

## Software Release Notes and Installation Instructions

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### Important information

The Clarius+ software application suite is the software for the Model 4200A-SCS Parametric Analyzer. Clarius+ software requires Microsoft® Windows® 10 to be installed on your Model 4200A-SCS Parametric Analyzer.

### Introduction

This document provides supplemental information about the behavior of Clarius+ software. This information is organized into the categories presented in the following table.

<a href="#">Revision history</a>	Lists the version of software, the document version, and the date of the software release.
<a href="#">New features and updates</a>	Summary of each significant new feature and update included in Clarius+ software and the 4200A-SCS.
<a href="#">Problem fixes</a>	Summary of each significant software or firmware bug fix in Clarius+ software and the 4200A-SCS.
<a href="#">Known issues</a>	Summary of known issues and workarounds where possible.
<a href="#">Usage notes</a>	Helpful information describing how to optimize the performance of Clarius+ software and the 4200A-SCS.
<a href="#">Installation instructions</a>	Detailed instructions describing how to install all software components, firmware, and help files.
<a href="#">Version table</a>	Lists the hardware and firmware versions for this release.



## 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
4/2025	v1.14	077132619	19
5/2024	v1.13	077132618	18
3/2023	v1.12	077132617	17
6/2022	V1.11	077132616	16
3/2022	V1.10.1	077132615	15
10/2021	V1.10	077132614	14
3/2021	V1.9.1	077132613	13
12/2020	V1.9	077132612	12
6/10/2020	V1.8.1	077132611	11
4/23/2020	V1.8	077132610	10
10/14/2019	V1.7	077132609	09
5/3/2019	V1.6.1	077132608	08
2/28/2019	V1.6	077132607	07
6/8/2018	V1.5	077132606	06
2/23/2018	V1.4.1	077132605	05
11/30/2017	V1.4	077132604	04
5/8/2017	V1.3	077132603	03
3/24/2017	V1.2	077132602	02
10/31/2016	V1.1	077132601	01
9/1/2016	V1.0	077132600	00

## New features and updates

Major new features in this release include:

- **Data compression:** Set up rules to highlight the display of interesting data while limiting the display of other data.
- **Support for using the quasistatic technique for capacitance-voltage (C-V) measurements:** A user library, application note, project, and test were added.
- **Support for using the JEDEC JEP183A standard for measuring threshold voltage on silicon carbide MOSFETs:** A user library and tests were added.

## Data compression (CLS-1218)

The data compression feature of Clarius minimizes data that is not of interest. It allows you to collect uncompressed data from areas that are of interest while compressing data from other areas of the data acquisition. For example, in a breakdown test, you may want to store uncompressed data points near a breakdown transition, but compress other data. In addition to simplifying the display of data, data compression allows you to execute long-running tests without exceeding the maximum number of points allowed in Clarius.

For detailed information on Data Compression, refer to the "Data Compression" section of the Learning Center and the *Model 4200A-SCS Clarius User's Manual*. Also see the new application note *Long-Term Data Collection and Breakdown Testing Using Data Compression in the Keithley 4200A-SCS Parameter Analyzer*.

## Quasistatic technique for capacitance voltage (C-V) measurements (CLS-1632)

Tests that perform the forced current quasistatic capacitance voltage (Force-I QSCV) technique are now included with the Clarius software. A single SMU with a preamplifier is required to run the Force-I QSCV tests. A new application note, *Forced Current Quasistatic CV Method for SiC Devices with the 4200A-SCS Parameter Analyzer*, describes the Force-I QSCV technique, explains how to use the tests in the Clarius software, compares this technique to other methods, and derives calculations for internal charges on a SiC MOSFET from the forward and reverse C-V sweeps.

The new project is named SiC MOS Device Force-I Quasistatic C-V Project (`sic-mos-device-force-i-qscv`) and includes the tests SiC MOScap Force-I Quasistatic C-V (`sic-moscap-force-i-qscv`) and SiC MOSFET Force-I Quasistatic C-V (`sic-mosfet-force-i-qscv`).

## JEDEC JEP183A standard for measuring threshold voltage on silicon carbide MOSFETs (CLS-1330)

The new `wbg_ulib` user library provides user modules that use the JEDEC JEP183A standard for measuring threshold voltage ( $V_{TH}$ ) on silicon carbide MOSFETs. The `SMU_vgsweepvdfixed` user module uses a user-defined Target Current ( $I_{dTarget}$ ) to find  $V_{TH}$  from an  $I_D$ - $V_G$  curve while sweeping  $V_G$  and biasing  $V_D$ . The `SMU_vgvdsweep` user modules uses  $I_{dTarget}$  to find  $V_{TH}$  from an  $I_D$ - $V_G$  curve while sweeping both  $V_G$  and biasing  $V_D$  ( $V_G = V_D$ ).

## Document changes

The following documents were updated to reflect the changes for this release:

- *Model 4200A-SCS Clarius User's Manual* (4200A-914-01F)
- *Model 4200A-CVIV Multi-Switch User's Manual* (4200A-CVIV-900-01F)
- *Model 4200A-SCS Prober and External Instrument Control* (4200A-913-01C)
- *Model 4200A-SCS Setup and Maintenance User's Manual* (4200A-908-01F)
- *Model 4200A-SCS KXCI Remote Control Programming* (4200A-KXCI-907-01E)

## Other features and updates

<b>Issue number</b>	<b>CLS-123 / AR-60565, CAS-366256-L7T2N1</b>
<b>Subsystem</b>	Clarius
<b>Enhancement</b>	You can now choose to preserve the selection of runs in the Run History while the test is running. To set this option, select <b>My Settings &gt; Run Settings dialog</b> , then select "Keep selected runs while running the test."
<b>Issue number</b>	<b>CLS-256 / AR-66864</b>
<b>Subsystem</b>	Clarius
<b>Enhancement</b>	Clarius Messages pane can be expanded to display more messages.
<b>Issue number</b>	<b>CLS-282 / AR-63405</b>
<b>Subsystem</b>	Clarius
<b>Enhancement</b>	You can now add project notes. You can access Project Notes from Configure when a project is selected in the project tree and from the Select Projects dialog.
<b>Issue number</b>	<b>CLS-787</b>
<b>Subsystem</b>	Clarius – Data Export
<b>Enhancement</b>	The Clarius Data Export tool was updated to support the export of subsite data. In addition, the "Use Clarius data file naming" option was added to allow the use of data file names as they are created internally in Clarius instead of user-specified names.
<b>Issue number</b>	<b>CLS-1030 / CAS-287410-Z4R7C3</b>
<b>Subsystem</b>	Clarius
<b>Enhancement</b>	The Clarius Messages pane record length was increased to include up to 6000 messages.
<b>Issue number</b>	<b>CLS-1032</b>
<b>Subsystem</b>	Clarius – Project Tree
<b>Enhancement</b>	The Project Tree Item Management item was added to Clarius Configure pane when a project is selected. It allows you delete multiple devices and tests in project.
<b>Issue number</b>	<b>CLS-1113</b>
<b>Subsystem</b>	Clarius – Subsite
<b>Enhancement</b>	The "Target Values ABS Change" option was added to Clarius subsite stressing. It can be used instead of the "Target % Change" option.
<b>Issue number</b>	<b>CLS-1243 / CAS-255291-D9J4H0</b>
<b>Subsystem</b>	Clarius – Subsite
<b>Enhancement</b>	A dialog was added for the input of list items in subsite stress configuration. It supports flexible functionality to add list items, including the ability to paste data from Microsoft™ Excel™.

<b>Issue number</b>	<b>CLS-1486 / CAS-345375-P9Z2T4</b>
<b>Subsystem</b>	Clarius – User Libraries
<b>Enhancement</b>	User modules supporting 4-channel, 6-channel, 8-channel, and multi-channel PMU SegArb were added to <code>PMU_examples_ulib</code> user library. Test names are <code>pmu-segarb-complete-4ch</code> , <code>pmu-segarb-complete-6ch</code> , <code>pmu-segarb-complete-8ch</code> , and <code>pmu-segarb-complete-multi-ch</code> .
<b>Issue number</b>	<b>CLS-1671</b>
<b>Subsystem</b>	Clarius – Prober Drivers
<b>Enhancement</b>	Micromanipulator P200L (NP7) Prober Driver support was added to Clarius.
<b>Issue number</b>	<b>CLS-1692</b>
<b>Subsystem</b>	Clarius – Data Export
<b>Enhancement</b>	If a path is selected in the Data Export dialog, the path is retained when Clarius is relaunched.
<b>Issue number</b>	<b>CLS-1826 / CAS-389128-W6K4Z0</b>
<b>Subsystem</b>	Clarius – Subsite
<b>Enhancement</b>	Maximum number of cycles/stresses for Clarius Subsite was increased from 128 to 4096.

## Problem fixes

<b>Issue number</b>	<b>CLS-1069</b>
<b>Subsystem</b>	UTM UI Editor
<b>Symptom</b>	The HasRPM and HasPA declarations do not work as visibility constraints for list items in the UTM UI Editor.
<b>Resolution</b>	This issue has been corrected.
<b>Issue number</b>	<b>CLS-1127 / CAS-287424-T8R9Q4</b>
<b>Subsystem</b>	Clarius – Data Export
<b>Symptom</b>	A subsite Excel (XLS) file from the Clarius 1.12 export tool does not match a subsite XLS file from Clarius 1.11.
<b>Resolution</b>	This issue has been corrected.
<b>Issue number</b>	<b>CLS-1149</b>
<b>Subsystem</b>	Clarius – Installer
<b>Symptom</b>	Running the installer from an external drive on the 4200A-SCS- causes an error.
<b>Resolution</b>	This issue has been corrected.

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<b>Issue number</b>	<b>CLS-1190</b>
<b>Subsystem</b>	Clarius – UTM
<b>Symptom</b>	PMU load-line correction produces different results in UTM compared to ITM/KXCI.
<b>Resolution</b>	This issue has been corrected. The UTM correction procedure was synchronized to the correction in ITM/KXCI.
<b>Issue number</b>	<b>CLS-1291 / AR-R3J5X9</b>
<b>Subsystem</b>	Clarius – Graph
<b>Symptom</b>	The Clarius Graph caused a crash if the user attempted to plot a data series that had a name with special characters.
<b>Resolution</b>	This issue has been corrected.
<b>Issue number</b>	<b>CLS-1334</b>
<b>Subsystem</b>	Clarius – ITM
<b>Symptom</b>	Clarius allows the configuration of an ITM with a PMU pulse timing rule that can generate an endless waveform.
<b>Resolution</b>	This issue has been corrected.
<b>Issue number</b>	<b>CLS-1341</b>
<b>Subsystem</b>	Clarius – CVIV
<b>Symptom</b>	Clarius does not validate the CVIV firmware version properly at launch.
<b>Resolution</b>	This issue has been corrected.
<b>Issue number</b>	<b>CLS-1344</b>
<b>Subsystem</b>	Clarius – Subsite
<b>Symptom</b>	Subsite does not translate subsite run settings when it is exported or imported to Clarius v1.11 format.
<b>Resolution</b>	This issue has been corrected.
<b>Issue number</b>	<b>CLS-1362</b>
<b>Subsystem</b>	Clarius – User Library
<b>Symptom</b>	The <code>flashulib</code> user modules do not accept PMU channels as valid assignments for pulse terminals.
<b>Resolution</b>	This issue has been corrected.

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<b>Issue number</b>	<b>CLS-1377</b>
<b>Subsystem</b>	Clarius
<b>Symptom</b>	Clarius crashes when opening a legacy 4200-SCS project with a Calc sheet item that contains long text.
<b>Resolution</b>	This issue has been corrected.
<b>Issue number</b>	<b>CLS-1381</b>
<b>Subsystem</b>	Clarius
<b>Symptom</b>	There is an invalid operation exception for some projects on relaunch of Clarius.
<b>Resolution</b>	This issue has been corrected.
<b>Issue number</b>	<b>CLS-1404</b>
<b>Subsystem</b>	Clarius – Graph
<b>Symptom</b>	The Clarius graph crashes when the user adds multiple data series in the configuration dialog.
<b>Resolution</b>	This issue has been corrected.
<b>Issue number</b>	<b>CLS-1429</b>
<b>Subsystem</b>	Clarius – Run History
<b>Symptom</b>	If run history items have custom names and the user selects a new run after opening the test, then deletes the selected run, Clarius test run history may be corrupted. As a result, the graph and grid configuration became corrupted as well.
<b>Resolution</b>	This issue has been corrected.
<b>Issue number</b>	<b>CLS-1436 / CAS-339619-M8K5T1</b>
<b>Subsystem</b>	Clarius – Installation
<b>Symptom</b>	Upgrading to V1.13 in some cases may cause 4200A to be in Offline (PC) mode.
<b>Resolution</b>	This issue has been corrected.
<b>Issue number</b>	<b>CLS-1450</b>
<b>Subsystem</b>	Clarius – Graph
<b>Symptom</b>	In certain conditions, the Project level graph may lose configured data series after rerunning a test.
<b>Resolution</b>	This issue has been corrected.
<b>Issue number</b>	<b>CLS-1451</b>
<b>Subsystem</b>	Clarius – Graph
<b>Symptom</b>	The Clarius graph may lose the configured data series after the first run of the test.
<b>Resolution</b>	This issue has been corrected.

<b>Issue number</b>	<b>CLS-1520</b>
<b>Subsystem</b>	Clarius
<b>Symptom</b>	ITM SMU configuration caused an incorrect sweep step calculation on subordinate SMU sweeper when it is set to dual sweep and the master SMU sweep is a one-way sweeper.
<b>Resolution</b>	This issue has been corrected.
<b>Issue number</b>	<b>CLS-1527</b>
<b>Subsystem</b>	Clarius – Data Export
<b>Symptom</b>	Data Export for a project with partially converted XLS to h5 data files fails to generate the files for tests without h5 files.
<b>Resolution</b>	This issue has been corrected.
<b>Issue number</b>	<b>CLS-1565</b>
<b>Subsystem</b>	UTM UI Editor
<b>Symptom</b>	The UTM UI Editor does not save the UTM Image "Expand to Top" configuration setting.
<b>Resolution</b>	This issue has been corrected.
<b>Issue number</b>	<b>CLS-1613 / CAS-360140-C2Z7P9</b>
<b>Subsystem</b>	Clarius – ITM
<b>Symptom</b>	Changing an SMU to Voltage Step in some ITMs causes Clarius to crash.
<b>Resolution</b>	This issue has been corrected.
<b>Issue number</b>	<b>CLS-1630</b>
<b>Subsystem</b>	Clarius – Project Graph
<b>Symptom</b>	Data from some ITMs and UTMs is not scaling correctly in the Project Level graph.
<b>Resolution</b>	This issue has been corrected.
<b>Issue number</b>	<b>CLS-1658</b>
<b>Subsystem</b>	Clarius
<b>Symptom</b>	The import of some legacy 4200-SCS KITE projects causes Clarius to hang.
<b>Resolution</b>	This issue has been corrected.
<b>Issue number</b>	<b>CLS-1666</b>
<b>Subsystem</b>	Clarius – Save Data
<b>Symptom</b>	When using the Save Test Data dialog, the data file is overwritten if the user closes the "File Already Exist" prompt by selecting the x on the dialog instead of No.
<b>Resolution</b>	This issue has been corrected.

<b>Issue number</b>	<b>CLS-1694</b>
<b>Subsystem</b>	Clarius – Subsite
<b>Symptom</b>	When a subsite is created as <b>New</b> , there are "SMU1-missing" errors in Configure when the subsite is selected.
<b>Resolution</b>	This issue has been corrected.
<b>Issue number</b>	<b>CLS-1745</b>
<b>Subsystem</b>	Clarius – Subsite, Analyze
<b>Symptom</b>	In Analyze, when saving subsite data using Save Data in XLSX format, a file is created with the incorrect cell format.
<b>Resolution</b>	This issue has been corrected.
<b>Issue number</b>	<b>CLS-1760</b>
<b>Subsystem</b>	Clarius – ITM
<b>Symptom</b>	An ITM with configured PMU dual sweeping may generate the error message "sweeping is not properly defined," even if the configuration is valid.
<b>Resolution</b>	This issue has been corrected.
<b>Issue number</b>	<b>CLS-1763</b>
<b>Subsystem</b>	Clarius – Subsite
<b>Symptom</b>	The Target Type Abs Value Degradation is missing in subsite stress configuration.
<b>Resolution</b>	This issue has been corrected.
<b>Issue number</b>	<b>CLS-1794</b>
<b>Subsystem</b>	KXCI
<b>Symptom</b>	An incorrect error message may be shown in KXCI when calling a user module if the default parameter values contain spaces.
<b>Resolution</b>	This issue has been corrected.
<b>Issue number</b>	<b>CLS-1795</b>
<b>Subsystem</b>	Clarius – Subsite
<b>Symptom</b>	Subsite Linear stressing does not accept values in the range of 0 to 1 s for the first stress time.
<b>Resolution</b>	This issue has been corrected.

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<b>Issue number</b>	<b>CLS-1796</b>
<b>Subsystem</b>	Clarius – Subsite
<b>Symptom</b>	Subsite List stressing does not accept values of less than 1 s for the stress time.
<b>Resolution</b>	This issue has been corrected.
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<b>Issue number</b>	<b>CLS-1804</b>
<b>Subsystem</b>	Clarius – Project Tree
<b>Symptom</b>	When the Project node is open in the Configure view, Clarius may crash when other project items are deleted.
<b>Resolution</b>	This issue has been corrected.
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<b>Issue number</b>	<b>CLS-1814</b>
<b>Subsystem</b>	Clarius – SARB
<b>Symptom</b>	In Clarius v1.13, the maximum number of Seq Loops is limited to 20 in SegArb user modules. It should be up to 2.14E9 loops.
<b>Resolution</b>	This issue has been corrected.
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<b>Issue number</b>	<b>CLS-1820 / CAS-397328-V2D6Z0</b>
<b>Subsystem</b>	KULT – VS Code Extension
<b>Symptom</b>	The gdb debugger does not attach to the UTMServer.exe process while modifying a UTM in Visual Studio Code.
<b>Resolution</b>	This issue has been corrected.
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<b>Issue number</b>	<b>CLS-1847 / CAS-326776-V5H0X4</b>
<b>Subsystem</b>	Clarius – Subsite
<b>Symptom</b>	The total test time increases significantly as the number of subsite cycles increases.
<b>Resolution</b>	This issue has been corrected.
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<b>Issue number</b>	<b>CLS-1856</b>
<b>Subsystem</b>	Clarius
<b>Symptom</b>	The Messages pane is not visible in Analyze in Clarius v1.13.
<b>Resolution</b>	This issue has been corrected.

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<b>Issue number</b>	<b>CLS-1914</b>
<b>Subsystem</b>	Clarius – Graph
<b>Symptom</b>	In some circumstances, the Clarius Graph may lose the autoscale settings for the X-axis and Y-axis while running a test.
<b>Resolution</b>	This issue has been corrected.
<b>Issue number</b>	<b>CLS-1943</b>
<b>Subsystem</b>	Clarius – Graph
<b>Symptom</b>	Running a UTM after changing the user module selection and setting some valid graph configuration produces an incorrect graph.
<b>Resolution</b>	This issue has been corrected.
<b>Issue number</b>	<b>CLS-1954</b>
<b>Subsystem</b>	Clarius – Graph
<b>Symptom</b>	The Clarius Graph fails to add additional curves after running a test with an increased number of steps in a stepper-sweeper test.
<b>Resolution</b>	This issue has been corrected.
<b>Issue number</b>	<b>CLS-1958</b>
<b>Subsystem</b>	Clarius – Graph
<b>Symptom</b>	The Clarius Graph may produce inconsistent color, pattern, and data point behavior when selecting runs.
<b>Resolution</b>	This issue has been corrected. The Save Settings option was added to the Graph Definition Menu to allow users to save and preserve the present settings of runs in the graph.
<b>Issue number</b>	<b>CLS-1959</b>
<b>Subsystem</b>	Clarius – Graph
<b>Symptom</b>	The Graph Legend gets cut off in some circumstances.
<b>Resolution</b>	This issue has been corrected.
<b>Issue number</b>	<b>CLS-1988</b>
<b>Subsystem</b>	Clarius – Graph
<b>Symptom</b>	A Clarius graph with a configured line fit may lose track of the selected data series to plot.
<b>Resolution</b>	This issue has been corrected.

<b>Issue number</b>	<b>CLS-1997</b>
<b>Subsystem</b>	Clarius – Subsite
<b>Symptom</b>	The Clarius subsite graph does not save Log scaling and other configuration settings for its axes.
<b>Resolution</b>	This issue has been corrected.
<b>Issue number</b>	<b>CLS-1998</b>
<b>Subsystem</b>	Clarius
<b>Symptom</b>	The Save Test Data dialog from Analyze view has a misleading error message if the user saves the graph when graph is not shown.
<b>Resolution</b>	This issue has been corrected.
<b>Issue number</b>	<b>CLS-2007</b>
<b>Subsystem</b>	Clarius
<b>Symptom</b>	Exporting a Clarius project to a kzp file may cause the test graph to lose the configured data series.
<b>Resolution</b>	This issue has been corrected.
<b>Issue number</b>	<b>CLS-2010</b>
<b>Subsystem</b>	Clarius
<b>Symptom</b>	Using the Save As operation may cause the test graph to lose the configured data series.
<b>Resolution</b>	This issue has been corrected.

## Known issues

<b>Issue number</b>	<b>SCS-6486</b>
<b>Subsystem</b>	Clarius
<b>Symptom</b>	It is difficult to move the line fit markers using the touchscreen.
<b>Workaround</b>	Use a mouse to move line fit markers.
<b>Issue number</b>	<b>SCS-6908</b>
<b>Subsystem</b>	4215-CVU
<b>Symptom</b>	Performing a frequency sweep with the start frequency higher than the stop frequency (sweep down) may calculate incorrect frequency points.
<b>Workaround</b>	None.

<b>Issue number</b>	<b>SCS-6936</b>
<b>Subsystem</b>	Clarius
<b>Symptom</b>	Monitoring of PMU multi-channel tests does not work.
<b>Workaround</b>	None.
<b>Issue number</b>	<b>SCS-7468</b>
<b>Subsystem</b>	Clarius
<b>Symptom</b>	Some projects created in Clarius 1.12 cannot be opened using Clarius 1.11 and prior releases. Attempting to open the project in Clarius 1.11 results in "Corrupted test run history" messages.
<b>Workaround</b>	Use Clarius 1.12 to export the project to a <code>.kzp</code> file with the "Export run data for Clarius version 1.11 or earlier" enabled. Import the project in Clarius 1.11.

## Usage notes

### Visual Studio Code Workspace Trust

As of May 2021, Visual Studio Code opens new file directories in Restricted Mode. Some Visual Studio Code features such as code execution and extensions are automatically disabled. Some features of the Clarius software (such as the KULT code extension) will not work unless you enable Workspace Trust for the applicable folders.

Follow this link for more information on trusting workspaces, enabling code extensions, and other topics related to Restricted Mode:

<https://code.visualstudio.com/docs/editor/workspace-trust>

### 4200A-CVIV

Before using the Model 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. Make sure to close the Clarius application before opening KCon on the desktop. Then run the **Update Preamp, RPM, and CVIV Configuration** option in KCon. 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. Make sure to close the Clarius application before opening KCon on the desktop. Then run the **Update Preamp, RPM, and CVIV Configuration** option in KCon.

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.

## 4210-CVU or 4215-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 4200A-CVIV, a best practice is to use the `cvu-cviv-comp-collect` action.

## 4200-SMU, 4201-SMU, 4210-SMU, or 4211-SMU

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:

- Use the `setmode` command when generating user modules to turn off the compliance indicator value. With this workaround, the reading is returned as 105% of the present range.
- Use smaller sweep and ramp rates ( $dv/dt$  or  $di/dt$ ).
- Use fixed SMU ranges.

## LPTLIB

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 autorange to a higher range or set a higher voltage range with `rangev`.

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 autorange to a higher range or set a higher current range with `rangei`.

## KULT

If you change or need to rebuild `ki82uilib`, please note that `ki82uilib` depends on `ki590uilib` and `winuilib`. You must specify these dependencies in the Options > Library Dependencies menu in KULT before building `ki82uilib`. 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 – 1 nA:** The default current measurement range for 4200 SMUs with preamplifiers.
- **Limited Auto – 100 nA:** The default current measurement range for 4200 SMUs without preamplifiers.

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 sets SMU1 (with preamplifier) to the Limited Auto – 10 pA range

## Microsoft® Windows® mapped network drive error

When installing Clarius+ on a personal computer, 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 computer.

## Computer installation, language packs

Clarius+ does not support additional languages in Microsoft Windows 10 other than 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 reinstall Clarius+ software on your 4200A-SCS. All CVU Open, Short, and Load compensation constants must be re-acquired after the latest version is installed.

If you are installing Clarius+ and ACS on the same system, Clarius+ must be installed first.

If you are using the KULT Extension, you must uninstall and reinstall the KULT Extension after installing Clarius+.

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

Installing Clarius+ software reinstalls the `C:\S4200\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. Uninstall the 4200A-SCS Clarius+ Software Tools

Before installing Clarius+, you need to uninstall the existing version using Windows Control Panel.

If you are uninstalling a version of Clarius+ later than V1.12 and plan to install an earlier version, you need to convert the projects from the HDF5 data file format to the Microsoft Excel 97 .XLS data format.

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### NOTE

If you want to export run data for use in an earlier version of Clarius+ without uninstalling, you can use the Projects > Export option. Refer to the topic "Export a project" in the Learning Center for detail.

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#### ***To uninstall Clarius+:***

1. From Start, select **Windows System > Control Panel**.
2. Select **Uninstall a program**.
3. Select **Clarius+**.
4. For the prompt "Do you want to completely remove the selected application and all of its features?", select **Yes**.
5. On the Convert Data Files dialog, if you want to:
  - Install a version prior to v1.12: Select **Yes**.
  - Reinstall v1.12 or a later version: Select **No**.
6. After completing the uninstall procedure, install Clarius+ as described in the release notes for the version you are installing.

## STEP 3. Install the 4200A-SCS Clarius+ Software Tools

You can download the Clarius+ software from the [tek.com](http://tek.com) website.

#### ***To download and install the Clarius+ software from the website:***

1. Go to [tek.com](http://tek.com).
2. Select the **Support** link.
3. Select **Find Software, Manuals, FAQs by Model**.
4. In the Enter Model field, enter **4200A-SCS**.
5. Select **Go**.
6. Select **Software**.
7. Select the software version.
8. Select the software link that you want to download. Note that you will need to log in or register to continue.
9. Unzip the downloaded file to a folder on the C:\ drive.
10. Double-click the `setup.exe` file to install the software on your 4200A-SCS.

11. 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.
12. 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 4. Initialize each 4200A-SCS user account

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 Microsoft Windows login screen, type the user name and password of the account to be initialized. This must 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 initializes the current user.

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

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### NOTE

The HTML5-based Learning Center is not supported in Internet Explorer. The installation will install Microsoft Edge Chromium, but you may need to change the default browser on user accounts that have the default set to Internet Explorer. You can use one of the following browsers: Microsoft Edge Chromium, Google Chrome, or Firefox.

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## STEP 5. Upgrade 42x0-SMU, 422x-PxU, 4225-RPM, 4225-RPM-LR, 4210-CVU, and 4200A-CVIV firmware

Clarius software checks for compatible instrument firmware during startup and does not run if all instruments are not upgraded to compatible firmware versions.

To find the current hardware and firmware versions of your 4200A-SCS cards, use the KCon utility and select each card.

The firmware upgrade program automatically indicates the hardware that needs to be upgraded to the approved or latest firmware version.

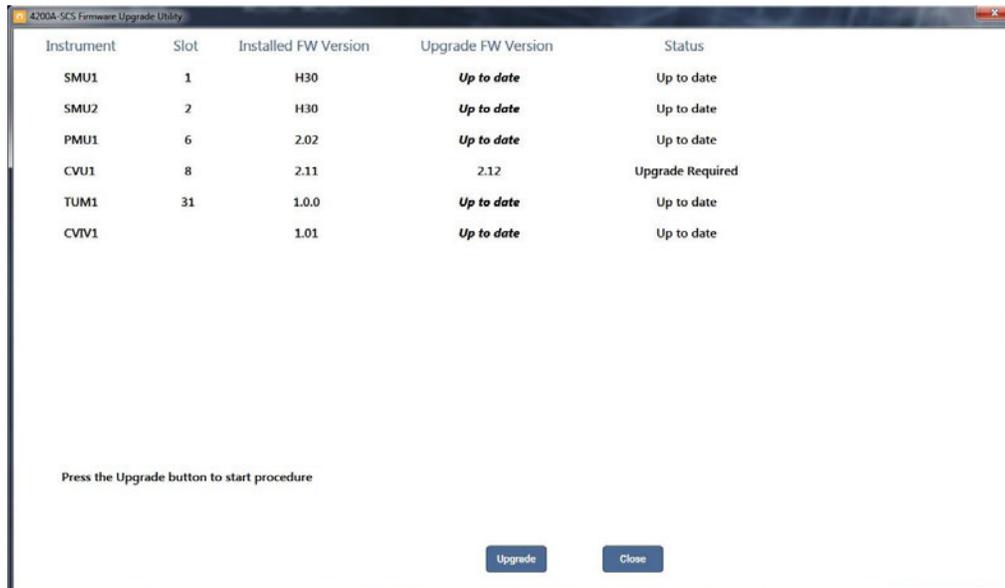
The 4200A-SCS cards are organized by families of related models, as shown in the following.

**To upgrade the firmware of your 4200A-SCS cards:**

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 Microsoft 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 an instrument, as shown below.
5. Select **Upgrade**.

The Firmware Upgrade Utility dialog below shows that the upgrade is not complete. The CVU1 requires upgrading.

**The Firmware Upgrade Utility dialog**

## Version table

4200A-SCS instrument family	Hardware version from KCon	Firmware version
4201-SMU, 4211-SMU, 4200-SMU, 4210-SMU <sup>1</sup>	05,XXXXXXXX or 5,XXXXXXXX	H31
	06,XXXXXXXX or 6,XXXXXXXX	M31
	07,XXXXXXXX or 7,XXXXXXXX	R34
4200-PA	This product cannot be flash upgraded in the field	–
4210-CVU	ALL (3.0, 3.1, 4.0, and later)	2.15
4215-CVU	1.0 and later	2.16
4220-PGU, 4225-PMU <sup>2</sup>	2.XX only	2.08
	3.XX only	3.00
4225-RPM, 4225-RPM-LR	1.0 and later	2.00
4200A-CVIV <sup>3</sup>	1.0	1.05
4200A-TUM	1.0	1.0.0
	1.3	1.1.30

<sup>1</sup> There are several different models of SMUs available in the 4200A-SCS: 4201-SMU or 4211-SMU (medium power) and 4210-SMU or 4211-SMU (high power); all use the same firmware file.

<sup>2</sup> 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.

<sup>3</sup> The 4200A-CVIV firmware contains two files to upgrade. The firmware utility uses both files in the version folder.