

OptiSystem 19.0 Release Notes

IMPORTANT - PLEASE READ ME

Installation Notes:

- If you have an earlier major version of OptiSystem on your computer, OptiSystem 19.0 will be automatically installed in a separate directory.
- OptiSystem 19.0 includes the option to install OptiSystem samples during (or at any time after) installation. The samples are installed by default in the folder “C:\Users\username\Documents\OptiSystem 19.0 Samples”. If you have saved any projects to the target installation location it is highly recommended to save this folder to a backup folder).

Minimum hardware and software requirements

OptiSystem requires the following minimum/recommended system configuration:

- Minimum PC configuration: PC with Pentium processor (E6, G Series) or equivalent.
- 8GB RAM.
- Recommended PC configuration: PC with a clock speed > 2 GHz with 2-4 cores (e.g. Intel i5, i7, i9 or equivalent AMD) and 16GB RAM or more.
- Operating Systems: Microsoft Windows 10 and Windows 11 (**64-bit only!**)
- **Microsoft has shelved Windows 7**, we are dropping Windows 7 support starting this release. However, the software might run under Windows 7, but we do not guarantee it and we will not be able to provide technical support for bugs/crashes.
- 1.5 GB free hard disk space.
- 1280 x 1024 graphic resolution

Application execution

- Administrators: when installing OptiSystem for users with Restricted User Profile, install the sample files in a folder where these users have Read/Write access. By default, the sample files are installed in the current user's Document folder. OptiSystem requires the read/write file access and will not work with read-only files.
- There are some MATLAB files (xxxxx.m) included that are necessary to make the samples work properly. Another important point - the path in the MATLAB search path (Main tab of the MATLAB component) has to be updated with the path to the MATLAB files, otherwise the samples will not work.
- The path to the Scilab/bin folder has to be added to Scilab component (a parameter field has been created for this purpose), otherwise the Scilab component library will not work.
- For the OptiSystem Help feature to function properly, Adobe Acrobat Reader must be installed. To get the latest version please visit the Adobe website at <http://www.adobe.com/>.
- Some computers are configured in power saving mode to go to Hibernation or Sleep mode when they are not in use. **It is recommended to disable this feature**, especially when running unattended lengthy simulations. Typically, after the simulation is complete, the computer idles and eventually goes to Hibernation. This causes the licensing platform drivers to invalidate the license. When the computer

wakes up and resume its execution, OptiSystem software will issue a message that the license is not available and terminate, losing the simulation results in the process. Please disable the computer hibernation feature to avoid this problem.

OptiSystem Version 19.0 list of updates

Components

Table 1: New Components

Component	Library	Changes/Update
Equipment Comm and Control	Default/Visualizer Library/	This component allows users to communicate with different instruments and get data for usage in OptiSystem projects. To use this component the user must have OptiInstrument installed on the same computer.
Universal Multimode Fiber	Default/Optical Fibers Library/	This component allows users to import the fields of SM and MM multicore fibers designed using OptiMode to OptiSystem to calculate crosstalk.
Universal Optical Sampler	Default/Signal Process Library/Tools/Optical/	This components allows users to up-sample and down-sample optical signals to the desired number of samples.
Universal Electrical Sampler	Default/Signal Processing Library/Tools/Electrical/	This components allows users to up-sample and down-sample electrical signals to the desired number of samples.
PAS Library	Default/	This library has 20 components used to design optical communication systems with probabilistic pulse shaping for PAM and QAM modulation schemes.

Other features and improvements

Features	Changes/Updates
Units conversion	Add the unit conversions mV, μ V, nV and pV for Volt (V) and the same for Ampere (A)
CPP, Python, Scilab and Matlab components	Allow the range for the number of input and output ports to be from 0 to 100. This change allows to make no input or output ports for the components
PAM Decision component	Set the Include noise to TRUE as default for the PAM Decision component to represent correct performance. Check the example (4PAM direct modulation direct detection transmission link.osd) at the following location. C:\Users\USER NAME\Documents\OptiSystem 19.0 Samples\Advanced modulation systems\PAM systems

CPP, Python, Scilab and Matlab components	New parameter "iteration" is added to the CPP, Python, SCilab, Matlab component properties window to allow calculating the component many times when no input port exist and global iteration is more than one.
QAM Sequence Generator and QAM Pulse Generator components	Add Square/Rectangular feature to the Constellation type for these components in the Main tab in addition to Star and Circular.
QAM Sequence Generator and QAM Pulse Generator components	Remove the letters X and Y in the title of the Bits and Symbol columns.
Video clips	Users can create videos of the results of swept data by accessing the graphs of the visualizers in the Project Browser. First select the graph then right click on it and choose create Iteration Movie. Name the movie and its location in the popup window. The movie will be save at the desired location as .gif file.
User defined bits/ symbol mapping	Users can load their own special 3, 5, and 7 bits/symbol maps into QAM related components.
Global Parameters Window	Users can set a non-power-of-two Number of Samples per bit and Sequence length necessary for Probabilistic Amplitude Shaping (PAS).

Documentation

Document	Changes
Spatial VCSEL Laser	The datasheet of the Spatial VCSEL component is edited after adding a Polarization Rotator in the component to allow all possible polarization setting for the produced modes.
Project Global Parameters	A new parameter has been added to the Simulation tab of the project layout properties window to allow using a non-power of 2 Sequence length and Samples per bit. This feature is important for Probabilistic Amplitude Shaping (PAS).
CPP, Python, Scilab and Matlab components	The datasheets of these components were edited to show the range change for the input and output ports from 0 to 100 instead from 1 to 50.
PAM Decision and Decision Components	The word soft decision is replaced with decision in these components.
Universal DSP	Edit the field Initialize in the datasheet for the sequence of AE-FOE-CPE when the setting is True and False. It should be FOE-AE-CPE when False and AE-FOE-CPE when True.

OptiSystem Version 19.0 Improvements & Fixes

Additional release notes issues

- a. The Polarization of Spatial VCSEL Laser is fixed by adding a Polarization Rotator component within the compound component to enable all polarization setting of the generated modes.
- b. Move the component **Compliance Test Pattern** component from the location Default/Transmitters Library/Coders to Default/Transmitters Library/Bit Sequence Generators.
- c. Change the frequency range for the OWC and FSO component to the range from 1 to 1e10 THz.

Examples Library

- 1) An example 4PAM - VCSEL MMF Fiber Link using PAM Decision Component_Linear MMF.osd is created using Linear Multimode Fiber and placed in the Multimode System directory of the Example Library. Note that there are two layouts one when the fiber uses the transfer function model for the MMF or when the fiber uses the modes specified in the file CamMMFi.txt to carry the optical field.
- 2) The example Duobinary with chaotic laser.osd is added to OptiSystem Example Library at the location Lightwave systems
- 3) The example VCSEL State of Polarization Control.osd is added at Multimode systems directory. This example allows users to set any desired polarization for the generated mode(s).
- 4) The example Sinewave generation.osd is added to the following location in OptiSystem Example Library C:\Users\USER NAME\Documents\OptiSystem 19.0 Samples\Component sample files\Transmitters Library\Pulse Generators\Electrical\. The example generates a sine wave from a square wave using low-pass filter.
- 5) A new example Hybrid SMF and MMF transmission system.osd is added to the Example library at the Multimode systems directory. The example demonstrates a transmission of 10Gbps over SMF and MMF segments.
- 6) The example Optical and Electrical Downsampler.osd is added at the following location in the Example Library C:\Users\USER NAME\Documents\OptiSystem 19.0 Samples\Component sample files\Signal Processing Library\Tools\
- 7) A new example PAM4 transmission link_symmetric and nonsymmetric eye.osd is added to the location C:\Users\USER NAME\Documents\OptiSystem 19.0 Samples\Advanced modulation systems\PAM systems. The example shows the differences between symmetric and nonsymmetric eye diagrams.
- 8) The example OFDM Coherent Detection Single Port Single Polarization 64QAM-80subcarriers.osd is added to the location C:\Users\USER NAME\Documents\OptiSystem 19.0 Samples\Advanced modulation systems\OFDM systems\ in the Example Library.
- 9) A new example FSO using 20mm laser with and without scintillation.osd is added to the location C:\Users\USER NAME\Documents\OptiSystem 19.0 Samples\Optical wireless\FSO\ to demonstrate the extended wavelength of the FSO channel.
- 10) The example 1310nm PON.osd is added to the Example Library at the location C:\Users\USER NAME\Documents\OptiSystem 19.0 Samples\Metro and access systems\PON and CDMA systems\
- 11) A new directory called Universal MCF is added at the location C:\Users\USER NAME\Documents\OptiSystem 19.0 Samples\Fiber analysis and design\Multicore Fibers\ in the Example Library. The new directory has two subdirectory each has the required design files generated by OptiMode and used in an OptiSystem example that demonstrated a published paper located in the same folder.
- 12) A new directory called Instrumentation is added to OptiSystem Example Library. This directory has few examples on using the newly introduced OptiInstrument Equipment Comm and Control component.

- 13) Mixing of measured 25MHz sine wave signal with ideal one.osd
- 14) Modulating measured 25MHz sine wave signal.osd
- 15) Synthesis of 25MHz sine wave signal.osd
- 16) A new subdirectory PAS Systems has been added to the Advanced modulation systems directory in the Example Library. This subdirectory includes many examples on using PAS for QAM and PAM modulation schemes.
- 17) A new subdirectory called PAS Components has been added to the Component Sample files directory in the Example Library. This subdirectory includes few examples on the components used for PAS technique.
- 18) A new Python EDFA analysis examples is added to PythonScript directory. This example is solved using Matlab (CallOptiSystem.m) also in the Matlab call OptiSystem directory.