PHOTOSS Development Overview

Version 5.11 (2012-01-16)

- New: Support for Microsoft® Windows® 7 Service Pack 1, MATLAB® 7.11 (R2010b), and MATLAB® 7.12 (R2011a)
- New: Automatic GPU selection for accelerated fiber simulation (if more than one is available) when PHOTOSS is run from the command line
- New: Separate user defined A_{eff} parameter per Raman pump
- New: Ability to import a power distribution along a fiber (instead of an attenuation coefficient)
- New: Option to save a signal when right-clicking a link
- New: Option to open an oscilloscope (amplitude, power, phase, chirp) or a spectrum analyzer (frequency or wavelength, linear or logarithmic) when right-clicking a link
- New: In combined simulations, the pattern modifier component may now update the parametric signal with more precise values from the sampled signal (useful for single-channel transmission)
- The usual bunch of bugfixes and improvements (far too many to describe in detail)

Version 5.10.3 (2011-04-04)

- New: User defined β_0 parameter in low birefringence fiber calculations with two polarization planes
- Improved: Several new options and enhancements to GPU accelerated fiber simulation
- The usual bunch of bugfixes and improvements (far too many to describe in detail)

Version 5.10 (2010-11-19)

- New: GPU accelerated fiber simulation now supports the NVIDIA® GeForce® GTX 400 series
- New: Phase synchronizer component
- New: Frequency and location dependent attenuation profiles also in *Total field* fiber calculations
- New: Automatic parameter range and consistency checks
- Improved: GPU accelerated fiber simulation (single precision) up to 200 times faster than CPU
- Improved: Enhanced algorithm for Raman amplification
- Improved: Enhanced Poincaré sphere visualization
- Improved: Optimized step size allocation for fiber calculations
- The usual bunch of bugfixes and improvements (far too many to describe in detail)

Version 5.0 (2010-06-21)

- New: Extensive scripting capabilities with the new built-in PScript language
- New: GPU accelerated fiber simulation (requires a supported NVIDIA® graphics adapter)
- New: Poincaré visualizer in the polarimeter component
- Improved: Enhanced algorithm for Raman amplification
- Support for the 64-bit edition of Microsoft® Windows® 7
- Support for MATLAB® 7.10 (R2010a)
- The usual bunch of bugfixes and improvements (far too many to describe in detail)

Version 4.60 (2010-01-07)

- Support for Microsoft® Windows® 7 (32-bit edition)
- Support for MATLAB® 7.8 (R2009a) and 7.9 (R2009b)
- Support for Condor® based grid computing
- The usual bunch of bugfixes and improvements (far too many to describe in detail)

Version 4.51.1 (2009-08-02)

- Maintenance release (primarily bugfixes and minor improvements)

Version 4.51 (2009-04-06)

- Support for Microsoft® Windows® XP 64-bit edition (in 32-bit mode)
- Support for Microsoft® Windows® Vista 64-bit edition (in 32-bit mode)
- Support for MATLAB® 7.7 (R2008b)
- The usual bunch of bugfixes and improvements (far too many to describe in detail)

Version 4.50 (2008-10-06)

New Features:

- PHOTOSS now officially supports Microsoft® Windows® Vista 32-bit edition
- MATLAB® interface: Now supports MATLAB® 7.5 (R2007b) and 7.6 (R2008a)
- Completely new OpenGL based visualizer components:
  Blazingly fast, more memory efficient, more capabilities, better usability, nicer graphics, …
- Completely new setup program with an even more thorough uninstaller than before
- New ideal modulator component
- File loader: May now convert analytical to numerical noise
- File loader: May now feed more blocks than actually present using cyclic repetition
- Polarization controller: Now also supports the separated channels simulation mode
- CW laser: Optional phase noise
- Global string parameters
- Adjustable attenuation of Raman pumps

Improvements:

- MATLAB® interface: If multiple supported MATLAB® versions are installed, you may now override the automatic selection of the newest supported version
- Several enhancements and some new options to improve the overall memory efficiency
- New automatic layout of component links
- Improved support for Condor based grid computing
- Improved and updated simulation examples
- Improved and updated documentation

Fixes and minor improvements:

This release includes by far too many bugfixes and minor improvements to describe them in detail.
Lots of work has been done in the following areas:
- Application stability
- User interface
- User options and customizability
- Handling of parameterized signals
- Handling of global variables
- Path analysis feature
- MATLAB® interface
- Command line interface
- PMD or PDL calculations
- Single mode fiber
- Analytical BERT
- Numerical BERT
- EDFA
- Pattern modifier
- Polarizer
- File loader
- CW laser
- Semiconductor optical amplifier
- Pulse generator
- Network component
- Logging of errors and warnings
- Formula parsing

- … and many more …

Version 4.10 (2007-08-22)

New Features:

- PHOTOSS is now compatible with Microsoft® Windows® Vista (although not yet officially supported).
- MATLAB® interface: Now also supports MATLAB® 7.4 (R2007a).
- PHOTOSS may now delegate simulation tasks to other PHOTOSS instances.
- Command line interface: CLI components may now pass results back to PHOTOSS.
- Single mode fiber: May now calculate "backwards" in order to generate an appropriate pre-distorted input signal from a given desired output.
- Generic components such as Network, Iterator, or MATLAB® components, may now have user-defined component icons.
- Single mode fiber: In separated channels mode, each signal channel may now be calculated with linear or nonlinear algorithms, independent from the other channels.
- Network and Iterator components may now have their own variables.
- Parameter variation: Large multi-dimensional variations may now be automatically divided into several sub-variations with multiple results files.
- New/updated macro models for duobinary, DQPSK, and DBPSK have been added to the user tree.
- Transient importer: May now also import noise data.
- Numerical BERT: May now save the detected bit sequence for a given decision threshold to a file.
- Common parameters of multiple selected components can now be edited simultaneously.
- Pattern generator: Can now also generate de Bruijn sequences in DQPSK mode.
- Parameter variation: The creation of separate files for each result may now be deselected.
- PHOTOSS now automatically creates non-existient files and folders to be written to.
- New options *Shutdown when finished* and *Force shutdown* allow to make PHOTOSS shut down Windows® and turn off the computer when all simulations have finished.

Improvements:

- MATLAB® interface: Breakpoints are now disabled when PHOTOSS runs in batch mode.
- MATLAB® interface: Errors are now always logged.
- MATLAB® interface: *Stop on MATLAB® error* is now selected by default.
- Oscilloscope: Can now display multiple channels in *separated channels* mode.
- Component names are now logged with their respective parent networks.
- The main window title now shows the full path of the simulation file.
- Visualizer: You may now zoom outside the actual data range.
- Visualizer: Automatic axis scaling if complex-valued data is displayed.
- Components in the model tree are now shown in alphabetical order.
- EDFAs may now enhance the OSNR (if explicitly confirmed by the user).

Fixes:

- Arrayed waveguide grating: Might not function properly if used with multiple inputs.
- Analytical BERT: BER@OSNR did not work with jittered lines.
- File saver: Did not save the relevant data for the analytical BERT.
- Copying components between different simulations could fail sometimes.
- Minor formula parsing errors fixed.
- Importing global variables could sometimes fail.
- Closing a main network did not also close associated child networks. Open child networks could no longer be closed afterwards.
- The *Add new global variable* dialog could crash in certain situations.
- Text objects were sometimes not properly displayed on the grid.
- Parametric simulation: Calculation of the static delay could sometimes be incorrect.
- Some component results were displayed with an improper description.
- The component results dialog would not open again after being closed with ESC.
- Unlinked components could crash PHOTOSS in rare situations.
- CW laser: More accurate output spectrum.
- Phase modulator: The electric signal is now properly normalized.

- Parameter variation: Values were not properly rounded under special circumstances.
- Rearranging components in the model tree could sometimes cause PHOTOSS to hang.
- More accurate calculations in the *Frequency table* dialog.
- Logging did sometimes not work when PHOTOSS was run in batch mode.
- The results grid did not display units.
- Single mode fiber: More accurate PMD handling in total field mode.
- Single mode fiber: The *gamma* parameter was not remembered after switching to linear mode and back.
- Pattern generator, Pattern modifier: The number of bits could be wrong due to improper rounding.
- Coupler: Documentation error fixed.
- Eye analysis: Could crash in rare situations.
- File loader: Did sometimes change the simulation parameters without requesting permission.
- Pattern generator: Duobinary mode did not always work properly.
- Oscilloscope: The parameterized signal was sometimes not correctly displayed.
- Inactive components can no longer generate parse errors.

Version 4.00 (2007-01-21)

Fixes:

- Fractional bitrates such as 11.7 Gbit/s could yield too few bits per block due to improper rounding.
- PHOTOSS could not be started when no MATLAB® installation was found.
- Some warnings were not displayed in the corresponding window.
- The user defined OADM network was sometimes not linked correctly.
- File loader: Could impose an artificial delay or modify the bit sequence in multi-block simulations.
- Simulation parameters: Changed values could be disposed when the dialog was left with the *Return* key instead of the *OK* button.
- Some minor GUI typos fixed.
- MATLAB® interface: Did sometimes not work correctly with different numbers of multi-signals at different input ports.
- Iterators could yield an error when used in combination with the *Combined run* and *Use sampled power* options.
- Eye analyzer: Could sometimes not find the correct delay for phase encoded or inverted signals.
- Eye analyzer: Could sometimes use more bits than specified.
- The online variation could refuse to work in certain situations.
- Path analysis: Could sometimes yield unprecise OSNR values inside of long fibers.
- Pattern generator: Could not be bypassed.
- Pattern modifier: Did sometimes not change the *Pulse code* parameter correctly from CW to RZ or NRZ.
- Single mode fiber: Calculation of the SRS effect could lead to unprecise results in certain situations.
- Calculator: Accessing global variables in formulas could fail.
- Parameter variation: Variations of the delay time of a delay component did not work properly.
- Lab filter: Did sometimes not work correctly with the parametric signal in *Seperated channels* mode.
- Visualizers: Color selection could yield an error.
- Visualizers: The *Save all lines* function could sometimes disregard certain lines.
- Global variables: The load and save functions could sometimes yield errors or dismiss value changes.
- 3 dB coupler: Could yield an incorrect OSNR in certain situations.
- Some minor visual inconsistencies fixed throughout the GUI.
- Some rare situations where PHOTOSS could crash have been identified and fixed.
- Parameter variation: Dependent parameters were not updated accordingly when the PMD value of a fiber was varied.
- Analytical BERT: Did sometimes not correctly pass its eye analysis settings to the eye analyzer.
- Analytical BERT: Could cause an exception when polarization effects were included.
- The zoom functionality is now controlled with the "*Alt +*" and "*Alt -*" keys, which makes it possible to enter a minus in the component grid.
- Enhanced thread safety: More consistent locking of signals, more convenient GUI functionality for automatic handling of signals under concurrent access.
- Separated channels mode: XPM and FWM calculations could be less accurate when polarization effects were included.
- Single mode fiber: GUI could crash in certain situations when PMD related options were accessed.

- Component parameters could sometimes accidentally be adjusted when components were copied.

New Features:

- 3 dB coupler: Now also supports the Separated channels mode.
- Pulse generator: Electrical signals now support negative amplitude values.
- Parameter variation: Most result files are now directly stored after each single run (instead of once after the complete variation has finished).
- PHOTOSS now supports grid computing with Condor, including parallel use of multiple PCs with automatic job scheduling.
- Numerical BERT: The BER threshold is now available as a component result for Monte Carlo simulations.
- Numerical BERT: A threshold may now be specified for all BER calculations in Monte Carlo simulations.
- File loader: The *Combined run* and *Use sampled power* options may now be set independent from the simulation parameters specified in the loaded files.
- The built-in email support request now automatically adds the exact PHOTOSS build number to the version and date information.
- Email support requests are now directly addressed to the support team instead of info@lenge.de.
- New component *Command line interface*:
  1. Writes the input signal to a text file,
  2. executes an arbitrary system command´and waits for its completion,
  3. reads its output signal from another text file and passes it to the subsequent components.
- Numerical BERT: New results *Number of simulated bits* and *Number of erroneous bits*
- New *Transient importer* component to import a power spectrum from PHOTOSS Transient
- Single mode fiber: The low birefringence functionality is now incorporated in the main algorithm and has been removed as a separate option.
- Separated channels fiber model: More precise designations for options related to either stimulated Raman scattering (SRS) or Raman pumps.
- Parametric signal analysis: Now incRaman gain is now included.
- Visualizers: Visual enhancements; zero is now always displayed.
- Installer: Now includes WIBU-KEY software 5.20a.
- Installer: Now includes Adobe® Reader® 7.0.9.
- MATLAB® interface: In *Combined run* mode, the MATLAB® engine is now only run once and reused for all MATLAB® components.
- MATLAB® interface: Now also supports MATLAB® 7.1 (R14 SP3), 7.2 (R2006a), and 7.3 (R2006b).
- MATLAB® interface: The conventional parameter file is now replaced with a set of user-defined parameters to be transferred to MATLAB®. Each parameter is defined by its name, type, and value.
- MATLAB® interface: Results that are transferred to PHOTOSS may now have arbitrary names.
- Analytical signal analyzer: The component now also supports the separated channels simulation mode. Analytical BERT: New *OSNR at BER* results provide the required OSNR for a given BER.
- Simulation parameters: New *Combined simulation* option reduces the memory consumption of single-block simulations in combination with the *Clear promptly* option.
- The maximum memory consumption is now logged when a simulation has finished.
- Path analysis: You may now customize the file where the results are stored.
- Parameter variation: Variation values are now stored without loss of accuracy.
- Parameter variation: In the *Global variables* dialog, you may now customize the file where the results are stored.
- White noise source: The component is now also available as an electrical source.
- Eye analyzer: New option *Use all bits for eye analysis* controls access to the *Number of bits for eye analysis* option.
- Eye analyzer: The sampling time is now shown in the log window.
- Eye analyzer: The sampling time can now be set manually. Together with the preceding feature, this enables to determine the sampling time for a noiseless signal and afterwards reuse it for noisy signals.
- Eye analyzer: Constellation diagram now uses the same scaling for x and y axes and a centered origin by default.
- Eye analyzer: The eye diagram can now optionally highlight areas that are shared by multiple bit lines with brighter colors.

- Eye analyzer: The eye analysis is now only perfomed once at the end of multi-block simulations, while in all preceeding blocks only the relevant data is collected. Together with an optimized memory allocation strategy, this massively speeds up simulations with multiple blocks.

User Interface:

- New product and application design with a modern look & feel.
- New user interface algorithms for a more flexible and responsive GUI experience.
- Completely redesigned simulation parameters dialog.
- Eye analysis: The *ignore first bits* parameter is now visually disabled for cyclic convolutions.
- Multi-block simulations: Component checkmarks are now removed when each block has been calculated.
- Output window now also displays the time when a simulation had finished.

Version 3.50 (2006-01-31)

Fixes:

- File loader: Did sometimes not load subsequent signal blocks in multi-block simulations.
- Pulse generator, pattern generator: In multi-block simulations, bit patterns read from an input file needed to cover the total simulation regardless of the loop settings.
- Pulse generator: After changing the output from optical to electrical while the component is already linked, the simulation would still run without a respective warning.
- Path analysis: Calculation effort estimation is now more accurate for included fibers.
- Path analysis: EDFA behavior in separated channels mode was different from the corresponding description in the manual.
- File parameters did sometimes misinterpret *no file* values ("none" or empty).
- Improper pulse generator settings could interfere with the simulation parameters and crash a simulation in certain scenarios.
- Multiplexers can no longer be bypassed.
- Single mode fiber: Duplicate PMD results have been removed which are better handled by the PMD path analyzer component.
- PMD path analyzer: The PMD path object is now correctly re-initialized before a new simulation.
- In special situations, an "A component is not sequenced" error could occur when a simulation was running for several hours.
- Global variables: The length of formulas is no longer limited to short expressions.
- Global variables: Loading a new simulation or running a parameter variation that still uses a variable which has been deleted could lead to multiple "unexpected characters" errors when the respective formulas were parsed.
- Parameter variation: Global variables are now set to the first variation value also when the list is edited manually.
- Parameter variation: Multiple variation runs involving multiple variables could lead to wrong results being saved in certain scenarios.
- Parameter variation: Fixed GUI error when a result window is manually opened and closed during the simulation.
- Parameter variation: New variation counter function fixes two problems concerning path analysis runs and plotting of results.
- Parameter variation: Memory leak fixed, result sliders would not be deleted in certain situations.
- Frequency dialog: Checkbox GUI error fixed.

New Features:

- New calculation algorithms are dramatically faster without loss of accuracy. Special scenarios are sped up by a factor of seven to ten, typical fiber simulations are up to four times faster, and many other components also gain speed benefits from the new algorithms.
- Eye analysis: New parameters *Determine delay* and *User defined delay* allow skipping the automatic delay detection and overriding it with a user defined value.
- Eye analysis: New graphical constellation diagram added.
- Eye analysis: New *Force optical eye* option allows to either perform the eye analysis in the electrical or optical domain.

- Parameter variation: New component option *Save parameters to file* allows saving the current parameter values (after parsing all formula expressions) to a file during a variation run.
- New component property grid allows editing component parameters without opening a dialog.
- New results grid shows component results when left-clicking the respective component.

User Interface:

- Component dialog: Reworked appearance, second column now automatically resizes to completely show the corresponding values.
- Parameter variation: Results are now continuously updated also in the main window.
- Parameter variation: Result table is now resizable.
- Global variables: Enhanced add/edit dialog with improved handling of formulas
- Toolbar tooltips now also show shortcut keys.
- Simulation parameters: If there are PMD path components in the network, all relevant options are now accessible even if the sampled signal representation is disabled.
- The paths of example simulation files are no longer used as the default location of a new simulation.
- Component parameter dialog: The parameter list does no longer scroll up when a parameter is changed.
- Analytical BERT: Eye analysis parameters appeared twice in the respective dialog.

Version 3.20 (2005-05-18)

Fixes:

- Lab filter: Input files could sometimes be interpreted improperly
- The clear simulation message could be unnecessarily displayed in certain situations.
- Accessing receiver results could yield errors in some special situations.
- The simulation directory could not be deleted after a simulation run until PHOTOSS was closed.
- Parameter variation: Some Parse{…} inconsistencies fixed
- Pin diodes and APDs might accept electrical input signals.
- The block number was not properly set in special scenarios.
- Global variables: Some errors and inconsistencies fixed that could occur in special situations
- Problems with the selection of multiple lines in certain list controls fixed
- Undo/redo was not reset before starting a simulation.
- Analytic performance evaluation could yield errors when no frequencies have been specified.
- Certain components might refuse being linked in very special situations
- Window title bar: Name inconsistency when opening a new simulation after a calculation fixed
- Component tree: Dragging certain components could yield errors in rare situations.
- Component tree: Renaming and deleting components
- Path analysis: Missing line names added, several minor bugs fixed
- Single mode fiber: Parameter S und D may be varied directly without falling back to beta2 and beta3
- Wavelength converter: Improper f0 calculation when used with couplers in separated channels mode
- MATLAB® interface: Dynamic library was not always unloaded properly when PHOTOSS exited.
- The component view might have been maximized when other actions were performed.
- Undo/redo functionality: Certain scenarios could lead to false behavior
- Progress bar now also works correctly when iterators are used.
- Online help could yield an assertion error in certain situations.
- Text input fields now show the currently selected font and color.
- Some minor memory leaks fixed
- Various minor fixes in the graphical user interface

New Features:

- Polarization cross phase modulation is now also regarded in fibers with negligible PMD in separated channels mode.
- MATLAB® interface: Extensive rework with various improvements
- MATLAB® interface: New debugging options
- Single mode fiber: The two separate algorithms have been integrated into a common appearance.
- Parameter variation: Current parameters added to output
- Pulse generator: Enhanced bit sequence handling
- Pulse generator: Enhanced chirp model

- Path analysis: Parameters are now also saved in the parameter RTF file.
- Path analysis: Memory management optimized for higher performance
- Path analysis: Three new receiver types involving freely programmable MATLAB® components
- Polarimeter: Enhanced functionality; you may now access the degree of polarization of single bits as a result or save them to a file.
- Simulation parameters are automatically adapted when numerical or analytical BERT components are placed on the grid while the minimum and maximum signal levels are inappropriate.
- Simulation parameters: Noise bandwidth check improved
- Visualizers: Improved thread safety
- Lab filter: Improved interpolation of measured samples
- Analytical BERT: More results added for parameter variations
- Wavelength converters may now be used in iterators when using separated channels mode.
- Optimized order of execution of network components for faster access to intermediate results
- External files (such as MATLAB® algorithms) may now be directly viewed from within PHOTOSS.
- Accelerated application startup by optimized loading of dynamic libraries
- More intelligent linking of couplers and other components

User Interface:

- Integrated Windows® XP theme support without a separate manifest file
- Direct access to component-specific online help by right-clicking components on the grid or in the tree and selecting *Help* in the context menu
- You may now zoom in and out using the + and - keys.
- Component bar registers (Models, User, DLLs) may be individually shown or hidden.
- More components enforce different colors for electrical and optical links
- MATLAB® components and functions are now disabled if MATLAB® is not installed.
- Newly created or loaded simulations are now initially shown in maximized state.
- Errors and Warnings are now displayed in separate register pages.
- Some potentially misleading options have been renamed to clarify their respective purpose.
- Various minor typos fixed

Version 3.19 (2004-10-12)

Fixes:

- Double-clicking integer type combo-box parameters opened the wrong dialog
- Pulse generator: incorrect alpha roll-off and duty cycle checks for Gaussian or soliton pulses fixed
- Some very specific scenarios fixed where PHOTOSS could become slow or sometimes even hang

New Features:

- New component *PMD Path Analyzer* for analyzing polarization mode dispersion along several components
- New command line batch mode for running PHOTOSS simulations from the command line
- The MATLAB® interface now also supports MATLAB® 7.0 (R14).
- Optimizations for Intel® Pentium® 4 and AMD® Athlon™ XP processors
- The file loader component automatically adjusts the main simulation parameters according to the selected input data file.

User Interface:

- More exact positioning of links that connect components with multiple ports
- A warning is shown when the file saver component cannot write to its output file.
- Context menus appear when right-clicking components or the component grid.
- Right-clicking a parameter in the main simulation parameters dialog shows a tooltip help.
- The text in the output window can now be deleted, copied to the system clipboard, or saved to a file.
- Ports now respond visually when linking components.
- Component names are now displayed after all component icons have been drawn (no more invisible names).
- Simulation files can now also be opened by dragging them into the PHOTOSS window.

Version 3.18 (2004-07-20)

Fixes:

- Parametric signal description: a wrong extinction ratio was displayed in some situations
- A simulation with two optical polarization planes could fail when electrical components were bypassed
- Numerical BER estimation: improper Q and BER values were displayed when the preceding eye analysis did not receive an open eye diagram
- Analytical BER estimation: improper Q and BER values were displayed when the preceding eye analysis did not receive an open eye diagram
- Polarimeter: completely reworked, two bugs fixed that might occur at extremely low power levels
- Eye pattern analyzer: in rare situations, the analysis could fail or even crash for specific parameter settings
- Parameter variation: the auto-save option now also works with multi-dimensional parameter sweeps
- Spectrum analyzer: an incorrect x axis scale was displayed when exporting the *Sampled Spectrum (Frequency), logarithmic scaling* plot to MATLAB®
- Phase conjugator: now also works when using *Separated channels* mode
- User interface: some minor bugs related to copying networks and iterators via drag-and-drop are fixed
- Online help: corrected links when called from the *Edit paths* or *Global variables* dialog

New Features:

- PMD: PMD path settings are now more robust against invalid or inconsistent selections
- Online help: more detailed explanations including the exact formats required for component input files
- EDFA: a warning message appears if the output power is lower than the input power so that no noise is added
- Pulse generator: roll-off and duty cycle parameters of RZ pulses are automatically adjusted if invalid combinations are chosen
- Pattern modifier: may now also change the duty cycle parameter within the parametric signal description
- Pattern modifier: may now also change the average signal power (pavg) in the parametric signal description
- Polarimeter: new result *DOP* (degree of polarization)
- Improved file format for the auto-save options of various components
- Iterator: the current iteration step is now displayed in the output window
- New component *PDL element*: polarization dependent loss (PDL) component with full control over each relevant parameter; you may specify the PDL vector on the Poincaré sphere
- Fibers (both total field and separated channels): the linear convolution algorithm is undergoing a thorough rework and is currently disabled within fibers
- Redesign of the auto-save option
- User interface: additional options have been added to the *Tools/Options* dialog
- User interface: *Open examples* now also works if the examples reside within the PHOTOSS directory
- User interface: the simulation progress is displayed in the main window caption and the taskbar
- User interface: more context sensitive activation of buttons and controls
- User interface: you may now select multiple links with the *Ctrl* key
- User interface: the *Global Parameter List* dialog is redesigned and renamed to *Global variables*
- User interface: the *Frequency Table* dialog is redesigned and optimized
- User interface: Window captions have been added to various visualizer windows

Version 3.17 (2004-05-24)

Fixes:

- 3D parameter variation: certain results were not saved to ASCII files
- Single pulse analyzer: automatic output of units fixed
- Re-opening of iterators or networks that are already open now shows the existing window.
- Iterator: irregular crashes of highly memory-consuming setups fixed
- Pattern modifier: no more errors when the input file contains not enough bits
- Pattern modifier: copy problems fixed
- Analytical BERT: no more problems with crashing simulations
- Coupler, 3 dB Coupler: SNR problems resolved

- Visualizers: display problems with PMD calculation results fixed

New Features:

- New component: *EAM* (electro-absorption modulator)
- New component: *DCM* (directional coupler modulator)
- New component: *Polarimeter*, measures the polarization state of signals (both Stokes and Jones parameters)
- New macro models for DQPSK modulators und de-modulators (*User* tree)
- Parameter variation: may now vary the duty cycle parameter
- Pulse generator: several pop-up warnings are now suppressed
- Pulse generator: more realistic duobinary transmitter model
- Pulse generator: the roll-off parameter is now shown for sine, triangle, and saw up/down pulse shapes
- Pulse generator: automatically adapted roll-off and duty cycle parameters for RZ pulses when inappropriate or inconsistent values are entered
- EDFA: warning if output power is smaller than input power (no noise is added)
- Eye pattern analyzer: new result *sig_center* records the standard deviation of 1-bits in the middle of the box
- Eye pattern analyzer: new result *mue_center* records the mean value of 1-bits in the middle of the box
- Eye pattern analyzer: *Save variances* writes mean values and variances of all 0/1-bit samples to a file
- Eye pattern analyzer: new result *Var_box* averages the variance of 1-bit samples within the box
- Eye pattern analyzer: new result *Avg_box* averages the mean value of 1-bit samples within the box
- Pattern modifier: may now also change pulse code, bit code, and bit shape settings
- Significantly enhanced PMD and PSP coupling features
- You may now define and examine a "PMD path" that spans over multiple fibers
- Single mode fiber: simple calculation of PMD without waveplate modeling, more useful results in the case of spatially constant birefringence parameters
- Polarization state adjuster: polarization states may be exactly specified using Jones parameters
- Polarization state adjuster: polarization states may be exactly specified on the Poincarè sphere
- Polarization state adjuster: polarization states may be adjusted in relation to the PSPs of entire "PMD paths"
- Polarization filter: signals may be filtered in relation to the PSPs of entire "PMD paths"
- User interface: the "worker" icon is now animated automatically
- User interface: components are graphically marked after they finish their calculation
- User interface: improved text dialog ("T" button)
- User interface: several tasks may now be controlled via keyboard shortcuts, e. g. for quick linking components (Ctrl+F, Ctrl+D) or opening networks/iterators (F8)
- User interface: thorough re-structuring of menus and toolbars
- User interface: the output bar now allows selecting and copying of text
- User interface: you may now open multiple simulation files in parallel
- User interface: new *Options* dialog (*Tools* menu) for user-specific program settings
- User interface: the Examples button now accounts for different example installation locations
- User interface: improved context-sensitive tooltips for numerous component parameters, e. g. with detailed descriptions of the required file formats of input files
- System: thorough rework and re-structuring of system registry handling
- Setup: new installer/de-installer tool based on Microsoft® Windows® Installer (MSI) technology
- Setup: thorough cleanup of system registry entries and user preference files on de-installation
- Protection: PHOTOSS now supports network protection with centralized license management

Version 3.16 (2003-09-11)

Fixes:

- Eye pattern analyzer: the filename "Browse" button now works correctly
- Eye pattern analyzer: "Parse{…}" now also works here
- Eye pattern analyzer: the number of samples per block in output files is now correct
- Eye pattern analyzer: error could occur in rare cases when saving samples to a file
- AWG: file selectors now appear correct for AWG lengths and coupling coefficients
- AWG: Gaussian noise no longer requires an unnecessary input file

- Path analysis: the length axis was sometimes scaled incorrectly after the second use
- The calculation of global parameters that depend on other global parameters could fail sometimes
- A stack corruption error could occur when using parameter variations
- Online variation: non-variable parameters are no longer selectable (PHOTOSS could crash)
- CW laser spectrum was sometimes incorrect when using the separated channels method
- Visualizer: memory leak fixed
- Visualizer: extremely fast and frequent menu access could crash PHOTOSS in special situations
- Visualizer: selection of one menu item could sometimes open a different one
- User interface: multiple headers when an iterator was opened more than once
- Complete rework of the link concept; several problems fixed
- The undo function could cause errors when changing the number of in-/out-ports of a network
- Memory leak fixed that could occur when accessing component results after a simulation run

New Features:

- New examples concerning PMD/PSP coupling and "Parse{…}"
- Thorough rework of all component tool-tips
- AWG: interactive show/hide functionality for currently unused component parameters
- PIN diode, APD: the inclusion of numerical shot noise is now optional
- The single channel fiber model now supports four wave mixing (FWM)
- Oscilloscope may now display the bit sequence stored in the "ChannelData" information
- The "phase conjugator" component now supports the separated channels method
- Pattern modifier: may now remove channels from the "ChannelData" information
- Rework of the iterator component; fixes several problems and accelerates simulations with iterators
- "Extended views" (such as networks within the main network) are now closed automatically
- Electrical and optical links are now displayed with different colors
- Clicking an output link of a network now directly opens the overview dialog of the component that feeds the respective output

Version 3.15 (2003-06-25)

Fixes:

- The linear convolution mode did not work under special circumstances
- Visualizer import functionality failed sometimes
- Visualizer "export file to bitmap" feature now works with Microsoft® Windows® XP
- Networks and iterators in the "user" tree view now support the latest PHOTOSS version

New Features:

- Analytical BER estimation: new result types "ASE shot noise", "ASE-ASE noise", "ASE-channel noise", "channel shot noise", and "thermal noise"
- Eye pattern analyzer: You can now save an arbitrary number of samples per bit and vary the detection time in order to simulate detection errors
- The "pattern modifier" component now supports multiple WDM channels
- The "pattern modifier" may now change the central frequency, the "inverted" flag, and the bitrate
- Significantly accelerated numerical BER estimation when multiple signal blocks are processed (at the same level of accuracy)

Version 3.14 (2003-05-15)

Fixes:

- Numerical BER estimation: two bugs could affect the proper calculation of Q factors (e. g. no more "Root must be bracketed" errors now)
- Raman calculation bug fixed
- "Parse{IteratorName_ItrNo}" is now possible when fibers are used inside iterators
- MQW and bulk laser models were mixed up in some cases
- Increased stability of the waveplate model in non-linear mode
- Iterators could crash under certain conditions
- Thorough elimination of various memory leaks

- Path analysis: no more EOP discontinuities (appropriate limitation of variables such as "length")
- Opening old .pho-files is now suppressed when improper links would be generated
- MATLAB® interface: The "Reference to non-existent field 'comp'" warning should no longer occur (however, the warning was no serious issue and could be ignored)
- Some extremely rare crashes fixed
- Location of the online help files failed in certain scenarios

New Features:

- Numerical BER estimation: more precise calculation of Q factors
- New "multi-mode laser" component
- New "Bypass" functionality added
- Significant improvement of the optional Microsoft® Visual C++® programming interface

Version 3.13 (2003-04-22)

Fixes:

- Fiber attenuation was slightly incorrect in linear mode when no dispersion was present
- Some memory leaks could occur under special conditions
- Significantly enhanced stability when several iterator components are involved
- Online help: some possibly misleading phrases concerning the "reference optical bandwidth" have been replaced with more precise explanations
- Some additional minor bugfixes

New Features:

- New components for inner linking of networks (based on structural changes of the graphical and internal linking of components)
- Adapted handling of OLE containers, "Undo" functionality and saving components
- Fibers may now have z-dependent attenuation
- Event-driven completion of simulation runs

Version 3.12 (2003-02-21)

Fixes:

- Numerical BER estimation: ASE-ASE beat noise was too dominant in some cases
- Eye pattern analyzer: more stable and exact eye detection

New Features:

- Analytical BERT: new result types "electrical bandwidth" and "optical bandwidth"
- Eye pattern analyzer: enhanced to deal with bi-polar signals
- Random generator: optional static or deterministic initialization ($\Rightarrow$ main parameters)

Version 3.10 (2003-01-14)

New Features:

- Raman-pumped fibers with multiple pumps, forward/backward pumping, user-defined power and frequency
- Enhanced "pattern modifier" component (manual access to p_min, p_max, delay)