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GENERAL INFORMATION

This document describes the features added to the Keithley Instruments Automation Characterization Suite (ACS) Standard Edition software (version 6.4).

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

SUPPORTED OPERATING SYSTEMS

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

- Microsoft Windows 11, 64-bit
- Microsoft Windows 10, 64-bit
- Microsoft Windows 10, 32-bit
- Windows 7, 64-bit (with Service Pack 1)
- Windows 7, 32-bit (with Service Pack 1)



ACS STANDARD REVISION HISTORY

Version	Release date
6.4	August 2024
6.3	November 2023
6.2	November 2022
6.1	March 2022
6.0	August 2021
5.4	February 2021
5.3	December 2017
5.2.1	September 2015
5.2	December 2014
5.1	May 2014
5.0	February 2013
4.4	December 2011
4.3.1	June 2011
4.3	March 2011
4.2.5	October 2010
4.2	June 2010

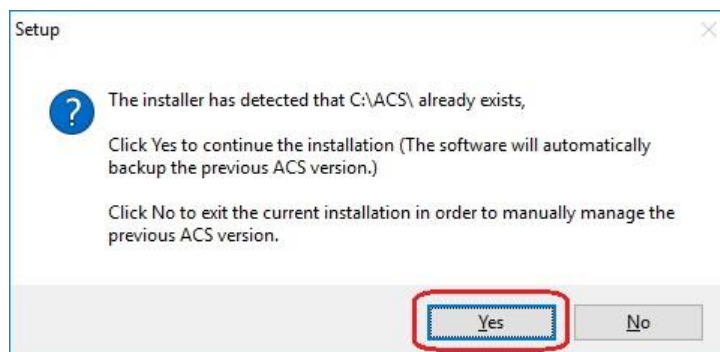
INSTALL ACS

You can install ACS on a personal computer or a 4200A-SCS Parameter Analyzer.

To install ACS software on a personal computer:

1. Log in to your computer as an Administrator.
2. Open the ACS executable file.
3. Follow the software installation instructions.
4. Select **Yes** if you have an older version of ACS installed, as shown in the following figure.

Figure 1: ACS Software installation

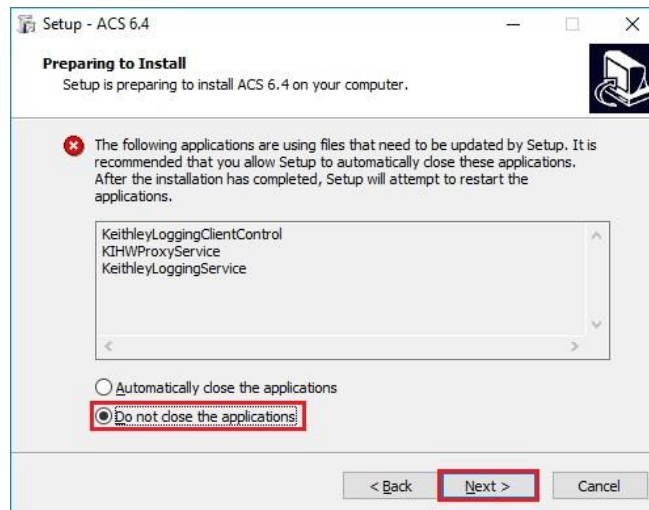


5. Follow the instructions to specify how you want to install the software on your system.
6. If you have projects you need to backup or restore from a previous version of ACS, see [Update previous versions of ACS files](#).

Install ACS on a 4200A-SCS Parameter Analyzer:**NOTE**

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

When you are installing ACS on a 4200A-SCS Parameter Analyzer, the following dialog is displayed. It indicates that the applications identified are needed for installation. Make sure you select **Do not close applications** and **Next** to install (see the following figure).

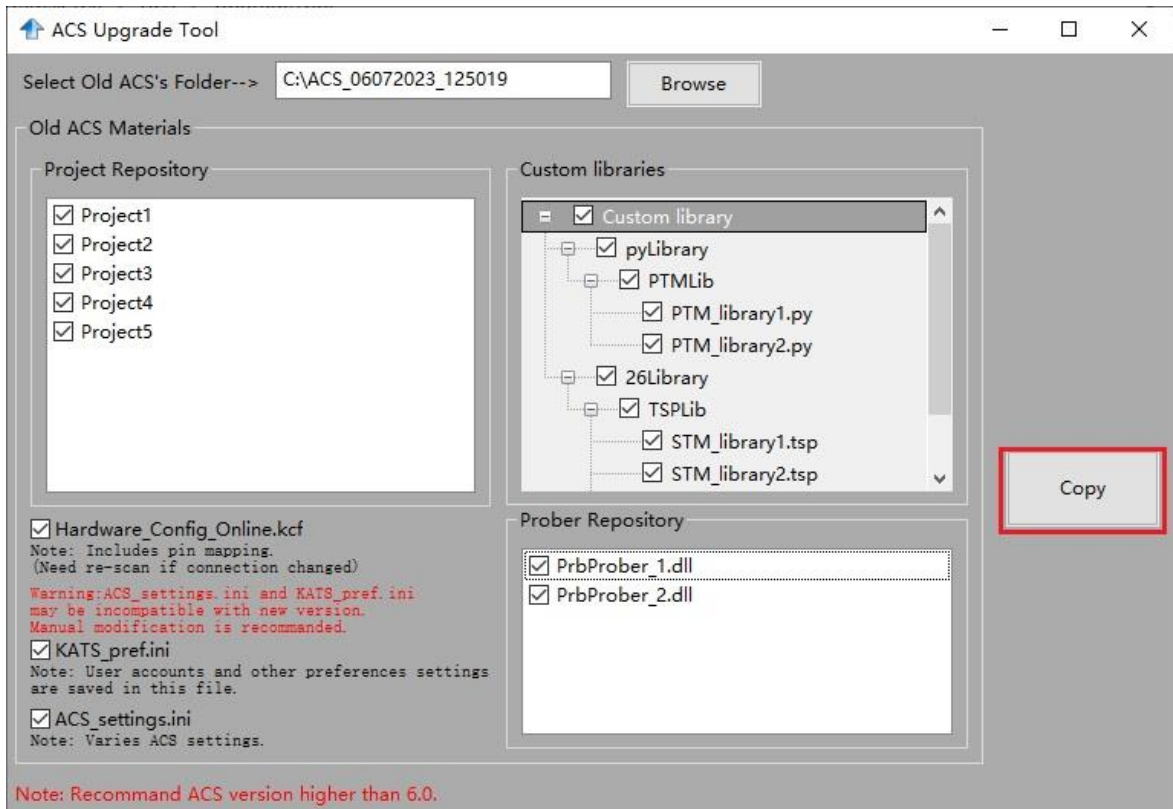
Figure 2: ACS 6.4 Preparing to Install dialog**UPDATE PREVIOUS VERSIONS OF ACS FILES**

Once ACS is installed, you can use the `UpgradeTool.exe` to convert your ACS 6.0 files or later to the present version, which includes projects, libraries, and settings from previous versions.

To update previous software files:

1. Go to `C:\ACS\UpgradeTool\`.
2. Double-click **UpgradeTool.exe**.
3. Choose the items in the folder you want to update (see the following figure).

Figure 3: ACS Upgrade Tool



4. Select **Copy**.

When the updated version of ACS is installed, the previous version is renamed. You can copy the projects and libraries from the previous version using the following steps.

NOTE

If you have ACS version 5.4, or a previous version, you must manually copy the projects and libraries using the following steps.

To copy and paste folders:

1. Locate the C:\ACS_DMMYYYY_HHMMSS\Projects\ folder.
2. Copy and paste to the present C:\ACS\Projects\ folder.
3. Locate the C:\ACS_DMMYYYY_HHMMSS\library\pyLibrary\PTMLib\ folder.
4. Copy and paste to the present C:\ACS\library\pyLibrary\PTMLib\ folder.
5. Locate the C:\ACS_DMMYYYY_HHMMSS\library\26library\ folder.
6. Copy and paste to the present C:\ACS\library\26library\ folder.

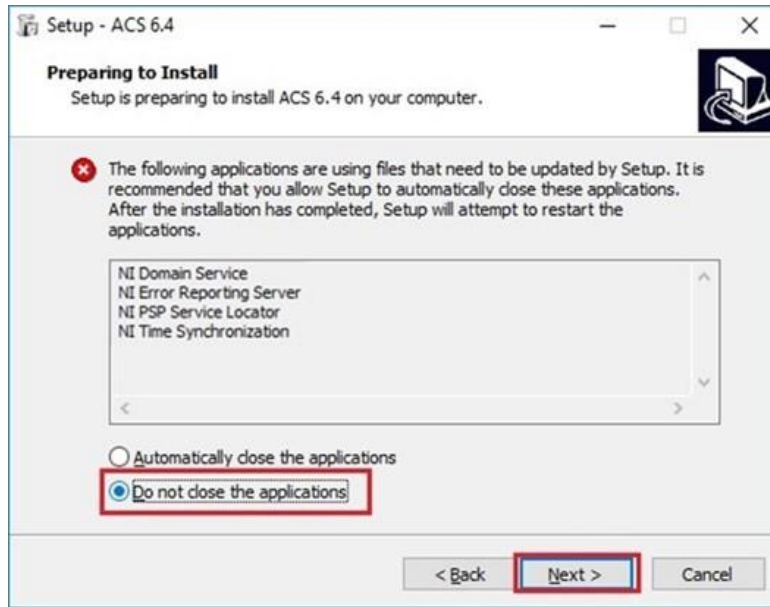
NOTE

ACS 6.4 is based on the Python 3.7 programming language. If you customized your projects in a previous version of ACS you may need to change the projects created in the previous version of ACS, 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-3.7>.

INSTALL ACS AFTER INSTALLING NI-488.2 DRIVERS

If you are installing ACS on a system that contains NI-488.2 drivers, the following dialog is displayed, indicating that the applications identified are needed for installation. Make sure you select **Do not close applications** and **Next** to install (see the following figure).

Figure 4: ACS 6.4 prepare to install



SUPPORTED MODELS AND TEST CONFIGURATIONS

ACS software is used to characterize semiconductor devices with a variety of Keithley Instruments products in a variety of different test configurations. The *ACS Fundamentals Reference Manual* (part number ACS-914-01) and *ACS Advanced Features Reference Manual* (part number ACS-908-01) contain detailed information about the supported hardware and test configurations.

- Perform multi-group testing with the Series 2600B and 2400 Graphical Series SMU instruments using ACS software installed on a personal computer or laptop.
- Control hardware using ACS software installed on the Model 4200A-SCS Parameter Analyzer or Model 4200-SCS.
- Perform combined group testing with a 4200A-SCS Parameter Analyzer or 4200-SCS and Series 2600B instruments using the combined test-execution engine in ACS software.
- Control other external GPIB, LAN, or USB instruments using ACS software installed on a personal computer or laptop.

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

Instrument type	Supported models
SMU instruments	2600B Series: 2601B-PULSE (DC only), 2601B, 2602B, 2604B, 2611B, 2612B, 2614B, 2634B, 2635B, 2636B
	2600A Series: 2601A, 2602A, 2611A, 2612A, 2635A, 2636A
	2400 Graphical Series SMU (KI24XX TTI): 2450, 2460, 2460-NFP, 2460-NFP-RACK, 2460-RACK, 2461, 2461-SYS, 2470
	2400 Standard Series: 2401, 2410, 2420, 2430, 2440
	2650 Series for High Power: 2651A, 2657A
Parameter analyzers	4200A, including the following 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	DMM6500, DMM7510, 2010 Series
Sensitive	6220, 6221, 2182A
Switching and data acquisition systems	DAQ6510, 707A/B, 708A/B, 3700A
Pulse generators	3400 Series

The following probers are supported in ACS.

Probers	Manual Prober Micromanipulator 8860 Prober Suss MicroTec PA200/Cascade CM300 Prober Cascade 12000 Prober Cascade S300 Prober Electroglas EG2X Prober Electroglas EG4X Prober TEL P8/P12 Prober TEL 19S Prober Tokyo Semitsu TSK9(UF200/UF3000/APM60/70/80/90) Prober Wentworth Pegasus 300S Prober with SRQ check Micromanipulator P300A Prober Yang Sagi3 Prober with SRQ check Signatone CM500 Prober (WL250) TEL T78S/80S Prober MPI SENTIO Prober Semiprobe SPFA Prober MJC AP-80 (SP-80) prober Apolowave AP200/AP300 Prober Vector Semiconductor AX/VX Series prober HiSOL prober (Python code)
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NOTE

The graphical interactive test module (ITM) supports 24xx Graphical Series SMU instruments and 26xx instruments at the same time. The 24xx instrument should be connected as the primary instrument and the 26xx connected as the subordinate.

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

Existing ACS STM and PTM libraries support specific instruments based on the library definition.

SUPPORTED COMMUNICATIONS INTERFACES

- GPIB
- LAN (Auto Scan and LAN)
- USB
- RS-232 (see following topic)

CONNECTING RS-232 INSTRUMENTS

If you are using an RS-232 connection, the instrument is not automatically added to the hardware configuration.

To add RS-232 instruments:

1. Add instruments connected with RS-232 manually.
2. Open the hardware configuration file, located at
C:\ACS\HardwareManagementTool\HWCFG_pref.ini. An example is shown in the following figure.
3. In the [RS232] section, change the baud rate, parity, byte, and stopBit settings to match your setup.

Figure 5: RS-232 connection

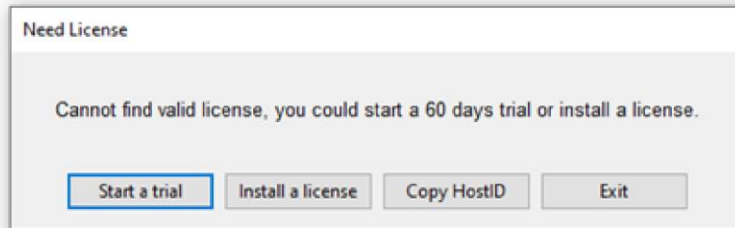


```
HWCFG_pref.ini - Notepad
File Edit Format View Help
rs232_enable=0
auto_scan_lan_enable=0
manual_lan_enable=0
kxci_enable=1
#ip_addr=192.168.1.1
ip_addr=
#kxci_addr=127.0.0.1
kxci_addr=127.0.0.1
[RS232]
#config number of RS232/Baud_Rate/Parity/Com/Byte/StopBit, Com is necessary! below is
example
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 allows you to create tests, manipulate settings, and view previous data without a license. However, you must have a license for ACS to control and retrieve data from a physical instrument. You can launch a one-time, 60-day trial for ACS after the initial installation. Once the trial expires, you need to purchase a full license to use the software.

Figure 6: ACS 6.4 license information



LICENSE MANAGEMENT

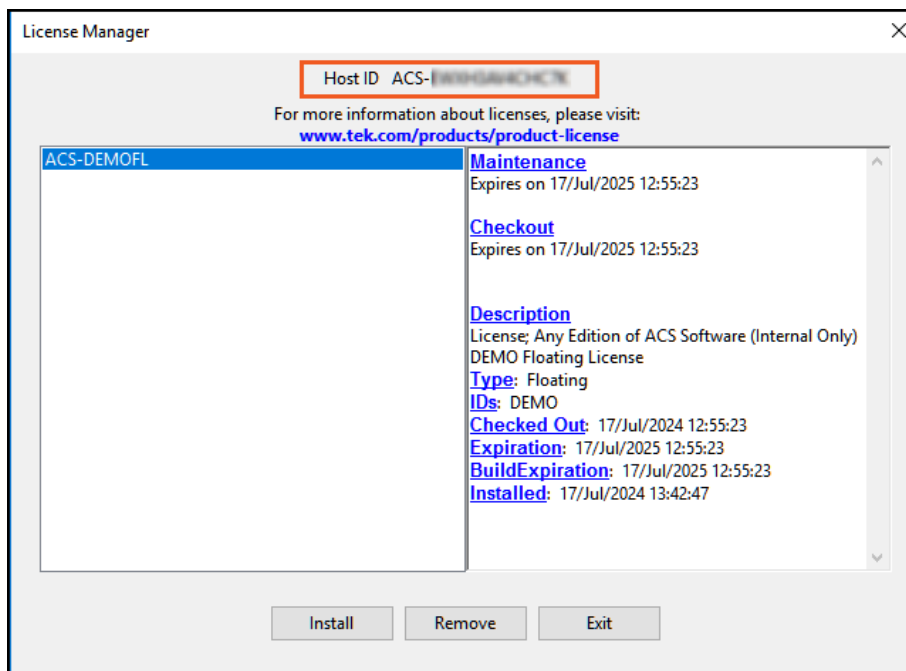
The ACS software license is managed using the Tektronix Asset Management System (TekAMS). For more information about TekAMS, see tek.com/products/product-license.

To generate a license file, you need to submit your Host ID to TekAMS and install the license file, as described in the following procedure.

To generate a license file:

1. In ACS, select **Help**, then select **License**.
2. Select the Host ID, shown in the following figure, to copy it to the clipboard.

Figure 7: ACS Host ID license information



3. Go to tek.com/products/product-license.
4. Submit your Host ID to TekAMS.
5. When you receive the license file, on the License Manager dialog, select **Install** to select the file.

ACS STANDARD VERSION 6.4

ENHANCEMENTS

Hardware configuration	
Issue number	ACS-859
Enhancement	MPI Python prober driver with LAN connection is now supported.
Issue number	ACS-828, CAS-260880-D0W1L1
Enhancement	You can now use ACS to control K4200 using GPIB.
ACS software and libraries	
Issue number	ACS-891
Enhancement	In the PowerSupplyLib, an error is now displayed to alert the user when the 2290 interlock is not engaged.
Issue number	ACS-869
Enhancement	The ACS user interface no longer flickers when running tests.
Issue number	ACS-857
Enhancement	The keys "Fixture ID", "Test Plan Version", and "Laser ID" are now provided in the KDF file header.
Issue number	ACS-854
Enhancement	The instrument communication log is recorded in the log file.
Issue number	ACS-827
Enhancement	ITM speeds for large data sets such as 1000 points x 25 columns were improved.
Issue number	ACS-822
Enhancement	Responsiveness of the Instrument tree of the Comparison page improved.
Issue number	ACS-782
Enhancement	ACS now includes a Cascade CC12K python prober driver.
ACS manual updates	
Issue number	ACS-885
Enhancement	Updated all manuals for changes to ACS v6.4.
Issue number	ACS-884
Enhancement	Updated the 4200A-SCS LPTs in the <i>ACS Programmer's Manual</i> , document number ACS-907-01J.
Issue number	ACS-883
Enhancement	Removed descriptions of undefined global variables from the <i>ACS Fundamentals Reference Manual</i> , document number ACS-914-01D.

Issue number	ACS-819
Enhancement	Added instructions for the updated <code>VgVdBothSweep</code> in the <code>VthSiC_JEP183</code> library in the <i>ACS Programmer's Manual</i> , document number ACS-907-01J.
Issue number	ACS-808
Enhancement	Updated the Shared Stress Application (<code>Shared_Stress_app.py</code>) instructions in the <i>ACS Advanced Features Reference Manual</i> , document number ACS-908-01D, to include new demo projects.

RESOLVED ISSUES

Issue number	ACS-908, CAS-330340-B8R8M5
Symptom	ACS V6.3 4200A ITM: Certain current ranges are not available.
Resolution	This issue has been corrected.
Issue number	ACS-900
Symptom	The <code>vds_ccs</code> library is missing after importing from <code>Vds_Reliability\SingleDevice</code> .
Resolution	This issue has been corrected.
Issue number	ACS-899
Symptom	ACS software trial stopped after 10 days, but should have run for 30 days.
Resolution	This issue has been corrected.
Issue number	ACS-897
Symptom	The NI-VISA runtime version for ACS was outdated.
Resolution	This issue has been corrected.
Issue number	ACS-886
Symptom	When the user scans a 4200A using GPIB but does not save, there is incorrect information in the online configuration file
Resolution	This issue has been corrected.
Issue number	ACS-881
Symptom	License Broken Error message is potentially confusing.
Resolution	This issue has been corrected.
Issue number	ACS-874
Symptom	Sometimes the ACS installation stops when an old ASC folder is renamed.
Resolution	This issue has been corrected.
Issue number	ACS-868, CAS-305404-H4B2T9
Symptom	When using the Repeat button to run an ITM, all history data is deleted.
Resolution	This issue has been corrected.
Issue number	ACS-855, CAS-296265-P1Y9P0
Symptom	ITMs freeze if run multiple times.
Resolution	This issue has been corrected.

Issue number	ACS-850, CAS-290833-G3T9W1
Symptom	ACS installation issues.
Resolution	This issue has been corrected.
Issue number	ACS-849, CAS-289688-Q5Z8S7
Symptom	When aborting an ITM, ACS will freeze and lose communication with the 2470.
Resolution	This issue has been corrected.
Issue number	ACS-844
Symptom	The <code>exceptions.log</code> is too big; invalid log messages need to be removed from the <code>exceptions.log</code> file.
Resolution	This issue has been corrected.
Issue number	ACS-830
Symptom	If CVU compensation fails, the <code>.csv</code> file cannot be opened.
Resolution	This issue has been corrected.
Issue number	ACS-826
Symptom	When switching between the run history data page and the run test many times when communicating with a 2636A, communication with the 2636A is lost and the test is not continued.
Resolution	This issue has been corrected.
Issue number	ACS-793
Symptom	In the Hardware Management Tool, setting one 24XX Graphical Touchscreen Series SMU to rear output changes all 24xx Graphical Touchscreen Series SMUs to the rear output. Users should be able to set different outputs for different 24XX instruments.
Resolution	This issue has been corrected.
Issue number	ACS-789
Symptom	An error occurs when import and run a test module template if the SMUs do not match.
Resolution	This issue has been corrected.

SOFTWARE COMPATIBILITY

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

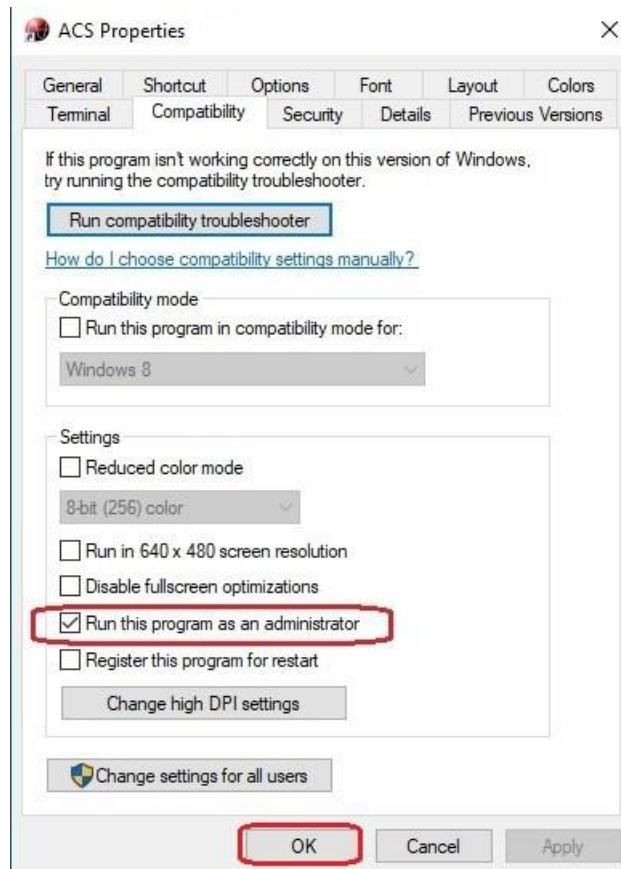
Figure 8: KXCI did not start



To manually configure the compatibility settings:

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

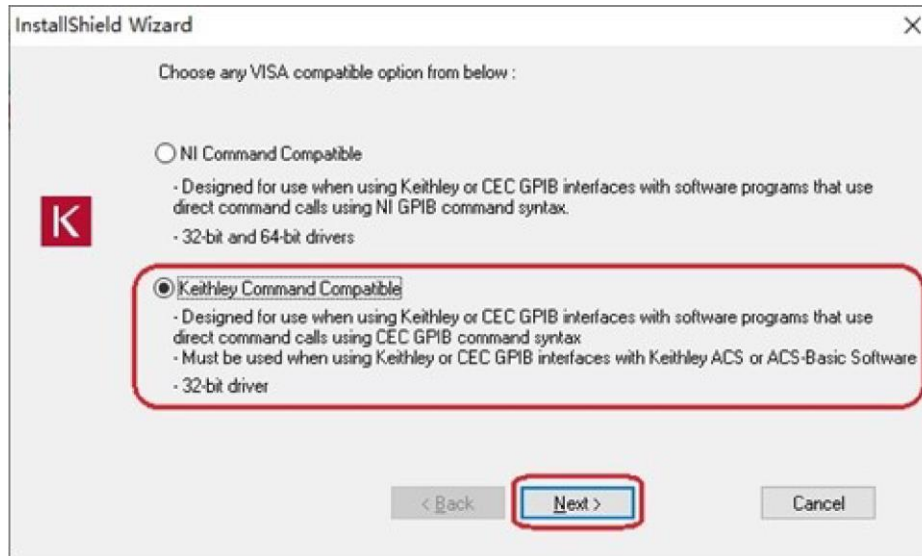
Figure 9: ACS properties



USAGE NOTES

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

Figure 10: ACS command compatible



Issue number	ACS-691, CAS-162126-B3Y7Y6
Resolution	<p>Microsoft® Windows® mapped network drive error.</p> <p>When installing ACS on a personal computer, Microsoft policy settings can limit ACS from accessing mapped network drives in its file windows. You can modify the registry to fix this issue.</p> <p>To modify the registry:</p> <ol style="list-style-type: none"> 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 (32 bit) entry named EnableLinkedConnections. 4. Set the value to 1. 5. Restart the computer.