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GENERAL INFORMATION

This document describes the features added to the Keithley Instruments Automated Characterization Suite (ACS) Basic Edition software (version 3.6).

The Keithley 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 that meets the minimum requirements, including the Keithley 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:

- 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 BASIC EDITION REVISION HISTORY

Version	Release date
3.6	August 2026
3.5	October 2025
3.4	August 2024
3.3	November 2023
3.2.1	March 2023
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

NOTE

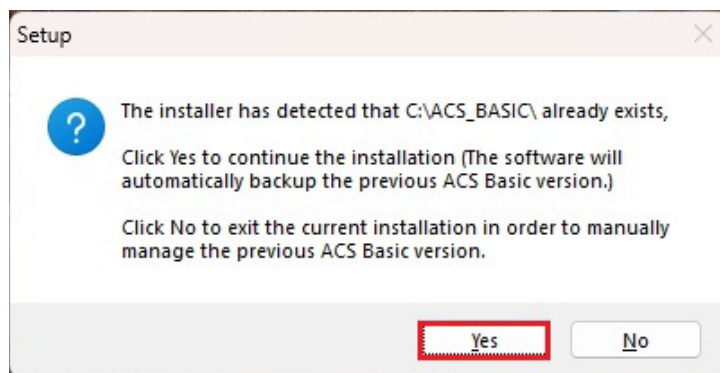
If you are installing ACS Basic on a Model 4200A-SCS Parameter Analyzer, refer to [Install ACS Basic on a 4200A-SCS](#).

If you are using a GPIB interface, it is recommended that you install the GPIB card and its associated driver before installing ACS Basic. For more information on the installation of a GPIB card driver, refer to the GPIB interface documentation from the GPIB manufacturer.

To install ACS Basic software on a personal computer:

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

Figure 1: ACS Basic Software installation



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

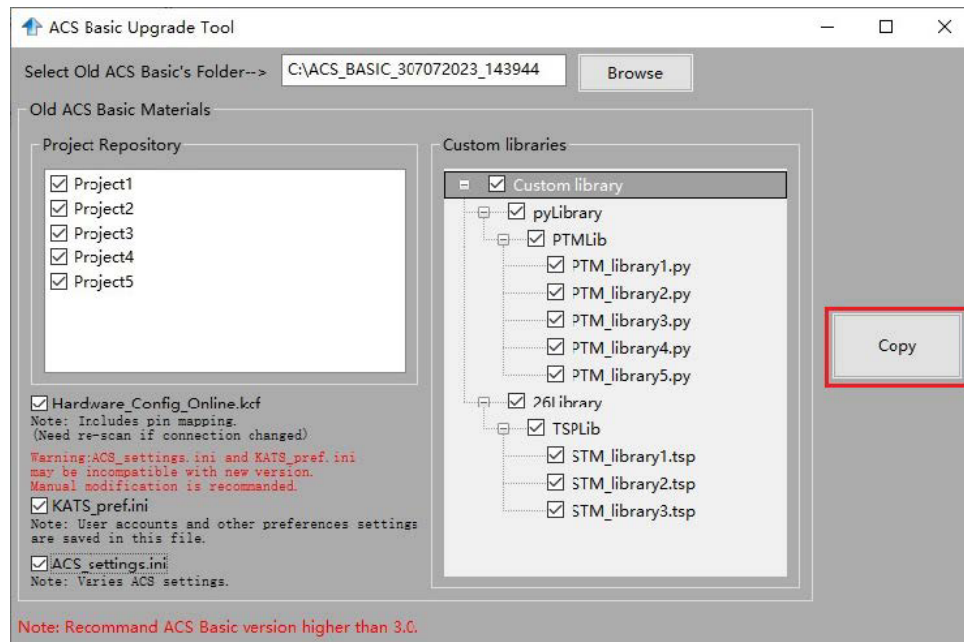
UPDATE PREVIOUS VERSIONS OF ACS BASIC FILES

Once ACS Basic is installed, you can use `UpgradeTool.exe` to convert your ACS Basic version 3.0 files or later to the present version. The converted files will include projects, libraries, and settings from previous versions. ACS Basic files before version 3.0 cannot be converted using this method.

To update previous software files:

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

Figure 2: ACS Basic Upgrade Tool



5. Select **Copy**.

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

NOTE

If you have ACS Basic version 2.1.5 or later, you must manually copy the projects and libraries using the following steps.

To copy and paste folders:

1. Find the `C:\ACS_BASIC_DDMMYYYY_HHMMSS\Projects\` folder.
2. Copy and paste to the present `C:\ACS_BASIC\Projects\` folder.
3. Find the `C:\ACS_BASIC_DDMMYYYY_HHMMSS\library\pyLibrary\PTMLib\` folder.
4. Copy and paste to the present `C:\ACS_BASIC\library\pyLibrary\PTMLib\` folder.
5. Find the `C:\ACS_BASIC_DDMMYYYY_HHMMSS\library\261library\` folder.
6. Copy and paste to the present `C:\ACS_BASIC\library\261library\` folder.

NOTE

ACS Basic 3.6 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>

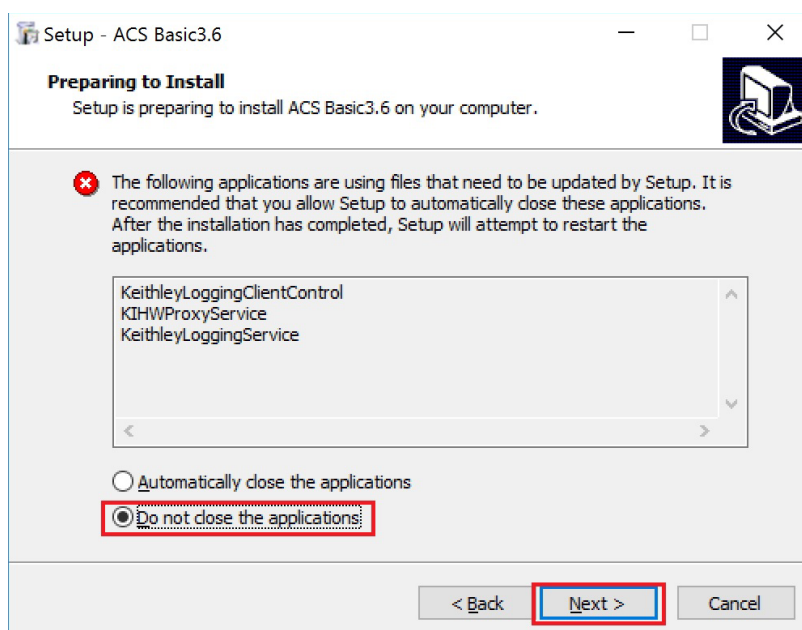
INSTALL ACS BASIC ON A 4200A-SCS

NOTE

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

When you install ACS Basic 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).

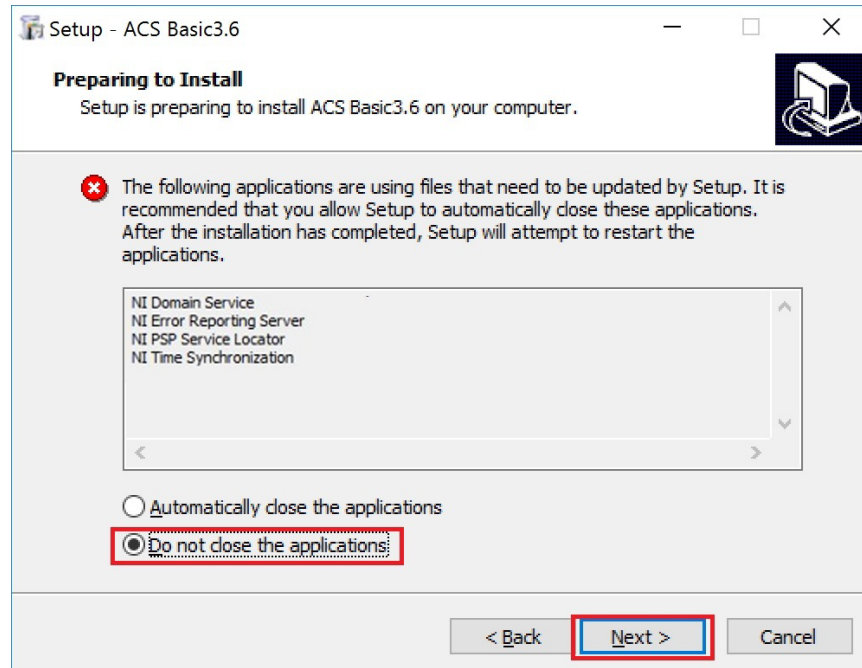
Figure 3: ACS Basic 3.6 prepare to install



INSTALL ACS BASIC AFTER INSTALLING NI-488.2 DRIVERS

If you are installing ACS Basic 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 Basic 3.6 Preparing to Install dialog



SUPPORTED MODELS AND TEST CONFIGURATIONS

ACS Basic Edition software is used to characterize semiconductor devices with a variety of Keithley Instruments products in a variety of different configurations.

The following table summarizes the instruments supported in the ACS Basic 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 SMUs (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
MP5000 series	MSMU60, MPSU50
DMMs	DMM6500, DMM7510, 2010 Series
Sensitive	6220, 6221, 2182A
Switching and data acquisition systems	DAQ6510, 707A/B, 708A/B, 3700A
Pulse generators	3400 Series

NOTE

For MP5000 series, users can develop STM with TSP commands to control SMU and PSU. Only limited TSP LPT functions are supported (refer to `acsbasic_libraries_reference_manual` - TSP LPT functions).

For MP5000 series, users can develop PTM to control SMU and PSU with pyvisa module sending commands and receiving data. Only limited Python LPT functions are supported (refer to `acsbasic_libraries_reference_manual` - Python LPT functions).

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 Basic 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)

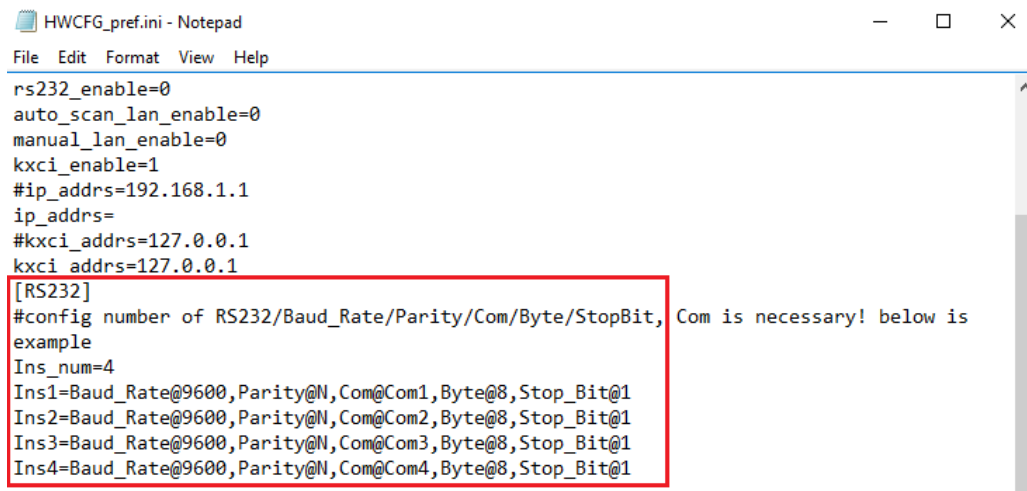
CONNECTING RS-232 INSTRUMENTS

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_BASIC\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.

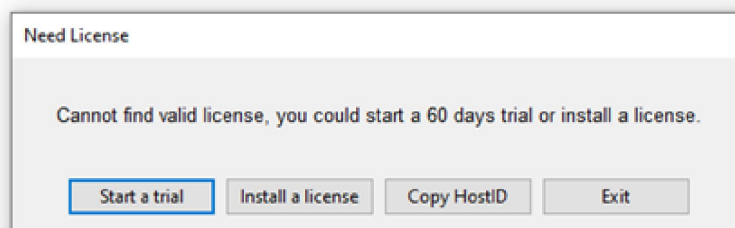
Figure 5: RS-232 connection



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 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 trial expires, you need to purchase a full license to use the software.

Figure 6: ACS Basic 3.6 license information



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.

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

The screenshot shows the 'License Manager' window. At the top, the 'Host ID' is displayed as 'ACS-F7B7HGA4CHC7R'. Below this, a message states: 'For more information about licenses, please visit: www.tek.com/products/product-license'. The main area is divided into two panes. The left pane lists the license 'ACS-DEMOFL'. The right pane provides details for this license, including 'Maintenance' (Expires on 17/Jul/2025 12:55:23), 'Checkout' (Expires on 17/Jul/2025 12:55:23), 'Description' (License: Any Edition of ACS Software (Internal Only) DEMO Floating License), 'Type: Floating', 'IDs: DEMO', 'Checked Out: 17/Jul/2024 12:55:23', 'Expiration: 17/Jul/2025 12:55:23', 'BuildExpiration: 17/Jul/2025 12:55:23', and 'Installed: 17/Jul/2024 13:42:47'. At the bottom, there are three buttons: 'Install', 'Remove', and 'Exit'.

Host ID ACS-F7B7HGA4CHC7R

For more information about licenses, please visit:
www.tek.com/products/product-license

License Name	Details
ACS-DEMOFL	Maintenance Expires on 17/Jul/2025 12:55:23 Checkout Expires on 17/Jul/2025 12:55:23 Description License: Any Edition of ACS Software (Internal Only) DEMO Floating License Type: Floating IDs: DEMO Checked Out: 17/Jul/2024 12:55:23 Expiration: 17/Jul/2025 12:55:23 BuildExpiration: 17/Jul/2025 12:55:23 Installed: 17/Jul/2024 13:42:47

Install Remove Exit

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 BASIC VERSION 3.6

ENHANCEMENTS

Hardware configuration	
Issue number	ACS-1382
Enhancement	AHMT: Configuration GUI support MP5000 TSP-Linked system.
Issue number	ACS-1381
Enhancement	AHMT: Comparison GUI support MP5000 TSP-Linked system.
Issue number	ACS-1362
Enhancement	AHMT: Scanning function support MP5000 TSP-Linked with 26/24/Matrix/DMM.
Issue number	ACS-1360
Enhancement	AHMT: Scanning function support MP5000 TSP-Linked with DMM.
Issue number	ACS-1345
Enhancement	AHMT: Scanning function support MP5000 TSP-Linked with Matrix.
Issue number	ACS-1344
Enhancement	AHMT: Scanning function support MP5000 TSP-Linked with 26xx/24xx.

ACS Basic software and libraries	
Issue number	ACS-1472
Enhancement	Add the Hardware_Config_Online.kcf to the Support_info.zip folder generated in ACS Basic Troubleshooting function.
Issue number	ACS-1449
Enhancement	MP5000 Support: Write a script example to demo waveform capture function by 1us fast sampling.
Issue number	ACS-1397
Enhancement	ACS ITM: MP5000 Compliance Exit there should be "stop and next stepV" option.
Issue number	ACS-1388
Enhancement	LPT functions for MP5000 in ACS Basic v3.6.
Issue number	ACS-1354
Enhancement	ACS ITM: MP5000 SMU/PSU working with 26xxB and 24xx TTI SMU.
Issue number	ACS-1346
Enhancement	MP5000-Add the PSU information in global_dict - UNITDICT.
Issue number	ACS-1333
Enhancement	TSPLPT optimization-verify measure commands for PSU and optimize related functions.
Issue number	ACS-1332
Enhancement	TSPLPT optimization-set nodenum to local to avoid interfering among functions.
Issue number	ACS-1331
Enhancement	TSPLPT optimization-Constants MODEL_MP5, MODEL_MP5_PSU, MODEL_MP5_SMU.
Issue number	ACS-1330
Enhancement	TSPLPT optimization-Verify format.data & format.byteorder for 24xx to optimize postbuffer().
Issue number	ACS-1325
Enhancement	gpibsend() & gpibenter() in ACSLPT.py should be changed to more general names than "gpib".
Issue number	ACS-1324
Enhancement	Adding the new quasistatic CV to ACS Basic.
Issue number	ACS-1226
Enhancement	Need to add MP5103 to instrument models in ACS Basic single mode.
Issue number	ACS-1216
Enhancement	Add 'Firmware Refresh Kit' tool in HW management tool.
Issue number	ACS-1005
Enhancement	EUCRA support in ACS Basic 3.6.

ACS Basic manual updates

Issue number	ACS-1393
Enhancement	Manual updates for ACS Basic v3.6.
Issue number	ACS-1392
Enhancement	Manual-LPT functions for MP5000 part1 update in ACS Basic Libraries Reference Manual.
Issue number	ACS-1387
Enhancement	EUCRA Manual Documents in ACS Basic v3.6.
Issue number	ACS-1379
Enhancement	Manual-Support TSP-Link of MP5000-24xx-26xx.
Issue number	ACS-1377
Enhancement	Manual-AHMT MP5000 LAN connection with password.

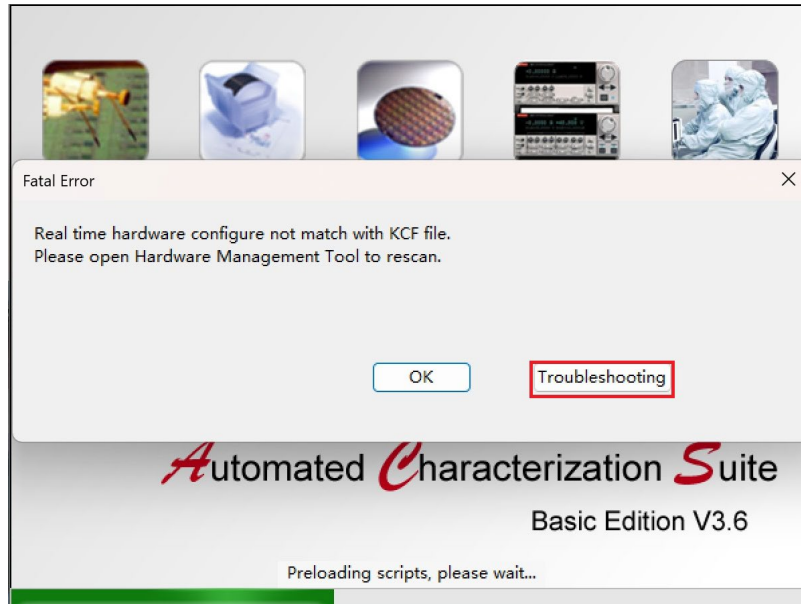
RESOLVED ISSUES

Issue number	ACS-1443
Symptom	4200ITM output 0 after changing the hold time and running the test.
Resolution	This issue has been corrected.
Issue number	ACS-1407
Symptom	disable() is not in C:\ACS\KATS\sys\preload_scp.bin (TSP_source_code\2426LPT).
Resolution	This issue has been corrected.
Issue number	ACS-1376
Symptom	Manual- modifications in ACSLPT-bsweepi/bsweepv.
Resolution	This issue has been corrected.
Issue number	ACS-1371
Symptom	bsweepv + trigig does not work when using 4201 SMU.
Resolution	This issue has been corrected.
Issue number	ACS-1369
Symptom	ACS will fail to start when only connect a 26xx (-286 nil value error occurs).
Resolution	This issue has been corrected.
Issue number	ACS-1348
Symptom	The default compliance value is 0 will cause ITM parameter too small runtime error.
Resolution	This issue has been corrected.
Issue number	ACS-1347
Symptom	The time is not getting captured in data sheet for PSU when timestamp is enabled.
Resolution	This issue has been corrected.
Issue number	ACS-1337
Symptom	AHMT: issue that in the scanned instruments deletion function needs to be fixed.
Resolution	This issue has been corrected.
Issue number	ACS-1217
Symptom	Update the 'Firmware Refresh Kit' step1 to support GPIB/LAN/USB.
Resolution	This issue has been corrected.

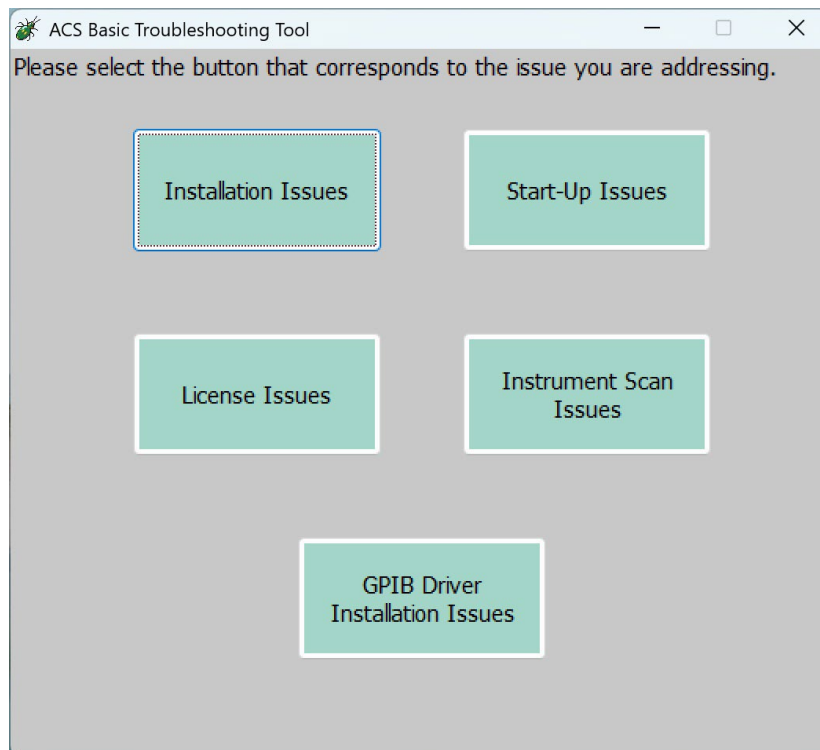
TROUBLESHOOTING TOOL

When you meet an error while starting ACS Basic, you have 2 ways to start Troubleshooting Tool:

1. You can double-click the `TroubleshootingTool.exe` file to start it. (The file exists in `C:\ACS_BASIC\TroubleShootingTool`)
2. There may be a Troubleshooting button in the error reporting window, similar to the following picture.



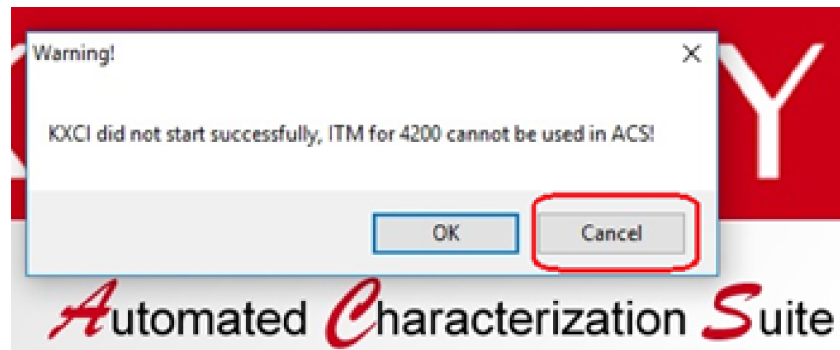
Click the button and Troubleshooting Tool will start. Select the issue button according to the situation, and the corresponding instructions of solution will be shown.



SOFTWARE COMPATIBILITY

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

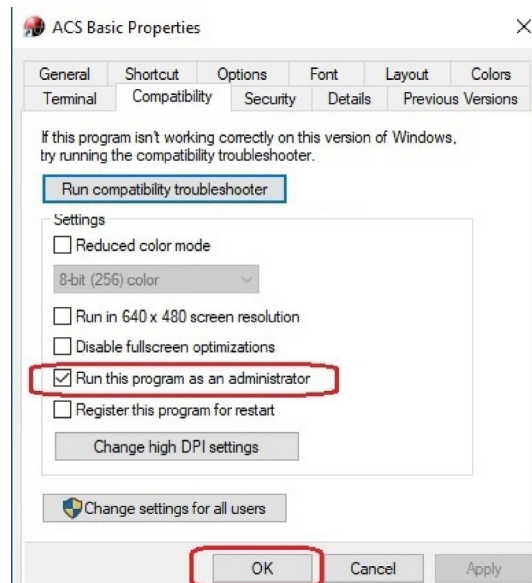
Figure 8: KXCI did not start



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 select **OK** to save.

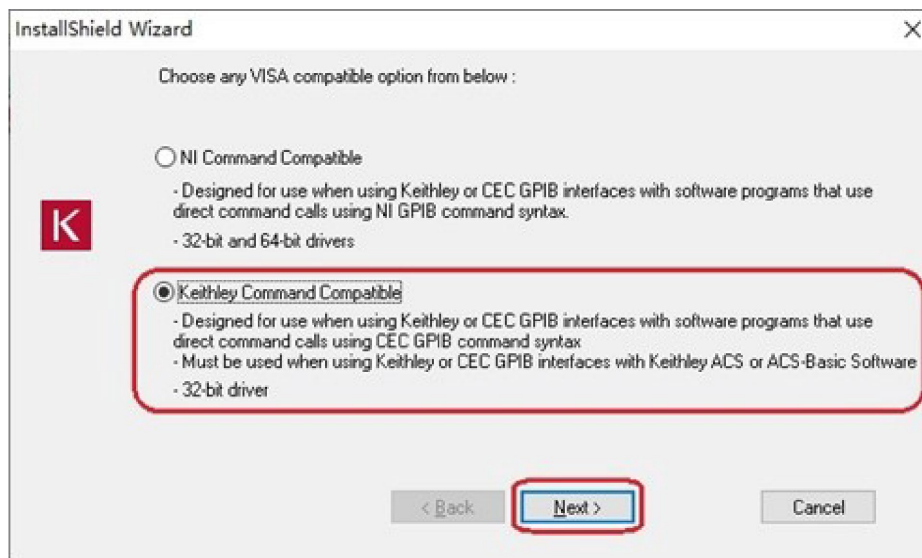
Figure 9: ACS Basic properties



USAGE NOTES

Issue number	N/A
Resolution	If 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 Basic command compatible



Issue number	ACS-691, CAS-162126-B3Y7Y6
Resolution	Microsoft® Windows® mapped network drive error. When installing ACS Basic on a personal computer, Microsoft policy settings can limit ACS Basic from accessing mapped network drives in its file windows. Modifying the registry fixes 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 (32 bit) entry named EnableLinkedConnections. 4. Set the value to 1. 5. Restart the computer.