

What's New in ASPEN OneLiner V15.5

This maintenance release contains fixes for software bugs, plus some program improvements.

Run the OneLinerV15.5Setup.exe that you downloaded to update an existing installation or to create a new OneLiner V15.5 installation on your computer.

Note: *This is a maintenance release, and no new parameters are introduced for any network or relay objects. This means that the data files generated by OneLiner V15.5 are fully compatible with the earlier releases of OneLiner V15.4 and V15.3. (More on differences between a maintenance release and a major release can be found on the last page of this document).*

Please write to support@aspeninc.com in English (suporte@aspeninc.com in Spanish and Portuguese) or call us (650-347-3997) if you have questions.

Program Improvements between Versions 15.4 and 15.5

1. **New OIxAPI Python library:** This object-oriented library will allow users to implement OIxAPI Python applications to process OneLiner network and relay data easily, with a minimum amount of coding.
2. **New interpretation of branch ratings in MVA when checking relay loadability at voltages at other than 1 per-unit:** In OneLiner v15.5 when the ratings of lines and transformers are entered in the unit of MVA, the Check | Relay Loadability command calculates the highest level of load current that the relay should not trip by always assuming the voltage is 1.0 per-unit. This calculation method fully meets the requirements in the latest PRC-023-4 standard.

In OneLiner v15.4 or earlier when the ratings of lines and transformers are entered in unit of MVA, the Check Relay Loadability command calculates the highest level of load current that the relay should not trip by assuming the load is constant-MVA. For studies done at 0.85 per-unit voltage, for example, this results in a current that is 1/0.85 or 17.6% higher than the load current at the voltage of 1.0 per-unit.

3. **The range of some parameters of Voltage controlled current sources (VCCS), Type-3 wind generators and Converter interfaced resources (CIR) has changed:**
 - For VCCS, type-3 wind plants and CIRs, the lower voltage limit for shutdown is now zero.
 - The limit for the slope of positive- and negative-sequence reactive current injections for CIRs is now 10 and 6, respectively. Please be aware that for most CIRs, the positive-sequence slope is between 1 and 2. Higher positive-sequence slopes should be used only for FACTS and special-purpose devices.

Most CIRs in operation in North America have a negative-sequence slope of zero. Only some of the newest CIRs inject negative-sequence reactive current for unbalance faults. The negative-sequence slope recommended by the German grid code is 2.

4. The solution method for CIRs with non-zero negative-sequence slope has changed in this version: The advantages of the new method are these:

- The fault currents of unbalanced faults are symmetric. As an example, the fault currents for single-line-to-ground faults on phase 'a', phase 'b' and phase 'c' are always the same. Previous versions give different values.
- This method has good convergence characteristics.
- This method works with large positive- and negative-sequence slopes.
- The negative reactive current is 90 degrees (plus or minus 1 degree) ahead of the negative-sequence voltage.

The new method is described in a PowerPoint file that you can download at:

<https://www.aspeninc.com/download/UserDownload/ConvSim/AnotherMethodToSimulateConverters.pdf>

5. Import/export support for the latest ANAFAS file format: The updated ANAFAS-to-ASPEN Conversion program with version number of 15 is shipped in this release. Here is a summary of what have done:

- The parameters NUN and NOP in ANAFAS data are stored in OneLiner as "user defined data", a new feature that is available for the first time in version 15 of OneLiner. You can edit these two parameters, but please be aware that there is no automatic update of the associated network parameters. You will have to update the network parameters separately by hand.
- All wind generators that are modeled as "synchronous generators" in ANAFAS data are translated verbatim to synchronous generators in OneLiner. We wanted to convert them to type-3 wind generators in OneLiner but we found it impossible because we do not know how to estimate the MVA rating of these devices.
- All solar plants in the DEOL section of ANAFAS data are converted to Converter-Interfaced Resources in OneLiner. The MVA rating for these plants is estimated based on the maximum current and the nominal kV. Please be aware there can be no more than one group of identical devices on any bus.

6. Merge Bus command logic is enhanced to automatically address anomalies in branch circuit ID, as well as issues in load, shunt, and generating unit IDs and breaker names.

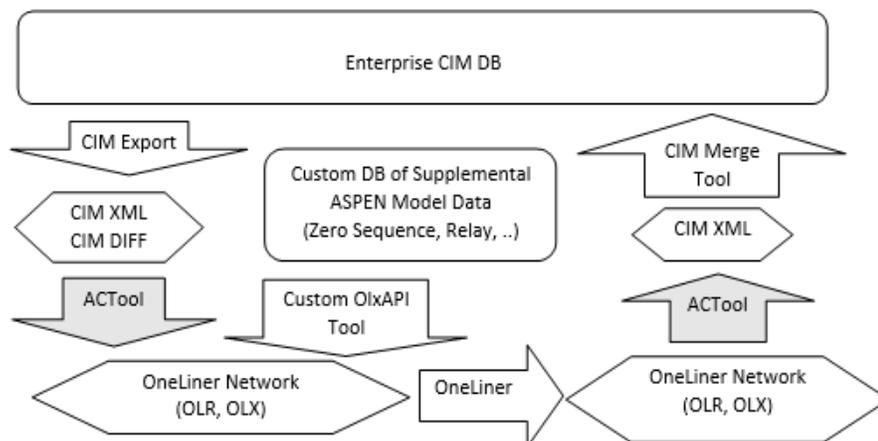
7. Enhanced change-file generation logic to speed up the program execution time.

8. Enhanced data validation logic in several dialog boxes of differential relay, type-3 wind plants, CIRs, and VCCS.

9. Enhanced the distance relay dialog box to make it more user-friendly.

10. **Introduced a new logic scheme “OC relay signal INST/DT TRIP”**, which is a full equivalent of the “INST TRIP” signal in *OneLiner* V14. This signal will assert when either the instantaneous element or the fastest of definite time element operates.
11. **Improved the Disguise File Identity command**: The command now also processes data in memo, tags and user-defined data fields.
12. **Enhancement in the CHECKRELAYOPERATIONSEA API**: The new input OPTIONSFILEPATH will let user specify the relay checking option file to be used in the execution of the API.
13. **Implemented scripting engine write logic for data fields**: LU_sID, GU_sID, SU_sID, XR_sID, XR_nMetered, XR_nLTCside, XR_nLTCtype, X3_sID, X3_nFictBusNo, PS_sID, PS_nControlMode, SH_nActive, LD_nActive, GEN_nActive, LU_sID, GU_sID, Cx_dIntrTime.
14. **New scripting engine logic for data fields**: Ox_sTapType, Ox_dMinTripTime, DP_dZ2OCTD, DG_dZ2OCTD, DP_dZ2OCPickup, DG_dZ2OCPickup, DP_dKAngEx, DG_dKMagEx, DP_sZ2OCCurve, DG_sZ2OCCurve, LN_dI2T, LN_nMeteredEnd, XR_nMeteredEnd, DC_nMeteredEnd.
15. **New add-on CIM Module has been released**: This module facilitates the exchange of ASPEN network- and relay-model data using the CIM standard. The module includes:
 - The ASPEN CIM profile with the extensions for ASPEN network model data and relay data.
 - A Python program ACTool that performs the model data conversion and processing tasks.

The ASPEN CIM Module is a component of the enterprise CIM-based network model data management system as shown in the following picture:



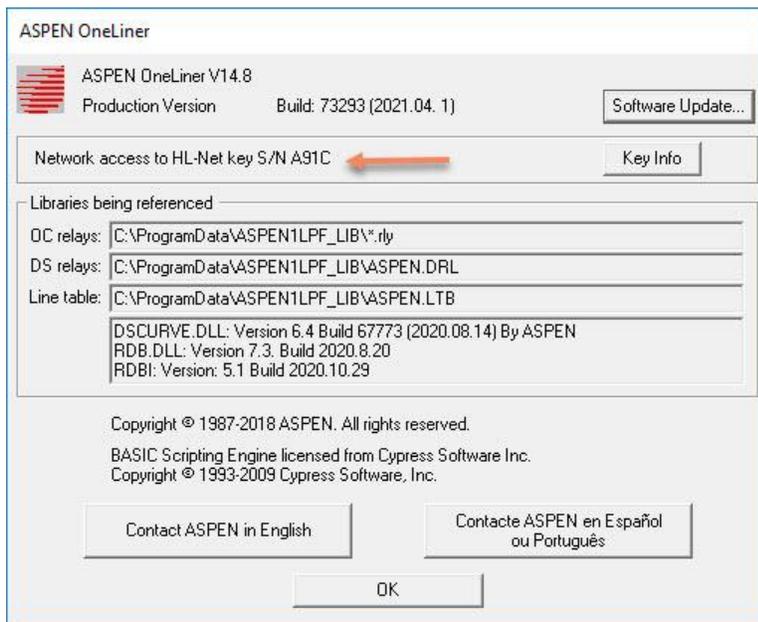
Please contact ASPEN for additional details and demo of this module.

ASPEN Software No Longer Works with “Network Access using HASP HL-Net Key”

ASPEN OneLiner, Power Flow, and DistriView software (ASPEN software) released after January 1, 2022 will no longer work with “Network access to HL-Net key”.

The “Network access to HL-Net key” configuration requires a network connection to the Hasp License Manager software. This software has not been updated for many years and is becoming obsolete. In many cases it adversely affects ASPEN software’s reliability.

The best way to find out the key type and the method of access is to start your ASPEN software and execute the Help | About This Program command. You will see a dialog box that looks like this.



If the text left of the arrow reads “Network access to HL-Net key S/N xxxx”, then please read on. Otherwise you can stop because the change will not affect you.

First we suggest you write down the 4-digit hex serial number of your existing key (the key number in this example is A91C).

We strongly recommend you change the key type and the method of network of access to one of the following:

1. A USB key known as a “HL-Net key with a Sentinel Sector” or
2. A software key, also known as an “SL key”.

Both of the above program configurations are supported by the Sentinel® license manager. Built-in support for the Sentinel license manager has been available in all the existing major versions of ASPEN software: OneLiner/Power Flow since version 12, and DistriView since version 10.

The Sentinel license manager software is bundled in the same package as the key driver and requires no separate installation. It comes with an easy-to-use Sentinel Control Panel that lets users monitor and manage the license usage. The software is actively maintained by the vendor (Thales) with regular security updates and feature enhancements.

For more information on the installation of these new hardware and software keys, please download the following manuals:

1. Hardware key: [Getting Started Manual](#)
2. SL Key: [SL-Key Administration Manual](#)

If you plan on sharing your ASPEN software license among multiple users on a network after January 1, 2022, you need to take the following steps as soon as possible:

1. Contact ASPEN support <support@aspeninccom> to exchange your existing HL-Net key for a new [HL-Net key with Sentinel Sector](#), or an [SL key](#). Please provide ASPEN the serial number of your existing HL-Net key, and in the case of a hardware key, the shipping address for the new key.
2. Install the latest Sentinel® LDK and Sentinel HASP® Run-time Environment on the license server computer, and connect/install the new key to the computer that host the network key.
3. Change the ASPEN program configuration on each application PC to match the new key type.

Q. How can I tell if “HL-Net key with a sentinel sector” (hardware key) or “Sentinel Software SL key” (software key) is the right choice for me

A. You will need to take the following into account:

- ASPEN programs will work the same way with both key types.
- Both key types require the Sentinel® LDK and Sentinel HASP® Run-time Environment software on the license server.
- The exchange of “HL-Net” key for “HL-Net key with Sentinel Sector” key is free of charge for all users with an active software maintenance subscription.
- The exchange for SL software key will require an additional fee, which will be calculated based on the number of seats to be programmed in the key.
- The hardware key requires a USB connector on the license server computer. If your license server computer does not have an USB port, you must use a SL key.
- The software key is created based a “fingerprint” of the license server computer. The key can stop working, be damaged, and even lost if changes are made to the server hardware or operating system without taking the proper precautions. A hardware key is unaffected by these changes.

Bug fixes between Versions 15.4 and 15.5

- Fixed error in OneLiner bus fault current report: the total fault current reported by ASPEN OneLiner for bus faults and close-in faults can be wrong when all three of the following conditions are met:
 1. The faulted bus has an active Voltage Controlled Current Source (VCCS), a type-3 wind generator (GenW3), or a Converter-interfaced resource (CIR).
 2. One or more of the following fault-simulation options are turned on: VCCS, GenW3, and CIR.
 3. The VCCS, GenW3, or CIR unit on the bus did not shut down due to low voltage when the fault was applied.

This error may affect the simulation of relay operations within relay groups that are on branches that connect directly to a bus that has an active VCCS, GenW3, or CIR when a close-in fault is applied in front of the relay group. Additionally, this error may affect ASPEN Breaker Rating report for breakers on a bus with an active VCCS, GenW3, or CIR when the breakers are set to protect the bus or the branches that are connected to the bus. This mistake does not affect any the other currents and voltages in the fault simulation results that the program shows on the one-line diagram and in text reports

- Bug fix in scripting engine logic for short circuit current calculation. This bug affected the GetSCCurrent() and GetRelayTime() APIs
- Bug fix in the OC relay import logic
- Restored v14 Pilot signal INST TRIP to ensure backward compatibility. The same signal is now called INST/DT TRIP. Also renamed INST PICKUP to INST/DT PICKUP to match the correct v15 logic: this signal will assert on INST as well as on any DTx element. Also amended the Check network anomalies "Logic scheme equation" logic to show schemes with invalid reference
- Cosmetic bug fix in the scripting engine GetPSCVoltage() API
- Bug fix in SEL32 reverse dir logic
- Bug fix in the FT_nNOfaults logic.
- Memory bug fix in text file import logic.
- Fixed a bug in PowerCalc constant definition.
- Multiple bug fixes in the file comparison and ADX logic.
- Tested the new CHF logic.
- Bug fix in the Paste network command.
- Fixed a bug in the read binary data logic to avoid relay data anomalies.
- Memory bug fix in relay operation time report logic.
- Fixed a bug in v15 pilot evaluation logic for the signal-only flag.
- Fixed a GUI refresh issue in the DS relay dialog box.
- Fixed a bug in the Load flow simulation logic that affected the solution in network with type-3 wind turbines and CIRs.
- Fixed a bug in the Preferences dialog box
- Fixed a bug in OG_dInst and OG_dInst logic.
- OC DT element trip current report bug fix
- Bug fix in PostUnitXXX sID logic

- RAT file import bug fix.
- Bug fix in RAT file import logic.
- Bug fix in the GetObjUDFByIndex() API.
- Fixed a bug in Copy/Paste OC relay logic that caused problem with the DT element and the RDBLINK data.
- Fixed a bug in Copy/Paste OC relay logic that caused problem with the INST element data
- Fixed bugs in OLX/ADX read/write logic.
- Fixed a bug in COMTRADE channel selection logic.
- Fixed a Check relay setting bug that caused the TOC elements to be missed in the checking report.
- Bug fix in the Compare file logic that caused the program to crash in some cases.
- Bug fix in UDF field logic.
- Bug fix in 3-way file merge dialog box.
- Bug fix in the Ox_vdDirSetting logic. Introduced new token Ox_vdDirSettingV15.
- Bug fix in OC curve drawing logic.
- Fixed issue in the Data Browser logic for generators, shunts, and load unit UDF
- Fixed issue in Acquire Graphic command for with type-3 wind turbines and CIRs objects.
- Fixed issue in the data browser paste command.
- Fixed SEL relay import backward compatibility issue.
- Fixed a bug in v15 logic scheme evaluation for the legacy signal type.
- Fixed a bug in OlxAPIGetData() data buffer size requirement.
- Fixed a bug in read-line-table-data logic that caused program crash when the ltb file has junk data.
- Fixed a buffer size error in the tapped line logic.
- Bug fix in Show relay operation for all faults command in the OC relay window.
- Fixed a bug in the relay import logic that caused program crash when the relay name is longer than 20 char.
- Fixed bug in DXT import logic.
- Fixed bug in the Data Browser edit logic.
- Fixed the relay import backward compatibility issue for SEL421 and 411 relays.
- Fixed a bug in Journal data write logic that caused random program crashes.
- Fixed a bug that affected in-service status of pilot schemes that are tagged as either packageA or packageB.
- Fixed a bug in the Bus fault summary read base line CSV file.
- Fixed a bug in the Fault locator API logic.
- Fixed the OlxAPI Initialize bug which cause the module initialization failure when the HKEYLOCALMACHINE OneLiner registry key is not found.
- Fixed an error in the SEL DS relay model: The Z0MAG and Z1MAG setting-value range should be dependent on the INORM setting.

Explanation of Maintenance Release and Major Release

OneLiner's version number consists of two integers separated by a period, such as 15.5. The first integer "15" is the major release number, and the second integer "4" is the minor release number.

There are relatively few differences in program features between minor releases, e.g., between version 15.4 and version 15.5. Also, no new parameters are introduced for any network or relay objects in minor releases. Most of the changes between minor releases are bug fixes. *This means that the data files generated by different minor releases are 100% compatible.*

Major changes in program features and network and relay models happen only between major releases.

Backward and Forward Compatibility of OLR files

Backward compatibility: *OneLiner* can read olr data files generated by previous versions (3.1 or later) with no loss of information. Version 3.1 was released in 1990.

Forward compatibility: *OneLiner* can read olr files generated by future versions. For example, *OneLiner* v14 can read olr files generated by v15, except new objects and new parameters not available in v14 will be omitted by the v14's read-file logic.

Backward and Forward Compatibility of DXT files

Text data files with extension DXT were intended to be a medium of data transfer between data conversion programs and *OneLiner* of the same major version. Due to popular demand, *OneLiner* v15 can read DXT files generated by *OneLiner* v14. This is the only exception.