OptiSystem 16.1 Release Notes

IMPORTANT - PLEASE READ ME

Installation Notes:

- If you have an earlier major version of OptiSystem on your computer, OptiSystem 16.1 will be automatically installed in a separate directory.
- OptiSystem 16.1 includes the option to install OptiSystem samples during (or any time after) installation. The installation location for the samples folder can be defined (by default the samples folder will be installed in "C:\Users\username\Documents\OptiSystem 16.1 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:

- <u>Minimum PC configuration</u>: PC with Pentium processor (E6, G Series) or equivalent.
- 8GB RAM.
- <u>Recommended PC configuration</u>: 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.
- <u>Operating Systems</u>: Microsoft Windows 7/8.1/10 (**64-bit only!**)
- 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 16.1 list of updates

Components

Component(s)	Library	Changes/Updates
GN-Model CPP component	OptiSystem Example Library	This component is used to simulate long-haul single and multi-span transmission system. The GN model enables ultra-fast calculation of the optical transmission systems that uses nonlinear Schrodinger equation.
LiFi power distribution, channel impulse & frequency responses and BER versus SNR CPP components	OptiSystem Example Library.	These CPP components allow users to design LiFi system and investigate the power distribution for different transmitters located at different location in a room. As well as calculate the impulse response and frequency response of the LiFi channel. Finally, the BER versus SNR can be simulated using CPP component with proper driver.

Other features and improvements

Other features	Changes/Updates
Load Matlab software	OptiSystem version 16.1 allows users to load the Matlab software during the calculation of the project in OptiSystem. A new field “Load Matlab” is added to the component properties popup window. The default is not selected. Users can monitor the results of the Matlab calculation in the Matlab software. However, the results stored in the Matlab docker represents the last calculation conducted by the Matlab software.
Save results of selected parameters for components with available output results	Users can save selected results for components with output results of calculated projects in an excel sheet. The results are tabulated per component for further analysis. Procedures are described in OptiSystem Global Parameters document
Alternating zeros and Ones Sequence	A new feature is added to the “User Defined Sequence Generator” component to allow users to create sequences with alternating number of consecutive zeros and ones. The number of consecutive zeros and ones is set by the user. An error message is flagged if the user sets the number of consecutive zeros longer than the sequence length set in the Layout Parameters popup window.

Documentation

Document	Changes
OptiSystem Component Library	--The following data-sheets are edited or corrected: a. The name of the LOS FSO Channel was changed in release 16.0 to LOS Channel. However, the data sheet was not updated to reflect that, which caused no access to the data sheet of the component using the help feature in the component properties. This issue has been resolved. b. The data sheet of the 1X2, 1X4, 1X8 and Power Splitter components is edited to described the default splitting setting for these component such that 1 1 is equivalent to 50%/50%, 1 1 1 1 is equivalent to 25%/25%/25%/25%, and 1 1 1 1 1 1 1 1 is equivalent to 12.5%/12.5%/12.5%/12.5%/12.5%/12.5%/12.5%/12.5% c. The data sheet of the OFDM Demodulator is edited to correct the input signal format to be electrical not M-ary. d. The data sheet of the “Spectral Light Source” is edited to reflect the correct fields of the component properties popup window and the parameters definitions and values. The process of calculating the average power out of PSD is described in the data sheet. e. The data sheet of the Matlab Component is edited to reflect adding the “Load Matlab” feature to the component properties.
OptiSystem Global Parameters	The Global Parameters Reference Guide document is edited to show the time spacing (Δt) and frequency spacing (Δf) definition on Figure 1. Also, the document was edited to describe the process for saving results of certain parameters for any component that has output results

OptiSystem Version 16.1 Improvements & Fixes

Additional release notes issues

a. The units of the “Reference wavelength” in the CPP component in older versions can’t be switched from nm to THz or Hz. The same also was for parameters that are added (using “Add Param...” feature) to the component with units that have different display options. The issue is fixed.
b. Crashing of “Electrical Eye Viewer” in older versions in some example cases when extremely large number of samples is used. The viewer crash is resolved.
c. The units in the WDM Analyzer for frequency display wasn’t working properly in older versions of OptiSystem especially when the unit is THz and switched to nm, the reading shows 1552.5244e-9 (it should be 1552.5244 nm equivalent to 193.1THz), while when the unit originally in nm it reads 1552.5244, which is correct. This issue is fixed.

Examples Library

a. Created a copy of the “OFDM Modulator.osd” example located at C:\Users\USER NAME\Documents\OptiSystem 16.1 Samples\Component sample files\Transmitters Library\Modulators\Electrical\ and place it in the Advanced modulation systems library located at C:\Users\USER NAME\Documents\OptiSystem 16.1 Samples\Advanced modulation systems\OFDM systems\

b. Created a copy of the “OFDM Demodulator.osd” example located at C:\Users\USER NAME\Documents\OptiSystem 16.1 Samples\Component sample files\Receivers Library\Demodulators\ and place it in the Advanced modulation systems library located at C:\Users\USER NAME\Documents\OptiSystem 16.1 Samples\Advanced modulation systems\OFDM systems\

c. Updated all examples that have QAM Sequence Generator and QAM Sequence Decoder with new components of OptiSystem release 16.1 which have “User defined IQ” map bit sequences properly displayed in the table. i.e. (0000, 0001, 0010 … instead of 0, 1, 10, ….). The affected examples are those that have 16QAM and 64QAM

d. Created an example for GN-Model of 16QAM 128Gbps transmission located at C:\Users\USER NAME\Documents\OptiSystem 16.1 Samples\Advanced modulation systems\GN Model\. The users need to download Gnuplot software (www.gnuplot.info/ to be able to view the results.

e. Created a visible light communication example (LED VLC_OOK.osd) using LED directly modulated located at C:\Users\USER NAME\Documents\OptiSystem 16.1 Samples\Optical wireless\Terrestrial link\

f. Created new example (VCSEL spatial MMF transmission.osd) for VCSEL spatial transmission over multimode fiber. The example is located at C:\Users\USER NAME\Documents\OptiSystem 16.1 Samples\Multimode systems\

g. Created a new example (User Defined Sequence Generator with Alternating Zeros and Ones.osd) illustrating the concept of alternating zeros and ones sequence generation in the User Defined Bit Sequence Generator component. The example is located at C:\Users\USER Name\Documents\OptiSystem 16.1 Samples\Component sample files\Transmitters Library\Bit Sequence Generators\

h. Created three examples to simulate the power distribution, channel impulse & frequency response and BER versus SNR for a LIFI system. Users can place the transmitter(s) in a room, enter their parameters, then simulate the power distribution of these transmitters at a receiver plane. The channel impulse response and frequency of a LiFi channel can be simulated after entering the number of rays emitted of a transmitter and number of reflections in a room before reaching a receiver. The CPP components and their drivers for these examples are located at C:\Users\USER NAME\Documents\OptiSystem 16.1 Samples\Optical wireless\Indoor optical link\. The user needs to download Gnuplot software (www.gnuplot.info/ to be able to view the results. However, the data of the results can be accessed after creating folders at the following locations:

   C:\Temp\LiFi_ChannelPowerDistribution\

   C:\Temp\ LiFi_ChannelResponse\

   C:\Temp\ LiFi_ChannelSNR\