Translator User's Guide

Version 5.0

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Foreword

This User's Guide describes how to access and use the Microsoft Windows™ Translator. ITT Industries, Inc., Systems Division developed and is maintaining the Translator under the direction of the Federal Highway Administration (FHWA) on Contract Number DTFH61-95-C-00125.

Please refer to the TSIS User's Guide for information on obtaining the Microsoft Windows™ version of the Translator.

Abstract

The Microsoft Windows™ version of the Translator is distributed as part of, and is designed to operate efficiently in conjunction with, FHWA's **T**raffic **S**oftware **I**ntegrated **S**ystem (TSIS)**.** The Translator is used to translate CORSIM TRF files into TRAFED TNO files and TRAFED TNO files into CORSIM TRF files.

This guide:

Introduces users to the capabilities and features of the **Translator**.

Explains in detail how to use the **Translator** and how to access all of its functionality.

Contents

1 About the Translator

1.1 Welcome to the Translator

This User's Guide supports traffic engineers using the Microsoft Windows™ version of the Translator to translate CORSIM TRF files into TRAFED TNO files and TRAFED TNO files into CORSIM TRF files. The guide describes neither the technical aspects of CORSIM, nor the types of analyses that can be performed using traffic simulations.

1.2 Introduction

This document describes the TSIS Translator. The Translator is an executable program (xlatetool.exe). It can be run as a tool in TShell. The Translator is a component of TSIS. The TShell component of TSIS provides services to the Translator, such as passing filenames to the Translator. The Translator uses other files delivered with the TSIS package. These files are: TNOXLATE.DLL, TSISINTF.DLL, CORSIM.DLL, TRFFORMAT.MDB.

TRAFED is used to create models of traffic networks using a point-and-click, graphical user interface. It is designed to support users of the Federal Highway Administration's (FHWA's) CORSIM microscopic traffic simulator. The goal of TRAFED is to allow traffic engineers to quickly and easily layout and build simulated traffic networks without having to know the internal workings of the traffic simulation that will be used to perform analysis. By displaying, editing, and storing the data in a manner that makes sense to a traffic engineer, TRAFED allows the engineer to spend time analyzing the data and making decision rather than learning how to make the simulation work. There are over 1200 entries of data used to input and calibrate a traffic network. The CORSIM TRF file format stores this data on 84 record types. Many of the pieces of data were introduced by different people at different points over the thirty-year lineage of CORSIM. There is a very complicated relationship between the data and between the record types. TRAFED attempts to hide these relationships where possible.

TRAFED stores data in an object-oriented manner rather than using the record-oriented structure of CORSIM's TRF file format. All of the data used by CORSIM is contained in or derived from data in the object model used internally by TRAFED. The data is stored in its native format instead of the integer only format currently used by CORSIM. For example, much of the data are currently entered in the CORSIM record type format as tenths of feet or tenths of seconds (95 tenths of a second). TRAFED displays and stores this same data in floating point format as feet or seconds (9.5 seconds).

TRAFED is laying the foundation for the future of traffic simulation. As the simulation inputs change, TRAFED can be easily modified to handle the changes. For example, the current record type format of CORSIM only allows 99 bus stations because the allotted space in the TRF file format for bus station identification number (ID) can only hold two digits. TRAFED has no internal restrictions as to the bus station ID. TRAFED's object model includes some data, such as geometric detail, that is not currently used by

CORSIM. These details will assist TRAFED in drawing the network properly but may not be necessary for the simulation to model the traffic flow.

The Translator provides the functionality for easily moving from one type of file to the other. In most cases you will create new TRAFED TNO files and translate them to CORSIM TRF files to run them through the simulation or animation programs. If you have an existing valid CORSIM TRF file, you may first translate it into a TRAFED TNO file that can then be edited as you desire.

For some users who are comfortable directly editing the CORSIM TRF file with a text editor, there may not be a reason to use the Translator. Other users may want to use multiple methods of manipulating the traffic network. In this case it may be necessary to translate back and forth between the two file formats. There are some tasks that may be easier to edit in TRAFED and some tasks that are easier to edit in a text editor like the one provided with this version of TSIS. For example, you may quickly layout a network with TRAFED and translate it to a CORSIM TRF file. You can then edit the TRF file to change the number of lanes on multiple links (this can be done in TRAFED but it requires accessing each link's property page), and translating the changed CORSIM TRF file back into a TRAFED TNO file. Make some other changes in TRAFED and then export the TRAFED data, or translate the TRAFED file to a CORSIM file to simulate. Refer to the Exporting versus Translating section for more information on exporting.

1.3 Issues and Concerns

Translating a CORSIM TRF file to a TRAFED TNO file and then translating that file back to a CORSIM TRF file makes some changes to the original TRF file. The before and after version may not look exactly the same but will be functionally equivalent. We have translated hundreds of cases from TRF files to TNO files and back to TRF files without any problems. We have great confidence in the translation process, but we realize you may not share this confidence. Until you gain confidence in the Translator you may want to make backups of your existing CORSIM TRF files.

The following issues and concerns were raised during Beta testing:

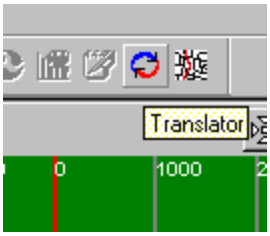
- Comments are removed. Lines of text in CORSIM input files that do not have record numbers or any text in columns 78, 79, and 80 have been used to comment the different sections of the TRF file. These comments are not translated. Record Type 00 comments and description of the test case will be translated and kept with the test case.
- Links may be reordered. The order the records are written to the TRF file may not be the same as the original TRF file. This may cause the animation of case to be different from the animation of the original case. (i.e. the exact same vehicles will not be in the exact same place at the exact same time.) CORSIM processes vehicles and signals in an order determined by the order of the links. This should not affect the functionality of the traffic network.
- Approaches may be reordered. Approach links to a signalized intersection may be reordered in the post-translation TRF file. This may cause the animation to look different but the functionality will remain the same.
- Node locations may be shifted. Node locations may be moved to locate the network in the first quadrant. That is, all locations will be positive but the left most point in the network will have zero for its X coordinate and the bottom most point in the network will have zero for its Y coordinate. All other nodes will be moved to maintain the same scale.

2 Using the Translator

2.1 Translator Within TSIS

In the TSIS environment, the Translator capability is enhanced to be TSIS aware. The Translator is designed to take in files with a TRF extension (CORSIM files) or files with a TNO extension (TRAFED files). If no output filename is provided and it is not running in silent mode, the Translator will prompt the user for the filename that will be used to translate to. Refer to the Command Line Arguments section for more information how to customize the Translator.

The Translator button is found on the Traffic Tool Toolbar within TShell. The button will be active whenever a valid input file is selected in the Project View or a valid input file is open in the workspace in its editor.



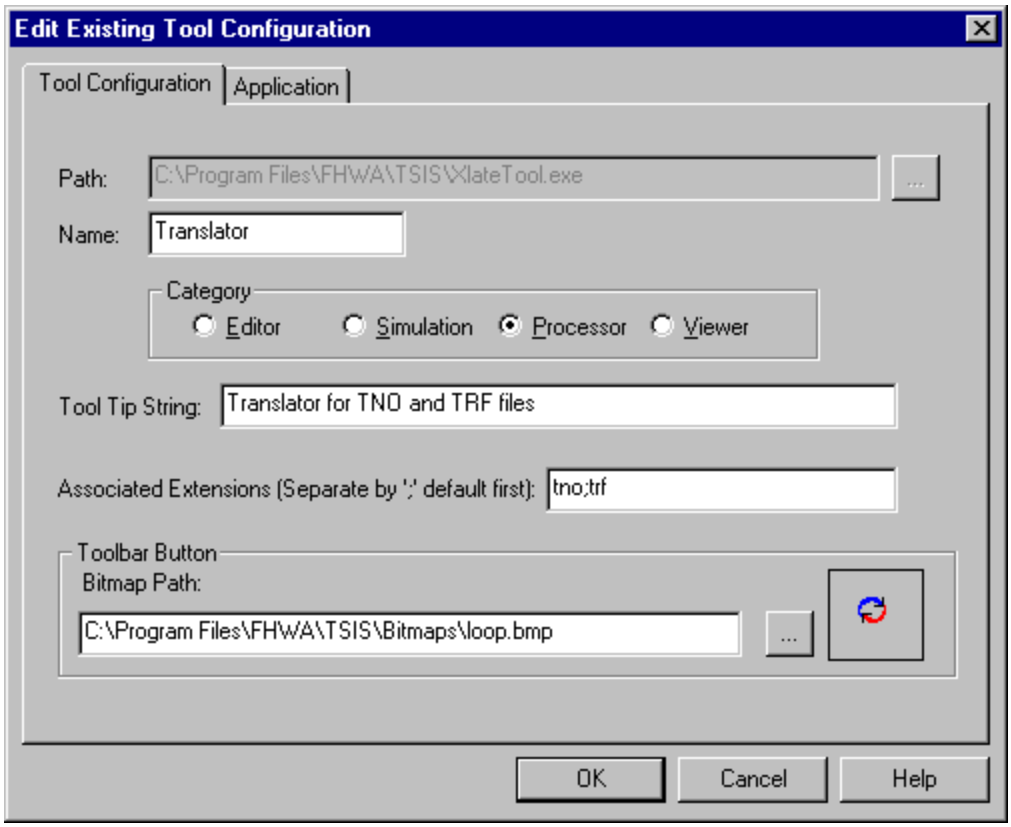
You can also use the tool by selecting a file in the Project View then selecting the Tools | Processors | Translator menu item.

Or you can right click in the desired file and select Open With | Translator from the pop-up menu.

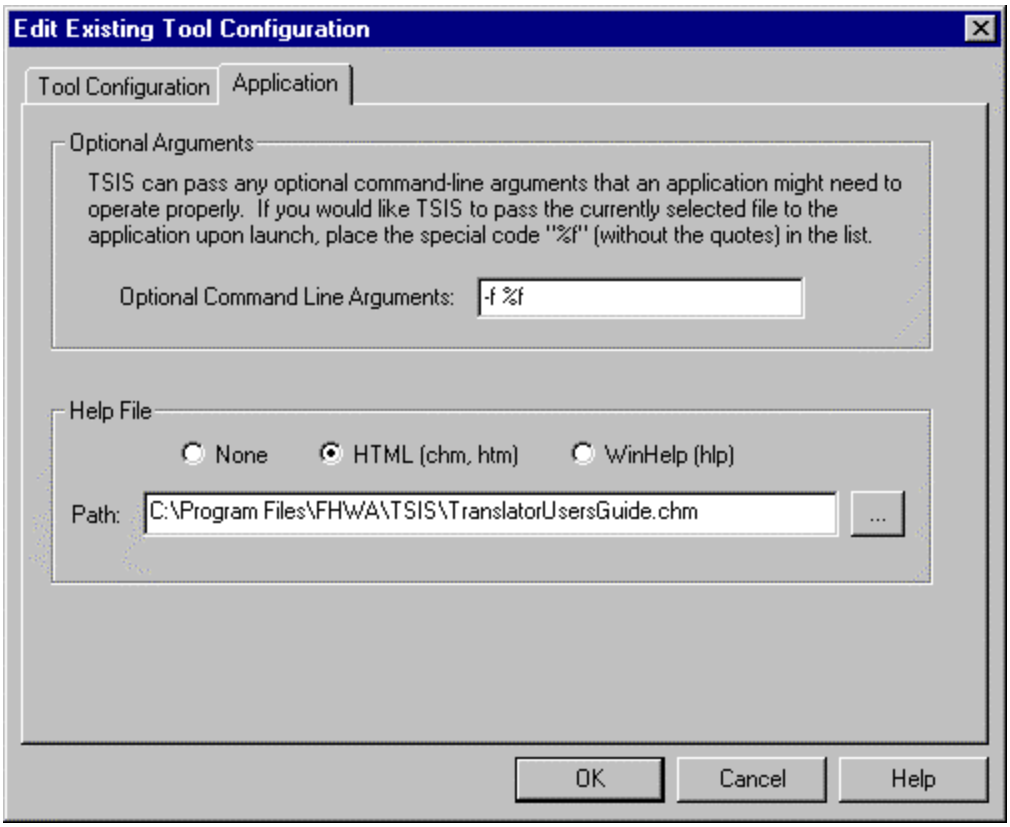
2.1.1 Tool Configuration

The Translator is a basic tool delivered with the TSIS 5.0 toolkit. Within the TShell environment you can setup and change the tool's configuration. By doing so, you can change the behavior of the tool. Refer to the TShell User's Guide for more information on configuring tools.

The Translator is delivered with the following settings. You can change these settings as desired. The tool (XlateTool.exe) is found in the install directory. The name is "Translator" and the Category is "Processor." The Tool Tip String is Translator. Translator can take in TNO files or TRF files so those extensions are designated in the Associated Extensions field. The default bitmap that shows up on the tool button is the "loop" bitmap.

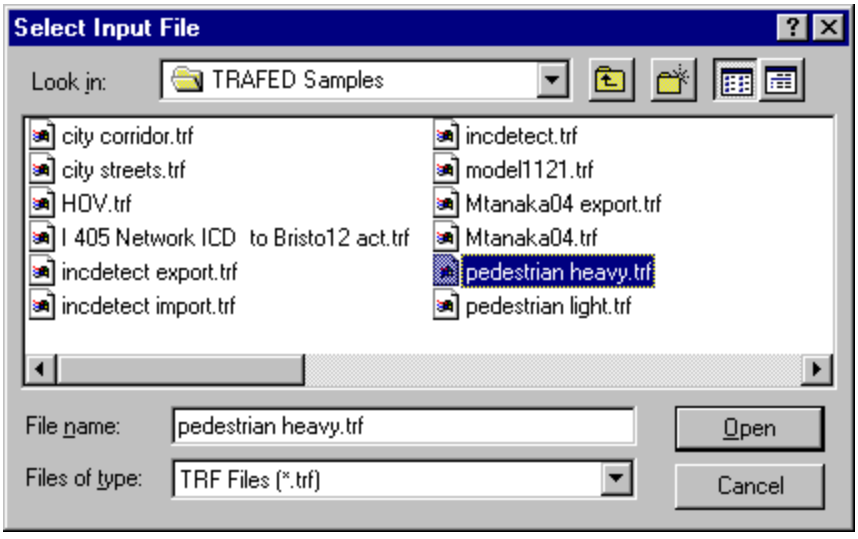


The Translator can take different arguments on the command line. These can be input on the Application tab in the Tool Configuration dialog in TShell. Refer to the Command Line Arguments section for more information on these arguments. The default arguments ("-f %f") passe the filename selected in the Project View to the Translator as the input file. There is no way to access help while running this application. The only way get help for this tool is to use the TShell Help | Help Topics menu item.

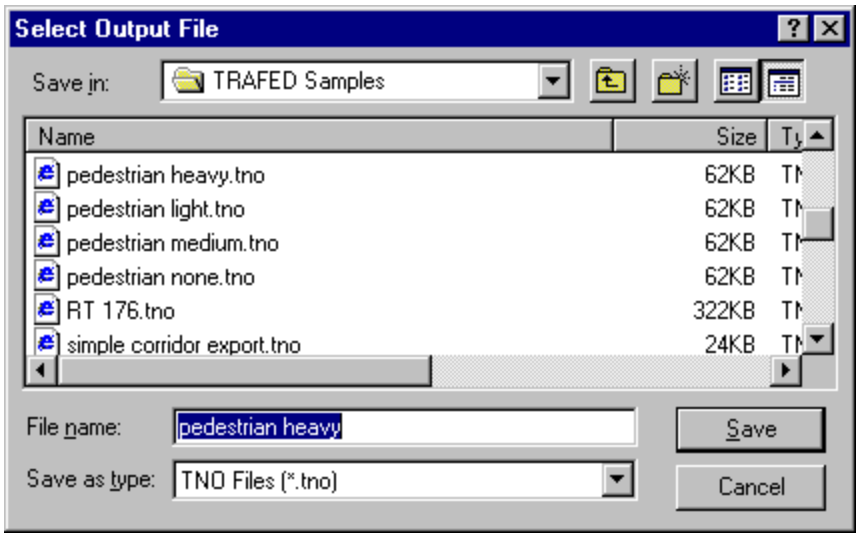


2.2 Running the Translator

If no input file is supplied to the Translator, the following dialog will be displayed. Browse and select the file you want to translate. You may need to change the extension to select the type of file you want.



If no output file is supplied to the Translator, the following dialog will be displayed. Browse to the directory where you want to save the translated file. The file name is defaulted to the root file name of the input file. Use the default name, select an existing file, or type in the desired name for the translated file. The extension or type of file will be the opposite of the type of file used as the input file.



After selecting the output file, the translation process will begin. The following dialog will be displayed while the translation process is taking place. The path and filename of the file being translated will be displayed as the title of the dialog.

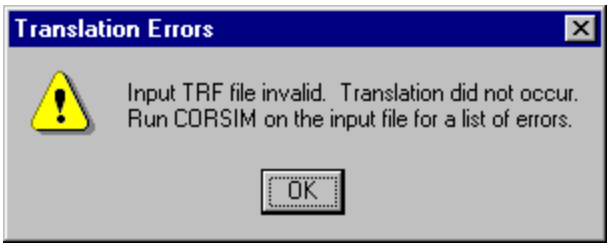
If the translation can not complete successfully error or warning messages will be displayed. Refer to the sections on translating different types of files below for descriptions of these errors and warnings.

When the translation completes successfully the following dialog will be displayed.

2.3 Translating a CORSIM file into a TRAFED file

Passing in a CORSIM TRF input file to the translator, by selecting a “Simulation (*.trf) file from the Project View, makes the Translator translate the file to a TRAFED TNO file. The Translator uses CORSIM to read in and validate the data in the CORSIM input file. This ensures that the input file is valid so that the Translator does not have to do error checking. The CORSIM program memory is read to determine the values of the various fields.

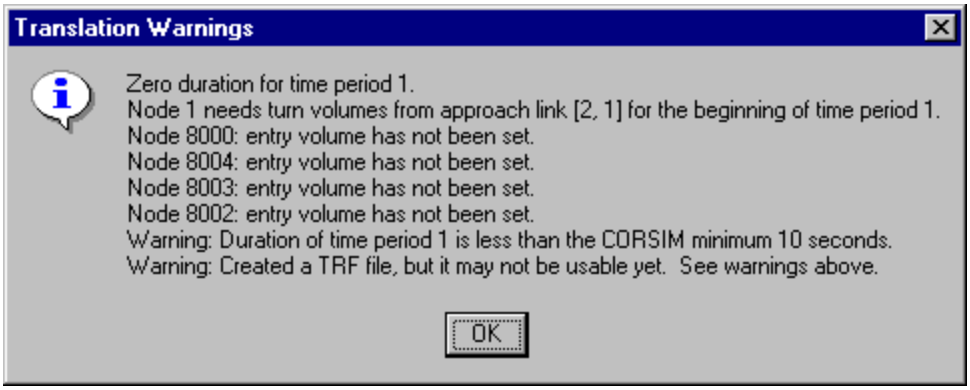
If the translation fails, it is most likely due to the input file not being a valid CORSIM file. The following error message will be displayed. Run the file through CORSIM to determine the cause of the problem. Correct any errors that may be present and then run the Translator on the input file again.



2.4 Translating a TRAFED file into a CORSIM file

Passing in a TRAFED TNO file to the translator, by selecting a "Network (*.tno) file from the Project View, makes the Translator translate the file to a CORSIM TRF input file. The Translator will load the TRAFED file and then create a CORSIM file from the data in the file.

Translating the TRAFED TNO file to a CORSIM TRF file may generate some warnings. A warning message similar to the follow dialog will be shown. In most cases the Translator will create a CORSIM TRF file even though that file may not be valid. The last line of the message indicates this warning.



2.5 Exporting versus Translating

Translating takes in a file (TNO or TRF) and translates into its functionally equivalent file (TRF or TNO). Exporting works on the currently active TRAFED network and exports the current data to a CORSIM file (TRF). The Export functionality is available from the Network | Export menu when TRAFED is running. Although these two pieces of software share some of the same code they are very different. The exporting software is built into TRAFED and creates a CORSIM TRF file based on the data that is currently set in TRAFED. Using this mechanism is very fast because it does not have to load the TRAFED data from the TNO file and then translate it to the CORSIM TRF file. It uses the data currently in memory and creates a CORSIM TRF file from it.

This is also a way of creating multiple CORISM TRF files without having to change the underlying TRAFED TNO file. You can make a change, export it, make another change, export it and so forth. The Translator requires the file to be saved first because it uses the file as the input file.

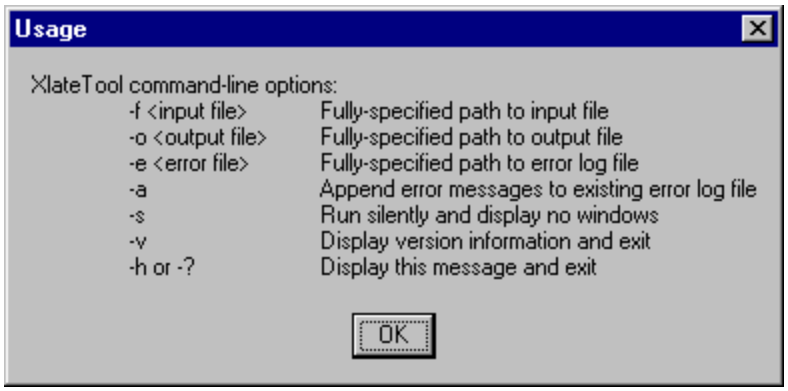
2.6 Command Line Arguments

The Translator can run in different modes based on "arguments" passed on the command line when the program is started. This functionality makes this a flexible tool that can be customized for your purposes. If no arguments are passed to the Translator, it will prompt you for the input file to process. Then it will prompt you for the output file to save the results of the translation.

The following arguments can be used with the Translator:

Command Line Argument	Usage
-f <input file>	Fully specified path to the input file. Provide a "–f" followed by the full path and filename that will be used as the input file.
-o <output file>	Fully-specified path to the output file. Provide a "–o" followed by the full path and filename that will be used as the output file.
-e <error file>	Fully specified path to the error log file. Provide a "–e" followed by the full path and filename that will be used as the error file.
-a	Append error messages to the existing error log file.
-s	Run silently and display no windows. No dialogs asking if you wish to overwrite an existing file will be displayed. If the output file name is not provided, the root filename of the input file will be used as the output filename.
-v	Display version information and exit. This simply pops up a small dialog with the version number diplayed. The dialog will disappear and the Translator will exit without doing anything when the OK button is pressed.
-h or -?	Display the usage message and exit. The dialog will disappear and the Translator will exit without doing anything when the OK button is pressed.

The usage message that is displayed when the –h or -? argument are used is shown below.



3 Glossary of Terms

ATMS

Advanced Traffic Management Systems

case

A single simulation for a specified traffic network as defined by its simulation input file. A case includes the simulation input file and all data files generated by the simulation during a run. Note, multiple runs of the simulation for gathering statistics is still considered part of a single case if the input has not changed.

CORSIM

CORSIM (CORridor microscopic SIMulation program) is the corridor simulation and modeling component of the Traffic Software Integrated System (TSIS) tool suite.

DOT

Department of Transportation

FHWA

Federal Highway Administration. Sponsor for the development of the TSIS suite of traffic analysis tools.

graphical user interface

A interface between a user and a software tool, consisting of graphical elements and controls, e.g., windows, dialogs, buttons.

GUI

Graphical User Interface

HTML

Hypertext Markup Language is a system of marking up or tagging a document so that it can be published on the World Wide Web. It is used to display Script Tool on-line help.

Output View

The Output View is a dockable control window in the TShell interface that displays the output generated by the traffic tools as they operate on files.

Project View

The Project View is a dockable control window in the TShell interface that displays a hierarchical tree structure of projects, cases, and case files. Using this tree structure, you can efficiently manage your traffic analysis projects and execute tools on project files.

tool

A program or component that is installed into the TSIS environment for use in conducting traffic operations analysis. A tool can be an application (EXE), Dynamic Link Library (DLL), COM object or ActiveX Control (OCX), or a batch program (BAT).

tool tip

A small rectangular pop-up window that displays a brief description of a command bar (toolbar) button's purpose.

TNO

A file contains the input data, used to define a CORSIM network using the TRAFED tool.

TRF

A file that contains the input data, in record format, used to define a CORSIM network and to drive the CORSIM simulation for a single simulation case.

TShell

The graphical user interface for the TSIS integrated development environment. It provides a Project View that enables you to manage your TSIS projects. It is also the container for the pre-configured tools and any tools that you add to the suite.

TSIS

Traffic Software Integrated System. TSIS is the integrated development environment that hosts the CORSIM simulation and its support tools .

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