GEN-I3V Instrument	
	The GEN-I3V is a high performance computer driven signal waveform generator and measurement system. It communicates directly with a PC under MicroSoft Windows. The GEN-I3V system is used for Recloser Controls testing with the main goal to evaluate wear trends (of the analog inputs) over time and thus allows for the establishment of a maintenance schedule for the Control Cabinet, thereby enhancing operational reliability and safety. With its three software programmable voltage sources and one (or three) programmable current source(s), the system is capable of testing any type of Recloser controls cabinet. Under the GenWin-I3V Software, the system is capable of injecting into the Control Cabinet a very precise and stable programmable current with accurate control of shape, amplitude and timing. The voltage sources are also independently programmable in frequency, phase, amplitude, shape and timing. The data acquisition subsystem allows for measuring and viewing the injected current and voltages along with the recording and viewing of Recloser Controls events such as Trip and Reclose commands generated by the control cabinet in response to current injections. GenWin-I3V gives the user complete control over the design of the current and voltages waveforms: be it the shape, the amplitude or the period. The generated waveforms are displayed on screen GenWin-I3V allows for the display of test points of current versus time along with the Recloser's Time Current Curve (TCC) on the same graph, allowing for quick and easy comparison of test results with normal behaviour. More than 130 protection curves from different manufacturers (Cooper McGraw, Schweitzer, ABB, Westinghouse, etc. …) are already predefined in the software. GenWin-I3V is a highly integrated and specialized software environment that includes all the necessary tools for testing in the field or in the laboratory, for processing, calculations, analysis, interpretations of test results and online help needed by Recloser control maintenance professionals. GenWin-I3V is included with the system free of charge with unlimited updates.

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GEN-I3V Specifications

High Performance: precision and resolution	• Independent programmable voltage and current sources • 28-bit Waveform generation precision for each source. • Each source programmable in frequency, phase and amplitude, independently • 12 bit Resolution on amplitude control, resulting in current steps as low as 1.5 mA • 16 bit resolution on data acquisition subsystem • SNR : - 84 dB (1 mV P-P) • Instantaneous display of generated current, voltages and Control Cabinet events on a computer screen
Current Range	• GEN-I3V-6: 0 to 6 A (rms) in steps of 1.5 mA • GEN-I3V-12: 0 to 14 A (rms) in steps of 3.5 mA
Frequency	• Sampling frequency: 31.25 Hz - 200 KHz • Sampling time: 44 microseconds to 28000 microseconds
Recording time	• 1 millisecond to 17 minutes
Waveform Design	• Current and voltage frequency 50 Hz or 60 Hz are default. • Programmable from 1Hz to 10 KHz • Ease of injected current and voltage waveform design: complete control of shape, amplitude and timing.
Graph display	• Display of generated current waveforms • Display of generated voltage waveforms • Display of captured Control Cabinet events such as Close / Open commands • Recloser's TCC protection curves
Computer Link	• Fast USB link to a computer (or notebook), with Windows 2000, XP, Vista or Windows7 • Fast data transfer
Dimensions and weight	• Robust construction: casing made of reinforced polyethylene with molded-in ribs for extra protection. • True Portable unit, no extra carrying case required

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	• Dimensions:
	  ○ GEN-I3V-6: 13”x13.5”x7” (33x35x18 cm).
	  ○ GEN-I3V-12: 17”x16.5”x10” (43x42x25.4 cm).
	• Weight:
	  ○ GEN-I3V-6: 18.6 lb (8.45 Kg).
	  ○ GEN-I3V-12: 29 lb (13 Kg).

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Inputs and outputs	

1 current output	• Waveform generator with :
	  ○ 28 bit resolution on frequency
	  ○ 12-bit resolution on amplitude
	  ○ 12-bit resolution on phase
	• 16 bit resolution on Analog to digital current measurement subsystem
	• Programmable in steps of 1.5 mA for GEN-I3V-6 and 3.5 mA for Gen-I3V-12
	• Fixed 50 / 60 Hz or programmable from 1 Hz to 10KHz.
	• Current measurement range: +/- 1 A, +/- 5 A, +/- 10 A and +/- 20 A
	• Signal to Noise Ratio: - 84 dB
	• Connector: 26 pin Amphenol circular connector

3 Voltage outputs	• Waveform generator with :
	  ○ 28 bit resolution on frequency
	  ○ 12-bit resolution on amplitude
	  ○ 12-bit resolution on phase
	• 16 bit resolution on Analog to digital current measurement subsystem 16 bit resolution on Analog to digital voltages measurement subsystem
	• Programmable from 10 V to 200 V in steps of 50 mV
	• Fixed 50 / 60 Hz or programmable from 1 Hz to 10KHz.
	• Independently Programmable phase
	• Signal to Noise Ratio: - -84 dB
	• Connector: 26 pin Amphenol circular connector

3 Phase current relay contacts outputs	• One current output that can be switched under software control to anyone of three phases
6 general purpose relay	• 3 DPST (NO, NC) relays with outputs organized in pairs of contacts: (52a1, 52b1), (52a2,

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contacts outputs	52b2), and (52a3, 52b3), • Software control • 52a outputs are the NO contacts and 52b outputs are the NC contacts •
2 inputs from Recloser Control Cabinet: Close-Cab, Open-Cab	• Command inputs from the cabinet to inform the Recloser (in this case the instrument) to Open or Close a contact •

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Software	Ease of use, Power and Flexibility
GenWin-I3V : Generation, measurement, recording and viewing (display) of injected current **Extensive Library for 0ver 170 TCC protection curves from different manufacturer**	GenWin-I3V drives the GEN-I3V system from a very friendly and intuitive graphical interface. Thanks to the integrated analysis and interpretation tools, it is possible to do a targeted and efficient Recloser Control Cabinet maintenance and thus generate a rapid intervention diagnostic. General characteristic are as follows: ○ Extensive library of typical Recloser Control Cabinet Protection curves ○ Total software control during tests ○ Fast transfer of recorded data to a PC ○ Instantaneous mathematical processing of test results on the PC for immediate analysis. ○ Generation of tabular reports for immediate viewing under Word or Excel or export in XML format. ○ Unlimited software upgrades.
Basic Functions	• Event recording and viewing • Current measurement and display • Easy Waveform design for current generator • Analysis of test points versus typical protection curves • Trend analysis •
Advanced Functions	• Test plans designer • Test designer(up to 30 test per test plan) • General information Screen Designer • Graphical reports Designer • Specialised Mathematical processing Designer: more than 100 mathematical functions are available • Tabular reports designer. • Batch tests designer

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Internationales standards certifications and accreditation	• Homologation: Hydro-Quebec (HQ) • Zensol is certified ISO 9001
Optimal Conditions of use	• Environmental : 0 to 50°C • Noisy environment in High Voltage area up to 800 kV • Humidity : 0-95% Non Condensing • Power input : universal autoranging 100 to 240 VAC 50/60 Hz +/-10%
Accessories included	Each GEN-I3V system is furnished (supplied) with • A set of cables • A fiber optic communication adapter with a10 feet of FO cable • Manual • 2 year warranty • Certificate of calibration and test reports
Recommended Accessories	• Coop box F3, F4 interface and cable • Coop box F6 interface and cable • ESV Westinghouse Interface

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