

## GEN Specifications

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GEN Instrument	
	<p>The GEN is a highly integrated current source (injector) and event recorder that is software driven by a PC (or a notebook) operating under Microsoft Windows.</p> <p>The Gen instrument is used for Recloser Control Cabinet testing. The main goal is to evaluate wear trends (of the analog inputs) over time and thus allows the establishment of a maintenance schedule for the Control Cabinet, thereby enhancing operational reliability and safety.</p> <p>Under the GenWin Software, the integrated current source is capable of injecting Control Cabinet with a very precise and stable programmable current with accurate control of amplitude and timing. The data acquisition part (section) allows measuring and viewing the injected current along with the recording and viewing of Control Cabinet events such as Open and Close commands generated by the control cabinet in response to current injections.</p> <p>GenWin gives the user (operator) complete control over the design of the injected current waveform: be it the shape, the amplitude or the period. The generated waveform is displayed on screen</p> <p>GenWin 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.</p> <p>GenWin is included with the system free of charge.</p>

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<b>High Performance: precision and resolution</b>	<ul style="list-style-type: none"> <li>• 12 bit Analog to Digital converter for generated current measurement and display.</li> <li>• 12 bit Digital to Analog resolution resulting in current steps as low as 1.5 mA</li> <li>• SNR : - 72 dB (3 mV P-P)</li> <li>• Timing accuracy: 1 microsecond.</li> <li>• Instantaneous display of generated current and Control Cabinet events on a computer screen</li> </ul>
<b>Current Range</b>	<ul style="list-style-type: none"> <li>• GEN-6: 0 to 6 A (rms) in steps of 1.5 mA</li> <li>• GEN-12: 0 to 14 A (rms) in steps of 3.5 mA</li> </ul>
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Sampling frequency: 31.25 - 22,727 Hz</li> <li>• Sampling time: 44 to 28 000 microseconds</li> </ul>
<b>Recording time</b>	<ul style="list-style-type: none"> <li>• 1 millisecond to 17 minutes</li> </ul>
<b>Waveform Design</b>	<ul style="list-style-type: none"> <li>• Current frequency 50 Hz or 60 Hz</li> <li>• Ease of injected current waveform design: complete control of shape, amplitude and timing.</li> </ul>
<b>Graph display</b>	<ul style="list-style-type: none"> <li>• Display of generated current waveforms</li> <li>• Display of captured Control Cabinet events such as Close / Open commands</li> <li>• Recloser's TCC protection curves</li> </ul>
<b>Computer Link</b>	<ul style="list-style-type: none"> <li>• Fiber Optic USB/RS232 link to a computer (or notebook), with Windows 2000, XP, Vista or Windows7</li> <li>• Fast data transfer</li> </ul>
<b>Dimensions and weight</b>	<ul style="list-style-type: none"> <li>• Robust construction: casing made of reinforced polyethylene with molded-in ribs for extra protection.</li> <li>• True Portable unit, no extra carrying case required</li> <li>• Dimensions:             <ul style="list-style-type: none"> <li>○ GEN-6: 13"x13.5"x7" (33x35x18 cm).</li> <li>○ GEN-12: 17"x16.5"x10" (43x42x25.4 cm).</li> </ul> </li> <li>• Weight:</li> </ul>

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	<ul style="list-style-type: none"><li>○ GEN-6: 18.6 lb (8.45 Kg).</li><li>○ GEN-12: 29 lb (13 Kg).</li></ul>
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<b>Inputs and outputs</b>	
<b>1 current output</b>	<ul style="list-style-type: none"><li>• 12 bit Digital to analog current generator</li><li>• 12 analog to digital current measurement</li><li>• Programmable in steps of 1.5 mA for Gen-6 and 3.5 mA for Gne-12</li><li>• 50 / 60 Hz</li><li>• Current measurement range: +/- 1 A, +/- 5 A, +/- 10 A and +/- 20 A</li><li>• Signal to Noise Ratio: - 72 dB</li><li>• Connecteur: 26 pin Ampohenol circular connector</li></ul>
<b>3 Phase current relay contacts outputs</b>	<ul style="list-style-type: none"><li>• One current output that can be switched under software control to anyone of three phases</li></ul>
<b>6 general purpose relay contacts outputs</b>	<ul style="list-style-type: none"><li>• 3 DPST (NO, NC) relays with outputs organized in pairs of contacts: (52a1, 52b1), (52a2, 52b2), and (52a3, 52b3),</li><li>• Software control</li><li>• 52a outputs are the NO contacts and 52b outputs are the NC contacts</li><li>•</li></ul>
<b>2 inputs from Recloser Control Cabinet: Close-Cab, Open-Cab</b>	<ul style="list-style-type: none"><li>• Command inputs from the cabinet to inform the Recloser (in this case the instrument) to Open or Close a contact</li></ul>

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Software	Easy to use, performant and flexible
<p><b>GenWin : Generation, measurement, recording and viewing (display) of injected current</b></p> <p><b>Extensive Library for Over 170 TCC protection curves from different manufacturer</b></p>	<p>GenWin drives the GEN 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.</p> <p>General characteristic are as follows:</p> <ul style="list-style-type: none"> <li>○ Extensive library of typical Recloser Control Cabinet Protection curves</li> <li>○ Total software control during tests</li> <li>○ Fast transfer of recorded data to a PC</li> <li>○ Instantaneous mathematical processing of test results on the PC for immediate analysis.</li> <li>○ Generation of tabular reports for immediate viewing under Word or Excel or export in XML format.</li> <li>○ Unlimited software upgrades.</li> </ul>
<p><b>Basic Functions</b></p>	<ul style="list-style-type: none"> <li>● Event recording and viewing</li> <li>● Current measurement and display</li> <li>● Easy Waveform design for current generator</li> <li>● Analysis of test points versus typical protection curves</li> <li>● Trend analysis</li> </ul>
<p><b>Advanced Functions</b></p>	<ul style="list-style-type: none"> <li>● Test plans designer</li> <li>● Test designer( up to 30 test per test plan)</li> <li>● General information Screen Designer</li> <li>● Graphical reports Designer</li> <li>● Specialised Mathematical processing Designer: more than 100 mathematical functions are available</li> <li>● Tabular reports designer.</li> <li>● Batch tests designer</li> </ul>

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<b>Internationales standards certifications and accreditation</b>	<ul style="list-style-type: none"><li>• Homologation: Hydro-Quebec (HQ)</li><li>• Zensol is certified ISO 9001</li></ul>
<b>Optimal Conditions of use</b>	<ul style="list-style-type: none"><li>• Environmental : 0 to 50°C</li><li>• Noisy environment in High Voltage area up to 800 kV</li><li>• Humidity : 0-95% Non Condensing</li><li>• Power input : universal autoranging 100 to 240 VAC 50/60 Hz +/-10%</li></ul>
<b>Accessories included</b>	Each Gen system is furnished (supplied) with <ul style="list-style-type: none"><li>• A set of cables</li><li>• A fiber optic communication adapter with a10 feet of FO cable</li><li>• Manual</li><li>• 2 year warranty</li><li>• Certificate of calibration and test reports</li></ul>
<b>Recommended Accessories</b>	<ul style="list-style-type: none"><li>• Coop box F3, F4 interface and cable</li><li>• Coop box F6 interface and cable</li><li>• ESV Westinghouse Interface</li></ul>