KEITHLEY
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Clarius+ Version 1.8

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Software Release Notes & Installation Instructions

Important information

The 4200A-SCS Clarius+ software application suite is a release of the software for the 4200A-SCS. Clarius+ software requires **Microsoft® Windows® 10** to be installed on your 4200A-SCS Parameter Analyzer.

Introduction

This document provides supplemental information regarding the behavior of Clarius+ software. This information is grouped into six categories:

Revision history	Lists the version of software, the document version, and the date of the software release.
New features / enhancements	Summary of each significant new feature included in Clarius+ software and the 4200A-SCS.
Problem fixes	Summary of each significant software/firmware bug fix in Clarius+ software and the 4200A-SCS.
Known problems	Description of each significant known problem and ways to work around it.
Usage notes	Helpful information describing how to optimize the performance of Clarius+ software and the 4200A-SCS.
Installation instructions	Detailed instructions describing how to install all software components, firmware, and help files.

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	Document number	Version
4/23/2020	V1.8	0771326	10
10/14/2019	V1.7	0771326	09
5/3/2019	V1.6.1	0771326	08
2/28/2019	V1.6	0771326	07
6/8/2018	V1.5	0771326	06
2/23/2018	V1.4.1	0771326	05
11/30/2017	V1.4	0771326	04
5/8/2017	V1.3	0771326	03
3/24/2017	V1.2	0771326	02
10/31/2016	V1.1	0771326	01
9/1/2016	V1.0	0771326	00

New features/enhancements

Issue number	SCS-4093
Subsystem	Manuals
Enhancement	Updated manuals information for instrument self tests.
Issue number	SCS-4387 / SCS-3574 / AR60515
Subsystem	Initialize New User
Enhancement	Clarius+ applications can now be run from user accounts that do not have administrator privileges.
Issue number	SCS-4389
Subsystem	CVU
Enhancement	Added support for the new 4215-CVU instrument with 1 V_{rms} AC drive level and 1 kHz frequency resolution. See the datasheet for details.
Issue number	SCS-4396
Subsystem	KULT
Enhancement	Added KULT Extension for Visual Studio Code to improve editing capability. See the *Model 4200A-SCS Parameter Analyzer Reference Manual, 4200A-901-01 Rev. H, Section 9: KULT Extension for Visual Studio Code* for details.
Issue number	SCS-4428
Subsystem	Clarius
Enhancement	Added a new test for measuring capacitor leakage, current versus time to support the 4201-SMU and 4211-SMU.
Issue number	SCS-4642
Subsystem	LPT
Enhancement	For the 4210-CVU, add support for a new measurement format model type of Y, Theta to the following LPT commands: getstatus, measz, setmode, smeasz, and smeasRT.
Issue number	SCS-4644
Subsystem	KXCI
Enhancement	Add Y,Theta measurement format to existing :CVU:MODEL model command. For use with 4210-CVU and 4215-CVU instruments.
Issue number	SCS-4645
Subsystem	KXCI, CVU
Enhancement	Support 4215-CVU 1kHz input frequency resolution for :CVU:FREQ freq Command. :CVU:FREQ freq Example: :CVU:FREQ 115000.
Issue number	SCS-4656
Subsystem	Clarius – User Libraries
Enhancement	The following modules of the nvm user library have been updated to allow up to 40V: doubleSweepSeg, pundEndurance, pundTest, reramEndurance, reramSweep.

Issue number	SCS-4638
Subsystem	LPT
Enhancement	For the 4215-CVU, added support for a new measurement format model type of Y, Theta to the following LPT commands: getstatus, measz, setmode, smeasz, and smeasRT
Issue number	SCS-4679
Subsystem	Clarius - User Libraries
Enhancement	A new user library combining the Model 622X DC or DC/AC Current Source with the Model 2182A Nanovoltmeter has been added. There are two modules in the library to make delta measurements and differential conductance measurements.
Issue number	SCS-4680
Subsystem	LPT, 4215-CVU
Enhancement	Provided an LPT command to perform a logarithmic frequency sweep. int sweepf_log(int instr_id, double startf, double stopf, long numPoints, double delaytime).
Issue number	SCS-4681
Subsystem	Clarius – User Libraries
Enhancement	Provided a generic CVU user library, cvuulib, with four modules. These modules include sampling, and sweeping frequency, ac voltage, and dc voltage.
Issue number	SCS-4707
Subsystem	CVU
Enhancement	New CVU measurement options "filter type" and "filter count" are available for the 4210-CVU and 4215-CVU.
Issue number	SCS-4730
Subsystem	CVU, LPT

Enhancement	Created LPT meass and smeass commands to return measurement status.
	meass(INSTR_ID instr_id, FPTYPE* result);
	smeass(INSTR_ID instr_id, FPTYPE* result);
	
	Measurement Status Result Key:
	Bit — **Description**
	31 — Measurement Timeout
	30:28 — -
	27 — CVH ABB Lock Fault
	26 — -
	25:24 — CVH Overflow Indicator (V & I)
	23:20 — -
	19 — CVL ABB Lock Fault
	18 — -
	17:16 — CVL Overflow Indicator (V & I)
	15:2 — -
	1:0 — IAC Measure Range Index (0: 1uA; 1:30uA; 2: 1mA)
	
	Anything greater than a value of two has a fault in the measurement.

Issue number	SCS-4733
Subsystem	Clarius - User Libraries
Enhancement	A new test combining the Model 6221 AC/DC Current Source with the Model 2182A Nanovoltmeter to measure low resistances with delta mode has been added to the library of tests.

Issue number	SCS-4735
Subsystem	Manuals
Enhancement	4201-SMU and 4211-SMU information added to the Reference Manual.
Issue number	SCS-4736
Subsystem	Manuals
Enhancement	4215-CVU information added to the Reference Manual.
Issue number	SCS-4741
Subsystem	Manuals
Enhancement	*KULT Extension for Visual Studio Code* information added the Reference Manual.
Issue number	SCS-4790
Subsystem	Clarius - Configure, CVU
Enhancement	The aperture time values are now displayed in the CVU Advanced Test Settings when selecting the following modes. Fast = 0.001 s Normal = 0.01 s Quiet = 0.1 s.
Issue number	SCS-4813
Subsystem	Clarius - User LIbraries
Enhancement	A new user module, PMU_10ns_Pulse_Example, has been added to the PMU_examples_ulib user library. This module demonstrates how to achieve 10ns pulse widths with the 4225-PMU.
Issue number	SCS-4815
Subsystem	Learning Center
Enhancement	*Technical Note, Generating 10 ns Pulse Widths Using the 4225-PMU,* added to the Learning Center.
Issue number	SCS-4820 / AR 62056
Subsystem	Clarius - User LIbraries
Enhancement	A user module has been added the hivcvulib that returns Cp-Gp and Cs-Rs parameters.
Issue number	SCS-4888
Subsystem	Clarius - User Libraries, CVU
Enhancement	A new project included, femtofarad-capacitance, for the 4215-CVU, has been added to the project library to demonstrate low capacitance and low noise capabilities.
Issue number	SCS-4907
Subsystem	Clarius - Project Tree
Enhancement	Enables delete key in rename operations in project tree.
Issue number	SCS-4928
Subsystem	Manuals
Enhancement	The differences between KiAdmin and KiUser are explained in the Reference Manual.

Issue number	SCS-4949
Subsystem	Clarius - Analyze - Run History
Enhancement	Run History User Experience Improvements: 1. Ability to unselect an item in the history. Toggles between selected and unselected when clicking on an item. 2. (Keyboard only) Ctrl+Click operation lets you select multiple runs at once. 3. Dialog for Delete Select All updated.
Issue number	SCS-4970
Subsystem	Learning Center
Enhancement	New applications note, *Making Femtofarad (1E-15F) Capacitance Measurements with the 4215-CVU Capacitance Voltage Unit*, added to the Learning center.

Problem fixes

Issue number	SCS-2592
Subsystem	LPT
Symptom	See a polarity shift when a current range of 100mA is entered for the NVM user library module test doubleSweep.
Resolution	This issue has been corrected.
Issue number	SCS-3125
Subsystem	Clarius - User Libraries
Symptom	The NVM user library's reramSweep module's 'pts' variable needs better description on the resulting value. It shows half of the points output.
Resolution	This issue has been corrected.
Issue number	SCS-3959
Subsystem	System
Symptom	When installing Clarius+, if software dependencies are required they will be installed and may require a restart. When prompted for a restart, if "no" is chosen and the install is attempted again without a restart, the installation will fail.
Workaround	Uninstall Clarius+, if necessary, and re-install, allowing restarts when requested.
Resolution	This issue has been corrected.
Issue number	SCS-4203
Subsystem	Clarius - Select
Symptom	Lost mouse up event in remote desktop can cause the project tree to repeat an operation.
Resolution	This issue has been corrected.
Issue number	SCS-4350
Subsystem	Clarius
Symptom	The ACSweep user module in the DLCP user library would issue an error message when attempting to run a test with the default settings.
Resolution	This issue has been corrected.

Issue number	SCS-4474
Subsystem	Learning Center
Symptom	Some of the descriptions in the Help pane and in the Library need to be updated to include the new 42x1-SMUs.
Resolution	This issue has been corrected.
Issue number	SCS-4587
Subsystem	CVU
Symptom	When running UTMs that use the 4210-CVU instrument card and the UTM is aborted, sometimes when the UTM is executed again requested frequencies of test below 10kHz will be rounded to 10kHz and therefore unavailable. This undesired behavior may persist until the 4200A-SCS chassis is rebooted.
Workaround	When this problem happens, reboot the 4200A-SCS.
Resolution	This issue has been corrected.
Issue number	SCS-4624
Subsystem	Clarius - Select
Symptom	Clarius fails to open project containing test with space in front of the test name.
Resolution	Whites spaces are trimmed from names on completion of rename operation. This issue has been corrected.
Issue number	SCS-4637
Subsystem	LPT
Symptom	Existing sweepf/dsweepf LPT commands, only provide startf and stopf input values.This command will only sweep on a discrete number of supported frequencies. Therefore, it returns a value for the number of points in the sweep. It does not provide an input value for step size.
Resolution	For the 4215-CVU, a resolution of 1kHz can be applied to frequency values within the 1kHz to 10MHz limits. Therefore, a new setmode modifier has been defined to provide the frequency step size. Default is set to 0. A devint() call will reset size to its default. If setmode() is not called prior to sweepf(), sweepf() will use the discrete frequencies. setmode(CVU1, KI_CVU_FREQ_STEPSIZE, 1000); modifier: KI_CVU_FREQ_STEPSIZE value: 1000 to 9.999e6 comment: Frequency step size used with sweepf and dsweepf
Issue number	SCS-4643
Subsystem	KXCI, CVU
Symptom	4210-CVU only allows 37 discrete frequencies. A sweep for the 4210-CVU would consist of a list using only a start and stop of one of the discrete values. For the 4215-CVU, a linear frequency sweep can be achieved using a 1kHz frequency resolution, so a step value would need to be provided. There was no command that existed in KXCI to provide a step size.
Resolution	A new command was created to configure a frequency step size. This is only used for the 4215-CVU. An error will occur if used with the 4210-CVU. This is a System mode command. Call prior to :CVU:STEP:FREQ and :CVU:SWEEP:FREQ Command - :CVU:FSTEPSIZE stepsize.

Issue number	SCS-4647
Subsystem	KULT
Symptom	If you copy a library in KULT, you will notice that it does not copy the library dependencies in the KIT_SRC/*_modules.mak file . It should do this.
Resolution	Library dependencies are now copied when libraries are copied in KULT. This issue has been corrected.
Issue number	SCS-4650 / AR63477
Subsystem	KULT
Symptom	KULT will occassionaly crash during build output.
Resolution	Race condition between threads causes occasion crash in build window. This issue has been corrected.
Issue number	SCS-4657
Subsystem	Prober Driver, User Library
Symptom	MPI prober driver issues PRB-MOVE_FAIL error in the Message Console when running the PrMovNxt() and PrSSMovNxt() user modules from the PRBGEN user library.
Resolution	This issue has been corrected.
Issue number	SCS-4659
Subsystem	Clarius
Symptom	Importing a project with initialization steps from a 4200 will not run until reloaded. This issue only occurs when you open a legacy project with init and term nodes, and you proceed with the conversion.
Workaround	You can work around the issue in prior Clarius releases by reopening the project after conversion.
Resolution	This issue has been corrected.
Issue number	SCS-4660
Subsystem	Clarius - Analyze - Sheet/Data
Symptom	In some circumstances columns with data from formulas in Clarius UTM data grid may have a smaller number of rows than they are supposed to.have.
Resolution	This issue has been corrected.

Issue number	SCS-4664
Subsystem	CVU
Symptom	For Clarius V1.7, it was noticed the voltage values in the sheet could return 0 for negative sweep values during a voltage sweep on a CVU. This could occur while running a user module for a CVU DC voltage sweep from -1V to 1V in 0.2 steps.
Resolution	This issue has been corrected.
Issue number	SCS-4675 / AR63553
Subsystem	Clarius.
Symptom	Clarius hangs while running extremely large projects.
Resolution	This issue has been corrected.
Issue number	SCS-4710
Subsystem	Clarius - Configure, PxU
Symptom	In an ITM using 4225-PMU instruments, in the Test Settings pane under Timing Parameters section, setting the Period, Width, Rise Time, Fall Time, and Delay values such that the following relation fails will result in Clarius hanging and become non-responsive. Period - (Width + 0.5*(Rise Time + Fall Time)) >= 20ns.
Workaround	By setting the Period to be at least 20ns larger than the sum of (Width + 0.5*(Rise Time + Fall Time)), the test will run.
Resolution	This issue has been corrected.
Issue number	SCS-4731
Subsystem	CVU
Symptom	The aperture setting, available when Custom timing mode is selected, may not provide expected timing if the country line code selected is 50Hz.
Resolution	This issue has been corrected.
Issue number	SCS-4754
Subsystem	Clarius - Analyze - Run History
Symptom	An error message may appear when opening the formulator.
Resolution	This issue has been corrected.
Issue number	SCS-4761
Subsystem	Clarius
Symptom	Using a 4211-SMU with the hivcvulib modules limits current to 100mA instead of allowing up to 1A.
Resolution	This issue has been corrected.
Issue number	SCS-4783
Subsystem	CVU, Clarius
Symptom	Under certain test conditions when using the auto measure range with the CVU, the CVU will not lock on to a single range. Instead it will continuously alternate between two ranges while taking measurements.
Resolution	This issue has been corrected.

Issue number	SCS-4788
Subsystem	CVU, Clarius
Symptom	Under certain test conditions, the first measurement point returned by the CVU may be notably different than all other measurement points that follow.
Resolution	This issue has been corrected.
Issue number	SCS-4794
Subsystem	Clarius - Configure, CVU
Symptom	CVU aperture resolution should be changed from 10 ms to 1 ms.
Resolution	This issue has been corrected.
Issue number	SCS-4795
Subsystem	Clarius - Configure, CVU
Symptom	CVU Advanced Test Settings: Filter Factor updates needed.
Resolution	Fast and Quiet Filter Factor values are changed to 1. The only valid Filter Factor values are 0, 1 to 707. For existing ITMs, values between 0 and 1 are automatically converted. This issue has been corrected.
Issue number	SCS-4824
Subsystem	Clarius
Symptom	A freeze may occur in UTMs when the size of return arrays are less than the size Clarius expects running a sweep command.
Resolution	This issue has been corrected.
Issue number	SCS-4831
Subsystem	Clarius - Configure
Symptom	In the Clarius Test Settings right pane and the Test Settings Advanced window under the Measure Settings section, when Custom Speed is selected, the Filter Factor minimum should be 1.
Resolution	The CVU minimum filter factor has been changed to 1. There is a tight relationship between filter factor and filter count where filter count is the filter factor squared. You can't have less than a count of 1. When opening existing tests with that have cvu filter factors less than 1, they will be changed to a value of 1. And, the aperture time will be set to the minimum value of 100 µs. This issue has been corrected.
Issue number	SCS-4832
Subsystem	Clarius - Configure
Symptom	Convert Aperture time to minimum value when Filter Factor is < 1.
Resolution	When opening existing tests that have CVU filter factors less than 1, they will be changed to a value of 1. And, the aperture time will be set to the minimum value of 100 µs. The update was made, because the true minimum value is 1. This issue has been corrected.

Issue number	SCS-4833
Subsystem	LPT
Symptom	Allowing invalid Filter Factor values less than 1. This would reduce the total measurement time. Instead aperture should be adjusted accordingly.
Resolution	This issue has been corrected.
Issue number	SCS-4871
Subsystem	KXCI, CVU
Symptom	The aperture setting, available when :CVU:SPEED Custom timing mode is chosen, may not provide expected timing if the country line code selected is 50 Hz.
Resolution	This issue has been corrected.
Issue number	SCS-4893
Subsystem	Clarius - User Libraries
Symptom	hci-1-dut project only runs a single cycle.
Resolution	The project did not account for the new SMU models, 4201-SMU and 4211-SMU. This issue has been corrected.
Issue number	SCS-4950
Subsystem	Clarius - Analyze - Run History
Symptom	Possible deadlock when deleting items in the run history.
Resolution	This issue has been corrected.
Issue number	SCS-4957
Subsystem	Clarius - User Libraries
Symptom	There was no Run1 data shown for vlf-cap-vsweep test in the vlp-cap-cv project.
Resolution	This issue has been corrected.
Issue number	SCS-4960
Subsystem	Clarius - Configure, Clarius - User Libraries
Symptom	When the `flashulib modules pmu_double_pulse and double_pulse` TransitionTimesPulse2 button is slected you will get notified about an incorrect configuration window for the parameter.
Workaround	Click on the All Parameter view and select parameter. This will provide the correct configuration window.
Resolution	This issue has been corrected.
Issue number	SCS-4968
Subsystem	Clarius - Configure
Symptom	Custom UTM with a large number (greater than 215; max 256) of char inputs has non-char values in some parameters when test is added to Clarius.
Resolution	This issue has been corrected.
Issue number	SCS-5037
Subsystem	KXCI, PxU
Symptom	A timeout may occur with the KXCI PE command for the 4220-PGU.
Resolution	This issue has been corrected.

Issue number	SCS-5044
Subsystem	Clarius-Select, CVU
Symptom	The cv-nmosfet test should run in quiet mode instead of normal mode.
Resolution	This issue has been corrected.
Issue number	SCS-5063
Subsystem	Clarius, CVU
Symptom	When running an ITM using a 4210-CVU or 4215-CVU, if you abort the test before all of the measurements are collected, many times the last row in the data grid contains very large values. If the columns containing these very large values are included in a graph plot, the vertical scale becomes so large that the rest of the collected data becomes indistinguishable with the x-axis.
Resolution	This issue has been corrected.
Issue number	SCS-5067
Subsystem	Clarius - User Libraries
Symptom	Change cgs test in the mosfet-cviv-cv-bias-tees project to fixed Log scale from 1e-9 to 1e-8.
Resolution	This issue has been corrected.
Issue number	SCS-5098
Subsystem	Clarius
Symptom	In some circumstances, the Clarius copy and paste operation for the test in the project tree may cause missing data in the new (copied) instance of the test.
Resolution	This issue has been corrected.
Issue number	SCS-5119 / AR64108
Subsystem	Clarius - Subsite/Site/Cycling
Symptom	The nbti-1-dut library project is missing subsite log stress controls and default timing input parameters.
Resolution	Fixed multiple import issues due to importing old projects that had periodic cycling enabled. This includes missing controls and incorrect list generation. This issue has been corrected.
Issue number	SCS-5138
Subsystem	Clarius
Symptom	Clarius can crash when switching to and from remote desktop operation while showing only the graph in analyze mode.
Resolution	This issue has been corrected.
Issue number	SCS-5154
Subsystem	KXCI
Symptom	A new status message should be shown in the KXCI message window when running PGU/PMU tests, "Data Handler received DONE signal from slot #."
Resolution	This was added for Clarius v1.8. This issue has been corrected.

Issue number	SCS-5157
Subsystem	Clarius
Symptom	Graph legends are not updating when executing tests at the project level.
Resolution	This issue has been corrected.
Issue number	SCS-5163
Subsystem	Clarius - Analyze - Run History
Symptom	Operators can set multiple runs in the run history with the same name.
Resolution	This issue has been corrected.
Issue number	SCS-5196
Subsystem	Clarius - Subsite/Site/Cycling
Symptom	When running legacy subsite cycling projects, not all cycles may be completed.
Resolution	This issue has been corrected.

Known problems

Issue number	SCS-619
Subsystem	Clarius
Symptom	The Configure screen All Parameter view does not include entries for the PMU Load Line Effect Compensation and DUT Resistance options.
Workaround	Select the Key Parameters pane on the Configure screen. In the right pane, select Terminal Settings, then select Advanced to open the PMU Advanced Terminal Settings dialog box, where you can enter PMU Load Line Effect Compensation and DUT Resistance values.
Issue number	SCS-3534
Subsystem	Clarius
Symptom	When copying a test from one subsite to another subsite, more rows of data may be copied than exist. The extra rows are copies of the last valid row.
Workaround	To keep this from occurring, set up the subsite and tests completely before collecting data. When creating a new collection of subsite tests, copied from existing subsites, run from this new subsite or higher to generate a new, valid set of data.
Issue number	SCS-5020
Subsystem	Clarius – User Libraries
Symptom	Depending on the test settings and the device under test, the “multiSMU_SweepV” user module in the “hivcvulib” user library may not control SMU outputs in the optimal way that is needed by the DUT.
Workaround	The user module may need to be modified to control the differential output voltage across the device terminals.

Usage notes

4200A-CVIV

Before using the 4200A-CVIV Multi-Switch, be sure to connect the SMUs, using the 4200-PAs and 4200A-CVIV-SPT SMU Pass-Thru modules, and the CVU instrument cables to the 4200A-CVIV inputs. Then run the “Update Preamp, RPM, and CVIV Configuration” option in KCon. Make sure to close the Clarius application before opening KCon on the desktop. Include the action `cviv-configure` before a SMU or CVU test in the project tree to switch between I-V and C-V measurements.

4225-RPM

Before using the 4225-RPM Remote Amplifier Switch Module to switch between I-V, C-V, and Pulse ITMs, be sure to connect all instrument cables to the RPM inputs, and run the “Update Preamp, RPM, and CVIV Configuration” option in KCon. Make sure to close the Clarius application before opening KCon on the desktop.

When using the 4225-RPM in UTMs, include the call in your user module to the LPT command `rpm_config()`. The `RPM_switch` user module in the `pmuulib` User Library is deprecated. For more information, see the Help pane in Clarius.

421x-CVU

When choosing the Custom Cable Length in the CVU Connection Compensation dialog box of the Tools menu to perform open, short, and load simultaneously, you must run Measure Custom Cable Length first. Then, enable Open, Short, and Load CVU Compensation within a test.

If you are performing Open, Short, and Load CVU Compensation when the CVU is connected to the CVIV, it is recommended that you use the `cvu-cviv-comp-collect` action.

42x0 SMUs

Under certain 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.

The workarounds for this situation are:

a. Use the `setmode` command when generating user modules 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 and ramp rates (dv/dt or di/dt).

c. Use fixed SMU ranges.

LPTLIB

1. If a voltage limit of greater than 20 V is needed from a 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 mA 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.

KXCI

In KXCI System Mode, in both KI4200A emulation and HP4145 emulation, the following default current measurement ranges exist.

"Limited Auto – 1nA" is the default current measurement range for 4200 SMUs with preamplifiers.

"Limited Auto – 100nA" is the default current measurement range for 4200 SMUs without preamplifiers.

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 preamplifier) to the “Limited Auto - 10pA” range

Subsite Stress Mode

In "Stress/Measure Mode," the "Leave Stress Conditions On" checkbox will maintain the stress voltage or current during the subsequent device testing. However, if the system configuration includes a matrix, then all outputs will be turned off, regardless of the checkbox, to prevent damaging matrix relays. Likewise, with a 4200A-CVIV Switch in the configuration, all outputs will be turned off if any signals are routed through the 4200A-CVIV Switch, regardless of the checkbox setting. The stress signals can be left on if they are all directly connected outside of the CVIV Switch, but they will be reset when a CVIV connection is made in the subsequent device testing to prevent damaging relays.

Windows® mapped network drive error

When installing Clarius+ on a PC, Microsoft® policy settings can limit Clarius from accessing mapped network drives in its file windows.

Modifying the registry will fix this issue.

To modify the registry:

1. Run `regedit`.
2. Navigate to `HKEY_LOCAL_MACHINE/SOFTWARE/Microsoft/Windows/CurrentVersion/Policies/System`.
3. If one does not exist, create a new `DWORD` entry named `EnableLinkedConnections`.
4. Set the value to `1`.
5. Restart the PC.

PC Installation, Help Pane PDF Link errors

When installing Clarius+ on a PC, PDF links may not open in Clarius from the help pane if you have Acrobat Reader installed and protected mode enabled.

Modifying Internet Explorer settings will fix this issue.

To modify the Internet Explorer settings:

1. Open Internet explorer.
2. Select Internet Settings.
3. On the general tab, find the Startup section, and change "Start with tabs from the last session" to "Start with home page."

PC Installation, language packs

Clarius does not support additional languages in Windows® 10 besides the English (United States) base language. If you encounter errors with Clarius while a language pack is installed, follow Microsoft® instructions for removing the language pack.

Installation instructions

These directions are provided as a reference if you need to re-install Clarius+ software on your 4200A-SCS. **NOTE: All CVU Open, Short, and Load compensation constants must be re-acquired after V1.2 is installed**.

STEP 1. Archive your user-modified user library data (optional)

CAUTION: Installing Clarius+ software will reinstall the C:\4200\kiuser\usrlib. If you made changes to the user library and do not want to lose these changes when this software is installed, copy these files to an alternate location before installation.

The easiest way to archive the user library is to copy the entire C:\S4200\kiuser\usrlib folder to a network drive or an archive area on the 4200A-SCS hard drive. Copy the files back after installation to restore them.

STEP 2. Install the 4200A-SCS Clarius+ Software Tools

If you are installing Clarius+ software using the supplied USB drive, follow these instructions:

1. Insert the **4200A-SCS Clarius+ software** USB flash drive into a 4200A-SCS USB port.
2. Double-click the **setup.exe** file on the USB drive to install the software on your 4200A-SCS.
3. Follow the on-screen installation instructions. If a previous version of Clarius+ software is installed on your 4200A-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 Clarius+ software is uninstalled, you must restart the system and then install the new Clarius+ software version.
4. After the installation is complete, remove the USB flash drive and select **Yes, I want to restart my computer now** to restart the 4200A-SCS before attempting to initialize or use the software tools.

If you are downloading and installing the Clarius+ software from www.tek.com, ***follow these instructions:***

1. Go to www.tek.com
2. Click the **DOWNLOADS** link.
3. From the DOWNLOAD TYPE list, choose **Software**.
4. For MODEL OR KEYWORD, type **4200A**, and click **SEARCH**.
5. Click the software link that you want to download (note that you will need to log in or register to continue).
6. Once you are logged in, click the **Download File** button and choose where to download your file (rename the file as needed).
7. Unzip the downloaded file.
8. Double-click the **setup.exe** file to install the software on your 4200A-SCS.
9. Follow the on-screen installation instructions. If a previous version of Clarius+ software is installed on your 4200A-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 Clarius+ software is uninstalled, you must restart the system and then install the new Clarius+ software version.
10. After the installation is complete select **Yes, I want to restart my computer now** to restart the 4200A-SCS before attempting to initialize or use the software tools.

STEP 3. Initialize each 4200A-SCS User Account

NOTE: Each user account on the 4200A-SCS must be properly initialized before attempting to run any of the Clarius+ software tools. Failure to initialize may cause unpredictable behavior.

From the Windows® login screen, type the user name 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 name	Password
kiadmin	kiadmin1
kiuser	kiuser1

When Windows® has completed startup, select **Start** > **Keithley Instruments** > **Initialize New User**. This will initialize the user who is currently logged in.

Repeat steps one and two for both Keithley accounts and for any additional accounts added by the system administrator.

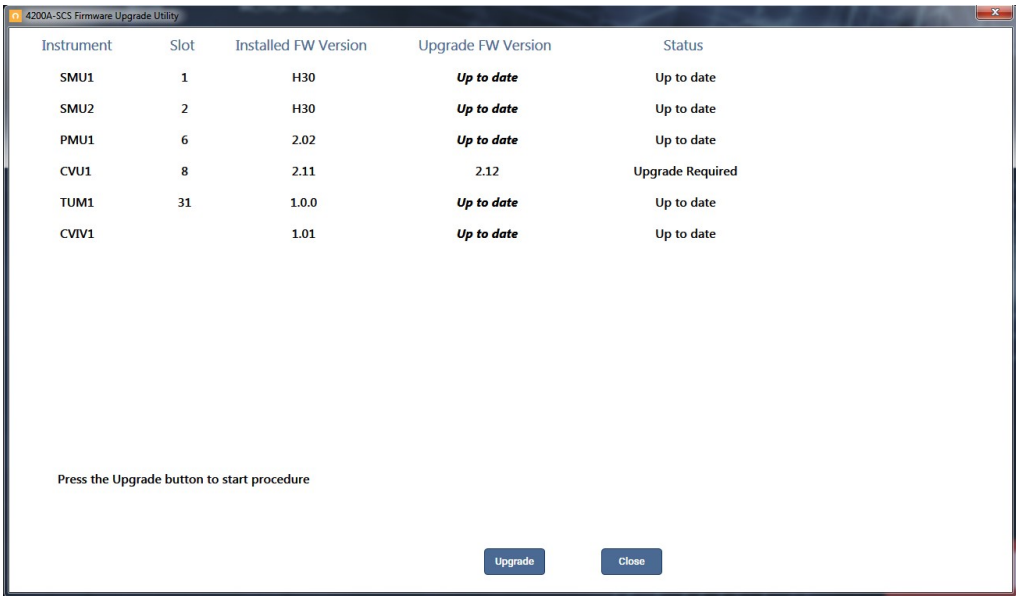
STEP 4. Upgrade 42x0-SMU, 422x-PxU, 4225-RPM, 4225-RPM-LR, 4210-CVU and 4200A-CVIV Firmware

- **NOTE:** Clarius 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 4200A-SCS cards, use the KCon utility and select each card.
- **NOTE:** The firmware upgrade program will automatically indicate the hardware that needs upgraded to the approved or latest firmware version.
- **NOTE:** 4200A-SCS cards are organized by families of related models as shown in the table below. To upgrade the firmware of your 4200A-SCS cards:

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

1. Exit all Clarius+ software programs and any other Windows® programs.
2. From the Windows® taskbar, select **Start**.
3. In the Keithley Instruments folder, select the **Firmware Upgrade** tool.
4. If your instrument needs to be upgraded, the Upgrade button becomes visible and there is an indication in Status that an Upgrade is required for a instrument as shown below.
5. Select **Upgrade**.

NOTE: The Firmware Upgrade Utility window below shows that the upgrade is not complete; the CVU1 requires upgrading.



The Firmware Upgrade Utility window

Version Table

4200A-SCS instrument family	Hardware version from KCon	Firmware version
420x-SMU/421x-SMU[1]	05,XXXXXXXX or 5,XXXXXXXX	H31
	06,XXXXXXXX or 6,XXXXXXXX	M31
	07,XXXXXXXX or 7,XXXXXXXX	R33
4200-PA	<this product cannot be flash upgraded in the field>	–
421x-CVU	ALL (3.0, 3.1, 4.0 and later)	2.15
4220-PGU/4225-PMU[2]	1.0 and later	2.05
4225-RPM/4225-RPM-LR	1.0 and later	2.00
4200A-CVIV[3]	1.0	1.04
4200A-TUM	1.0	1.0.0

[1] There are several different models of SMUs available in the 4200A-SCS, 420x-SMU (medium power) and 421x-SMU (high power); all use the same firmware file.

[2] The 4225-PMU and 4220-PGU share the same pulse and source board. The 4225-PMU adds measure capability through an additional hardware board but uses the same firmware file.

[3] The 4200A-CVIV firmware contains two files to upgrade. The firmware utility will use both files in the version folder.