

PAM-4 Measurement SDK

This document contains latest information on the PAM-4 Measurement SDK.

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Release 1.1.5.0

Release Date:	April 08, 2022
Operating System:	Microsoft Windows 10 (64 bit) 1607 or newer Microsoft Windows Server 2012 R2 (64 bit)
File Name:	PAM-4_MeasurementSDK_1.1.5.0.exe
N1010A FlexDCA	Must not be installed. This SDK is intended to separate the Analysis from the Acquisition. As such it needs to be installed on a different physical or virtual machine than the N1010A FlexDCA that is required for doing Waveform Acquisition.

Enhancements

- Added support for the following new measurement:
 - o Eye Levels

Release 1.1

Release Date:	October 27, 2021
Operating System:	Microsoft Windows 10 (64 bit) 1607 or newer Microsoft Windows Server 2012 R2 (64 bit)
File Name:	PAM-4_MeasurementSDK_1.1.3.0.exe
N1010A FlexDCA	Must not be installed. This SDK is intended to separate the Analysis from the Acquisition. As such it needs to be installed on a different physical or virtual machine than the N1010A FlexDCA that is required for doing Waveform Acquisition.

Enhancements

- Added support for the following new measurements:
 - o CEQ Noise Gain
 - o Partial TDECQ
- Added the capability to save the equalized waveforms

Release 1.0

Release Date:	March 26, 2020
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Operating System:	Microsoft Windows 10 (64 bit) 1607 or newer Microsoft Windows Server 2012 R2 (64 bit)
File Name:	PAM-4_MeasurementSDK_1.0.2.exe
N1010A FlexDCA	Must not be installed. This SDK is intended to separate the Analysis from the Acquisition. As such it needs to be installed on a different physical or virtual machine than the N1010A FlexDCA that is required for doing Waveform Acquisition.

This SDK enables you to perform the following PAM-4 measurements on waveforms captured with a Keysight Digital Communication Analyzer (DCA) oscilloscope:

- TDECQ
- Outer OMA and OER
- Eye Width
- Eye Linearity
- Eye Skew

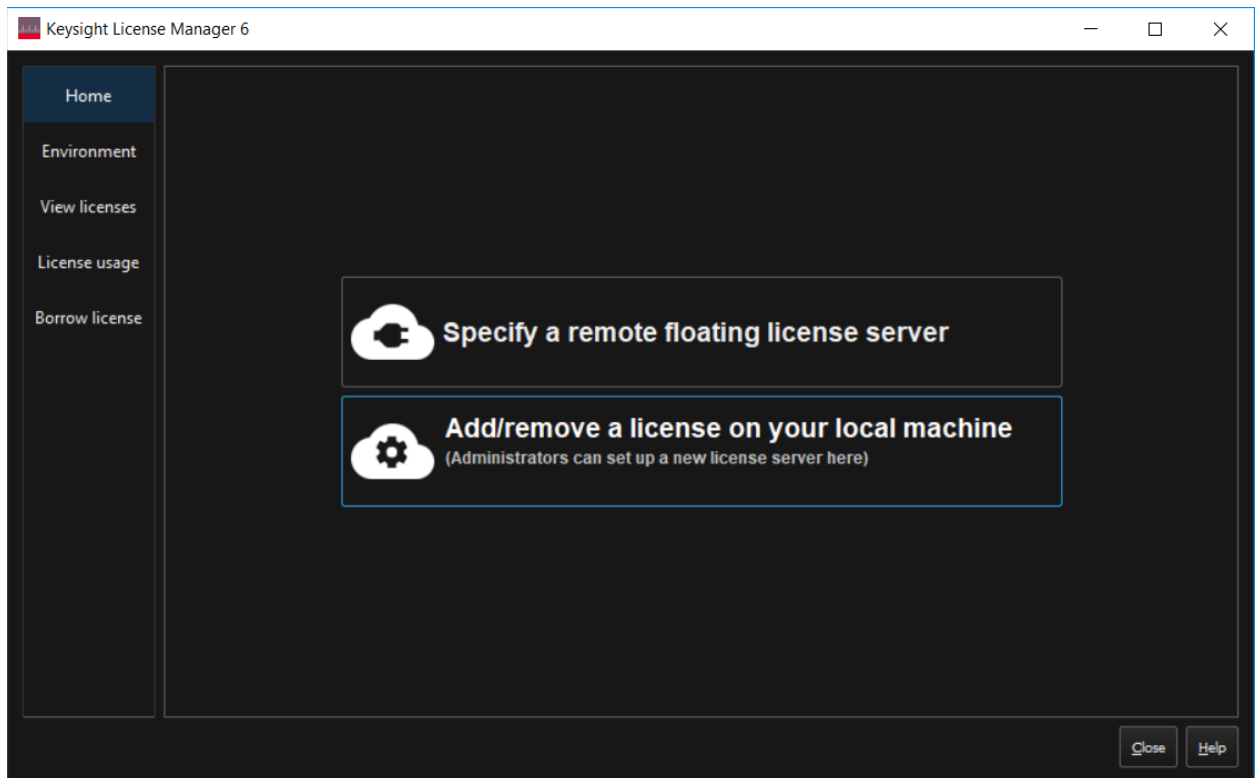
Licensing Setup

Setting up the license server

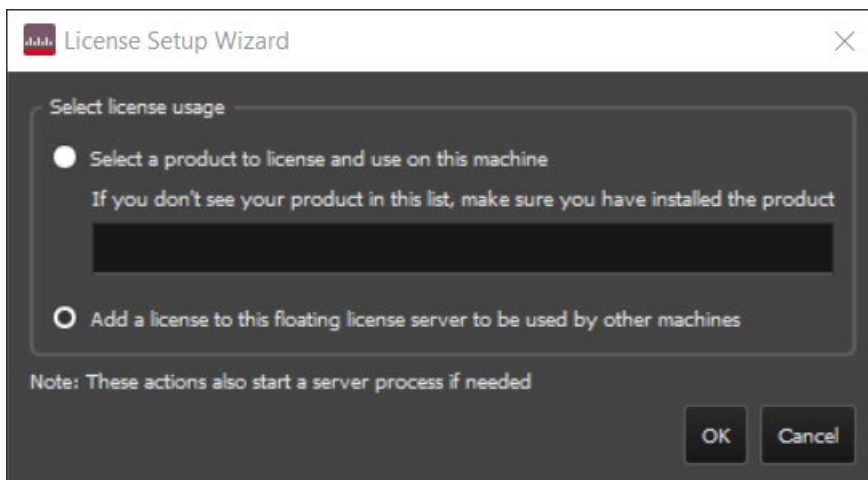
You are required to set up a license server on a physical machine. To install the license file, perform the following steps on this physical machine:

1. Install the Keysight License Manager 6 from [here](#).

2. Click “Add/remove a license on your local machine”.

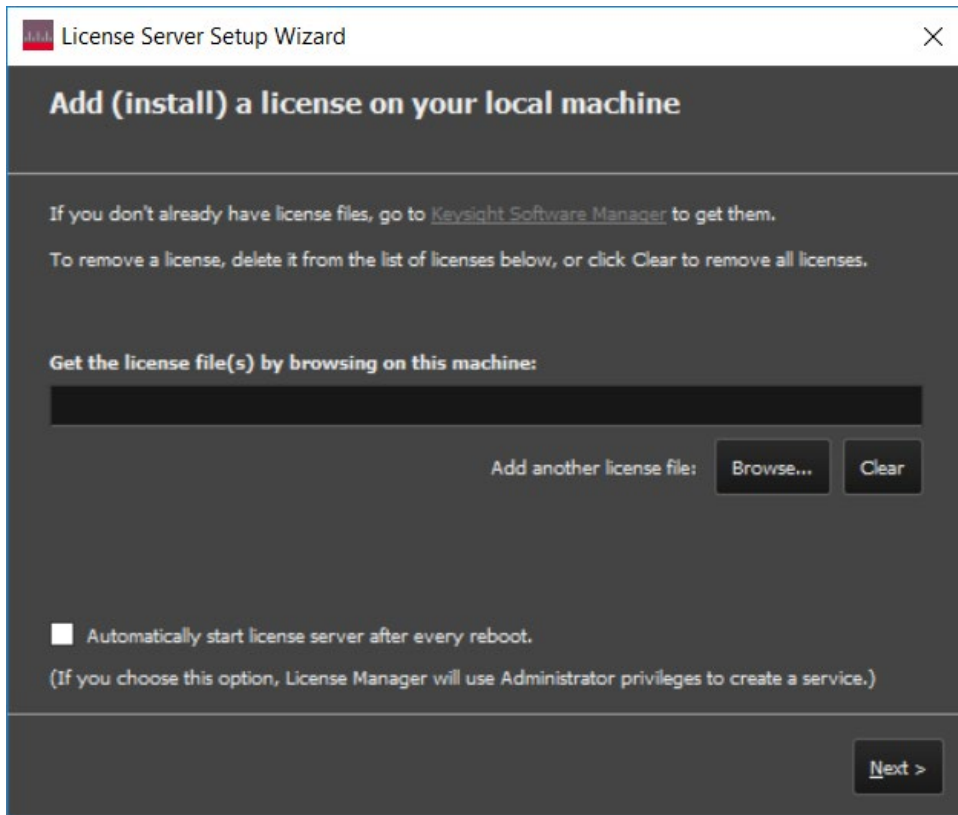


3. Click “Add a license to this floating license server to be used by other machines”.



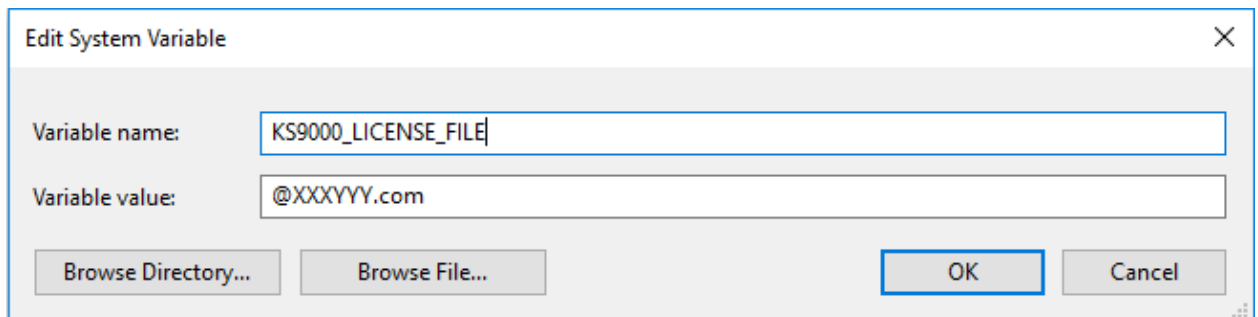
4. Click OK.

5. Specify the license file and proceed with the license installation.



Setting up the client machine

1. To connect to the license server in another OS on same network (Physical or Virtual Machine), add the environment variable with the Key as the license name (KS9000_LICENSE_FILE) and @Server name as the value.



Installation Steps

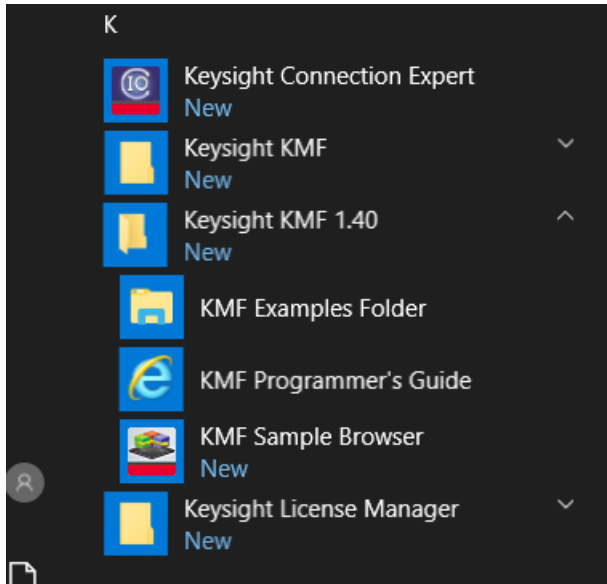
The PAM-4 Measurement SDK installer is for installation on 64-bit Windows 10 Operating Systems (OS version 1607 or newer) and Windows Server 2012 R2 64-bit. It must not be installed on a machine that already has the FlexDCA N1010A Software installed.

Perform the following steps to install the PAM-4 Measurement SDK:

1. Launch the installer file to run the setup. The User needs to be in the Administrator group to successfully install the software.
2. The installer will install the prerequisites one by one. One of the prerequisites is .NET Framework 3.5 which can fail if no internet connection is available. Refer to the [Known Issues](#) section for a workaround.
3. It is likely that the installation of prerequisites will prompt for reboot twice. Once after the installation of .NET Framework 4.7.1 and another after the installation of Keysight IO Libraries. Please do the reboot. After the reboot, installation will be invoked automatically. Proceed with the installation by clicking Ok.
4. After the installation of prerequisites, you will get "Welcome" screen. Click Next.
5. Check the *Keysight Software End User License Agreement* and select "I accept the terms of the license agreement" option.
6. Click Next to accept the terms of the license agreement.
7. In the Setup Type, select "Complete". It will now install the required files.
8. Click Finish.

Getting Started with the PAM-4 Measurement SDK

1. In the Start menu, locate the Keysight KMF 1.40 folder.



2. Open the KMF Examples Folder to verify that the installation works. Navigate to `Keysight\KMF\Examples\Product\Pam4AnalysisExample.1.40.XX.0\Pam4AnalysisExample.exe`. This is an application depicting a usage scenario of API. You can navigate to its source code as well at `Keysight\KMF\Examples\Product\Pam4AnalysisExample.1.40.XX.0\src`.
3. If you get the following error message related to the license, ensure that you have completed the licensing setup. For more information see the section [Licensing Setup](#). Also ensure that when you set up the client machine by adding the environment variable, you must close the Windows File Explorer and reopen it and then try. If you still get this error again then try after rebooting.

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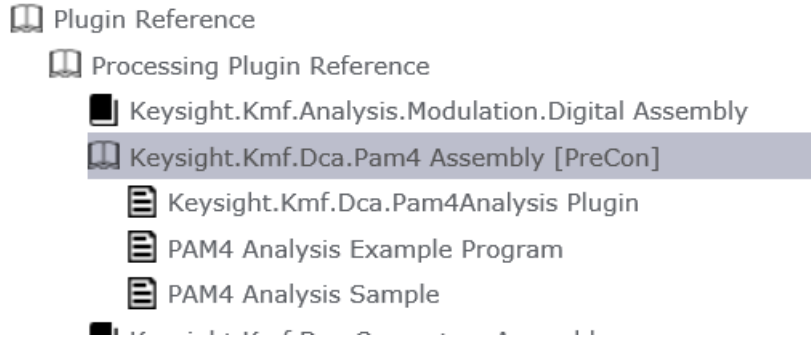
C:\Program Files\Keysight\KMF\Examples\Product\Pam4AnalysisExample.1.40.90.0\Pam4AnalysisExample.exe
Pam4Analysis plugin Example
Variant 1: process a byte array directly, as received from Analysis process
Create the KMF session
ERROR: License for plugin Keysight.Kmf.Dca.Pam4Analysis not found. Plugin can not be created. See event log for details.
Press any key to exit.

```

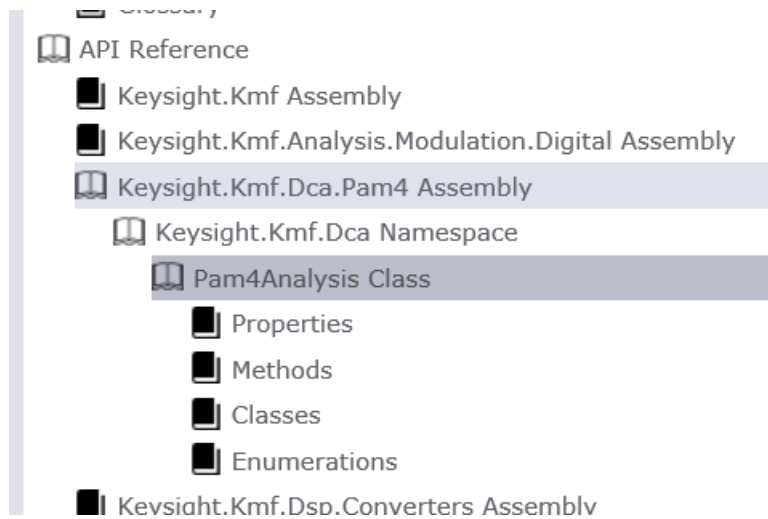
Related Documents

For detailed information, refer to the following document for this application:

- “KMF Programmers Guide”. This can be found in the Start menu. Refer to the following sections in this document.
 - o Programmers Guide > Plugin Reference > Processing Plugin Reference > Keysight.Kmf.Dca.Pam4 Assembly



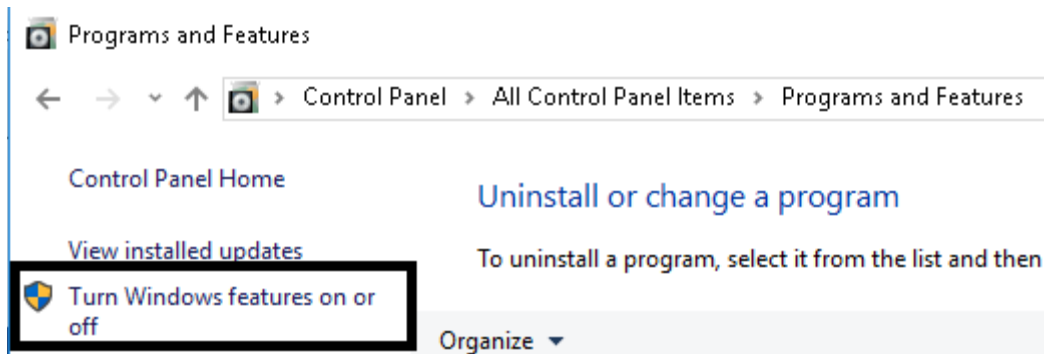
- o API Reference > Keysight.Kmf.Dca Namespace



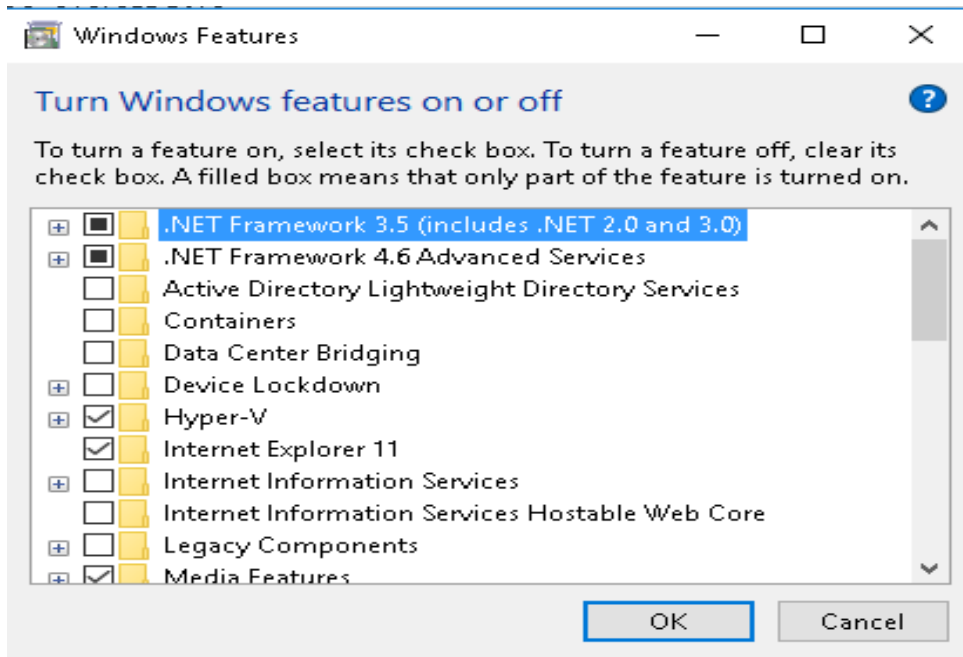
Known Issues

.NET 3.5 Framework installation

- Error code 0x800F081F might be received during the installation of .NET 3.5 framework. That could be because installation media of Windows 10 is absent. If installation media is absent, installer tries to install .Net Framework 3.5 from windows update. So, internet is required to get this one installed from windows update.
- Alternatively, user can also switch on .NET Framework 3.5 as it is a part of Windows 10 standard installation. In the Control Panel's Programs and Features window, click the "Turn Windows features on or off" link. Again, the installation media is needed or the internet connection so that it can be installed from Windows update.



- And turn on the .NET Framework 3.5, on. If no Windows installation media is present, you need a working internet connection as it will install from the Windows update.



- You can troubleshoot from [here](#).
- After that, proceed with the installation.

Invalid waveform file. Only files generated by Keysight DCA are valid.

If you get this message, then the provided waveform is either not from a Keysight DCA or the Keysight DCA is needing maintenance. Contact Keysight support.

Keysight N1000 Measurement science license missing. Please verify Keysight KMF Pam4 is installed properly.

If you get this message, then probably your executable process is not linked against Keysight.Kmf and Keysight.Kmf.Dca.Pam4 assembly. This might happen with dynamic assembly loading scenarios, which are currently not supported.

KMF Sample Browser PAM 4 Analysis not working

Only use the Console Example, as described in step 2 of [Getting Started with the PAM-4 Measurement SDK](#).