



We re-cabled the Cartman 4200 today. Now SMU 1 and PMU 1-1 are both connected to 4225-RPM 1-1, and SMU 2 and PMU 1-2 are both connected to 4225-RPM 1-2. The 4225-RPM will automatically select/switch between SMU and PMU according to the test program. Please do not change the line connection!





For users who only use SMU, please regard 4225-RPM 1-1/1-2 as SMU 1/SMU 2, and they can be used as before. For users who use PMU, the automatic switching function of 4225-RPM can save the time of manually changing cables. Once again, if you want to use the PMU function, please contact the first response for training.

The updated Keithley 4200 has more functions and a new interface, here are some guides and rules.

- 1. To login for the first time, you need to connect to the Internet and login with your LiU ID. Similar to many other instruments. If you cannot log in normally, please contact LiU helpdesk. After login, new interface "**Clarius**" will automatically load. The interface is showed below.
- 2. Please use your **own** test program every time you use it, and it is **forbidden** to change the test program of other users. To create and edit test programs, enter from "**My Projects**".

Select Configure	Analyze	Yoola My Project	My Settings Learning Center
b) Copy aut aut 	Tests     Devices     Actions     Wafer Plan     Projects       Outer     Sort By.     Test Library (129)     Image     Description       Name: A to Z     Image     Searth     Image     Description       Image     Custom Test     Add a blank test that can be configured into a DC, Pulse, or C-V test ((TM)).     Choose a test from a preprogrammed library (UTM).	Filters Help      Technology      Dectrochemistry     Materials      Memory     Nanotech     Organic	Device Type Capacitor Diode Electrochemistry Generic Resistor
– vgs-id – ig-vg – cv-nmosfet – pulse-vds-id	Capacitor High-Voltage Bias Capacitance Measurements (200vbias) Applies a high-voltage and measures the capacitance as a function of time of a capacitor.	Semiconductor	Solar Cell Transistor Other
– waveform-meas 〈 3terminal-npn-bjt – vce-ic	Capacitor High-Voltage C-V Sweep (200vsweep) Makes a high-voltage C-V sweep on a capacitor.	CV	2 2 3
- gummel - vcsat ww- 2-wire-resistor	Image: Constraint Current vs Gate Voltage (2dfet-id-vg)         Image: Constraint Current vs: Constrain	Resistivity	6 8
- res2t - pulse-resistor ⊖+ diode	Schottky Diode 400V C-V Sweep (400vsweep) Generates a high-voltage C-V sweep on a Schottky diode.	Factory User	

3. In this "My Projects" menu, you can create, load, copy, edit, and delete test programs. With the consent of other users, you can copy their test programs and rename it to your own test program. Don't delete other people's test programs. You can also import or export your own test programs to the personal network hard disk, copy settings from one 4200 to another. The new test program is not compatible with the old version.

afault - Clarius							- a
				Rut 3000	Eave Code		Center Learning Center
Copy Cut	Import Esport	real Sort By: Last A	Accessed V		Search 🗸 Im	age Z Description ype	9
- vds-id - vds-id - subvt	default Demo Project Includes common DC I-V,	C-V, and pulse I-V tests for MOSFETs, BJTs, res	sistors, diodes, and capacitors.			acit le troc eric	or
vgs-id ig-vg cv-nmosfet	Chi-Yuan OECT Chi-Yuan OECT Includes common DC I-V, C	V, and pulse I-V tests for MOSFETs, BJTs, resir	stors, diodes, and capacitors.			stor r Ce sist	r HI tor
pulse-vds-id waveform-meat 3terminal-np	Hanyan OECT Hanyan OECT Includes common DC I-V, C	V, and pulse I-V tests for MOSFETs, BJTs, resir	stors, diodes, and capacitors.			9  3	
vce-ic gummel vcsat	Jennifer_OECT Demo Project Includes common DC I-V, C	V, and pulse I-V tests for MOSFETs, BJTs, resis	stors, diodes, and capacitors.				
wv 2-wire-resiste - res2t		Q	pen Project Exit				
- pulse-resistor	✓ ✓ () Mes	Generates a high-voltage C-V sweep on a sages 2020/10/22 - 12:53:44: Clarius Hard	schottky diode. Jware Server started.		•	ser	
<u>ه</u> ۹						^ 1⊋ 4€ 000 B	NG 100 PM

 After creating your own test program, you can return to the main interface for configuration. Click "Configure" to modify the parameters, and click "Analyze" to view the test results. In "Select" menu, you can search more unit test programs to add to the left list.

C default - Clarius			– 0 ×
Select	Nyze	Tools On My Projects	My Settings Earning Center
0 1 2 1	Tests Devices Actions Wafer Plan Projects	Filters Help	
Copy Cut Passe Hename 1	Test Library (129)	Technology	Device Type
default	Sort By:	Electrochemistry	Capacitor
	Name: A to Z V Description	Materials	Diode
- vds-id	Custom Test	Memory	Electrochemistry
— vtlin	Add a blank test that can be configured into a DC, Pulse, or C-V test (ITM).	Nanotech	Generic
- subvt	Choose a test from a preprogrammed fibrary (UTM).	Organic	Resistor
— vgs-id		Semiconductor	Solar Cell
— ig-vg	Capacitor High-Voltage Bias Capacitance Measurements (200vbias)	Other	Transistor
- cv-nmosfet	Applies a high-voltage and measures the capacitance as a function of time of a capacitor.		Other
— pulse-vds-id		Magguramante	Terminale
waveform-meas	Capacitor High-Voltage C-V Sweep (200vsweep)		2
a 🤇 3terminal-npn-bjt	Makes a high-voltage C-V sweep on a capacitor.		
vce-ic			
— gummel		Pulse	
- vesat	2D FET Drain Current vs Gate Voltage (2dfet-id-vg)	Reliability	0
A www. 2.wire-resistor	ore or realings argument area or a generate a main content tas gate realings can to or a 201 cm	Resistivity	8
		Author	
1621	Schottky Diode 400V C-V Sweep (400vsweep)	Factory	
- pulse-resistor	Generates a high-voltage C-V sweep on a Schottky diode.	User	
⊿ -b+ diode			
	Messages 2020/10/22-12/53/44 Clanus Hardware Server started.		
🛋 🔎 🖽 💽		~ 1	C de 🖾 ING 1017M

5. The interface for parameter modification is different from before. The main interface can modify the simple test range of each SMU, and more detailed settings need to be set in the "Advance" or "All Parameters" menu. The test speed is in the "Test settings" menu.

default - Clarius					- 0
Select Configure	Analyze			Run Stop Save	Yools Ny Projects Vy Settings Learning Center
Copy Cut In Nervame	Delete	vds-id#1		Key Parameters All Parameters	Test Settings Terminal Settings Help
4 terminal o fet				Drain SMU2	
- vds-id				Operation Mode Voltage List Sweep	- Force
- vtlin				List Values Enter Values	Operation Mode Voltage List Sweep
- subvt				Points 20	List Values
— vgs-id				Compliance 0.0011 A	Points 20
- ig-vg	~		VE	Measure Current Report Voltage	Compliance 0.0011 A
- cv-nmosfet	~	Gate SMU3			- Measure
- pulse-vds-id	~	Operation Mode Voltage Bias 🔻		Butik GNOU	Current
- waveform-meas		Bias 0 V		Operation Mode Ground Unit	Range 10mA 🛛
🤇 3terminal-npn-bjt		Compliance 0.1 A	N.		Voltage
- vce-ic	<b>v</b>	Measure Current Meport voltage		Course Child	Report Value Programmed 💌
— gummel	~			Source SMUT	
- vcsat	~			Uperation mode Voltage bias	
www- 2-wire-resistor	~			bias 0 V	
- res2t	~			Compliance 0,1 A	
- pulse-resistor	~			I neasure current I neport Voltage	
- diode					

6. In the test result "**Analyze**" interface, you can choose to display the data list, images, and both. You can select multiple test results to superimpose in the image, in the right side menu.

Select Configure	Analyze							Put	Stop Save	Teo	As My Projects My Sett	ngs Learning Cent
B X B /	ÎÎ ve	ds-id#1					Vie	w 🕑 🏢	Save Duta	D	Run History Terminal Se	ttings Help
Copy Cut Parts Hename	Delete	un10 Formulas Li	st					Local Control of Contr	- Formulator	16	Run10 10/21/2020 11:47:22.272	***
4terminal-n-fet		Time	Drainl	DrainV	Gatei	GateV					More	Exec: 5.5
	1	48.34335-3	-7.29195-6	-200.0000E-3	1.29515-6	000.0000E-3					10/21/2020 11 43 58 533	**
V05-10	2	99.52038-3	-6.8897E-6	-200.0000E-3	920.08445-9	000.0000E-3					More	Exec: 7 s
vtlin		150.6965E-3	6 6485E-6	-200.0000E-3	734.6698E-9	000.0000E-3					Run8 10/21/2020 11:32:35.068	**
subvt		253.0087E-3	-6.3883E-6	-200.0000E-3	519,76765-9	000.0000E-3					More	Exec: 125
une ld	6	304.1924E-3	6 3090E-6	-200.0000E-3	448 11996-9	000 0000E-3					Run7	**
vgs-u	7	355.3705E-3	-6.2378E-6	-200.0000E-3	376.48266-9	000.0000E-3					More	Exec: 32 I
- ig-vg	✓ 8	406.5247E-3	-6.1922E-6	-200.0000E-3	376.4826E-9	000.0000E-3					Run6	**
- cv-nmosfet		457.6912E-3	-6 1522E-6	-200.0000E-3	321 7010E-9	000.0000E-3					10/21/2020 11 19:07.438	~~~
pulse-vds-id		509.0921C-3	-6.11346-9	-200.0000E-3	330,12936-9	000.00002-3					Run5	**
waveform-meas		· · ·							Hun bettings		More	Esec. 16 s
	102	1.00-041				n-MOSFET D	n Family		Graph Settings.	-	Run4	where where
3terminal-npn-bjt	~	1.42.00									3/3/2017 20:18:17.923	AA
vce-ic	<b>v</b>	1.28-04					(			1 <b>-</b>	Bup3	Exec. 9.6
aummel		8.06-05									3/3/2017 20 17 44 618	XX
damine.		4.00-01									More	Exec: 10 r
vesat	~	2 08-01									Run2 8/3/2017 20:17:13:371	**
w 2-wire-resistor	~	2 05 05					· · · · · · · · · · · · · · · · · · ·			1	More	Exec. 9 s
res2t		-4 07-02		ę			8	ę		8 Date	Name Ch	ecked Star
- pulse-resistor	~			101			ne	86		5		
diode										_		

7. The new "**Configure**" interface makes it easier to copy unit tests. In the menu, right-click the unit test to copy and paste, and rename it. You can save multiple unit tests of similar types.

Select Configure Analyze	Run Stop Stor	Cola Kay Projecta Lag Cola Lagranda Central
Image: Section of the section of th	Key Parameters         All Parameters         Drain       SMA2         Operation Mode       Voltage List Survep         List Values       Compliance         Objection Mode       Output         Messure Current       Report Voltage         Source       Source         Uperation Mode       Voltage Bias         V       Bias         Operation Mode       Voltage Bias         Wassure Current       Report Voltage	Test Settings Terminal Settings Help   vds-id#1 Advace   - Measure Settings Image: Speed Normal Image: Speed Image: Sp

8. USB data copying has been **banned** by IT engineers. Please save all the test data in the **personal network hard disk**, do not save them in the C drive.

File     Computer     Vie	ew					
> - 🛧 🔜 > Thi	is PC >					
🖈 Quick access		V Folders (6)				
Desktop	1	Deskton	Documents	Downloads	Music	Pictures
Downloads	1	- Deskop	. Sociality	- Connords	, music	
Documents	*	v Devices and drives (1)				
Pictures Chi-Yuan OECT	*	4200A-SCS (C:) 193 GB free of 224 GB	1			
This PC		chiya01 (\\ad.liu.se\home) (H:)	itn (\\fillager.liu.se\liu) (l:)	ResearchArchive (Z:)	Labview programs (Y:)	
🥩 Network		186 GB free of 186 GB	198 GB free of 1.46 TB	952 GB free of 1.42 TB	164 GB free of 583 GB	

## 11 items

9. This guides and rules applies to Keithley 4200 in both FET station and Cartman.