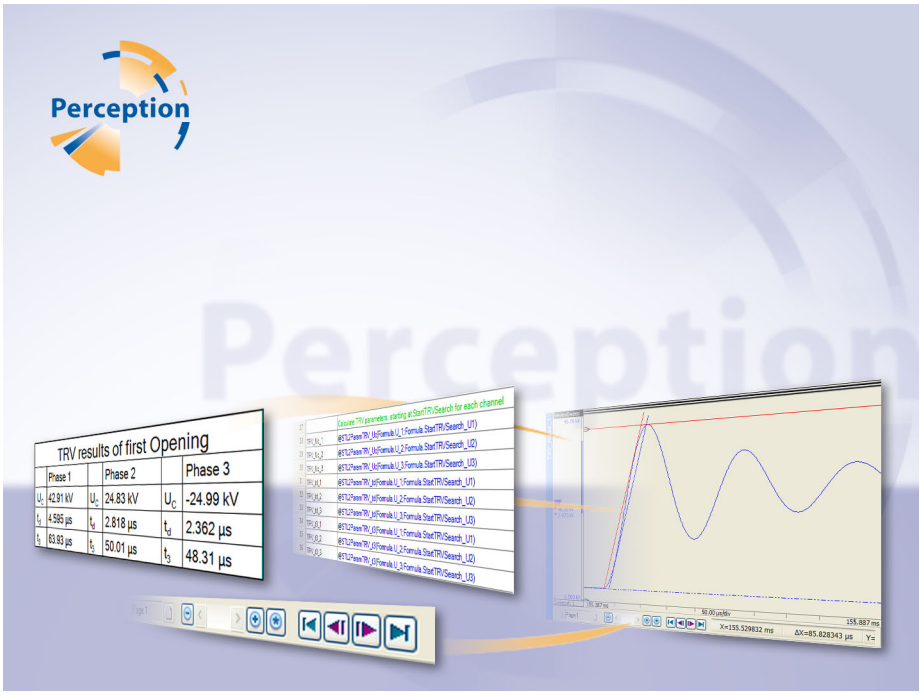
Genesis HIGH SPEED

User Manual

English



STL Analysis Option

Perception

HBM

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For Perception 6.0 or higher

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1 STL - Analysis Option

1.1 Introduction

Testing of switchgear devices and fuses requires advanced analysis capabilities to generate reproducible and accurate test results. Real world signals may be distorted, carry noise or spikes, but they still have to be evaluated appropriately. The STLA (Short- Circuit Testing Liaison Agreement) defined methods to unify the evaluation process of signals for HV electrical power equipment.

The calculations presented in this document are designed and implemented according to the STL technical report “Harmonisation of data processing methods for High Power Laboratories, September 2004”. Each implemented function in Perception is referenced to the relevant paragraph in the STL technical report.

The Perception STL Analysis option provides a set of calculations. For this it requires the Perception Analysis Option (a.k.a. formula database) also be installed. The calculation functions use advanced algorithms and methods like iterative loops, curve fitting, spike/noise suppression etc. to comply with the STL technical report. There are a number of generic calculations available for different purposes, a set of calculations for recovery voltage evaluation and a number of symmetric and asymmetric current calculations. In addition, various calculations for No-Load and travel recorder traces are available.

1.1.1 How to install the STL option

The Perception software requires a HASP key. HASP (Hardware Against Software Piracy) is a hardware-based (hardware key) software copy protection system that prevents unauthorized use of software applications.
Each HASP key contains a unique ID number used for personalization of the application according to the features and options purchased. The key is also used for storing licensing parameters, applications and customer-specific data.
If you have purchased the STL option as a separate item, you will receive a personalized "key file". Use this file to unlock the additional features.

You can find the serial number of your key in **Help ▸ About Perception**

To update the key information:

1 Choose **Help ▸ Update Key...**
2 In the Open dialog locate the Key File (*.pKey) and click **Open**.
3 If everything is OK you will see the following message:

Figure 1.1: Software copy protection dialog

4 Click **OK**.
After the installation you can go to **Help** ▸ **About Perception** ▸ **More...** to see all installed options.

You will need to restart the program before the changes take effect. The STL option is now available.

2 STL - Functions

2.1 @STLSignalStart

Function
This function will be used to recognize the start of a signal.

Syntax
@STLSignalStart*(Waveform; Frequency; StartPos; EndPos)*

Parameters

Waveform	Sinusoidal input waveform
Frequency	Frequency of the sinusoidal waveform.
StartPos	Optional begin of search
EndPos	Optional end of search

Output
A Numerical value indicating the start of the signal.

Basefunction
This function uses the STL base function: ***WavSTLSignalStartEnd***

STL documentation reference
§ 6.2.2. Recognition of signal

2.2 @STLSignalEnd

Function
This function will be used to recognize the end of a signal.

Syntax
@STLSignalEnd*(Waveform; Frequency; StartPos; EndPos)*

Parameters

Waveform	Sinusoidal input waveform
Frequency	Frequency of the sinusoidal waveform
StartPos	Optional begin of search
EndPos	Optional end of search

Output
A Numerical value indicating the end of the signal.

Basefunction
This function uses the STL base function: ***WavSTLSignalStartEnd***

STL documentation reference
§ 6.2.2. Recognition of signal

2.3 @STLNextZeroCrossing

Function
This function will be used to obtain the correct zero-crossing moment for a sinusoidal signal.

Syntax
@STLNextZeroCrossing*(Waveform; Frequency; StartPos; EndPos)*

Parameters

Waveform	Sinusoidal input waveform
Frequency	Optional Frequency of the sinusoidal waveform, default 50Hz.
StartPos	Optional begin of search
EndPos	Optional end of search

Output
A Numerical value indicating the first found zero crossing time after *“StartPos”*.

Basefunction
This function uses the STL base function: ***WavSTLZeroCrossing***

STL documentation reference
§ 6.3.3. Calculation of the zero crossing of a signal

2.4 @STLPrevZeroCrossing

Function
This function will be used to obtain the correct zero-crossing location for a sinusoidal signal.

Syntax
@STLPrevZeroCrossing*(Waveform; Frequency; StartPos; EndPos)*

Parameters

Waveform	Sinusoidal input waveform
Frequency	Optional Frequency of the sinusoidal waveform, default 50Hz.
StartPos	Optional begin of search
EndPos	Optional end of search

Output
A Numerical value indicating the first found zero crossing time before *“StartPos”*.

Basefunction
This function uses the STL base function: ***WavSTLZeroCrossing***

STL documentation reference
§ 6.3.3. Calculation of the zero crossing of a signal

2.5 @STLNextCrestTime

Function
This function will be used to determine the time corresponding to the next peak value of a sinusoidal-like signal.

Syntax
@STLNextCrestTime*(Waveform; StartPos; EndPos)*

Parameters

Waveform	Sinusoidal input waveform
StartPos	Optional begin of search
EndPos	Optional end of search

Output
A Numerical value indicating the time of the first found peak value after *“StartPos”*.

Basefunction
This function uses the STL base function: ***WavSTLCrestValue***

STL documentation reference
§ 6.3.2. Calculation of the peak value of a signal

2.6 @STLPrevCrestTime

STLPrevCrestTime
This function will be used to determine the time corresponding to the previous peak value of a sinusoidal-like signal.

Syntax
@STLPrevCrestTime*(Waveform; StartPos; EndPos)*

Parameters

Waveform	Sinusoidal input waveform
StartPos	Optional begin of search
EndPos	Optional end of search

Output
A Numerical value indicating the time of the first found peak before *“StartPos”*.

Basefunction
This function uses the STL base function: ***WavSTLCrestValue***

STL documentation reference
§ 6.3.2. Calculation of the peak value of a signal

2.7 @STLNextCrestVal

Function
This function will be used to determine the next peak value of a sinusoidal-like signal.

Syntax
@STLNextCrestVal*(Waveform; StartPos; EndPos)*

Parameters

Waveform	Sinusoidal input waveform
StartPos	Optional begin of search
EndPos	Optional end of search

Output
A Numerical value indicating the first found peak value after *“StartPos”*.

Basefunction
This function uses the STL base function: ***WavSTLCrestValue***

STL documentation reference
§ 6.3.2. Calculation of the peak value of a signal

2.8 @STLPrevCrestVal

Function
This function will be used to determine the previous peak value of a sinusoidal-like signal.

Syntax
@STLPrevCrestVal*(Waveform; StartPos; EndPos)*

Parameters

Waveform	Sinusoidal input waveform
StartPos	Optional begin of search
EndPos	Optional end of search

Output
A Numerical value indicating the first found peak value found before *“StartPos”*.

Basefunction
This function uses the STL base function: ***WavSTLCrestValue***

STL documentation reference
§ 6.3.2. Calculation of the peak value of a signal

2.9 @STLFirstMaxCrestVal

Function
This function will be used to determine the max peak value of one of the first two peaks of a sinusoidal-like signal.

Syntax
@STLFirstMaxCrestVal*(Waveform; StartPos; EndPos)*

Parameters

Waveform	Sinusoidal input waveform
StartPos	Optional begin of search
EndPos	Optional end of search

Output
A Numerical value indicating the max peak value out of the first two crests after *“StartPos”*.

Basefunction
This function uses the STL base function: ***WavSTLFirstMaxCrest***

STL documentation reference
None

2.10 @STLFirstMaxCrestTime

Function
This function will be used to determine the time corresponding to the max peak value of one of the first two peaks of a sinusoidal-like signal.

Syntax
@STLFirstMaxCrestTime*(Waveform; StartPos; EndPos)*

Parameters

Waveform	Sinusoidal input waveform
StartPos	Optional begin of search
EndPos	Optional end of search

Output
A Numerical value indicating the time of the max peak value out of the first two crests after *"StartPos"*.

Basefunction
This function uses the STL base function: ***WavSTLFirstMaxCrest***

STL documentation reference
None

2.11 @STLValueFunction

Function
This function returns the instantaneous value of a signal at a specified time.

Syntax
@STLValue*(Waveform; XPosition)*

Parameters

Waveform	Input waveform
XPosition	X position at which the value of Waveform is to be determined.

Output
A Numerical value indicating the value of a waveform at a specified x-position.

Basefunction
This function uses no STL base function.

STL documentation reference
§ 6.3.1. Calculation of the instantaneous value of a signal

2.12 @STLNextSlopeAtZeroCrossing

Function
This function will be used to determine the slope at the next zero crossing of a sinusoidal-like signal.

Syntax
@STLNextSlopeAtZeroCrossing*(Waveform; Frequency; StartPos; EndPos)*

Parameters

Waveform	Sinusoidal input waveform
Frequency	Optional Frequency of the sinusoidal waveform, default 50Hz.
StartPos	Optional begin of search
EndPos	Optional end of search

Output
A Numerical value indicating the slope at the next zero crossing found after *“StartPos”.*

Basefunction
This function uses the STL base function: ***WavSTLSlopeAtZeroCrossing***

STL documentation reference
§ 6.3.4. Determination of the slope (e.g. di/dt) at zero crossing of a signal

2.13 @STLPrevSlopeAtZeroCrossing

Function
This function will be used to determine the slope at the previous zero crossing of a sinusoidal-like signal.

Syntax
@STLPrevSlopeAtZeroCrossing*(Waveform; Frequency; StartPos; EndPos)*

Parameters

Waveform	Sinusoidal input waveform
Frequency	Optional Frequency of the sinusoidal waveform, default 50Hz.
StartPos	Optional begin of search
EndPos	Optional end of search

Output
A Numerical value indicating the slope at the previous zero crossing found before *“StartPos”.*

Basefunction
This function uses the STL base function: ***WavSTLSlopeAtZeroCrossing***

STL documentation reference
§ 6.3.4. Determination of the slope (e.g. di/dt) at zero crossing of a signal

2.14 @STLNext3CrestRMS

Function
This function will be used to determine the equivalent r.m.s. value of the ac component of a signal by the 3-crest method.

Syntax
@STLNext3CrestRMS*(Waveform; StartPos; EndPos)*

Parameters

Waveform	Sinusoidal input waveform
StartPos	Optional begin of search
EndPos	Optional end of search

Output
A Numerical value indicating the equivalent r.m.s. value of the ac component of the “waveform” signal.

Basefunction
This function uses the STL base function: ***WavSTL3CrestRMS***

STL documentation reference
§ 6.4.1. Evaluation of the equivalent r.m.s. value of the ac component of a signal by the 3-crest method

2.15 @STLPrev3CrestRMS

STLPrev3CrestRMS
This function will be used to determine the equivalent r.m.s. value of the ac component of a signal by the 3-crest method.

Syntax
@STLPrev3CrestRMS*(Waveform; StartPos; EndPos)*

Parameters

Waveform	Sinusoidal input waveform
StartPos	Optional begin of search
EndPos	Optional end of search

Output
A Numerical value indicating the equivalent r.m.s. value of the ac component of the *"waveform"* signal.

Basefunction
This function uses the STL base function: ***WavSTL3CrestRMS***

STL documentation reference
§ 6.4.1. Evaluation of the equivalent r.m.s. value of the ac component of a signal by the 3-crest method

2.16 @STLNextTrueRMS

Function
This function will be used to obtain the true r.m.s. value of a sinusoidal signal.

Syntax
@STLNextTrueRMS*(Waveform; Frequency; StartPos; EndPos)*

Parameters

Waveform	Sinusoidal input waveform
Frequency	Frequency of the sinusoidal waveform.
StartPos	Optional begin of search
EndPos	Optional end of search

Output
A Numerical value indicating the true r.m.s. value of *"Waveform"* between *"StartPos"* and *"EndPos"*.

Basefunction
This function uses the STL base function: ***WavSTLTrueRMS***

STL documentation reference
§ 6.4.2. Evaluation of the true r.m.s. value of a signal

2.17 @STLPrevTrueRMS

Function
This function will be used to obtain the true r.m.s. value of a sinusoidal signal.

Syntax
@STLPrevTrueRMS*(Waveform; Frequency; StartPos; EndPos)*

Parameters

Waveform	Sinusoidal input waveform
Frequency	Frequency of the sinusoidal waveform.
StartPos	Optional begin of search
EndPos	Optional end of search

Output
A Numerical value indicating the true r.m.s. value of *"Waveform"* between *"StartPos"* and *"EndPos"*.

Basefunction
This function uses the STL base function: ***WavSTLTrueRMS***

STL documentation reference
§ 6.4.2. Evaluation of the true r.m.s. value of a signal

2.18 @STL2ParamTRV_Uc

Function
This function will be used to obtain the Uc (Crest value) of a Transient Recovery Voltage (TRV) using a 2 parameter calculation.

Syntax
@STL2ParamTRV_Uc*(Waveform; StartPos; EndPos)*

Parameters

Waveform	Input waveform
StartPos	Optional begin of search
EndPos	Optional end of search

Output
A Numerical value indicating the Uc value of the TRV signal *"Waveform"* between *"StartPos"* and *"EndPos"*.

Basefunction
This function uses the STL base function: ***WavSTL2ParamTRV***

STL documentation reference
§ 7.3.2. Two parameters TRV

2.19 @STL2ParamTRV_t3

Function
This function will be used to obtain the t3 (rise time) of a Transient Recovery Voltage (TRV) using a 2 parameter calculation.

Syntax
@STL2ParamTRV_t3*(Waveform; StartPos; EndPos)*

Parameters

Waveform	Input waveform
StartPos	Optional begin of search
EndPos	Optional end of search

Output
A Numerical value indicating the t3 value of the TRV signal *"Waveform"* between *"StartPos"* and *"EndPos"*.

Basefunction
This function uses the STL base function: ***WavSTL2ParamTRV***

STL documentation reference
§ 7.3.2. Two parameters TRV

2.20 @STL2ParamTRV_td

Function
This function will be used to obtain the td (time delay) of a Transient Recovery Voltage (TRV) using a 2 parameter calculation.

Syntax
@STL2ParamTRV_td*(Waveform; StartPos; EndPos)*

Parameters

Waveform	Input waveform
StartPos	Optional begin of search
EndPos	Optional end of search

Output
A Numerical value indicating the td value of the TRV signal *"Waveform"* between *"StartPos"* and *"EndPos"*.

Basefunction
This function uses the STL base function: ***WavSTL2ParamTRV***

STL documentation reference
§ 7.3.2. Two parameters TRV

2.21 @STL4ParamTRV_Uc

Function
This function will be used to obtain the Uc of a Transient Recovery Voltage (TRV) using a 4 parameter calculation.

Syntax
@STL4ParamTRV_Uc*(Waveform; StartPos; EndPos)*

Parameters

Waveform	Input waveform
StartPos	Optional begin of search
EndPos	Optional end of search

Output
A Numerical value indicating the Uc value of the TRV signal *"Waveform"* between *"StartPos"* and *"EndPos"*.

Basefunction
This function uses the STL base function: ***WavSTL4ParamTRV***

STL documentation reference
§ 7.3.3. Four parameters TRV

2.22 @STL4ParamTRV_U1

Function
This function will be used to obtain the U1 of a Transient Recovery Voltage (TRV) using a 4 parameter calculation.

Syntax
@STL4ParamTRV_Uc*(Waveform; StartPos; EndPos)*

Parameters

Waveform	Input waveform
StartPos	Optional begin of search
EndPos	Optional end of search

Output
A Numerical value indicating the U1 value of the TRV signal *"Waveform"* between *"StartPos"* and *"EndPos"*.

Basefunction
This function uses the STL base function: ***WavSTL4ParamTRV***

STL documentation reference
§ 7.3.3. Four parameters TRV

2.23 @STL4ParamTRV_td

Function
This function will be used to obtain the td of a Transient Recovery Voltage (TRV) using a 4 parameter calculation.

Syntax
@STL4ParamTRV_td*(Waveform; StartPos; EndPos)*

Parameters

Waveform	Input waveform
StartPos	Optional begin of search
EndPos	Optional end of search

Output
A Numerical value indicating the td value of the TRV signal *"Waveform"* between *"StartPos"* and *"EndPos"*.

Basefunction
This function uses the STL base function: ***WavSTL4ParamTRV***

STL documentation reference
§ 7.3.3. Four parameters TRV

2.24 @STL4ParamTRV_t1

Function
This function will be used to obtain the t1 of a Transient Recovery Voltage (TRV) using a 4 parameter calculation.

Syntax
@STL4ParamTRV_t1*(Waveform; StartPos; EndPos)*

Parameters

Waveform	Input waveform
StartPos	Optional begin of search
EndPos	Optional end of search

Output
A Numerical value indicating the t1 value of the TRV signal *"Waveform"* between *"StartPos"* and *"EndPos"*.

Basefunction
This function uses the STL base function: ***WavSTL4ParamTRV***

STL documentation reference
§ 7.3.3. Four parameters TRV

2.25 @STL4ParamTRV_t2

STL4ParamTRV_t2
This function will be used to obtain the t2 of a Transient Recovery Voltage (TRV) using a 4 parameter calculation.

Syntax
@STL4ParamTRV_t2*(Waveform; StartPos; EndPos)*

Parameters

Waveform	Input waveform
StartPos	Optional begin of search
EndPos	Optional end of search

Output
A Numerical value indicating the t2 value of the TRV signal *"Waveform"* between *"StartPos"* and *"EndPos"*.

Basefunction
This function uses the STL base function: ***WavSTL4ParamTRV***

STL documentation reference
§ 7.3.3. Four parameters TRV

2.26 @STLOverVoltageVal

Function
This function will be used to obtain the overvoltage value of an input signal.

Syntax
@STLOverVoltageVal*(Waveform; StartPos; EndPos)*

Parameters

Waveform	Input waveform
StartPos	Optional begin of search
EndPos	Optional end of search

Output
A Numerical value indicating the value of the overvoltage of signal *"Waveform"* between *"StartPos"* and *"EndPos"*.

Basefunction
This function uses the STL base function: ***WavSTLOverVoltage***

STL documentation reference
§ 7.4. Evaluation of overvoltages

2.27 @STLOverVoltageTime

Function
This function will be used to obtain the overvoltage time position of an input signal.

Syntax
@STLOverVoltageTime*(Waveform; StartPos; EndPos)*

Parameters

Waveform	Input waveform
StartPos	Optional begin of search
EndPos	Optional end of search

Output
A Numerical value indicating the time position of the overvoltage of signal *“Waveform”* between *“StartPos”* and *“EndPos”*.

Basefunction
This function uses the STL base function: ***WavSTLOverVoltage***

STL documentation reference
§ 7.4. Evaluation of overvoltages

2.28 @STL3CrestDC

Function
This function will be used to return the percentage value of the d.c. component of an asymmetrical current.

Syntax
@STL3CrestDC*(Waveform; DCTime; StartPos; EndPos)*

Parameters

Waveform	Input waveform
DCTime	Time where DC percentage will be calculated
StartPos	Optional start time of search for crests
EndPos	Optional end time of search for crests

Output
A Numerical value indicating the percentage of the d.c. component compared to the AC signal.

Basefunction
This function uses the STL base function: ***WavSTL3CrestDC***

STL documentation reference
§ 8.4.2 Percentage value of d.c. component

2.29 @STLExpCrestDC

Function
This function will return the time constant τ (Tau) of the exponential d.c. component of an asymmetrical current (STC).

Syntax
@STLExpCrestDC*(Waveform; StartPos; EndPos)*

Parameters

Waveform	Input waveform
StartPos	Optional begin of search
EndPos	Optional end of search

Output
A Numerical value indicating the time constant of the exponential d.c. component of signal *"Waveform"* between *"StartPos"* and *"EndPos"*.

Basefunction
This function uses the STL base function: ***WavSTLExpCrestDC***

STL documentation reference
§ 8.4.1 Evaluation of the percentage value of d.c. component

2.30 @STLExpDelayCrestDC

Function
This function will return the time delay constant t_0 of the exponential d.c. component of an asymmetrical current.

Syntax
@STLExpDelayCrestDC*(Waveform; StartPos; EndPos)*

Parameters

Waveform	Input waveform
StartPos	Optional begin of search
EndPos	Optional end of search

Output
A Numerical value indicating the time delay constant of the exponential d.c. component of signal *"Waveform"* between *"StartPos"* and *"EndPos"*.

Basefunction
This function uses the STL base function: ***WavSTLExpCrestDC***

STL documentation reference
§ 8.4.1 Evaluation of the percentage value of d.c. component

2.31 @STLExpFactorCrestDC

Function
This function will return the multiplication factor α of the exponential d.c. component of an asymmetrical current.

Syntax
@STLExpFactorCrestDC*(Waveform; StartPos; EndPos)*

Parameters

Waveform	Input waveform
StartPos	Optional begin of search
EndPos	Optional end of search

Output
A Numerical value indicating the time delay constant of the exponential d.c. component of signal *"Waveform"* between *"StartPos"* and *"EndPos"*.

Basefunction
This function uses the STL base function: ***WavSTLExpCrestDC***

STL documentation reference
§ 8.4.1 Evaluation of the percentage value of d.c. component

2.32 @STLExpOffsetCrestDC

Function
This function will return the offset of the exponential d.c. component of an asymmetrical current.

Syntax
@STLExpOffsetCrestDC*(Waveform; StartPos; EndPos)*

Parameters

Waveform	Input waveform
StartPos	Optional begin of search
EndPos	Optional end of search

Output
A Numerical value indicating the offset of the exponential d.c. component of signal *"Waveform"* between *"StartPos"* and *"EndPos"*.

Basefunction
This function uses the STL base function: ***WavSTLExpCrestDC***

STL documentation reference
§ 8.4.1 Evaluation of the percentage value of d.c. component

2.33 @STL_STCValue

Function
This function calculates the RMS value of a STC (Short Time Current) signal.

Syntax
@STL_STCValue*(Waveform; StartPos; EndPos)*

Parameters

Waveform	Input waveform
StartPos	Optional begin of search
EndPos	Optional end of search

Output
A Numerical value indicating RMS value of a STC signal.

Basefunction
This function uses the STL base function: ***WavSTL_STC***

STL documentation reference
§ 8.1.1 Short-time current tests

2.34 @STL_ShorterSTCValue

Function
This function calculates the RMS value of a shorter STC (Short Time Current) signal.

Syntax
@STL_ShorterSTCValue*(Waveform; StartPos; EndPos)*

Parameters

Waveform	Input waveform
StartPos	Optional begin of search
EndPos	Optional end of search

Output
A Numerical value indicating RMS value of a shorter STC signal.

Basefunction
This function uses the STL base function: ***WavSTL_STC***

STL documentation reference
§ 8.1.2 Shorter short-time current tests

2.35 @STL_STCDuration

Function
This function will be used to obtain the duration of a STC (Short Time Current) signal.

Syntax
@STL_STCDuration*(Waveform; Frequency; StartPos; EndPos)*

Parameters

Waveform	STC input waveform
Frequency	Frequency of the sinusoidal waveform
StartPos	Optional begin of search
EndPos	Optional end of search

Output
A Numerical value indicating the duration in seconds of the STC signal between *“StartPos”* and *“EndPos”*.

Basefunction
This function uses the STL base function: ***WavSTL_STCDuration***

STL documentation reference
§ 8.1.1. Short-time current tests

2.36 @STL_ShorterSTCDuration

Function
This function will be used to obtain the duration of a STC (Short Time Current) signal.

Syntax
@STL_ShorterSTCDuration*(Waveform; Frequency; StartPos; EndPos)*

Parameters

Waveform	STC input waveform
Frequency	Frequency of the sinusoidal waveform
StartPos	Optional begin of search
EndPos	Optional end of search

Output
A Numerical value indicating the duration in seconds of the STC signal between *“StartPos”* and *“EndPos”*.

Basefunction
This function uses the STL base function: ***WavSTL_STCDuration***

STL documentation reference
§ 8.1.2. Shorter short-time current tests

2.37 @STLReadTestData

Function
This function is used to read test data generated by the TDG software program.

Syntax
@STLReadTestData*(Filename)*

Parameters

Filename	The filename of the ASCII file containing the TDG generated test data e.g. “Curve1.txt”

Output
A waveform of the input data. This waveform can be dropped into a Display.

Basefunction
None

STL documentation reference
§ 11 Software validation

2.38 @STLNoLoadClose

Function
This function calculates the moment of contact touch of a no-load signal.

Syntax
@STLNoLoadClose*(Waveform; StartPos; EndPos)*

Parameters

Waveform	Input waveform
StartPos	Optional begin of search
EndPos	Optional end of search

Output
A numerical value indicating the time of contact touch (closing) of the input signal.

Basefunction
This function uses the STL base function: ***WavSTLNoLoadContactTime***

STL documentation reference
§ 9.1 Determination of no-load characteristics

2.39 @STLNoLoadOpen

Function
This function calculates the moment of contact separation of a no-load signal.

Syntax
@STLNoLoadOpen*(Waveform; StartPos; EndPos)*

Parameters

Waveform	Input waveform
StartPos	Optional begin of search
EndPos	Optional end of search

Output
A numerical value indicating the time of contact separation (opening) of the input signal.

Basefunction
This function uses the STL base function: ***WavSTLNoLoadContactTime***

STL documentation reference
§ 9.1 Determination of no-load characteristics

2.40 @STLContactSpeed

Function
This function calculates the contact speed at a given time.

Syntax
@STLContactSpeed*(Waveform; Time)*

Parameters

Waveform	Input waveform
Time	Time where contact speed has to be calculated

Output
A numerical value indicating the contact speed at a given time, the dimension depends on the units of the Y-axis of the input signal and will be most likely “mm/s”.

Basefunction
This function uses the STL base function: ***WavSTLContactSpeed***

STL documentation reference
§ 9.1 Determination of no-load characteristics

2.41 @STLXRescale

Function
This function rescales a waveform, it modifies the display scaling with is used for calculating threshold levels.

Syntax
@STLXRescale*(Waveform; Yupper, YLower)*

Parameters

Waveform	Input waveform
YUpper	New upper scale value
YLower	New lower scale value

Output
The out put is a waveform with a modified display scaling (or full scale level).

Basefunction
This function uses no base function.

STL documentation reference
With this function the 3% threshold levels can be modified. The STL routines are using the waveforms “Display scaling” which is equal to the full scale level as mentioned at page 11 of the STL document.

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