



PERCEPTION HV-IA IMPULSE ANALYSIS

Overview

The HV Impulse Testing of transformers, switching devices, bushings and other exposed components requires well defined calculation methods to create reproducible measurement results and a means of automated analysis to increase the testing throughput. Real world signals may carry offset, overshoot, oscillations and noise. They still have to be evaluated appropriately and in an automated manner. A test object requires several measurements and all the results need to be compiled into a single test report.

SW Conformity

The existing international standards for this application are between 15 and 20 years old (IEC 60060-1 Ed.2.0 (1989-11) and IEEE4:1995) and newer versions are under revision. The new IEC 60060-1 Ed. 3.0 Draft is in the final stages and will most likely become active in 2010.

Perception's HV-IA Impulse Analysis option allows to evaluate results according to the existing or according to the new Draft standard by a simple setting in the software. The new standard uses more advanced techniques (k-factor) with curve fitting and filtering compared to simpler methods in the past to handle overshoot and oscillation.

- IEC 60060-1 Ed. 2.0 (1989-11)
 IEC 60060-1 Ed. 3.0 (CDV)

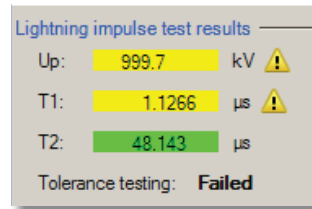
Testing according to old (existing standard) or new (k-factor) method is made easy by a simple setting

Implementation

The HV-IA option is designed as a specific application sheet inside Perception and allows managing the whole analysis, without the need of using all other Perception sheets (settings sheet, information sheet, formula sheet etc.). The main advantage of this approach is the simplified GUI (graphical user interface) for test field engineers, which provides a maximum testing throughput without the need to become a computer and software expert. HV-IA uses a new technology inside Perception to combine results of different tests with the same test object to create a single report out of a series of tests – the “collection”.

Major results on screen

Major results are shown on screen with color coding, when the limit testing is turned on.



Calculated results with color coding when the limit checking is enabled

Postprocessing for popular digitizers

HV-IA is used for post processing data files from the popular HV impulse digitizers PowerPro, Accura100HV and Sigma100HV (sold in the past under the LDS/Nicolet brand name). Together with isolated digitizers of the GenDAQ product family, the HW control and waveform analysis is performed in one go.

Available tests

- Lightning impulse (LI)
- Switching impulse (SI)

Collection

- Number of terminals
- Between 1 and 7 terminals
- Number of tests per terminal
- Between 1 and 200 tests per terminal

Automatically detected LI signal type (old method)

- Full wave
- Front chopped, Tail chopped
- Oscillation
- Overshoot

K-factor Evaluation (new method)

The k-factor evaluation according to the new IEC 60060-1 Ed. 3.0 (coming out soon) is performed on full-wave waveforms. Front, peak and tail chopped waveforms still use at the moment the old methods.

Specifications

International standards:

IEC 60060-1, IEC 61083-2 (old and new). The old method is also compliant with IEEE 4:1995

Calculated parameters (old method):

Lightning impulse Up, T1, T2, Tc, B, f, S, ko
Switching impulse Up, Tp, T2, Td, Tz

Calculated parameters (new method):

Lightning impulse Ut, T1, T2, Tc, B', f, S, ko
Switching impulse Up, Tp, T2, Td, Tz

Input data formats:

.wft files (PowerPro, Accura100HV and Sigma100HV)
.pnrf files (GenDAQ series)

Input data resolution:

10 bit (PowerPro), 12bit (Accura100HV and Sigma100HV) 14 bit (GenDAQ)

SW requirement:

Perception 6.06 Standard, Advanced, Professional or Enterprise (no Viewer)

Windows OS requirement

As required for Perception 6.06 (or higher)

Supported HW

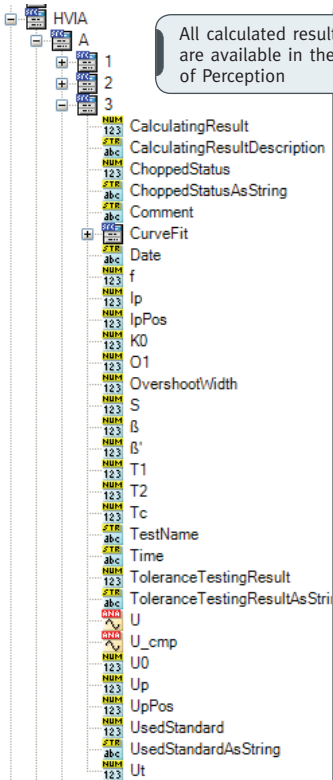
- Fiberoptic isolated digitizers of the GenDAQ series
- No hardware control for old PowerPro, Accura100HV and Sigma100HV



Perception HV-IA impulse analysis Specifications

Output results in the Data Sources

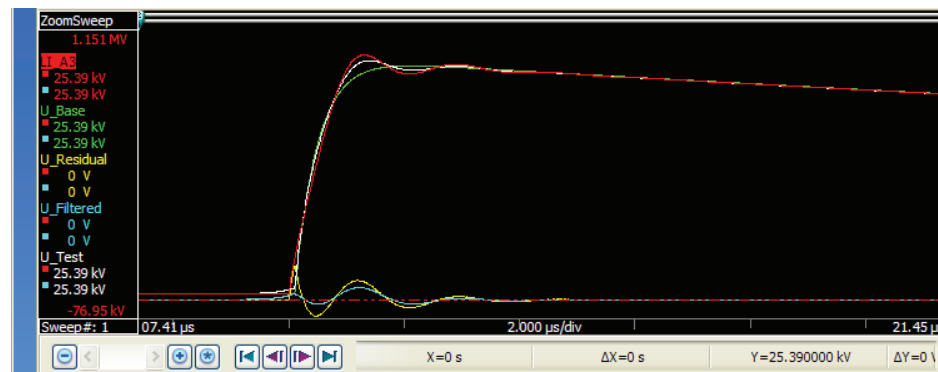
All calculated values (displayed major values, internally used parameters as well as optional calculations) are available in Data Sources of Perception to be reused in the Formula database and the Report generator.



All calculated results and curves are available in the DataSources of Perception

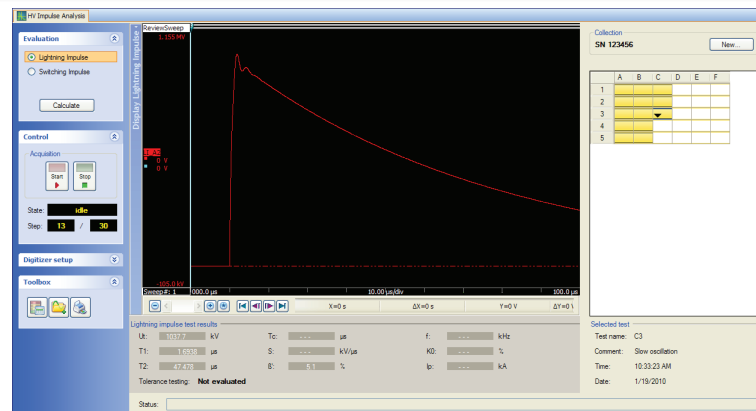
Curve fitting for k-factor method

For analysis with the new k-factor method, the calculated base curve, residual curve, filtered curve as well as the test voltage curve can be shown on screen for verification purpose.



For verification purpose, all internal calculated curves (fitted curve, residual curve, etc.) can be displayed.

Simplified graphical user interface to stay focused on the task, not on the computer

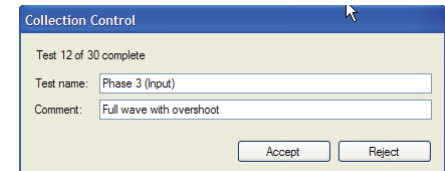


Collection

The "Collections" in the HV-IA option facilitate analysis of a series of individual tests per test object (e.g. 6 terminals have to be tested on a 3 phase transformer with 5 tests each; all results need to be in the same report). The results are combined and archived in a collection file.

	A	B	C	D	E	F
1						
2						
3						
4						
5						

The collection overview helps to identify the position in the testing sequence, review earlier tests, continue on another terminal etc.



Each test can be Accepted or Rejected and comments about observations added.

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