

HOTnote

Perception HV-IA – Frequently Asked Questions

HV-IA in general

What does HV-IA stand for?

The term HV-IA is the abbreviation of "High Voltage Impulse Analysis", which is the analysis of specific wave shapes measured during lightning impulse testing and switching impulse testing.

Which test objects are tested with HV-IA?

All components in power grids with exposure to potential lightning strikes on power lines have to be tested. Typically, these are transformers, switchgear devices (circuit breakers, switches and disconnectors), isolators, bushings, surge arresters, etc.

What is covered by the Perception HV-IA?

The HV-IA software option in Perception performs the evaluation of the measured wave shapes. The measured data can either come from GEN DAQ fiber-optic isolated digitizers or from .wft data files recorded by retired digitizers (PowerPro, Accura100HV and Sigma100HV).

International standards

According to which standards is the HV-IA software option designed?

The software is designed to meet the requirements in the IEC 60060-1 and the IEC 61083-2.

What is the IEC?

The IEC is the International Electrotechnical Commission. On their webpage www.iec.ch the introduction sentence states: "The IEC is the world's leading organization that prepares and publishes International Standards for all electrical, electronic and related technologies."

What about new standards?

The existing international standards for this application are between 15 to 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.

Are the revised standards covered as well?

Yes, Perception HV-IA allows evaluation of results according to the existing standards, or according to the new Draft standard by means of a simple setting in the software.

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

IEC 60060-1 Ed. 3.0 (CDV)

What is the major change in the standard?

The new standard uses more advanced techniques (k-factor) with curve fitting and filtering compared to the simpler method of the past.

Are the calculated parameters in the old and new standard the same?

No. Together with the changed calculation methods, some of the terminology has also changed. For example, in the existing standard the peak voltage U_p is calculated, while in the new standard the test voltage U_t is calculated.

What does the term CDV stand for?

CDV is the abbreviation used for draft documents (Committee Draft for Voting) at IEC committees. It is still an internal paper of the workgroup in IEC, and is not published.

How can Perception HV-IA be compliant with the new CDV standard, even if the standard is not yet published?

HBM participates in the committee work of the IEC, which means that it is involved in the revision of the new standards.

Old and new calculation methods

Why do the old and the new methods not produce exactly the same results for T_1 ?

In the new method using the k-factor, curve fitting and filtering are used before the evaluation of T_1 is performed. Depending on the measured signal, the results of the old and new methods may differ from each other.

How is the old method in Perception HV-IA compared to the method used with Accura100HV and Sigma100HV in the past?

The method according to the IEC 60060-1 Ed.2.0 (1989-11) in Perception HV-IA is very similar to the method used in Accura100HV and Sigma100HV: they produce very similar results.

Is the old method in Perception HV-IA also in compliance with IEEE 4-1995?

Yes.

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Verification of analysis algorithms

How is it assured that the algorithms work correctly?

Both, the existing as well as the new IEC 60060-1 standards, describe the requirements for the analysis. In IEC 61083-2, the verification method is described and supported by a test data generator tool (TDG) to create pre-defined wave shapes. These wave shapes are tested with Perception HV-IA.

Why do my old TDG data files not give correct results when tested with the new method?

For the new method using the k-factor, a new set of wave shapes is defined. This is the reason why also the IEC 61083-2 has been revised.

Are the old TDG data files and the new TDG data files compatible?

No. The old test data generator was DOS based and created a different file format (TDG 1.0) than the new test data generator (TDG 2.0).

How can I test the new TDG files myself?

The wave shapes of the new TDG 2.0 can be imported via the @ReadASCII function in Perception's formula database.

Num	Name	Formula
1		Filename creation for TDG test cases
2	StoragePath	"C:\Documents and Settings\blum\My Documents\My Recordings\TDG 61083-2_12bit"
3	name_LI_A1	Formula.StoragePath+"LI-A1.txt"
4	name_LI_A2	Formula.StoragePath+"LI-A2.txt"

How does HBM ensure that the measurement algorithms work correctly in all newer versions of Perception?

HBM uses a method called "unit test" for the quality testing during the development of Perception software. Each new build of the software is tested against all previously tested characteristics. This is an automated process which runs 24 hours a day and 7 days a week. With this continuous testing method, any deviation from previous results can be detected; it further assures that, once a problem is fixed, it will not reoccur.

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