND [6]	51) UFSP [1] *
12) CVU_MOSFET [2]	32) FlashEndurance-NOR [6]	52) EM_const_I [3]
13) CVU_nanowire [2]	33) FlashEndurance-Switch [10]	53) HCI_1_DUT [8]
14) CVU_PNjunction [3]	34) NVM_Examples [22] *	54) HCI_4_DUT [40]
15) CVU_PVcell [5]	35) PMU-Flash-NAND [9]	55) HCI_PULSE [9]
16) ivcvswitch [13]	36) ivswitch [17]	56) NBTI_1_DUT [6]
17) lifetime [7]	37) Lake Shore Temp Controller [10]*	57) Qbd [3]
18) qscv [1]	38) LowCurrent [4]	58) FourPtProbe [1]
19) SIMCV [7]	39) probesites [9]	59) vdp_resistivity [4]
20) STVS [7]	40) probesubsites [15]	60) SolarCell [13]
21) VLF_CV_Examples [11]	41) CNTFET [5]	

Default KITE Devices - Located in C:\S4200\kiuser\Devices

1) BJT - all	3) Diode - all	6) MOSFET - all	9) Resistor - all
2) Capacitor - all	4) General - all	7) Nanotech - all	
3) CV- all	5) JFET - all	8) PVcell - all	

Default KITE Tests - Located in C:\S4200\kiuser\Tests

1) BJT - all	4) General - all	7) Nanotech - all
2) Capacitor - all	5) JFET - all	8) Resistor - all
3) Diode - all	6) MOSFET - all	9) _CVU - all

Default User Libraries - Located in C:\S4200\kiuser\usrlib

[yy] denotes the number of user modules in each user library

*Denotes New Project or updated with KTEI V9.1

Libraries marked “No Source Code” are reserved and cannot be modified by customer

1) AVMControl [1]	16) ki340xulib [3]	31) PulseIV [11]
2) BeepLib [5]	17) KI590ulib [8]	32) QPulseIV [9]
3) chargepumping [8] *	18) KI595ulib [2]	33) QSCV [1]
4) charge trapping [1]	19) kipulseulib [1]	34) RPM_Ilimit_Control [no source code]
5) DLCP [1]	20) KIRingOscillator [13]	35) vlfcvulib [no source code]
6) DualPulseulib [18]	21) kiscopeulib [13]	36) VLowFreqCV [7]
7) flashulib [3]	22) LS336ulib [4] *	37) winulib [7]
8) hivcvulib [2]	23) Matrixulib [1] *	38) wlrlib [3]
9) Hotchuck_Temptronics3010B [1]	24) Nvm [17]	39) pivulib [no source code]
10) Hotcheck_Triotek [1]	25) OVPControl [1]	40) qpivulib [no source code]
11) HP4284ulib [2]	26) parlib [11]	
12) HP4294ulib [6]	27) PIVutil [1]	
13) HP8110ulib [3]	28) PMU_examples_ulib [8]	
14) KI42xxulib [1]	29) PMU_PCRAM_ulib [3]	
15) ki82ulib [8]	30) pmuulib [1]	

Default Prober Drivers - Located in C:\S4200\kiuser\usrlib

1) prbcc12k [5]	5) prbmanl [47]
2) prbcom [46]	6) prbmm40 [17]
3) prbfake [49]	7) prbpa200 [22]
4) prbgen [4]	8) prbcm500 [5]

Archive your previous Default Project, Test, and Device Data (OPTIONAL)

The easiest way to archive these components is to copy the entire C:\S4200\kiuser folder to a network drive or archive area on the 4200-SCS hard drive. For example, to copy these components to the secondary partition (D: drive) of the 4200-SCS hard drive, execute the following command at a command prompt:

```
xcopy c:\s4200\kiuser d:\backup\9.1archive\s4200\kiuser /s/e
```

and respond to the prompt with D for directory. Since this creates a backup of the ENTIRE kiuser subdirectory, it may take several minutes based on how much data your particular machine has in that directory. You will know the process is complete when the command prompt returns.

STEP 2. Install the 4200-SCS KTE Interactive V9.1 Software Tools

1. Insert the 4200-SCS KTE Interactive V9.1 DVD into the 4200-SCS DVD-ROM drive.
2. The setup program should start automatically. If it does not, run **setup.exe** from the DVD.

3. Follow the step-by-step installation instructions. If a previous version of *KTE Interactive* is installed on your 4200-SCS, you will be asked if you want to remove it. When asked, select **OK** to continue, selecting **NO** will abort the installation. If a previous version of KTE Interactive is uninstalled, you must reboot and then install *KTE Interactive V9.1*.
4. After the installation is complete, remove the DVD and select **YES, I WANT TO RESTART MY COMPUTER NOW** to re-boot the 4200-SCS before attempting to initialize or use the V9.1 software tools.

STEP 3. Initialize each 4200-SCS User Account

NOTE: Each user account on the 4200-SCS must be properly initialized before attempting to run any of the KTE Interactive V9.1 software tools, or unpredictable behavior may occur.

1. From the main Windows login screen, type the user and password of the account to be initialized. This will need to be done for each of the two default Keithley factory accounts, and for any additional accounts added by the System Administrator. The two factory accounts are:
 - User = kiadmin, password = kiadmin1
 - User = kiuser, password = (NULL; i.e. password field left blank, no password)
2. When Windows has completed start-up, select Start Programs Keithley Initialize New User. This will initialize only the currently logged user.
3. Repeat steps 1 and 2 for both Keithley accounts and for any additional accounts added by the system administrator.

STEP 4. Upgrade 42x0-SMU, 422x-PxU, 4225-RPM, 4225-RPM-LR, and 42x0-CVU Firmware

NOTE: KITE software checks for compatible instrument firmware during startup and will not run if all instruments have not been upgraded to compatible firmware versions.

NOTE: To find the current hardware and firmware versions of your 4200-SCS cards, enter the KCON utility and select each card.

NOTE: If you select the wrong firmware version per the hardware version, the firmware upgrade procedure will not allow this, and will warn you. The program will return you to the beginning of the firmware upgrade procedure allowing you to repeat the steps with the correct revision level.

NOTE: 4200-SCS cards are organized by families of related models in the table below. You will need to perform the firmware upgrade once for each family of devices installed your 4200 SCS. All cards in a given family will be upgraded at the same time. For example, if you have four 4210-SMUs in your system, all four SMUs will be upgraded automatically in turn when you initiate the fwupgrade process using the SMU firmware file. If you also have a 4210-CVU card in your 4200-SCS, you will need to run the fwupgrade utility a second time using the CVU firmware file.

To upgrade the firmware of your 4200-SCS cards, perform the following steps:

WARNING: It is strongly recommended that you connect the 4200-SCS to an un-interruptible power supply during the firmware upgrade process. If power is lost during the firmware upgrade, the SMUs may no longer be functional and will require factory servicing.

1. Exit all Keithley KTE Interactive programs and any other Windows programs that may be running.
2. Click on the Windows Start button.
3. In the program/file search box, enter: **fwupgrade** <Enter>. The firmware update utility will open.
4. Select the **Start** button on the **fwupgrade** main window. A window will be displayed restating the need to connect the 4200-SCS to an un-interruptible power supply. Select the **Yes** button when ready to proceed.

5. For each family of cards included in your 4200-SCS, follow the following steps:
 - a. Select the appropriate Flash file (*see the Card/Hardware/Firmware Version Table below*) from the file browser window and select the **Open** button.
 - b. A message window will be displayed showing status while all installed cards in that family are being upgraded to the selected firmware version. This can take several minutes. After successful upgrade is complete there will be a few audible tones and a window will be displayed stating the upgrade is complete.
 - c. If you have installed cards belonging to a different family, click the **Start** button and return to step a. Otherwise, click the **Close** button.

Card/Hardware/Firmware Version Table

4200-SCS Card Family	Hardware Version from KCON	Firmware file to use
4200-SMU/4210-SMU ¹	02,XXXXXXXX or 2,XXXXXXXX	Not supported in KTEI 9.1
	03,XXXXXXXX or 3,XXXXXXXX	Not supported in KTEI 9.1
	04,XXXXXXXX or 4,XXXXXXXX	Not supported in KTEI 9.1
	05,XXXXXXXX or 5,XXXXXXXX	4200-803-4H30.x
	06,XXXXXXXX or 6,XXXXXXXX	4200-803-4M30.x
4200-PA	<this product cannot be flash upgraded in the field>	<n/a>
4200-PG2 ²	ALL (1.0,1.1A, 1.2, 1.3, 1.4, and later)	4200VPU-V1.04.x
4205-PG2 ³	ALL (1.0,1.1 and later)	4205VPU-V1.01.x
4200-CVU ⁴	ALL (1.0, 1.1, 2.0, 2.01, 3.0, 3.01, 3.02, 3.1, 4.0 and later)	4200CVU-802SV2.10.x
4210-CVU	ALL (3.0, 3.1, 4.0 and later)	4210CVU-802SV2.11.x
4220-PGU/4225-PMU ⁵	1.0 and later	422xPxU-802SV2.01.x
4225-RPM/4225-RPM-LR	1.0 and later	4225RPM-801FV2.00.bin

¹There are two different models of SMUs in the 4200, 4200-SMU (medium power) and 4210-SMU (high power), both models use the same firmware files.

²This card is no longer offered for sale, but will continue to be supported. The 4200-PG2 dual channel pulse card was offered for purchase starting in December 2005. The 4200-PG2 was replaced by the 4205-PG2 in April 2007.

³This card is no longer offered for sale but will continue to be supported. The 4205-PG2 dual channel pulse card was offered for purchase starting in April 2007. The 4205-PG2 was replaced by the 4225-PMU/4200-PGU in May 2010.

⁴This card is no longer offered for sale, but will continue to be supported. The 4200-CVU Capacitance/Voltage card was offered for purchase starting in October 2007. Beginning with KTE Interactive V7.2 released in February 2009, the 4200-CVU has been replaced with the 4210-CVU. The 4210-CVU adds 9 additional frequencies (1kHz-9kHz, in one kHz increments). All existing 4200-CVU cards can be upgraded to 4210-CVU by sending the 4200-SCS back to factory for a re-calibration. 4200-CVUs cannot be upgraded to 4210-CVUs by the customer.

⁵The 4225-PMU and 4220-PGU share the same pulse/source board and use the same firmware file. The 4225-PMU adds measure capability through an additional hardware board but utilizing the same firmware image/file.

KTE Interactive V9.1 Installation and/or firmware upgrade is now complete.

Approved third-party software

A qualified system administrator may install Keithley Instruments approved non-Keithley software on a 4200-SCS. To maintain validity of your warranty, you may only install software listed in the table below, which has been tested for compatibility with the 4200-SCS and *KTE Interactive V9.1* software.

Product/Version	Vendor	Description
Windows 7 Embedded	Microsoft (www.microsoft.com)	Standard Operating System for 4200-SCS beginning with KTE Interactive 9.1
Acrobat Reader XI	Adobe Systems (www.adobe.com)	Portable Document Format (.pdf)file reader
Excel 2010	Microsoft (www.microsoft.com)	Spreadsheet software
Word 2010	Microsoft (www.microsoft.com)	Word processing software
LibreOffice 4.4	Libre (www.libreoffice.org)	Office suite software
Internet Explorer 11	Microsoft (www.microsoft.com)	Web browser
Chrome V40	Google (www.google.com)	Web browser
Firefox 36.0	Mozilla (www.mozilla.org)	Web browser
Visual Studio 2008, 2010, 2012, and 2013 ¹	Microsoft (www.microsoft.com)	C/C++ Compiler
Acronis True Image OEM 2012	Acronis (www.acronis.com)	Hard disk drive imaging and backup software
System Center 2012 Endpoint Protection	Microsoft (www.microsoft.com)	Virus and Malware protection software
Security Essentials	Microsoft (www.microsoft.com)	Virus and Malware protection software
Norton AntiVirus 2013 ²	Symantec (www.symantec-norton.com)	Virus protection software
Antivirus 7.0 ³	Avast (www.avast.com)	Virus protection software
AntiVirus 2013	AVG (www.avg.com)	Virus protection software

¹Refer to PA-1030 (4200-Compiler) for more information about using Microsoft Visual Studio with the Model 4200-SCS.

²See PR47683 in the known problems section.

³See PR47699 in the known problems section.