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General information

This document describes the features added to the Keithley Instruments Automated Characterization Suite (ACS) Basic Edition software (version 3.2).

The ACS Basic Edition software supports component characterization testing of packaged parts and wafer-level testing using a manual probe station. ACS Basic Edition software can be installed on any computer, including Keithley Instruments Model 4200A-SCS Parameter Analyzer or Model 4200 Semiconductor Characterization System (4200-SCS).

Supported operating systems

ACS Basic Edition software is supported on the following operating systems:

Windows® 11, 64-bit

Windows® 10, 64-bit

Windows® 10, 32-bit

Windows® 7, 64-bit

Windows® 7, 32-bit



ACS Basic Edition revision history

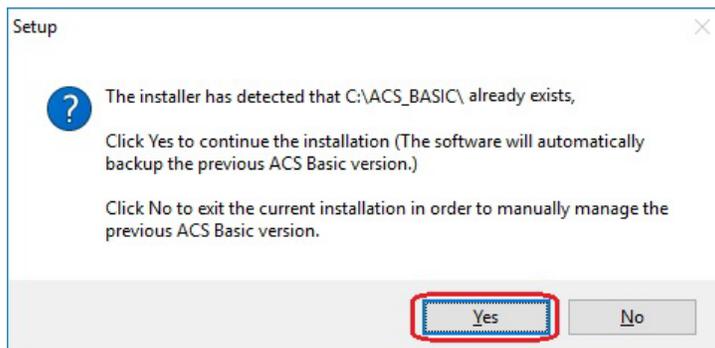
Version	Release date
3.2	November 2022
3.1	March 2022
3.0	August 2021
2.1.5	November 2017
2.1	November 2015
2.0	September 2012
1.3	July 2011
1.2	September 2010

Install ACS Basic

To install ACS Basic software:

1. Log in to your computer as an Administrator.
2. Open the ACS Basic executable file.
3. Select **Yes** if you have an older version of ACS Basic installed.

Figure 1: ACS Basic Software installation



4. Follow the instructions to specify how you want to install the software on your system.

Once the updated version of ACS Basic is installed, the older version will be renamed. You can copy the projects and libraries from the previous version using the following steps.

To copy and paste folders:

1. Find the `C:\ACS_BASIC_DDMMYYYY_HHMMSS\Projects\` folder; copy and paste to the current `C:\ACS_BASIC\Projects` folder.
2. Find the `C:\ACS_BASIC_DDMMYYYY_HHMMSS\library\pyLibrary\PTMLib\` folder; copy and paste to the current `C:\ACS_BASIC\library\pyLibrary\PTMLib\` folder.
3. Find the `C:\ACS_BASIC_DDMMYYYY_HHMMSS\library\26library\` folder; copy and paste to the current `C:\ACS_BASIC\library\26library\` folder.

NOTE

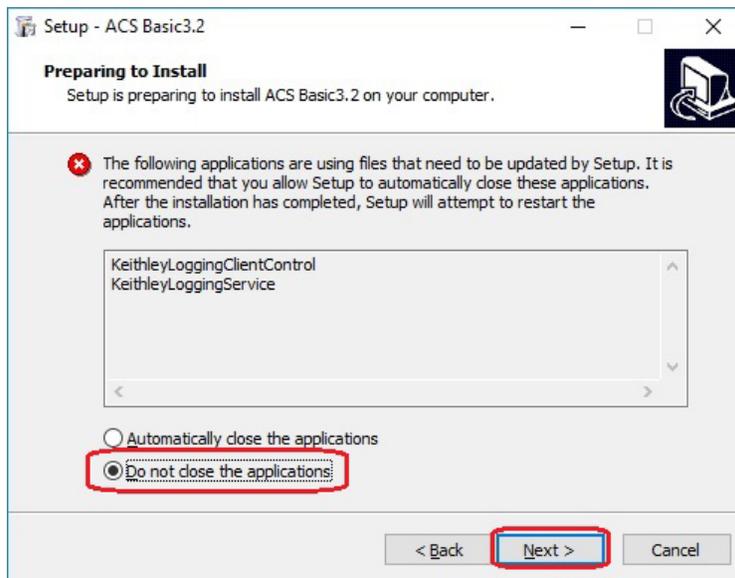
ACS Basic 3.2 is based on the Python 3.7 programming language. If you customized your projects in a previous version of ACS Basic you may need to change the projects created in the older version of ACS Basic, which includes the Python language test module (PTM) script libraries. You can go to this site to review the Python changes for more detail:

<https://docs.python.org/3/whatsnew/3.7.html#porting-to-python-37>

NOTE

When installing ACS Basic on a 4200A-SCS Parameter Analyzer, the following applications use files needed to close applications. Select **Do not close applications** and click **Next** to install (see the following figure). If you select **Automatically close the applications**, you must restart the computer after the installation has completed.

Figure 2: ACS Basic 3.2 prepare to install



Supported models and test configurations

ACS Basic Edition software can be used to characterize semiconductor devices with a variety of Keithley Instruments products. The *ACS Basic Reference Manual* (part number ACSBASIC-901-01) contains detailed information about the supported hardware and test configurations.

The following table summarizes the instruments supported in the ACS Basic test libraries.

Instrument type	Supported models
SMU Instruments	2600B Series: 2601B, 2602B, 2604B, 2611B, 2612B, 2614B, 2634B, 2635B, 2636B
	2600A Series: 2601A, 2602A, 2611A, 2612A, 2635A, 2636A
	2400 Graphical Touchscreen Series SMU (KI24XX TTI): 2450, 2460, 2460-NFP, 2460-NFP-RACK, 2460-RACK, 2461, 2461-SYS, 2470
	2400 Standard Series SMU: 2401, 2410, 2420, 2430, 2440
	2606B High Density SMU
	2650 Series for High Power: 2651A, 2657A
Parameter Analyzers	4200A and supported cards/modules (4210-CVU, 4215-CVU, 4225-PMU/4225-RPM, 4225-RPM-LR, 4200-SMU, 4201-SMU, 4210-SMU, 4211-SMU, 4200-PA, 4200A-CVIV)
DMMs	DMM7510, 2010 Series
Switching Systems	707A/B, 708A/B, 3700A
Pulse Generators	3400 Series

NOTE

The graphical interactive test module (ITM) supports 24xx Touch Test Invent® (TTI) instruments and 26xx instruments at the same time. The 24xx instrument should be connected as the primary and the 26xx connected as subordinate.

You can control any test script processor (TSP™) instrument using script test module (STM) script. You can control any instrument using the Python language test module (PTM) script, including instrumentation from other vendors.

Also, existing ACS Basic STM and PTM libraries support specific instruments based on the library definition.

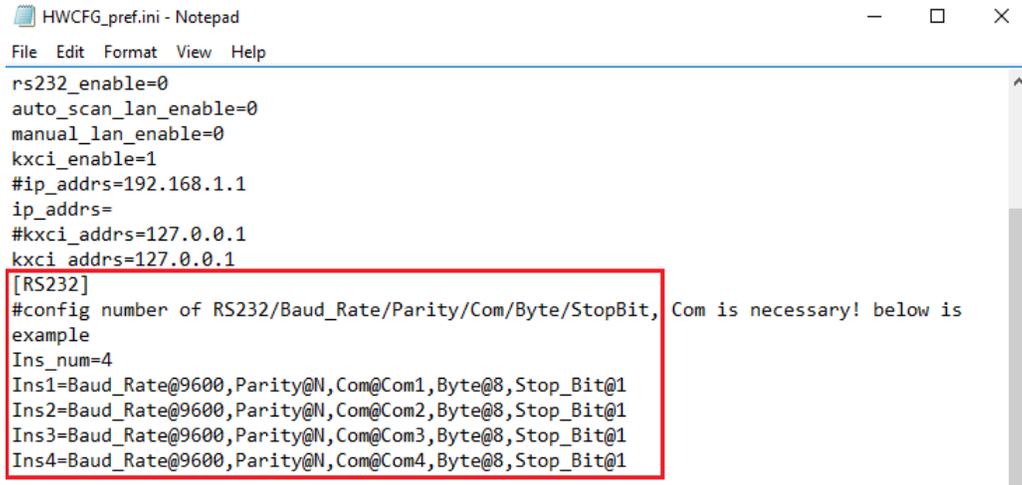
Supported communication interfaces

- GPIB
- LAN (Auto Scan and LAN)
- USB
- RS-232

NOTE

If you are using a RS-232 connection, the instrument will not be automatically added to the hardware configuration. You will have to add instruments connected with RS-232 manually. Change the hardware configuration file that is in the following directory on your computer:

C:\ACS_BASIC\HardwareManagementTool\HWCFG_pref.ini. In this file you will need to change the Baud rate, parity, byte, and stopBit settings. Review the following figure for details.

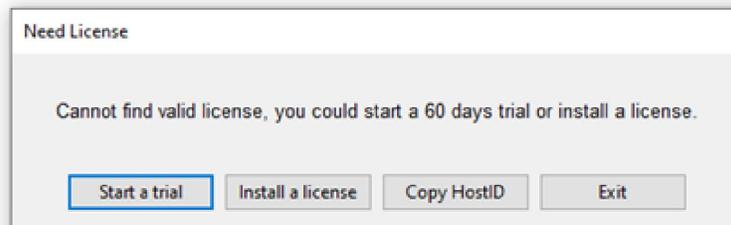


```
HWCFG_pref.ini - Notepad
File Edit Format View Help
rs232_enable=0
auto_scan_lan_enable=0
manual_lan_enable=0
kxci_enable=1
#ip_addr=192.168.1.1
ip_addr=
#kxci_addr=127.0.0.1
kxci_addr=127.0.0.1
[RS232]
#config number of RS232/Baud_Rate/Parity/Com/Byte/StopBit, Com is necessary! below is
example
Ins_num=4
Ins1=Baud_Rate@9600,Parity@N,Com@Com1,Byte@8,Stop_Bit@1
Ins2=Baud_Rate@9600,Parity@N,Com@Com2,Byte@8,Stop_Bit@1
Ins3=Baud_Rate@9600,Parity@N,Com@Com3,Byte@8,Stop_Bit@1
Ins4=Baud_Rate@9600,Parity@N,Com@Com4,Byte@8,Stop_Bit@1
```

Software license

ACS Basic allows you to create tests, manipulate settings, and view previous data without a license. However, you must have a license for ACS Basic in to control and retrieve data from a physical instrument. You can launch a one-time, 60-day trial for ACS Basic after the initial installation. Once the license expires, you will need to purchase a full license to use the software.

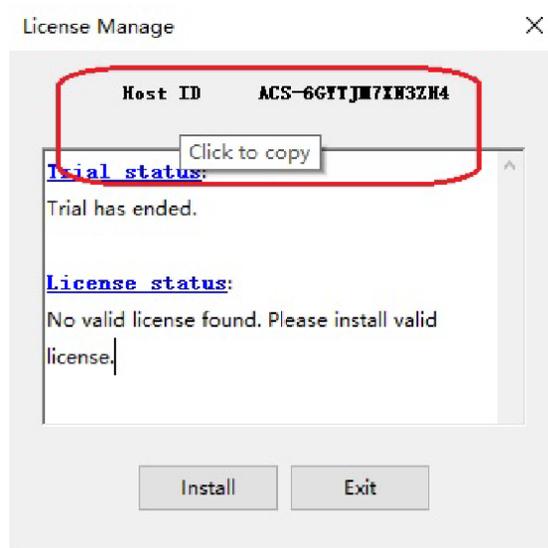
Figure 3: ACS Basic 3.2 license information



License management

The ACS Basic software license is managed using the Tektronix Asset Management System (TekAMS). To generate a license file, you must submit your Host ID to TekAMS. For more information on TekAMS, see tek.com/products/product-license. To find the host ID, open the License Manage dialogue box from the ACS Basic Help menu. Select **License > Host ID** > click to copy the Host ID. Select **Install**.

Figure 4: ACS Basic Host ID 3.2 license information



ACS Basic Edition version 3.2

Enhancements

Hardware configuration	
Issue number:	ACS-578
Enhancement:	Updated ACS Basic Hardware Management to display the 4215-CVU model on the configuration page.
License management	
Issue number:	ACS-617
Enhancement:	Updated the ACS Basic annual license (ACS-BASICFL-AN) and the ACS Basic 3-month license (ACS-BASICFL-3MO).
Issue number:	ACS-590
Enhancement:	Created two new ACS-BASIC licenses (ACS-BASICNL and ACS-BASICNL-UP).

ACS Basic software, plot and libraires

Issue number:	ACS-597
Enhancement:	The ACS graphical user interface (GUI) has been updated to fix the GUI refresh interval time. ACS Basic v3.1 interval of .csv output.
Issue number:	ACS-581
Enhancement:	Updated the capacitance voltage ITM (CVITM) to support the 4215-CVU and added a step option to the sweep function in the KI42xxCVU library.
Issue number:	ACS-580
Enhancement:	Optimized the 4215-CVU slow compensation problem.
Issue number:	ACS-579
Enhancement:	Updated the generic HV libraries (GenericHVCVlib) to support the 4215-CVU instrument.
Issue number:	ACS-570
Enhancement:	Optimized the PTM due to the slow switching problem.
Issue number:	ACS-565
Enhancement:	Optimized the ITM due to the slow switching problem.
Issue number:	ACS-557, CAS-87771-M8P0Q5
Enhancement:	Added ACS Basic plotting enhancements.
Issue number:	ACS-539
Enhancement:	Updated the graph Y legend color and the Y1 and Y2 autoscale feature.
Issue number:	ACS-537
Enhancement:	Updated the ability for you to move graph legends.
Issue number:	ACS-536
Enhancement:	Updated the graph display to indicate non-zero digits on the graph axis.
Issue number:	ACS-530
Enhancement:	Added a gate charge test to use with the PTM while using ACS software.
Issue number:	ACS-337
Enhancement:	ACS Basic supports Windows 11.

Resolved issues

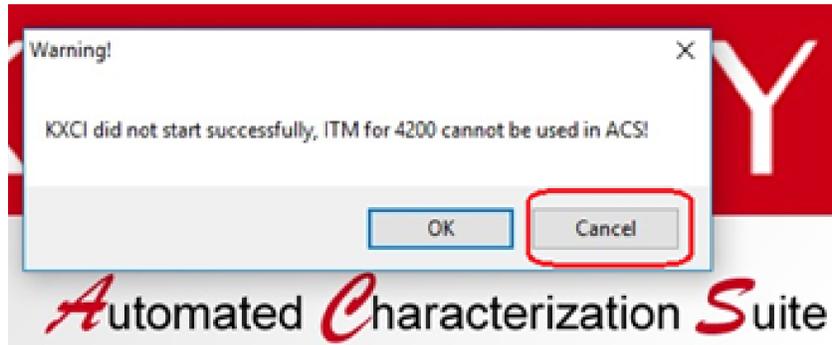
Issue number:	ACS-636, CAS-110171-W5M7C5
Symptom:	The Model 2290 instrument PM Library is not functional in ACS Basic v3.1.
Resolution:	This issue has been corrected.
Issue number:	ACS-632
Symptom:	When combining an SMU in series using 400 v is not functional in Trace Mode.
Resolution:	This issue has been corrected.
Issue number:	ACS-629, CAS-107068-G0G8Y6
Symptom:	There is an issue with the ACS Basic graph data selection.
Resolution:	This issue has been corrected.
Issue number:	ACS-628, CAS-107028-W3B7G8
Symptom:	The ACS Basic X-logscale is wrong.
Resolution:	This issue has been corrected.
Issue number:	ACS-626, CAS-106361-C5B8G3
Symptom:	The Model 2612B pulse testing feature was incorrect.
Resolution:	This issue has been corrected.
Issue number:	ACS-625, CAS-106360-J9K2B9
Symptom:	The Combine SMU feature is not working in ACS version 3.1.
Resolution:	This issue has been corrected.
Issue number:	ACS-616, CAS-100017-H3J4F6
Symptom:	When user scripts are created and then deleted causes script errors. User scripts should not be deleted.
Resolution:	This issue has been corrected.
Issue number:	ACS-595, CAS-88983-V0D7N8
Symptom:	ACS Basic V3.1 TSP scripts will not pre-load.
Resolution:	This issue has been corrected.
Issue number:	ACS-591
Symptom:	The Keithley Instruments Model 7510 configuration will not function with the matrix card using the Hardware Management Tool.
Resolution:	This issue has been corrected.
Issue number:	ACS-589, CAS-83785-Z9Z2N4
Symptom:	When using an ITM with the power on, the sequence of the power is slow when in IF mode.
Resolution:	This issue has been corrected.
Issue number:	ACS-586, CAS-84619-D6X6V5
Symptom:	When running ACS, the project DC Compensation, the project cannot be disabled.
Resolution:	This issue has been corrected.
Issue number:	ACS-585, CAS-85224-D0R1S0
Symptom:	When using the ACS DC Compensation project with the devint() command, the routing will reset.
Resolution:	This issue has been corrected.
Issue number:	ACS-584, CAS-85223-Q4F2K9
Symptom:	The ACS 2636B instrument IF Source Range 100pA is redundant.
Resolution:	This issue has been corrected.
Issue number:	ACS-583, CAS-83407-H3N3N2, AR67308
Symptom:	ACS will not allow the AC drive voltage of a 4215-CVU instrument to be set higher than 0.1V.
Resolution:	This issue has been corrected.

Issue number:	ACS-577
Symptom:	When using a GPIB communication you will encounter an error using a 24xxPTM without an interlock connection.
Resolution:	This issue has been corrected.
Issue number:	ACS-576
Symptom:	If you connect a 24xx instrument to a 4200 ITM, you will receive an error.
Resolution:	This issue has been corrected.
Issue number:	ACS-568
Symptom:	Unable to install DDUFT-ACS License problem.
Resolution:	This issue has been corrected.
Issue number:	ACS-567
Symptom:	The Keithley Instrument Model 2290 instrument encounters a scanning issue and cannot be used in the power supply library (PowerSupplyLib).
Resolution:	This issue has been corrected.
Issue number:	ACS-566
Symptom:	The off sequence (off_seq) command will not reset an issue if the SMU is turned off manually or by using an ICL command.
Resolution:	This issue has been corrected.
Issue number:	ACS-562
Symptom:	The Model 7530A card was displayed incorrectly in the hardware management tool.
Resolution:	This issue has been corrected.
Issue number:	ACS-561
Symptom:	The capacitance voltage ITM (CVITM) advanced dialog box will not close.
Resolution:	This issue has been corrected.
Issue number:	ACS-560
Symptom:	In the list of instruments, you will see a duplicate of the 2636B instrument and the 2602B is missing in the demo instrument list.
Resolution:	This issue has been corrected.
Issue number:	ACS-558, CAS-87915-C6Q7Y7
Symptom:	The capacitance voltage ITM in CVITM.py script does not work.
Resolution:	This issue has been corrected.
Issue number:	ACS-551, CAS-86141-Z2K7V0
Symptom:	The Model 2461 has issues with the ACS PTM.
Resolution:	This issue has been corrected.
Issue number:	ACS-541, CAS-86743-Q3H3T9
Symptom:	When using an ITM with the Model 24xx, the 24xx it is moved to the front when aborted.
Resolution:	This issue has been corrected.

Software compatibility

Issue number:	N/A
Resolution:	When you start ACS Basic on the 4200A-SCS that has Clarius software version 1.4 or higher (with the Windows 10 operating system), a warning message may appear indicating that KXCI did not start successfully. Select Cancel to dismiss the warning.

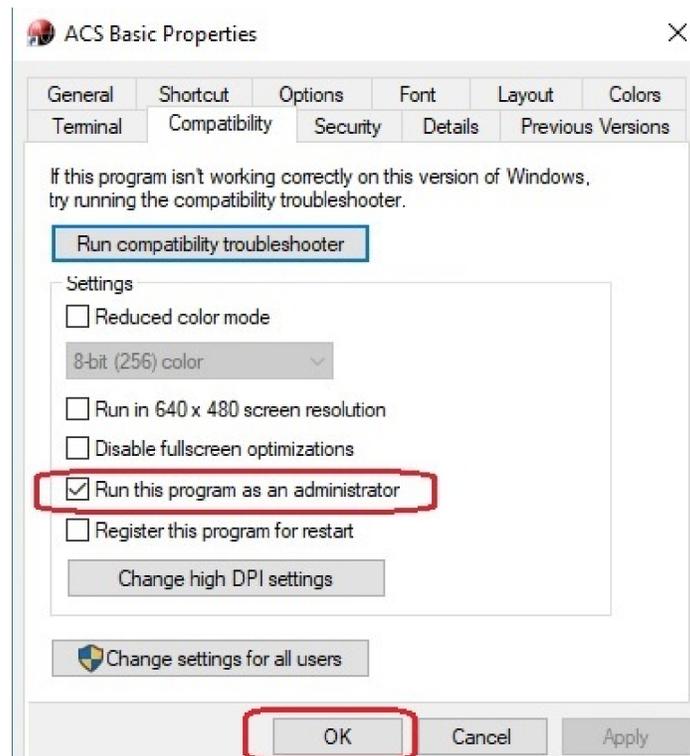
Figure 5: KXCI did not start



To manually configure the compatibility settings:

1. Right-click the **ACS Basic icon** and select **Properties**.
2. Open the **Compatibility** tab.
3. Select **Run this program as an administrator** and click **OK** to save.

Figure 6: ACS Basic properties



Usage note

Issue number:	N/A
Resolution:	If you install a KUSB-488B GPIB driver, you will see the following message. You must select the Keithley Command Compatible option. Select Next to continue the installation.

Figure 7: ACS Basic command compatible

