Comparison of Caputron Linear Current Isolators
with common isolated voltage controlled current sources

This document provides a comparison of specifications and features between the Caputron Linear Current Isolator (LCI) High Precision, Caputron Linear Current Isolator (LCI) High Current, Caputron Linear Current Isolator (LCI) High Voltage, Stanford Research Systems Model CS580 Voltage Controlled Current Source, A-M Systems Model 2200 Analog Stimulus Isolator and World Precision Instruments A395 Linear Stimulus Isolator.

This document contains a set of comparison tables and charts detailing the important parameters of each stimulator for a complete assessment of the different isolators. All products were new, calibrated and tested under the same exact conditions, outlined below.

---------- Caputron LCI Device Features ----------

Caputron LCI High Precision (HP) has the least output offset and best linearity out of all available stimulators on the market. High bandwidth and slew rate guarantee the fidelity of output waveform. LCI HP has the ability to DC couple or AC couple the input signal for an accurate charge balanced stimulation (removing unwanted offset of voltage output DACs), optional regulation of electrode voltage for a safe stimulation (this capability is comparable with AC coupling of outputs), input overload and Input/Output Mismatch Detector.

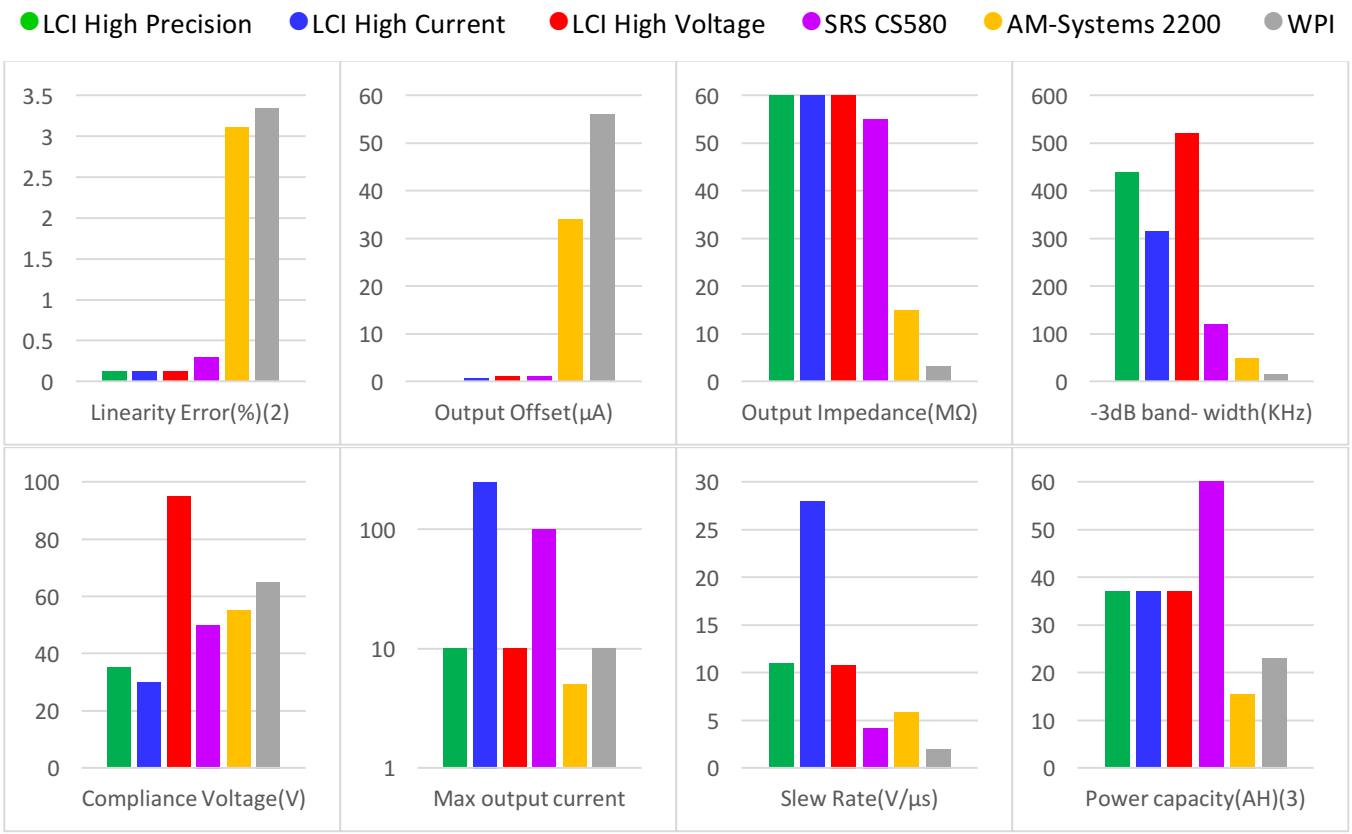
Caputron LCI High Current (HC) is able to deliver the highest current and has the highest slew rate out of all available stimulators on the market. LCI HC is optimized for coil stimulation. It has the ability to DC couple or AC couple the input signal for an accurate charge balanced stimulation, input overload and Input/Output Mismatch Detector.

Caputron LCI High Voltage (HV) has the highest compliance voltage and full power bandwidth out of all available stimulators on the market. LCI HV is optimized for stimulating high impedance loads with sharp waveforms. It has the ability to DC couple or AC couple the input signal for an accurate charge balanced stimulation, optional regulation of electrode voltage for a safe stimulation (this capability is comparable with AC coupling of outputs), input overload and Input/Output Mismatch Detectors.

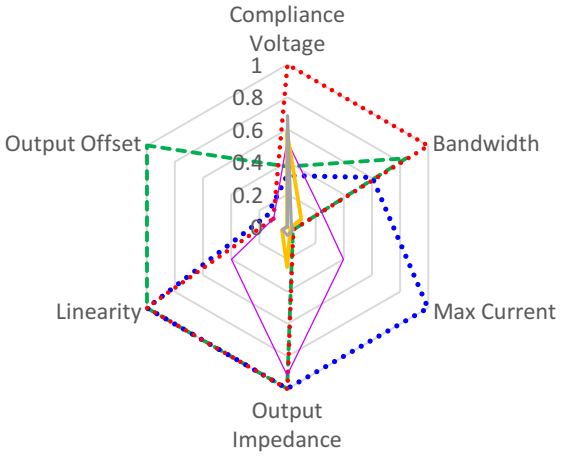
Customization of Caputron LCI: Customized features such as like Ultra Low Noise output, Customized gains or compliance voltage and Rack mount form factor are available upon request. Please contact Caputron for more information.

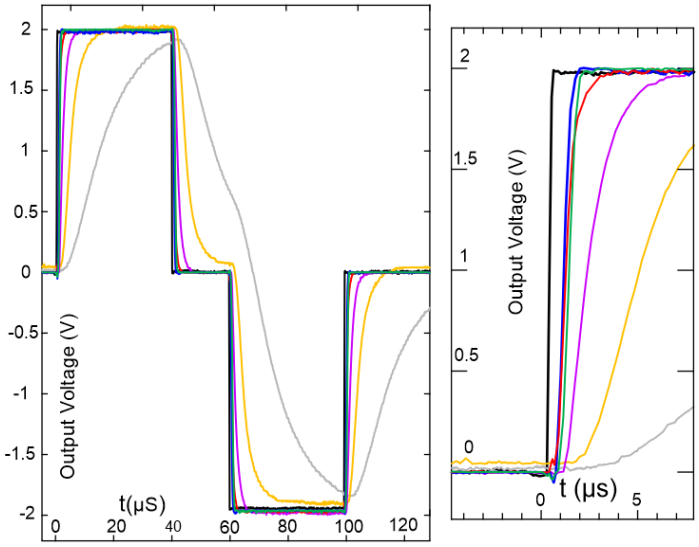
+1 (646) 926-3646
contact@caputron.com
www.caputron.com
New York, NY

---------- Device Comparison Highlights [1] ----------



Scaled performance of highlighted parameters [4]





Output voltage of stimulators with a 1000.0Ω as load (Black line is the input).

(1) Device ranges were set to 1 mA/v in all tests (LCI HC output is scaled down by 2.5).
(2) Percentage of Full Scale Range error.
(3) CS580 is powered by main power (unlimited power).
(4) Measurements are normalized to the best performance.

+1 (646) 926-3646
contact@caputron.com
www.caputron.com
New York, NY

---------- Device Comparison Table ----------

Parameter	Test Condition [1]	Caputron LCI High Precision	Caputron LCI High Current	Caputron LCI High Voltage	SRS CS580	AM System 2200	WPI A395	Units
Input Range	N/A	-10 to +10	-10 to +10	-10 to +10	-2 to +2	-5 to +5	-6 to 10	V
V to I Gain	N/A	1m, 100µ	25m, 2.5m	1m, 100µ	1n, 10n, 100n, 1µ, 10µ, 100µ, 1m, 10m, 50m	1µ, 10µ, 100µ, 1m, 1V/V, 10V/V	10 µ, 100 µ, 1m	A/V
Compliance Voltage	Input: ±1 V Output: Voltmeter	±35	±30	±95	0 to ±50	±55	±65	V
Linearity Error [2]	Input: -2 : 0.1 Step: +2 Load: 1 kΩ	0.121	0.121	0.121	0.302	3.109	3.35	%
Output Offset	Input: 0 V Load: I meter	0.1	0.7	1	1	34	56	µA
Output Impedance [3]	Input: 0 V & 1 V output: source meter series with 1kΩ	60	60	60	55	15	3.3	MΩ
Max Current Output	N/A	±10	±250	±10	±100	±5	±10	mA
Max Drivable Load	Output: 5 mA DC	6.5	6	19.5	9.7	9.8	13	kΩ
Input to Output Delay [4]	Input: Sine, 4 Vpp Load: 1 kΩ	1	1	2.1	5.3	9	4.5	µs
Slew Rate [5]	Input: Square, 4 Vpp Load: 10 kΩ	11	28	10.8	4.2	5.8	2	V/µs
-3dB Bandwidth	Input: sine, 2 Vpp Load: 1 kΩ	440	315	520	120	50	14	kHz
Input to Output Capacitance [6]	Input: 0 v, Load: 0Ω	220	220	220	485300	80	180	pF
Battery [7]	N/A	Li-ion, 37	Li-ion, 37	Li-ion, 37	Main power, Unlimited	Lead acid, 15.6 NiMH,.25	NiMH, 23	Type, Wh
Approximate Battery charge/discharge Cycles [7]	N/A	1200, Replaceable by user	1200, Replaceable by user	1200, Replaceable by user	N/A	350	1000	-
Dimensions	N/A	17x11x6	17x11x6	17x11x6	36x21x10	16x16x7	22x13x10	cm
Weight	N/A	1.44	1.44	1.44	15	2.76	3.54	lbs.

(1) Device Gain was set to 1 mA/v in all tests except LCI HC set in gain 2.5mA/V.
(2) Linearity Error is the percentage of absolute error divided by max output current (2mA in this setup).
(3) Sourcemeter series with 1kΩ connected as load. Sourcemeter output voltage: -10 V : step 1 V : +10 V, and measuring output current.
(4) Reported time is delay between input zero crossing to output zero crossing.
(5) Reported value is the maximum ΔV in a sweep of 1 µs period in rising edge.
(6) Input to output resistance of all devices are more than 1 GΩ.
(7) Data is derived from Panasonic-NCR18650B and Panasonic-LC-R121R3P and gp-17r8h

+1 (646) 926-3646
contact@caputron.com
www.caputron.com
New York, NY