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EARTHLIGHT

QUANTUM ELECTRO DYNAMIC LIGHTING

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Industry certification
Rosenberg quantum cycle light

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INTRODUCTION

Core Technology

Today's' lighting technology is 100 years old. It embraces classical theory of energy. This paper familiarize the reader with a novel application of quantum physics and explains how it works. A practical application of Quantum theory, applied to energy saving, recovery or energy conservation lighting technology is complex. Yet there are no chemicals, high temperatures, high voltages, toxic materials or complex manufacturing process. This should be welcome as a part of everyday life, increasing energy efficiency 10 fold, while reducing gas emissions, thermal pollution and consumer cost.

Executive Abstract

Emissions always leave room for improvement. Reducing CO^2 per KWH is presently a well-known challenge. Core technology permits a new approach to conservation that is 97% energy efficient converting ampere hours to light. Building managers can use this technology to improve operating margin. This technology exceeds latest GPL regulation in effect as of 2023. Lumens per watt rating is over 140 /lpw. Discount reduces KWH cost to .037 cents per Kilowatt Hour.

Consumer Benefits

¼ Cycle Electronic Power Source.
Reduces power drain to a negligible level.
Harvests RMS fringe energy.
Blanks 95% of carbon producing AC phase.
KWH rate .0375 cents per hour actual.
Disposable bulb meets EPA standards, Mercury and micro plastic free product.
Low voltage, low temperature lamp 5KHrs. One lamp fills all lighting requirements.
Neolight can be 10w, 20w, 25w, 30w, 50w, 60w, 75w, 100w bright.
Power levels can be adjusted from 2 watt soft light to 4.5 watt work light.
Infrared spectrum emissions attenuated 1:8 ratio.
Load resistance absorb 95% less electrical power.
Reduced carbon footprint.

Description of Rosenberg Cycle

The Rosenberg cycle is a means to force classic Edison lights to output 10x more light while reducing power. Both classic theory and quantum theory explain the high efficiency transforming type A19 incandescent light. Low cost in operation and usage meets today's economic performance needs. Performance data is organized on a comparison basis at 60 watt classic standards or LED. Building management benefits: reduced KWH charge, lower carbon footprint, low cost per lamp, and software platform.

Product Availability

Two types of product are due to be available on Amazon in 2024. Single light bulb with integral electronics and building External Power Supply in a 100 to 2,000 amp range.

Building Management

Neolight is an electronic building lighting system that has several advantages; unified design is one low cost lamp throughout installation. Computer management software measures the power used in industry standard Kilowatt hours for invoice purposes. Lighting costs can be reduced to a level that exceeds mix and match fluorescent and LED lamps. Light level easily adjusts to fit user's needs.

Electronic Quarter Cycle Power

RMS theory determines a portion of AC sine wave does not contribute to effective heating of a lamp. The True RMS meters increase KWH cost by 15% to compensate utility operators for reasonable generating cost. That portion of sine wave is deemed ineffective yet can now be used to electronically power a lamp. Known as energy harvesting or recover of lost energy in a process GenII returns a significant economic benefit. Electronic power source of this nature is measured by software Class one to determine billable Kilo Watt hour usage. G2 smart meter provides all the math functions required for commercial use in energy efficiency building lighting. Wi-Fi connectivity available to receive invoice, for remote monitoring and control.

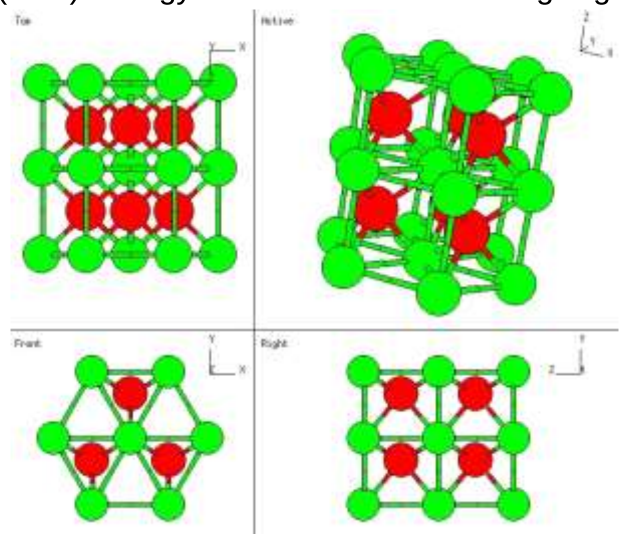
Electricity Source

60 Hz AC power is electronically processed thru a diode to conduct a half cycle. Further processed to less than half of the cycle available matches lamp resistance. USS patents protect ¼ cycle powers' novel and unique process. The benefits of ¼ cycle power is reduced operating voltage. This allows low voltage legacy lamps to exhibit vastly improved efficiency.

Sine wave energy has some limitations. As the cycle is near zero point, that energy is not used in conventional devices. QED light is powered by this "lost' energy, a negligible amount. The QED function introduces positrons into the lamps metal matrix. This is known to produce light by an annihilation process. Essentially this decarbonizes grid power, a new approach popularly known as solve for zero. This type of decarbonizing results in less input power to produce grid electricity, which translates to less CO^2 output.

Quantum Theory

Based upon two theories this lamp is considered to operate in a quantum state. The metal matrix is not heated to the point of incandescing (1200 Deg.). Quantum entanglement between the 2nd dimension and 3rd dimension can transfer energy from superluminal (dark) energy to the real world during high voltage events. Tungsten metal matrix is



electronically excited in a 50 Nano second current rise. Resulting flux levels capture muons in K space. Muon decay in side 4000 deg. crystalline structure space can withstand photonic heating positron/electron antimatter annihilation intermix causes. Light emission, in the opinion of the author, are similar to stellar corona plasma in spectrum and color. Tungsten matrix emits light as it returns to its base state (non-excited). This occurs 60 times per second. Electro dynamic momentum explains the large gap between electrical and photonic temporal events. A 1:8 electrodynamic ratio result in10x photons emitted, due to Muonic decay, light producing temporal loop. This disconnect between the electricity T and light T is proven quantum interaction discontinuous in its nature.

Generation 2 incandescent light

A tribute to Thomas Edison who's product endures in simplicity and value. Identical in design to Edison's original light, second generation light is 97% efficient. Einstein's space charge theory (voltage in a vacuum) that led to the vacuum tube and transistor also applies to the quantum lights' high output at low apparent (electrical) power.

New Regulation for general purpose lights

WASHINGTON, D.C. — The U.S. Department of Energy (DOE) today adopted two new rules for light bulbs, also known as general service lamps that will conserve energy and help consumers save on their energy bills. The first rule establishes a revised definition of general service lamps while the second implements the minimum standard of 45 lumens per watt for light bulbs that meet the revised definition. These rules are part of 100 energy efficiency actions the Biden Administration is completing this year, which together will save families $100 every year.

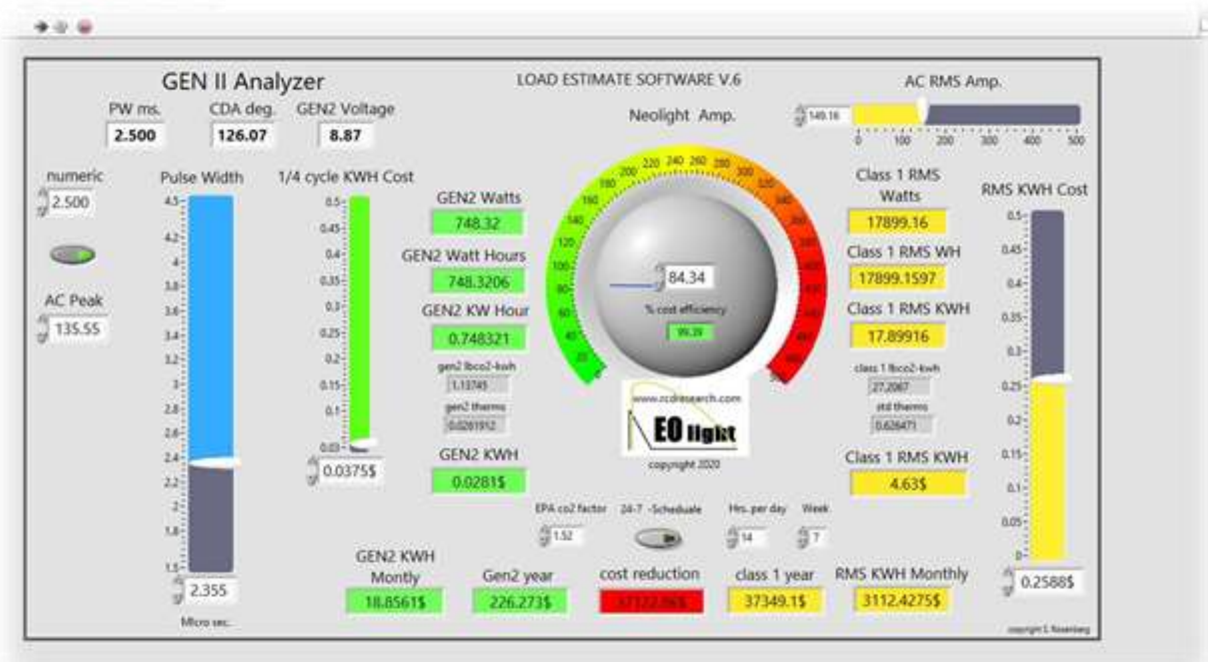
Once these light bulb rules are in place, DOE expects consumers to save nearly $3 billion per year on their utility bills. In addition to delivering significant cost savings for households, schools, and businesses, these energy efficiency actions also advance

President Biden’s climate goals. Over the next 30 years, the rules are projected to cut carbon emissions by 222 million metric tons an amount equivalent to the emissions generated by 28 million homes in one year. LED lightbulbs also last 25 to 50 times longer than incandescent bulbs.

“By raising energy efficiency standards for lightbulbs, we’re putting $3 billion back in the pockets of American consumers every year and substantially reducing domestic carbon emissions,” said U.S. Secretary of Energy Jennifer M. Granholm. “The lighting industry is already embracing more energy efficient products, and this measure will accelerate progress to deliver the best products to American consumers and build a better and brighter future.” Blanked cycle method of conservation projection applied to lighting sector can prevent 1-4mgt CO^2 carbon an hour worldwide. 1 to 2 thousand tons of mercury can be prevented. Standard type A lamp sockets allow for a direct replacement of lamps in most buildings. These specifications distinguish this lighting system as a new viable energy technology standard capable of making a significant improvement on several fronts.

Environmental energy impact

Quantum lighting system operate in low voltage mode. Simulators like the one below aid in calculating multivariate system in real time. A significant environmental and energy impact reduction of 97.5% (60w vs 2.5w) kinetic energy used in the generation and distribution of power for lighting sector use. 1,709 terra watt hours can be reclaimed and max 4Meg ton of carbon per hour eliminated. That equates to canceling 50% of global lighting sector energy products operating at a 1:1 ratio or in classic mode. Quantum mode, or 1:8 ratio, is the basis for cost and CO^2 reduction. Essentially this system recovers RMS energy deemed unused in modern AC grid operations. Quantum mode lighting can make a significant contribution controlling energy loss in large scale grid operations, eliminating harmonic distortion power loss, and low peak power emergencies. Uniform lighting of commercial buildings has many options. Carbon footprint, thermal loss to environment and mercury loss to environment. Exceptional KWH cost is an inherent benefit intrinsic to GENII system. Consumer recovers this cost when .0375 vs .20 cents per KWH is factored. These costs cannot be recovered from any other light source. New standard of efficiency 97% past classic engineered systems. Due to complexity of this systems' electrical properties, special software is used to compute energy recovered.



http://www.rcdresearch.com/PROGRAMslink.pdf

Recognition of Rosenberg cycle shall further advance common efforts to conserve energy, improve efficiency of building lighting operations and business cost, as current policy statements recommend. New technology is disruptive as it operates independently of utility companies best interests. As an energy efficiency product certain building codes support this connection. Class one KWH meters can be bypassed, as a recovery methodology of energy lost in the generation and transmission of full cycle AC power gives consumer another choice. Utilities stand to lose revenue and may consider this disruptive.

Present policy of concerned organizations support long term investment in research and business development. It is requested industry experts further recognize Rosenberg cycle (patented) as a useful means to achieve mandated goals. Based on facts developed recognition as required for funding, listing, procurement or contracting opportunities offered is in order. Recognition of **R**osenberg **C**ycle **D**evelopment & research as an independent testing authority and manufacturer with sufficient expertise in this field to produce credible reports of energy efficiency hardware.

Development Span

Independently Patented Oct. 31, 1995 and Sep. 4, 2012 Neolight continues to exceed efficiency standards 97%. Patented smart meter provides state of the art billing, on board diagnostics, and management data.

State of the art

Neolight exceptional efficiency merits special treatment in measurement and connection in benchmark building. US electrical code define GenII as a LOW VOLTAGE system. To further complicate matters, Class 1 meters required by law cannot measure ¼ cycle power use. US energy efficiency acts allows the system to operate in a disruptive fashion without KWH meters from utilities.

Deployment

This technology effective energy use can be measured with NITS standards of accuracy or by computer model of electrical parameters (download GEN2 analyzer). Exemption from current meter standards provides for accurate measurement of ¼ power data with patented and copyright software data processing integrals, relevant to billing and management purposes. Bypass of all class one apparatus on premises observing micro grid ground return plan is permitted by building code, US, state and local energy efficiency codes. Connecting GENII system directly to 120VAC mains results in a consumer KWH charge of $0.00 per hour.

Operations

The system is a standalone micro grid comprised of hundreds of lamps. Individual lamps rate at 2.25 watts and 800 lumens. Lifetime of five thousand hours, 100% recyclable. Direct replacement for any type of lamp in use, fits type A socket and can refit, retrofit any lighting design used in government building. Electronic ¼ cycle power source has an inherent 87% logical reduction in AC power requirement. Further refinements bring the effective efficiency to 97%.

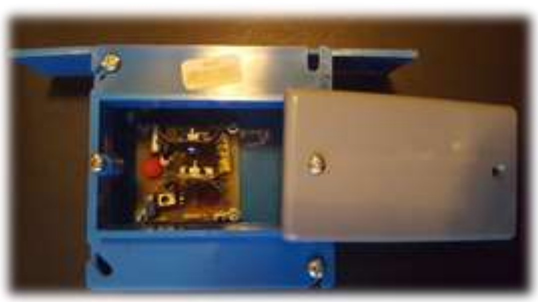
Energy savings-Energy recovery KWH Discount

The fact is this method of recovering energy categorized as RMS waste energy is new. Energy has been recovered by utility billing for years as a 15%RMS charge increases consumer cost of KWH expressed by TRUE RMS class 1 meters. Based on theory of billing consumers, and pressing need to improve consumer energy conservation, this must be made available to consumers and so must be granted the same consideration provided to classic lighting devices. KHW rate is equivalent to .037 cents. 24/7 operations for a year are broken down. 365 days x 24 hrs = 8,760 billable hours per year. Single lamp cost, at $0.10 per KWH (KWH rates may vary) are, $52.56 for a 60Watt lamp. $8.38 for GenII. A $52.56-$8.38=$44.18 cost savings per year per lamp.

Cost reduction per year for 10 lamps is $441.80, 100 lamps are $4,418, and 1,000 lamps are $44,180.

After 3 years cost reduction for 10 lamps is $1,325.40, 100 lamps is $13,254, and 1,000 lamps is $132,540.

100-lamp system will return initial investment quickly. A 10-year service span will return $120,540 to the customer. An installation with 1,000 lamps returns $444,000 in 10 years.



Primarily recognized method to measure quantum cycle quantum electrodynamic power is the differentiated integral. Designed to remove zeros from the data flow, Analog measurements are DSP processed in data sets to make software calculations. Proposed KWH rate for quantum reclaimed energy is .0375 cents per KWH. When illuminating a small building, cost can arguably be reduced to zero. Utilities claim no knowledge to measure or use quantum lights. Financial or fin tech incentives to save energy and KWH in a profitable fashion. In other words this tech (disruptive) forces adjustment of consumers fixed cost to illuminate building. Monthly budget for lighting is restructured.

ENERGY EFFICIENT LIGHTING

GEN II low cost lighting system, commercial celling retrofit. GENII refits drop in 2x4 boxes, replaces dual tube units in wide use today. Fluorescent units have a limited lifespan and there is a wide demand for mercury free replacements. Wide area lighting upgrade proposal is detailed to energy saved over a multiyear span.

GENII replacement 2x4 fixture consists of; 8-10 lamps @$1.25 each and 1 lamp driver unit @ $5 each. Decorative style sockets can be installed in groups of: four, six, eight or ten lamps, high hat and outdoor fixtures.

Estimated cost

100 lamp EPS unit covers 2,000 sqft. Space cost $650.
Electrician cost is $30 per hour.
Low voltage Electrical permit.
Total cost is less than $1000.

Energy savings analysis chart

3w each		x25 units	kwh	rate	kwh $	24/7 $py	$ reduced
GenII4	12w	300	0.3	$0.0370	$0.01	$89.50	
GenII6	18w	450	0.45	$0.0370	$0.02	$129.00	
GenII8	24w	600	0.6	$0.0370	$0.02	$177.40	$2,241.00
GenII10	30w	750	0.75	$0.0370	$0.03	$217.70	$2,200.00
80w	80w	2000	2	$0.1500	$0.30	$2,419.20	

Energy cost savings over 25 fluorescent dual 40w lights surpasses $2,200 per year on a 12 hour 7day a week schedule.

Summary

Quantum mode energy efficiency has specifications that exceed classic mode devices. Petitioner has made the facts presented here sufficient to approve a new standard commercial lighting system that exceeds standard, and must be recognized as presented. Granted Energy star recognition, investment support is in the best interests of new methods to support global and US conservation policy. Consistent effort to ensure long term improvement of energy and environmental issues requires this new standard of performance claimed herein. Consistent with current policy aims, technology in this case can reduce carbon produced per KWH across the lighting sector. A new account management benefit model emerges in KWH cost. This model is multivariate, and difficult to estimate without software tools.

Technology

2nd generation tungsten lamp

All electronic lighting systems in use operate with a 1:1 input to output ratio. This includes all LED driver circuits. Quantum mode light output expands to 1:8 ratio and this is standard as claimed Rosenberg cycle Electrodynamic light patents. Nobel laureate M. Bohm predicted muon field as a potential source of photons thru muon decay energy. This claim is presented as evidence regarding other types of lights that make similar claims or operate in a fashion similar to ¼ cycle do not actually achieve the results stated here, to distinguish this technology from classic lighting products in use today. For those of you who are not big fans of electrical engineering an introductory Guide is available at:

rcdresearch.com/power measurement guide.pdf

Quantum theory Photonics

Classic thermo-luminescent vs. Quantum antimatter annihilation luminescence

It is widely held that incandescent lamps in classic mode emit 95% of the energy as heat and are inefficient. The heat in this case is infrared energy emitted as the lamp is continuously heated with alternating current. As claimed, quantum light emissions, discontinuous of the input current, set a new standard 1:8 ratio as an efficient "incandescent" lamp.

Quantum mechanics

High light duration time is product of quantum mechanics, in which the Kspace material takes 8 times longer to return to base state due to muon saturated unified vacuum field or k space, evidenced as visible expression of the Bohm curve in oscilloscope tracing images (see charts). Energy emitted can exceed classic energy input/output expectations when muon decay product (500%) is added to the output unified field. This standard allows several extra efficiency methods; low voltage, low temperature, high speed pulse; electrodynamic discontinuous light output, full spectrum high quality light, and low KWH rate. None of these benefits are possible with full wave physic based consumer products.

Metrics

3a. one unit of ¼ cycle electricity (2.2ms) outputs 1:8 ratio or eight electro dynamic units of light (16ms) of 60 frames per second. While classic (or 1:1) mode at 120 frames per second has an inherent loss of energy that cannot be corrected. Cycle blanking corrects this, it is only possible with this product. GenII lamp creates a 360 deg. solid steradians high quality light. Carbon reduction is 97% improved over 60w standard. Power is 2.2 DC watts and low 8vdc voltage.

3b. Replacement cost for light emitter units is about $1 and the lamps last 5 thousand hours.

3c. Quantum mode is presently exempt from utility billing due to meter incompatibility and federal law allowing energy efficiency devices. The true power rate is .0375 cents per kilowatt hour. Please note the consumer has already paid for ¼ cycle, profiled as lost energy. This clarifies the reclaimed energy or repurposed waste energy reuse rate.

3d. Sine wave energy has a built in loss known as true RMS. This measurement to compensate for the loss of low sine wave voltage in the region around zero crossing. This portion of the cycle is proven to contribute nothing to heating ability of the majority of devices on electric distribution. Efficiency improvements now requiring closer management of classic AC. As with all low ratio lights and classic lights Harmonic distortion disrupts quality and is eliminated in high ratio lighting system. Further these effect reduce peak power and can damage equipment.

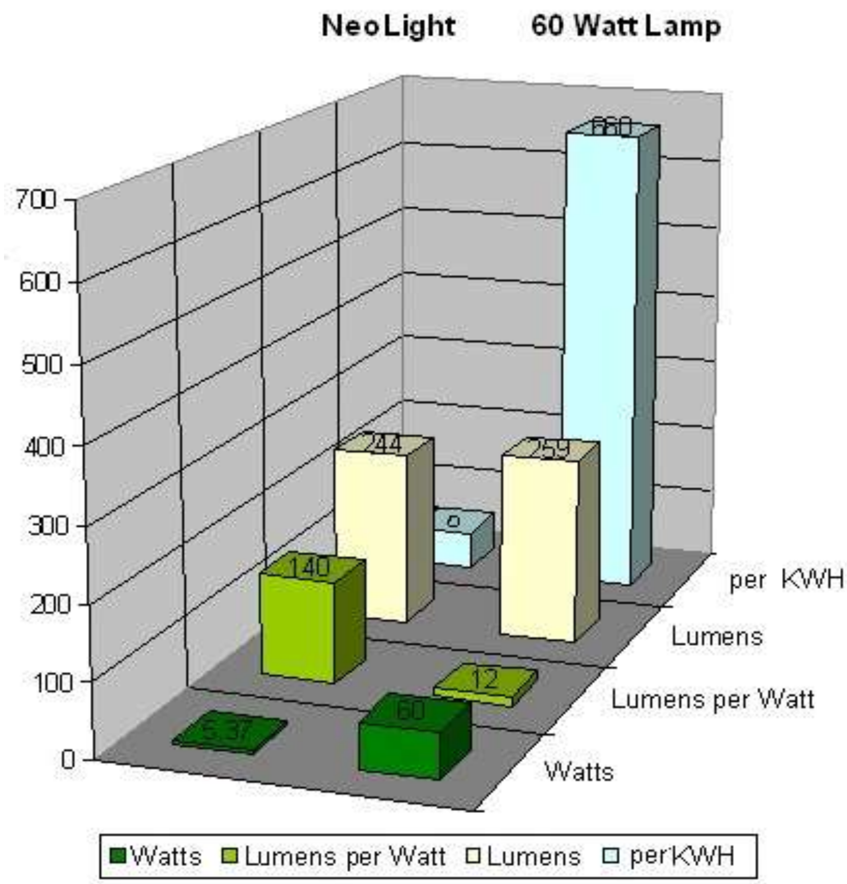
3e. Energy projection. Rosenberg cycle light bulbs (Omnilight) uniformity adds value to building lighting tasks and reduces cost. One type A-19 lamp can be illuminated at any lumens level to suite. Carbon is also reduced for every classic mode lamp that is replaced and thusly classic mode inefficiencies are resolved. GenII quantum mode operates at 8vdc (not 120 ac) and is entirely sustainable way to reclaimed energy. LOST classic lighting energy is available for recovery. ¾ of cycle load time T is not required to achieve quantum mode efficiency. Micro grid 2ms phasor conduction @60HZ is declared exempt from classic revenue standards restricting energy use to local standard rate. In the interest of energy efficiency policy, 1:1 ration devices may not obstruct the use of energy efficiency in any way. Defined by quantum theory rather than classic theory, 1:1 ratio energy transfer is an inherent limitation to energy management. Classic incandescent lamps are noted for operating at a 95% loss, in the form of infrared emissions, or continuous heating.

Phasor energy vectors available for consumer use after 135 degree conduction results in actual cost to operate near zero, and is declared relived of unlicensed class 1 KWH meters. GENII smart meters measure all critical variables and compute power used, carbon used and other data as needed. Windows 10 G code virtual electronic instrumentation package also operates on Google. This patented method is not to be confused with phase control diming, as1:1 ratio attempt always fails to yield as much as it costs.

Micro Grid

Standardized use of ¼ cycle AC to energize lamps in a micro grid array, supports International and energy star program specifications and goals to a new standard intended to recover energy presently lost in the transmission and generation of TRUE RMS Power AC electricity. Lighting sector recovery can be as high a 20% of all electricity generated. An equivalent carbon reduction is predicted.

Pictured here a 100 amp EPS with fan cooling, and over temperature protection. One unit can power 30 lamps, cover a wide area, at a competitive cost. Costing less than 5 dollars

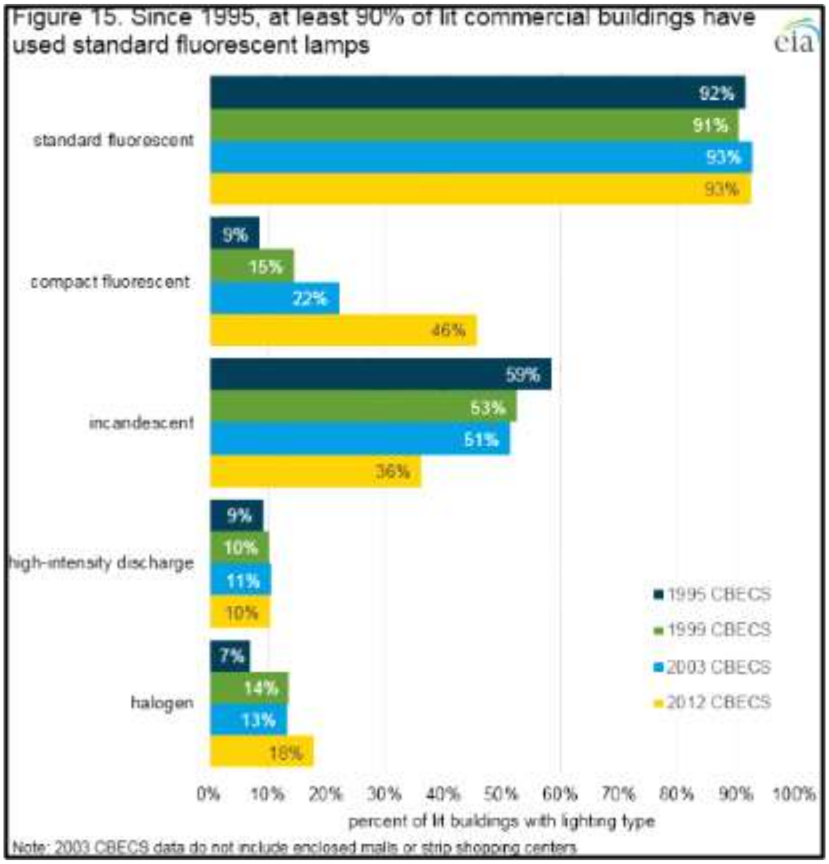


great coverage for security, night lights, garages, fields, building exteriors, decorative lighting strings, large tents, stockyards, and work areas.

CONCLUSION

Electrodynamic light sources offer financial savings standard for conserving energy. Exclusive ¼ cycle light benefits business consumer in KWH cost to illuminate premises, a new method to manage building utility budget. Quantum mode KWH cost to operate lights is zero, the quantum advantage plan. Outstanding facts developed here conclude that fore stated subject matter meets or exceeds classic standards and can be recognized as new standard of efficiency known as quantum cycle light. Light output quality, energy efficiency and materials meets EPA and ISO standards. 100% recyclable lamp, life is extended to five thousand hours. Infrared emissions, and KWH carbon are reduced in a unified grid light package presented as a low cost alternative refit of fluorescent tube fixtures. Where light quality is not important for task light or other high brightness applications, dimming feature can minimize power use more. The numerous features represents a culmination in type A lamp development. Classic efficiency methods have reached the limit of technology. This solution allows improved economics to energy efficient lighting.

Building installation



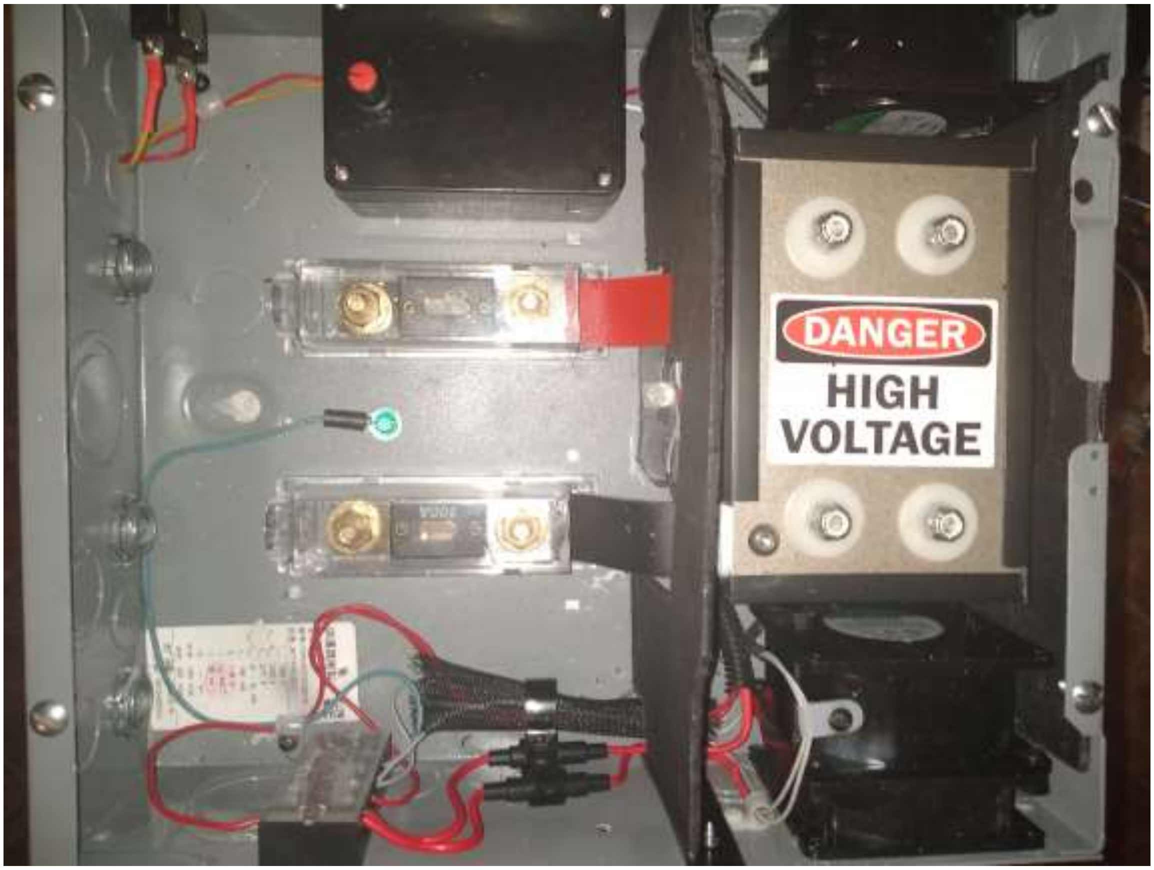
GENII PLAN 2X4 CELING UNITS, power ratings @ 5-8 EPS DC volts

4s' - 8.24 WATTS
5s' - 11.49 WATTS
6s' - 14.88 WATTS
8s' - 20.05 WATTS
10s'- 25.66 WATTS
12s'- 31.08 WATTS
14s'- 37.24 WATTS
16s'- 42.61 WATTS
24s'- 60.74 WATTS
32s' - 79 WATTS

Replacing classic tubes with GENII\Neolight is an energy savings advantage in the 97% range. GEN II smart KWH meter records ¼ cycle energy reduction with patented and copyrighted software. This manual is provided to ensure correct operation of GENII lighting system. Replacing one light fixture at a time results in an improvement, best efficiency and CO^2. GENII is perfect adaptation of modern power electronic devices, software, and low cost.

GEN II NEOLIGHT TECHNICAL

HYPER DRIVE 2,000 AMPS PER CYCLE



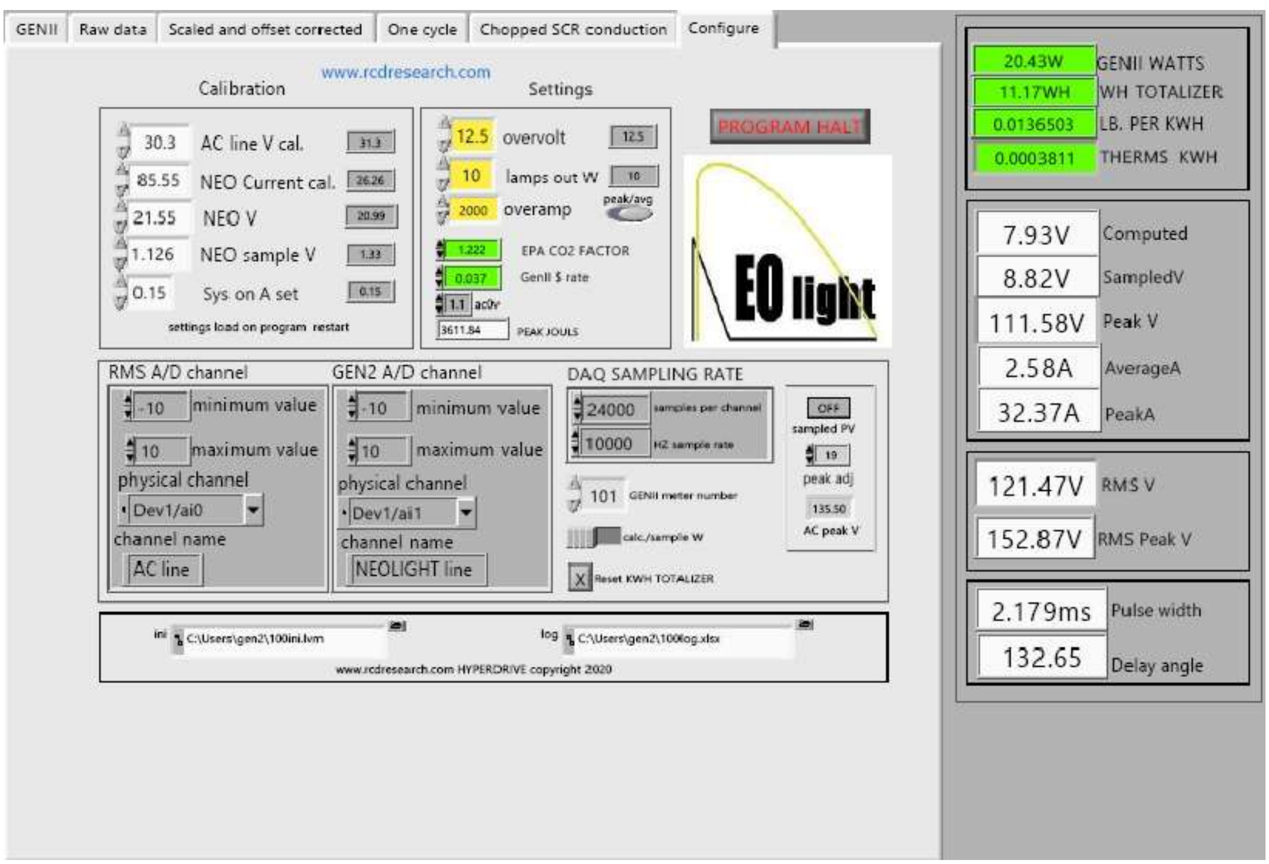
GENII SMART KWH METER

rcdresearch.com/gen2smartmeter.mp4

Description of control panel calibration settings and buttons

a. Meter number set to location ID.
b. Eps current cal set Hall Effect sensor EPS current.
c. AC voltage cal set RMS AC line reference voltage.
d. EPS v cal set to compute eps voltage based on Pulse duration.
e. EPS sample v sets sampled voltage.
f. Lamp out A set EPS current drops below set point lamp is out.
g. Cal/samp allows switching between calculated eps voltage and sampled in watt integral.
h. Program halts stops meter.
i. Reset kwh accumulator resets meter to zero.
j. Log enabled writes data to excel file. Saving data led lights when active.
k. Left column contains default settings. Right column auto saved initialization file settings.

All the sampled voltage and current are processed in the meter. DC offset s removed from DC pulse currently available from Hall Effect sensors. Digitized data is further processed into sets that can be as small as a single cycle. Programmable calibrations allow almost any sensor device to be interfaced. M100 meter's tabbed panels complete the program, ready for any building energy efficiency project in 22nd century upgrade.



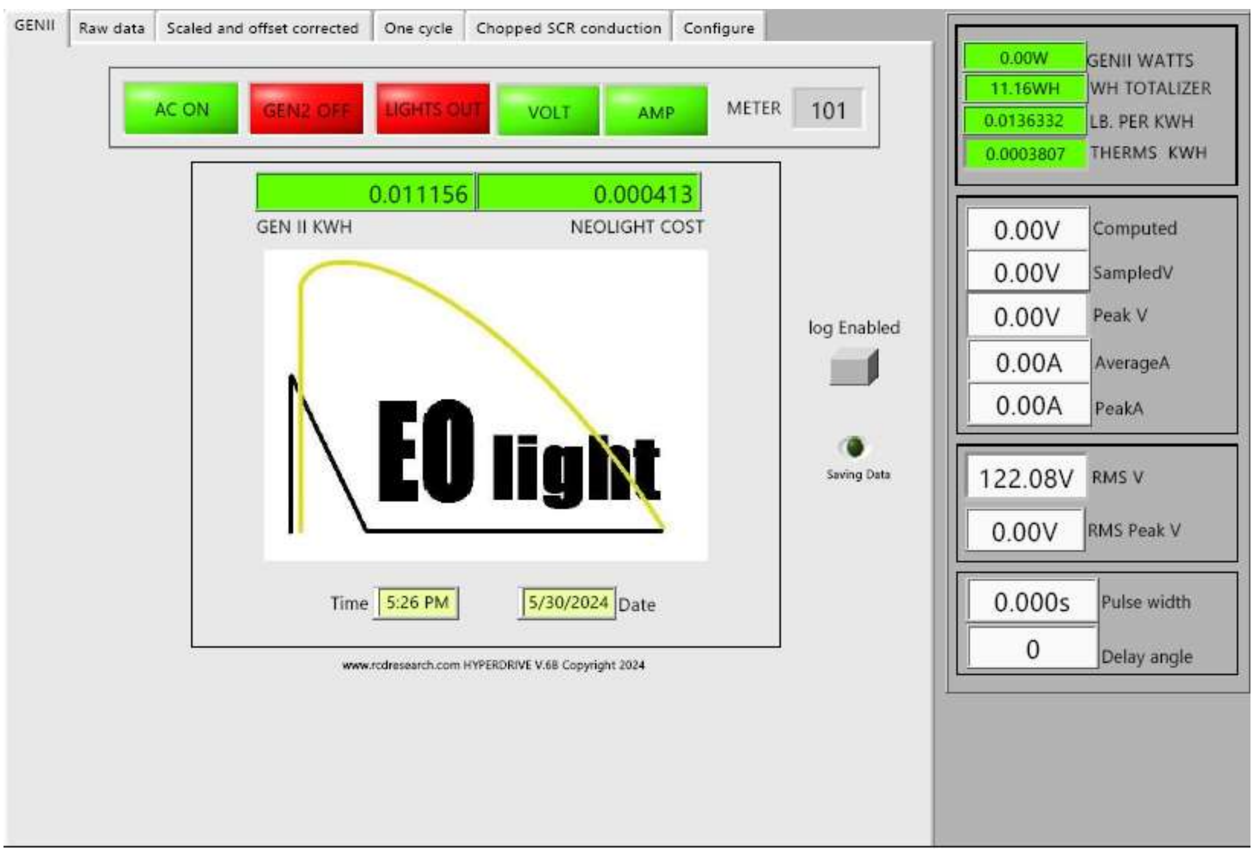
The above screen is instrument setup and monitoring of the system. Any data signal faults can be immediately determined to ensure proper operation of the software.

Logging features real time online copy of Hyperdrive micro grid events.

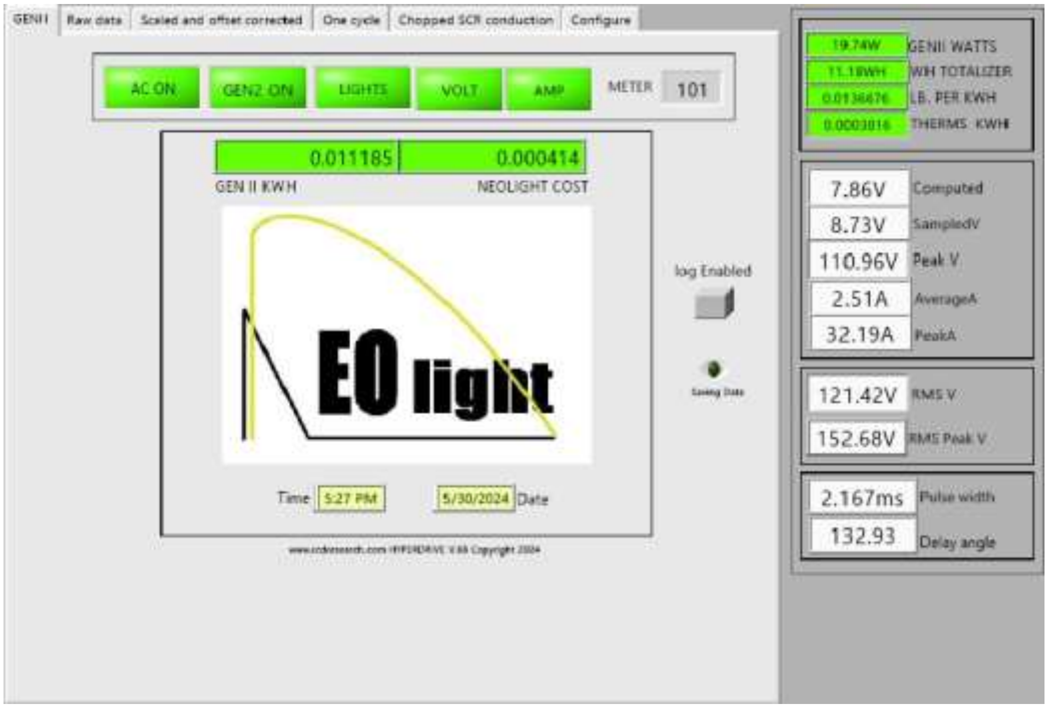
METER	ON	COST	TOTAL KW	VOLTS	AMPS	PULSE T	WATTS	LBS CO2	THERMS
101	1	0.000421	11.3653	8.338251	2.637488	0.002245	21.99204	0.013888	0.000388
101	1	0.000421	11.38032	8.351925	2.638613	0.002247	22.0375	0.013907	0.000388
101	1	0.000422	11.3953	8.335068	2.63868	0.002244	21.99358	0.013925	0.000389
101	1	0.000422	11.41028	8.331415	2.636793	0.002244	21.96821	0.013943	0.000389

An eight lamp fixture is measured, the screen shots shown here.

FRONT PANEL power off



Of interest is software capability of computing CO2 and Therms. These following images reveal meter+ data processing in real time.


GENII
Raw data
Scaled and offset corrected
One cycle
Chopped SCR conduction
Configure
AC ON
GEN2 ON
LIGHTS
VOLT
AMP
METER
101
0.011185
0.000414
GEN II KWH
NEOLIGHT COST
EO light
Time
5:27 PM
5/30/2024
Date
log Enabled
19.74W
GENII WATTS
11.18WH
WH TOTALIZER
0.0136676
LB. PER KWH
0.0003816
THERMS KWH
7.86V
Computed
8.73V
SampledV
110.96V
Peak V
2.51A
AverageA
32.19A
PeakA
121.42V
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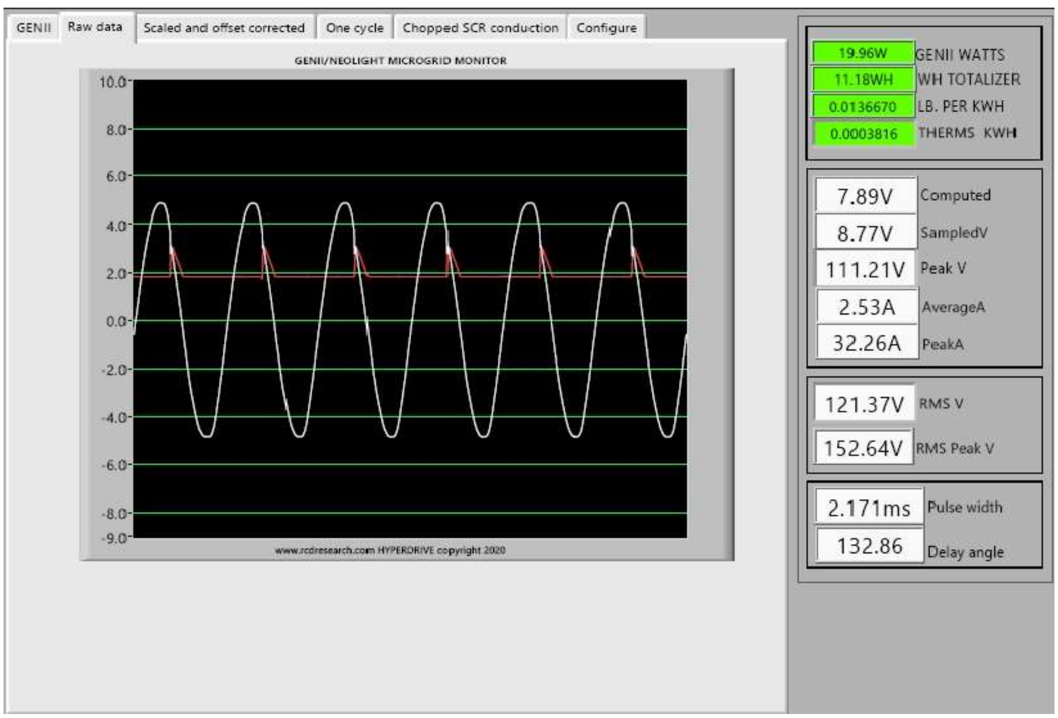
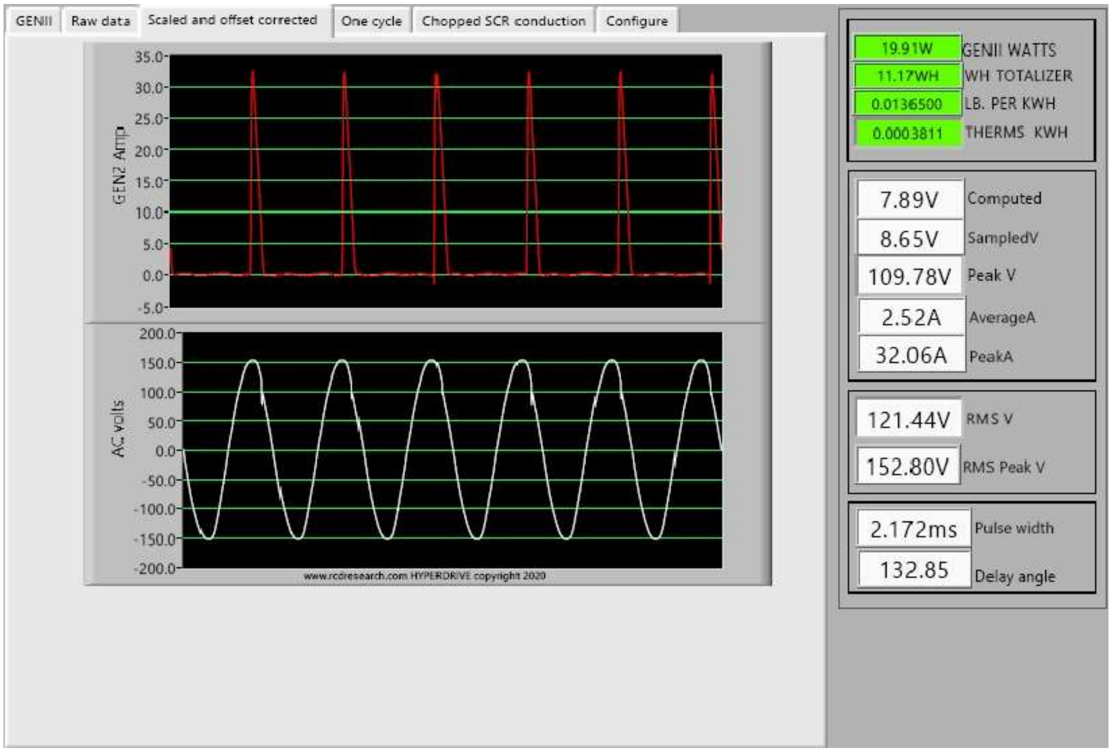
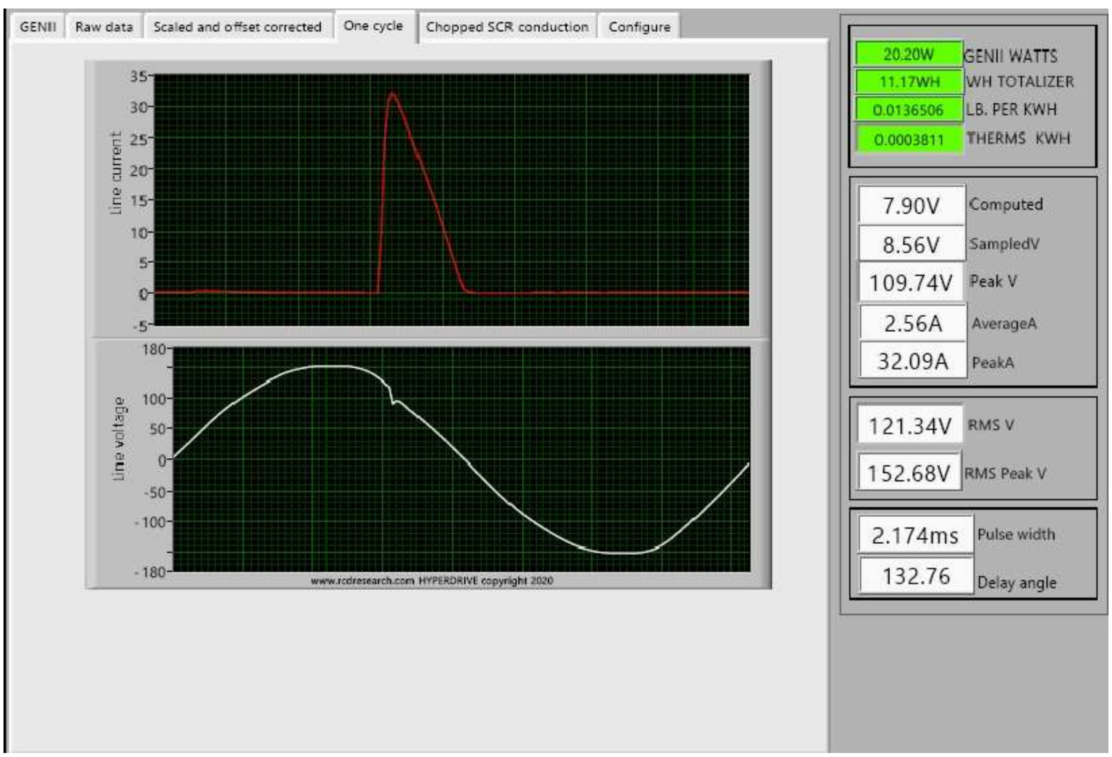
RMS Peak V
2.167ms
Pulse width
132.93
Delay angle


GENII
Raw data
Scaled and offset corrected
One cycle
Chopped SCR conduction
Configure
GENII/NEOLIGHT MICROGRID MONITOR
www.rcdresearch.com HYPERDRIVE copyright 2020
19.96W
GENII WATTS
11.18WH
WH TOTALIZER
0.0136670
LB. PER KWH
0.0003816
THERMS KWH
7.89V
Computed
8.77V
SampledV
111.21V
Peak V
2.53A
AverageA
32.26A
PeakA
121.37V
RMS V
152.64V
RMS Peak V
2.171ms
Pulse width
132.86
Delay angle


GENII
Raw data
Scaled and offset corrected
One cycle
Chopped SCR conduction
Configure
GEN2 Amp
AC volts
www.rcdresearch.com HYPERDRIVE copyright 2020
19.91W
GENII WATTS
11.17WH
WH TOTALIZER
0.0136500
LB. PER KWH
0.0003811
THERMS KWH
7.89V
Computed
8.65V
SampledV
109.78V
Peak V
2.52A
AverageA
32.06A
PeakA
121.44V
RMS V
152.80V
RMS Peak V
2.172ms
Pulse width
132.85
Delay angle


GENII
Raw data
Scaled and offset corrected
One cycle
Chopped SCR conduction
Configure
Line current
Line voltage
www.rcdresearch.com HYPERDRIVE copyright 2020
20.20W
GENII WATTS
11.17WH
WH TOTALIZER
0.0136506
LB. PER KWH
0.0003811
THERMS KWH
7.90V
Computed
8.56V
SampledV
109.74V
Peak V
2.56A
AverageA
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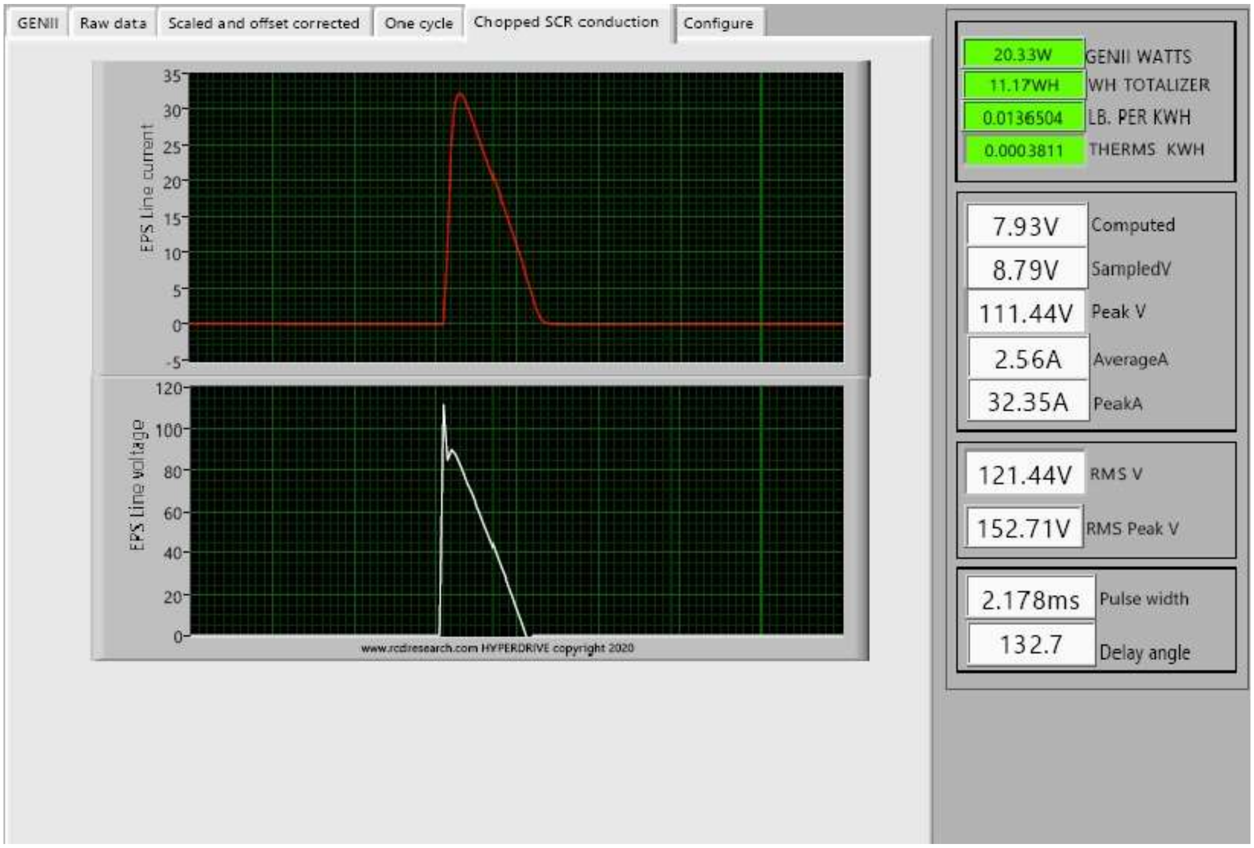
RMS Peak V
2.174ms
Pulse width
132.76
Delay angle

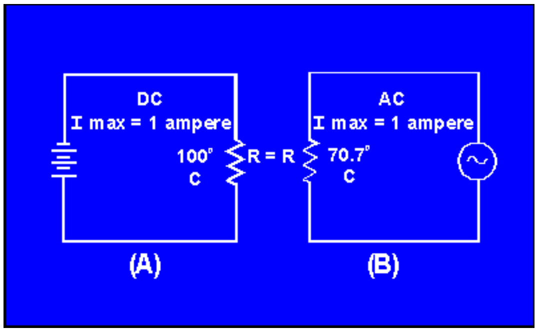


Several data sets are required to make precise measurements. The final data set above is integrated into watts per second as is the basis of the system.

EFFECTIVE HEATING VALUE OF A SINE WAVE

GENII efficiency is derived from several factors combined to achieve 95% BASE efficiency improvement when replacing or refitting 4’x2’ celling fixtures. In order to correctly install this system certain parameters must be observed. EFFICIENCY of DC vs. AC. E_{max}, E_{avg}, I_{max}, and I_{avg} are values used in ac measurements. Another value used is the EFFECTIVE value of ac This is the value of alternating voltage or current that will have the same effect on a resistance as a comparable value of direct voltage or current will have on the same resistance. When current flows in a resistance, heat is produced. When direct current flows in a resistance, the amount of electrical power converted into heat equals I^2R watts. However, since an alternating current having a maximum value of 1 ampere does not maintain a constant value, the alternating current will not produce as much heat in the resistance as will a direct current of 1 ampere.

GENII DC Heating effect producing light



Examine views A and B and notice that the heat (70.7° C) produced by 1 ampere of alternating current (that is, an AC with a maximum value of 1 ampere) is only 70.7 percent of the heat (100° C) produced by 1 ampere of direct current. Therefore, for effective value of ac (I_{eff}) = 0.707 X I_{max}.

The rate at which heat is produced in a resistance forms a convenient basis for establishing an effective value of alternating current, and is known as the "heating effect" method. An alternating current is said to have an effective value of one ampere when it produces heat in a given resistance at the same rate as does one ampere of direct current. For this reason, the effective value is often called the "root-mean-square" (rms) value. Since alternating current is caused by an alternating voltage, the ratio of the effective value of voltage to the maximum value of voltage is the same as the ratio of the effective value of current to the maximum value of current. As EPS is a DC voltage the instantaneous voltage is V squared. Light output ratio is the quantum effect, exceeding the input for 13.5 Ms. Efficiency is further improved by this ratio. When an alternating current or voltage value is specified the value is an effective value unless there is a true RMS meter.

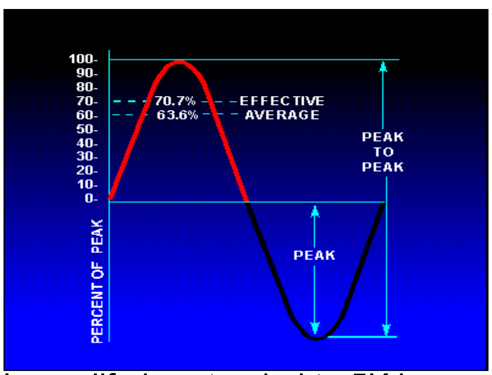
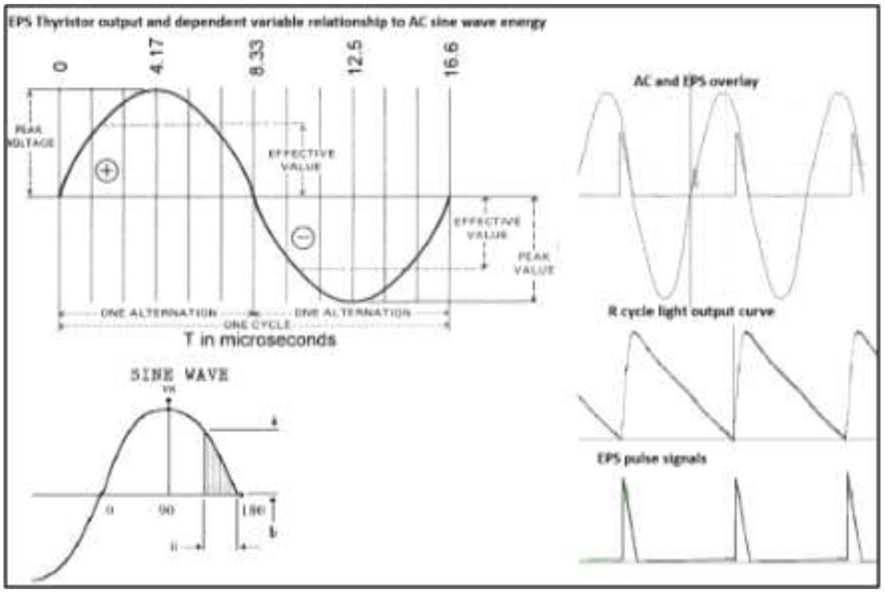


Figure shows the relationship between the various values used to indicate sine-wave amplitude. Various values used to indicate sine-wave amplitude. The peak voltage is relevant to the EPS peak voltage and are phase locked. EPS circuit rectifies AC to half wave DC. This is controlled so that conduction delay angle is frozen at the optimum voltage for the filament. Conduction is controlled past 90 degrees is known as ¼ cycle power. EPS outputs a low voltage between 5-8 VDC. One must be aware that the peak voltage is much higher. Average Lamp life is extended to 5K hours. Large efficiency gains are possible when these efficiency measures are combined as is the GENII R-CYCLE method.

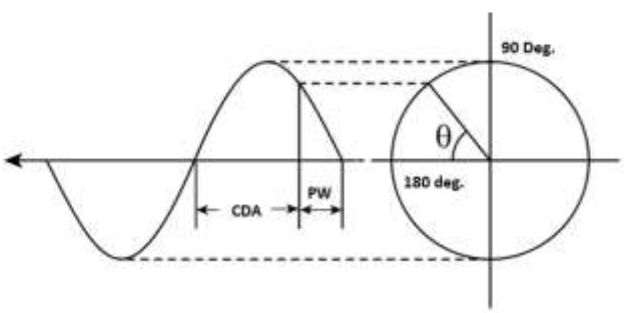
Collective Electrodynamics offers an explanation to high peak voltage and light emission momentum. Initial peak voltage is transferring a quantum of energy into filament matrix. As the rate of energy loss is proportional to the square of the amplitude, and, that the R cycle amplitude is proportionally greater for a 25-ohm resistance than the AC peak is for an 250-ohm resistance, the radiation of photons, or the loss of energy, is equivalent for the time period until the filament decay constant reaches base state. This suggests the cycle is radiating more light by a factor of 10. This also suggests a collapsing field condenses muons into the Matrix. Muon pairs emit 10x more photons equivalent to the increase over standard in photon emission. The light is similar to the light from the suns corona.

Compound conjugate math



EPS voltage is DC, more efficient at heating a resistor, such as Neolight lamp filament. R cycle pulse width is considerably shorter duration than conventional energy systems. EPS pulse is around 2ms @ 130 degrees conduction. Eliminates flicker fusion at 60 fps, resulting in high definition, high quantity light. Fast energy transfer attenuates thermal output (infrared) conserving energy.

Phasor diagram. EPS conduction angle is at 130 deg.



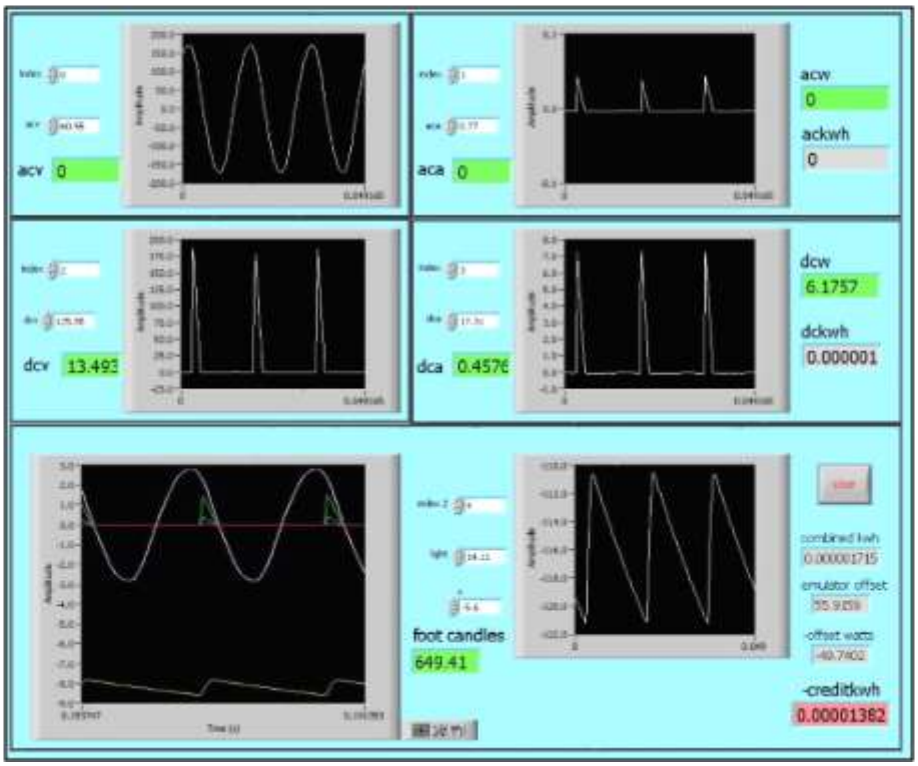
Voltage and Current sampling. EPS voltage and current is sampled with a National inst 6009 Daq. This device converts analog sensor output to digital data used in the GenII meter program.

Operating a Rosenberg cycle light @ 150 lumens per watt.

Based upon Quantum theory the lamp is considered to operate in a quantum state. This means the metal matrix is not actually heated to the point of incandescing continuously. The matrix is rapidly excited in a short time 60 times per second. Electro dynamic momentum explains the distinction between the electric and photonic events. Electrodynamic ratio during which the photons are emitted disconnects electric and light. A quantum interaction known as “discontinuous in its nature”. The filament photon output continues after power duration ends. The electrodydnamic momentum ratio of the Rosenberg cycle is 1:8. a 2.5ms electronic input results in a photon output for 16ms. This differential represents a true quantum device, distinct from classic forms of illumination.

Custom multiscope provide details regarding performance of various core technologies vs Neolight. First a classic 60w incandescent lamp, second a common spiral CFL and lastly led.

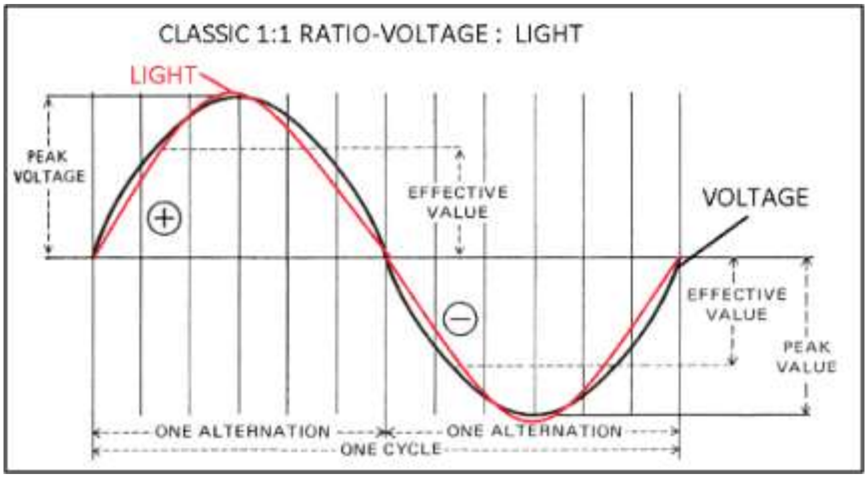
rcdresearch.com/60w.mp4 rcdresearch.com/cfl.mp4 rcdresearch.com/led.mp4



¼ cycle DC analyzer panel

Graphic displayed relationship between EPS wave and Photon output wave. Lower right and left bottom windows. High speed photometry reveals the light output "on" time exceeds all other lighting products is unique to Neolight.

WHY INCANDESCENT LAMPS ARE INNEFICIENT

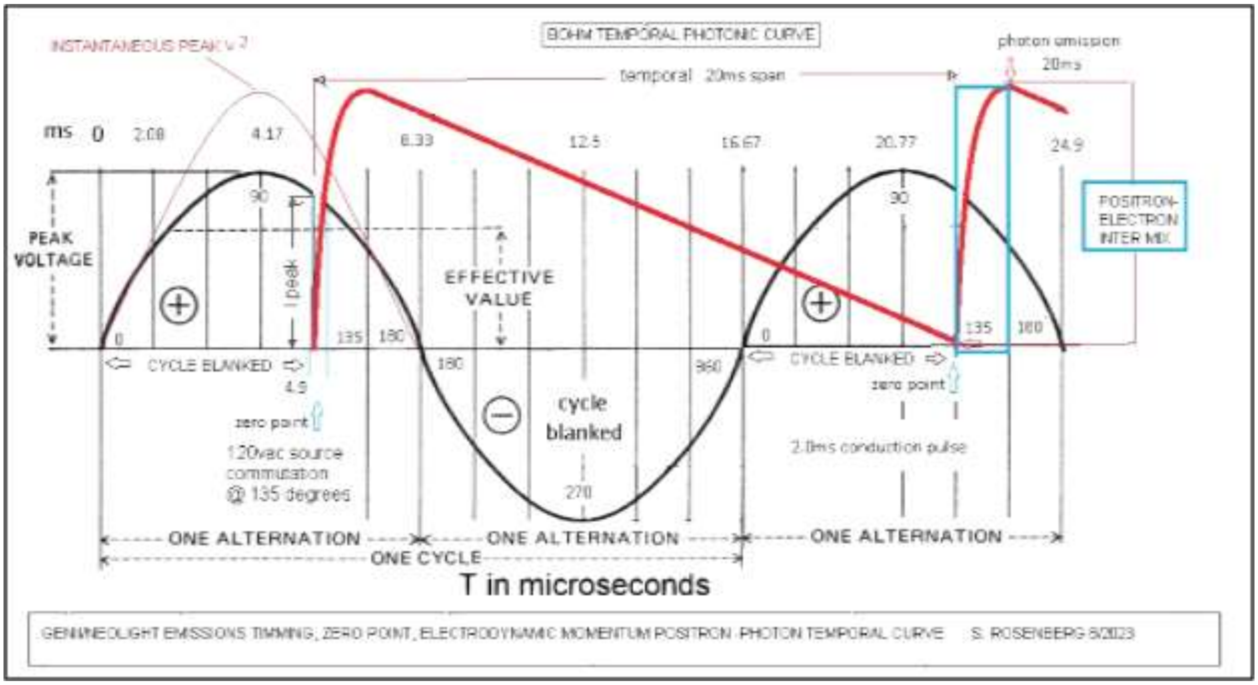


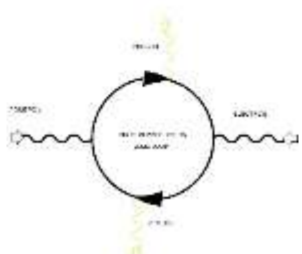
AC Voltage I/O curve.

High infrared output results from continuously charged lamp's heat soak. Current is centered on peak. Hard efficiency gains are illogical. The light wave span current flow during the half cycle is 20ms. Temporal distortion is obvious from the previous diagrams. In the negative half cycle all of the cycle is blanked, flowing zero phasor energy a 50% improvement towards efficiency is evident. Positive cycle 2ms current pulse, connected to ac line has infinite peak current possible as the square of the squared peak volts and amps. 50ns turn on time can alter quantum structure of the load device, as positron saturation of the conducting matrix. Device peak current capability make the SCR the correct choice for control element. 16ms cycle of rotational vectored phasors. Positive half cycle is only half used, after 90 degree peak. So, desired goal to reduce base power is a logical 75%+. ¼ cycle patented method further advances this approach to eliminate up to 2/3 of the active ¼ cycle. Notching of the ac sinewave can be seen on scope at about 135 degrees of commutation. The zero point response of the circuit is also visible at 135 deg.

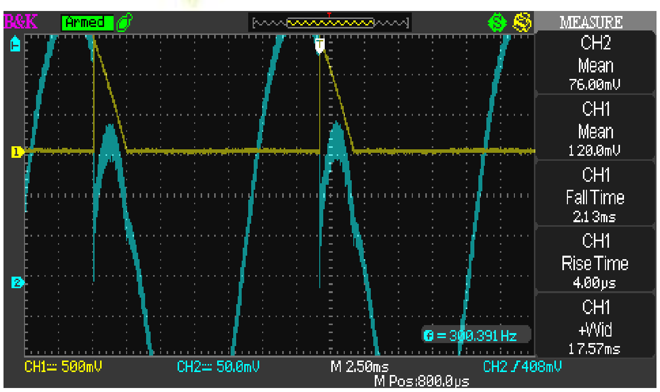
Muon decay product is a validated theory. Approximately 500 times more energy than an electron, circuit design presents challenges. Positrons (anti matter) and electrons (matter) interaction releases a photon as a decay product. Neolight mixes those particles known to emit light during contact. See timing diagram, of interest is the red trace. This transcends normal expectations of electro generated particles. As you can see, the T or time duration of this output curve is without precedent in any product available today. A dark energy theory (positrons) is confirmed.

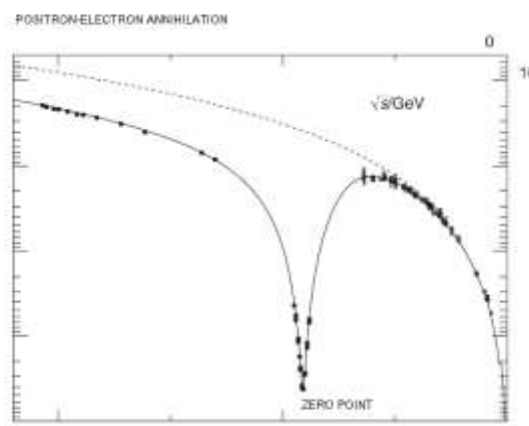
The patented methodology of driving a classic lamp into high emissions is based on driving the filaments atoms over the barrier performs beyond expectations. As predicted in the Bohm curve the result is a higher output, functioning similar to a laser.





Photonic quantum output time at 135 degrees exceeds input time. Attributed to positron/electron annihilation producing photons the decay rate curve above matches the photonic wave, in red. Fienman diagram positron/electron temporal loop in this circuit is the time duration of the light output exceeding power on pulse at 60 pulses per second. Essentially this filament does not reach incandescent temperatures 1,200 Deg.



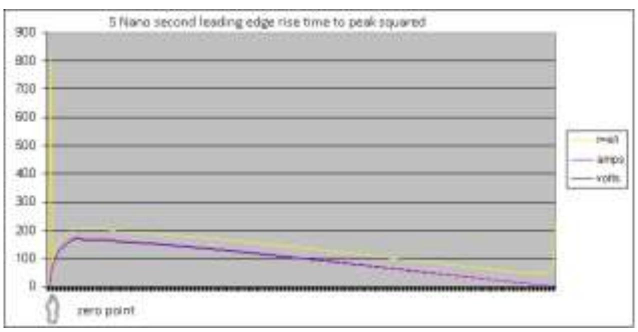


F. A Quantum process is producing light, building photons in visible spectrum. Infrared attenuation is preponderantly contributing to efficiency and prove Rcycle quantum process in a reasonable theory.

Zero point and negative energy

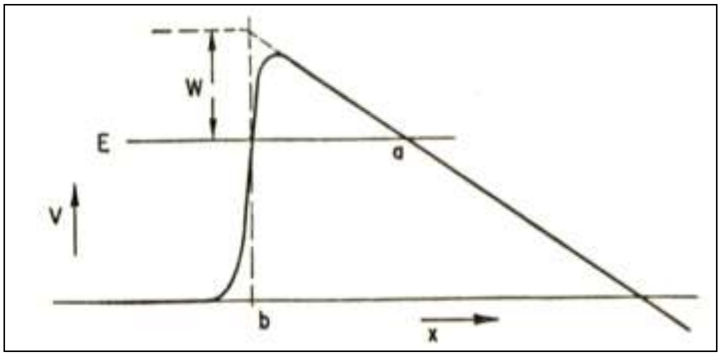
Apparently the rapid rate of rise in Neolight current pule (5-50ns) cause a time space structure distortion in which muons are introduced into the tungsten filament. Trapped in magnetic skin field of matrix rate of rise of joules introduces initial positron muons. The anti-matter effect stops all electrical flow shown in image as a dark spike. The zero point is evident of negative space energy. In a very short time the muons that are infused convert to electron muons. AC phasors power the filament and intermix with positrons trapped in k space matrix. The interaction and temporal time for this to complete result in cycle spanning photon emissions. This function allows for very low voltage to produce exceptional light output. This is not a thermal emission of light which is inefficient due to predominance of infrared spectrum, or hot incandescence as in classic lamps.

Comparison thermal graphing of powered lamp demonstrates a decrease in heat soak energy output. The light intensity is comparable to a 60-watt lamp but the heat output is on par with a 25-watt lamp. This efficiency gain is typical of the improvements found with pulse powered lamps. The infrared spectrum of emitted radiation is reduced. This is the first evidence of a quantum process at work.



Collective Electrodynamics offers an explanation to the high peak voltage and light emission, energy momentum. The initial peak voltage is transferring a quantum of energy into the filaments matrix. As the rate of energy loss is proportional to the square of the amplitude, and, R cycle amplitude is proportionally greater for a 25-ohm resistance than the AC peak is for an 250-ohm resistance, the radiation of photons, or the loss of energy, is equivalent for the time period until the filament decay constant reaches base state. This suggests the cycle is radiating more light by a factor of 10.

Quantum theory process is called cold emission, to contrast it with thermal emission, which takes place when the electron acquires enough energy from random thermal motions to go over the barrier. This curve fits the radiation output of the Rosenberg cycle depicted. Internal Photonic heating occurs to a much lesser degree than full cycle heating.



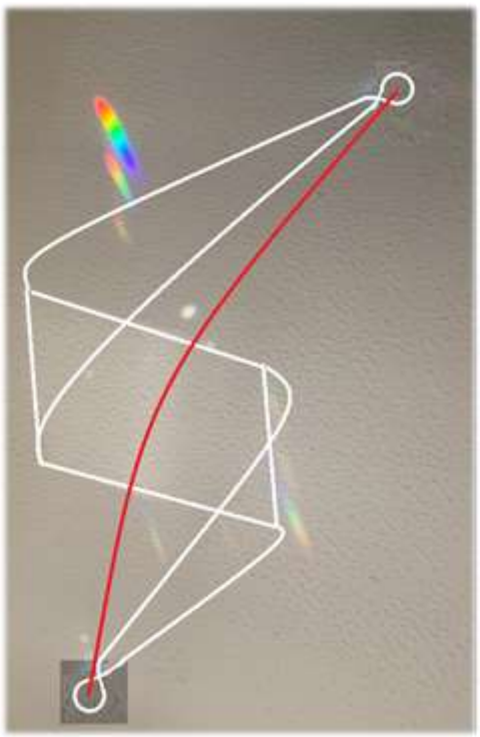
Rosenberg Cycle

The above elements combine into a cycle in which light output continues after power application. This powers an incadescent lamp of a low resistance. Relevant results are: high light output, reduced heat output and reduced electric power levels. The electrodydnamic momentum ratio of the cycle is 1:8. Light is output for 16ms. following a 2.5ms. pulse. The energy in K space contiues to reach the surface, but in what apears to be a very long time delay to reach base state, when all energy is released as photons. A resistance shift during the first microsecond of the Rosenberg cycle pulse is transferring a proportional quantum of energy into the filament. The filament emits photons, has a decay constant of approximately 15 microseconds with electrodynamic momentum ratio of 1: 8.

There is a 15ms. gap between end of pulse and end of light wave. (In all other devices the two always coincide.) In this case light cycle continues independent of electrical pulse. The 15ms. gap proves Rosenberg cycle is discontinuous in its process. This qualifies it as a quantum process similar to cold emission. Analysis of pulse involves peak values and surge current. Surge current is unusually high in this case as it is a filament. The resistance changes as it transitions from cold to hot or as quanta be transferred to the metal matrix as shown in resistance chart. Logically lower resistance always equates to lower power required to energize load device. This and cycle blanking produce energy efficiency not found in other products.

Quantum Entanglement

Based on two dimensional space Hawkins information can be conceived as rings of 2 dimensional structures spinning at superluminal speed near infinity. This spin can be transferred to 3 dimensional space through particle and field interactions. In this case during intermix T instantaneous wave voltage shows zero volts-point. The loss of signal indicates positron emissions are blanking voltage. Positron Muonic wave recedes to waves of electron muons. The working theory is that 2 dimensional energy has been condensed into 3d space-time. Both particles cannot co-exist and so “annihilate” or allowing sub space to condense, reformed as photons emitted to space. Similarly the image depicts folded space photon structure. A dark photon is included. Theoretical speed of rotation of 2d information, rings, is infinite, hence the separation of the light and dark matter. The potential for energy transfer from superluminal and light speed is the object we are addressing. On a quantum level transfer is infinite, or non-exhaustible. Annihilation is actually reforming time space information into photons by EM field warping, trapping both type of particles instantly. So, together particles associated with muon decay, apart from electrons, supply the photon creation, and supply’s the dark matter particles that are a part of every photon. Whether this is a result of quantum restructuring of quantum structure in the 2nd dimension, sub space, or folding space resulting in the structure on the left. The transcendental nature of muon waves produces much more conversion success than classic electronic circuit. Other theory is that dark space quanta, is only millionths of a second away, yet this separates 2 dimensions. Einstein conjectured that this type of energy can travel forward in time from the big bang, or backwards from the end of time, the next big bang. In so this serves to stabilize gravity, and 3d matter from suffering natural energy depletion of atomic bonds.

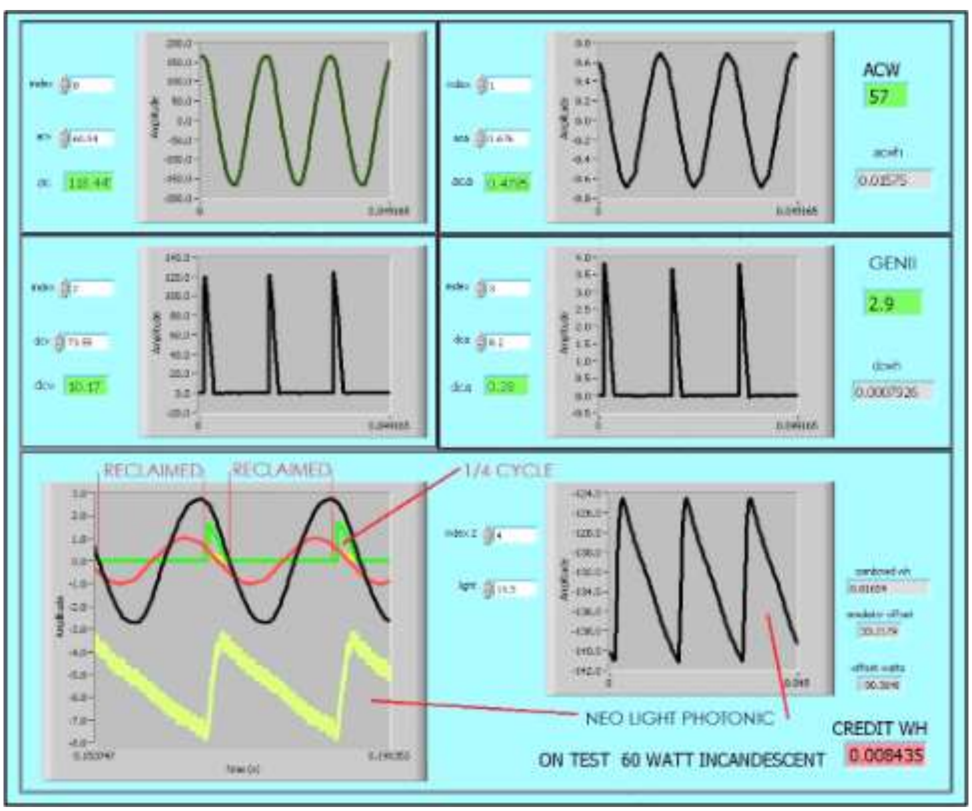


PHOTONIC HIGH SPEED WAVE ANALYSIS

Rosenberg cycle transfers a quantum of energy absorbed in filament matrix in every cycle. The filament emits photon output that continues after power application. The electrodydnamic momentum ratio of the cycle is 1:8. a 2.5ms electronic input results in a output for 16ms, to reach base state, when all energy is released as photons. (D. Bohm.)

Instantaneous voltage and current exceed conventional ratings of classic incandescent devices. Instantaneous power is developed thru thyristor conduction. A delay to about 133 degrees is typical. This method results in average voltage of 5-9 volts. True power measurement function is: Average load voltage = Epeak / 2π (1+ cosine α). Typically lamps operate from 2.3 to 5 watts at 5-8 volts DC Average.

The load resistance has a function as well. When the filament is cold at the beginning of a cycle the resistance is low. Application of instantaneous power is absorbed by the load rapidly thusly varying the resistance as matrix becomes energized. The result is a highly efficient transfer of quanta into the filaments' matrix. Peak light output occurs and continues to decrease as energy is dissipated. Visible radiation occurs for the duration of time between voltage applications. The result is an optically discontinuous light output, exhibiting a wave shape entirely different than any other incandescence. DC front panel software displays the photon wave shape. Essentially classic heating of the matrix does not occur. The matrix is excited only during the brief time the electronic energy is applied



Therefore significantly reduces emissions in the infrared. Since the filament never sustains continuous heating to 1,200 degrees (operating temp) it is much cooler and last longer than classic lights.

GENII/NEOLIGHT hardware installation management

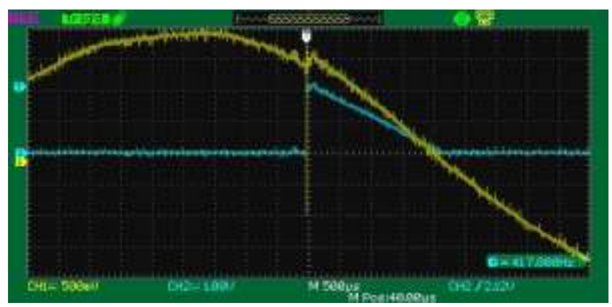
Analysis of pulse involves peak values and surge current. Surge current is unusually high in this case as it is a cold filament. Change as it transitions from cold to hot or as the quantum is transferred to the metal matrix by one pulse. The high rate of rise in current can cause positronic heating of conductor, spurious surges blow out the filaments resulting open circuit. RC filters are used to prevent this. High current peak may exceed working values of breakers tripping when peak current is too high. Peak voltage carries the same current, but can be derated for the ms time frame.

Electronic power source Engineering Preliminary checks

Oscilloscope and RMS digital meter required

EPS unit, lamp assembly.

Micro Grid PC board is installed by splice into local wiring. HOT side of PC board is 120vac. Return voltage is EPS, routed to lamp. Lamp return wire is connected to Ground. Multiple lamps are wired in a PARALLEL circuit. When at 5.0 volts the lamp life has been measured at 5,000 hours.



EPS Lamp assembly test and checkout.

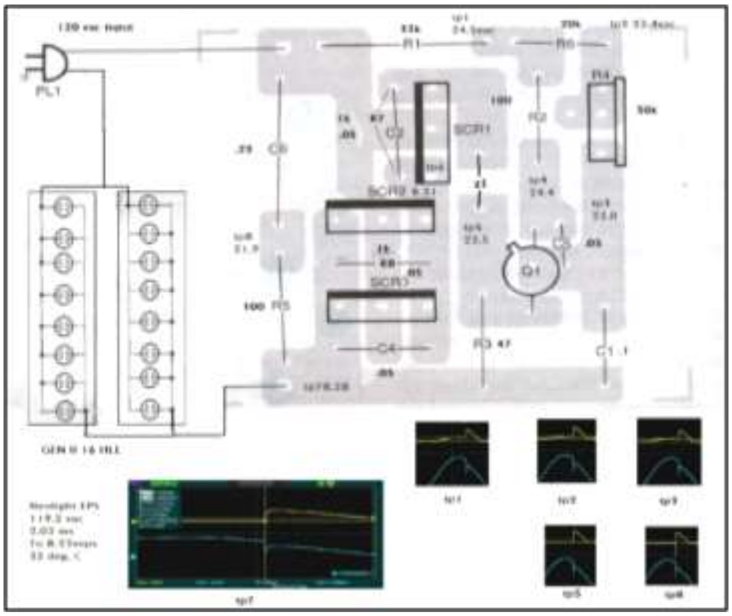
AC off. Splice EPS into Hot side (black). Terminal 1 is connected to 120 VAC hot side. Terminal 2 connects 24v lamps. Terminal 3 connects lamp return to Ground. First time applying AC to EPS and lamps, a standard 60-watt lamp is used as a check. The lamp filament should glow slightly. If lamp is bright, check circuitry, and do not go on to installing system lamps until over voltage condition is corrected. Voltage cant be adjusted via onboard potentiometer. Digital meter set to Direct Voltage, is connected ACROSS lamp to ground. Power up EPS and visually confirm a 60w lamp's light output is very low. Set EPS voltage (R3) 5 volts. Standard lamps are replaced with Neolight lamps. Confirm light output is as expected. Install or change out remaining lamps. Occasional increase or decrease in system brightness when operating is normal, and corresponds to changes in the line voltage delivered by the local power company.

This digital system is purpose designed to measure 2.0ms electronic power, voltages and current, when peak instantaneous values are involved. Althought combined grid standard features are available they are not included Brief videos demonstrate the correct operation of the system. To obtain a exact integral of the power flow several data sets process the analog voltages and make modern calculations in CO^2, therms and watts.

rcdresearch.com/6channelvi.mp4

Warning. Do not connect any inductive devices or consumer products to EPS Only use approved GENII lamps

Lamp driver board scope checkout



3. POWER UP. Checkout EPS Voltage and light settings.

120VAC RMS and PEAK AC Volts is measured at Terminal 1 and ground. EPS voltage is measured on DC 20v scale between ground and Terminal 2. EPS current is measured in circuit between EPS low voltage Thyristor output and lamps.

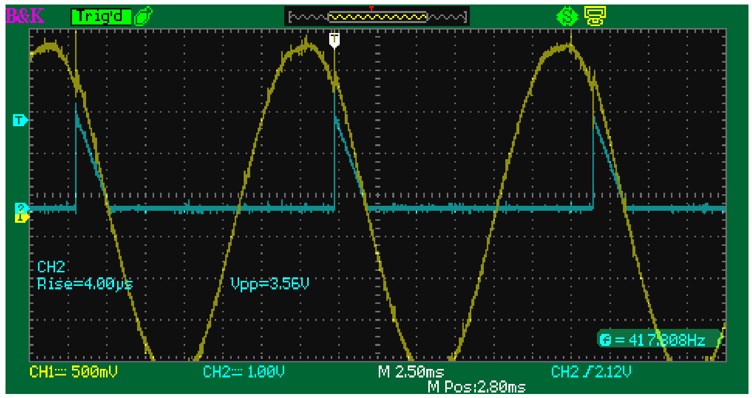
Neolight EPS calculator software is provided to ensure all field measurements and computer modeled calculations match. Neolight meter software compute EPS variables. A digital cursor scope with cursor measurement is also used to precisely determine Pulse width measurement in Milliseconds. Input and other settings required to confirm the GENII system is operating within specifications are selected with tabs. Calibration spin boxes are found in the GENII meter settings tab.

EPS Pulsed Watt formula

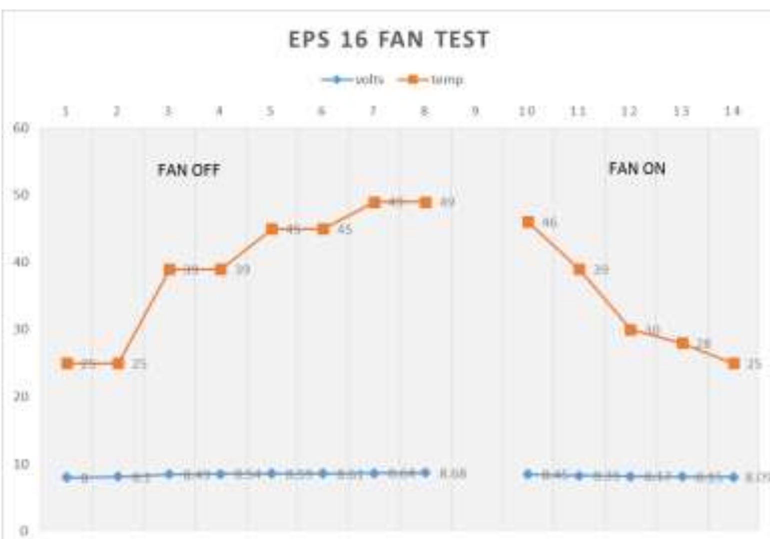
(Epeak / 2π * (1+ cosine α) combined with $P = E^2/R$) True Power of 60 HZ DC into a given resistance is solved below. $P = \frac{[Epeak/2\pi * (1+ \cos. \alpha)]^2}{R}$

$$\frac{[169/2\pi * (1+ \cos. 135)]^2}{11.52} = \frac{61.93}{11.52} = 5.37 \text{ watts}$$

Correct phasing of AC and EPS. This is required for accurate measurement of multiple EPS units in a micro grid branch circuit.



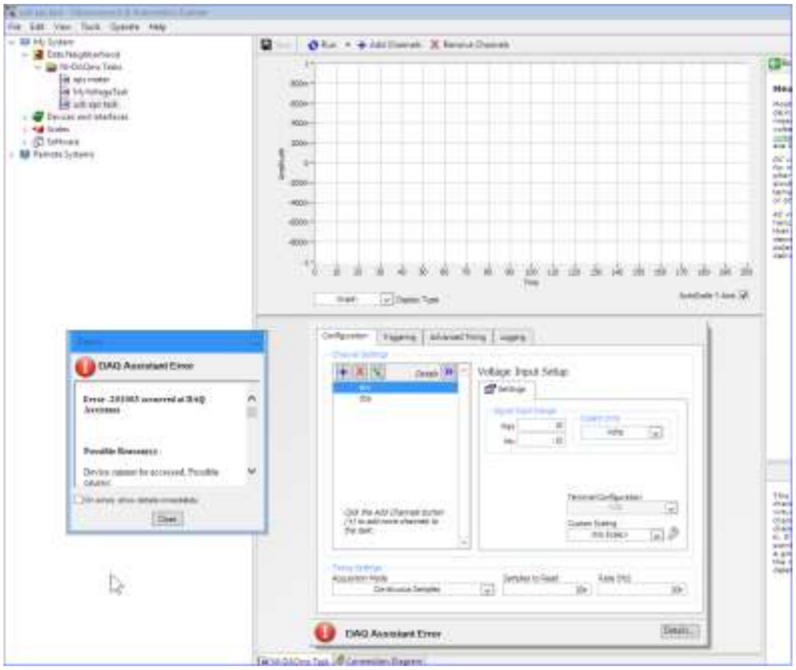
4. Thyristor Operating temp.



Keeping with minimal cost most EPS units do not have cooling fans. Heatsinks and ambient temperature are important to observe that units are kept below 60deg. C. to prevent output voltage increase that may reduce lamp life. Initial setting is .25 volts below target operating voltage.

C. GENII smart KWH meter

USB connection. Smart meter displays all the system variables and readouts in a tabbed format. National instruments labview G code in Windows 10 platform.



NI explorer is used to configure 6009. Test features real time display of input data. Configdata.nce configuration file, included in install set. If USB 6009 fails to connect or error message, use this program to trouble shoot.

EPS calculator.exe has three functions.

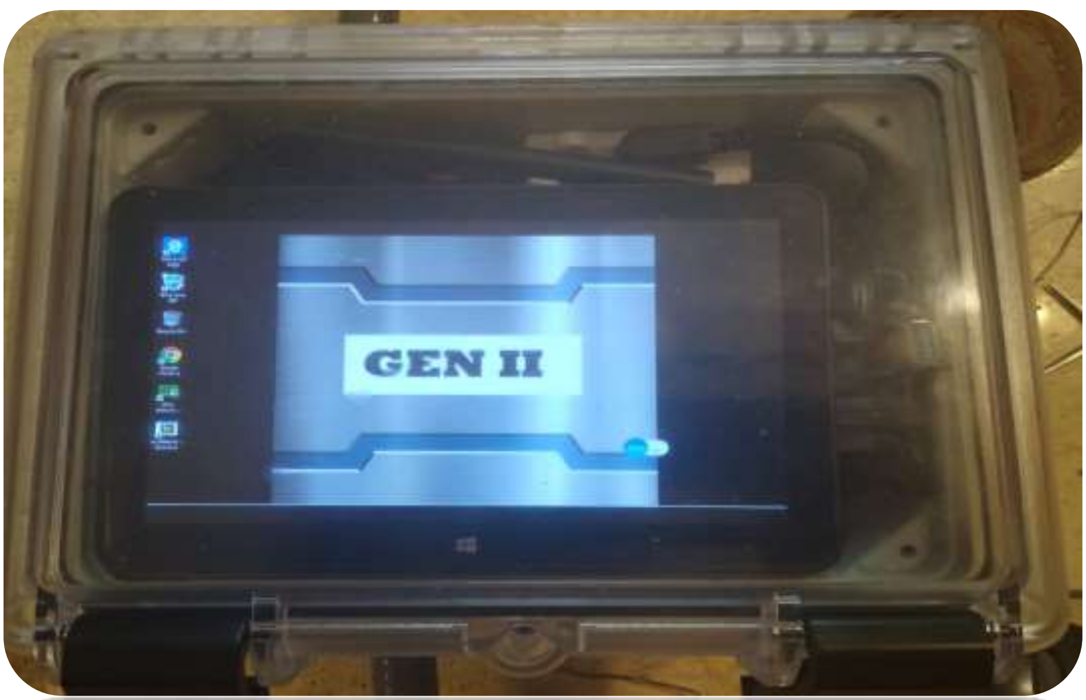
1. Compute EPS voltage based on pulse width.
2. Calculate AC power based on load current.
3. Compute engineering values for this type of power.

SMART KWH METER

EVALUATION SOFTWARE CAN BE DOWNLOADED AT THIS LINK

www.rcdresearch.com/DEMO SOFTWARE

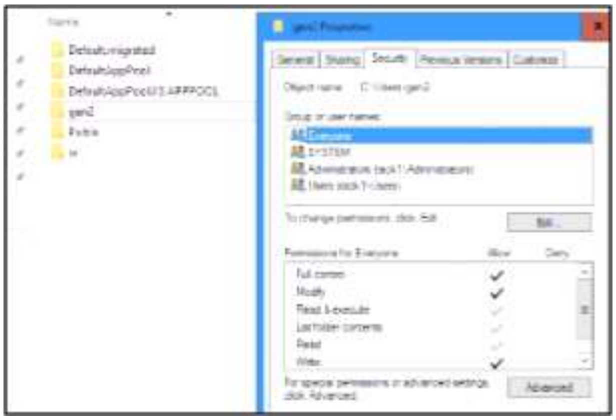
DAQbasic.pdf



SYSTEM SOFTWARE INSTALL

A. lvinstall.zip to Documents folder. RUN *NIDAQ rt13*, *reboot*, NI updater completes the install of runtime libraries.

B. Download m100t2.zip to documents folder



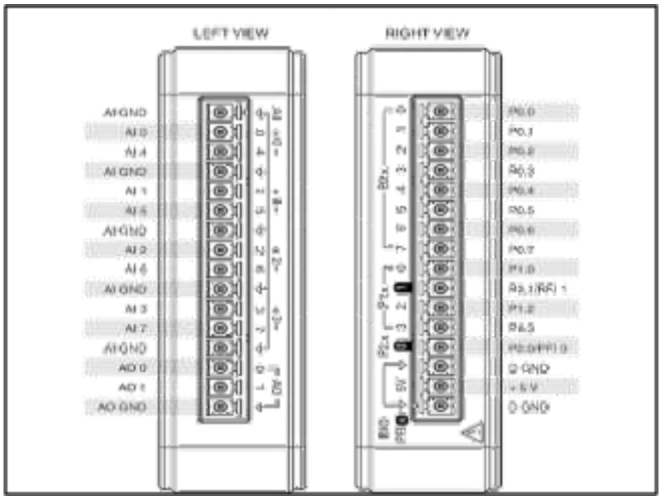
C. Copy or Move “Gen2” folder to C: users’ directory .ini and .log files are required. Select properties, security tab, edit permission for all groups and users. Permissions, check box to allow; full control, modify, and write. If this is not correct meter will not initialize or write log file.

D. Offline. Copy offline installer folder to documents folder. Available on dvd and download from NI. Run V15, V16, V17.

E. Restart pc, run Ni update service. Run windows update.

F. Meter start with windows. Accessories: run applet, enter shell:common startup, paste Gen2 shortcut to folder.

G. Confirm installation run GenII meter, an error dialog box pops up. Connect 6009 USB Daq, NI monitor program pops up, select dismiss to run meter or select configure and test to troubleshoot DAQ. Check 3009 daq is active as “Dev1”.



H. Enable restart on power fail feature in PC BIOS.

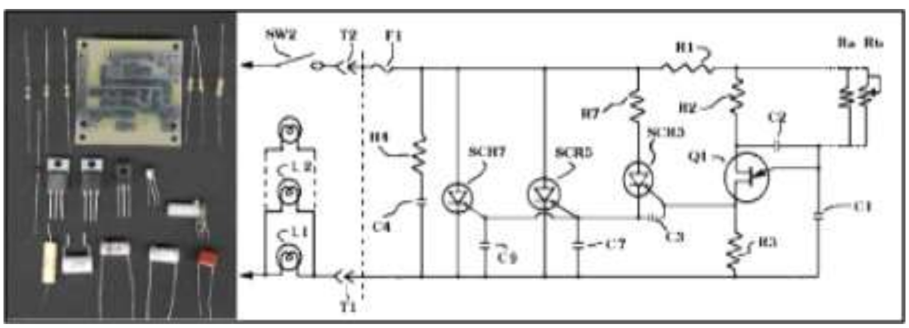
I. Pull down menu avail be to print meter screens to PDF or local printer.

Analog to digital converter Hardware setup

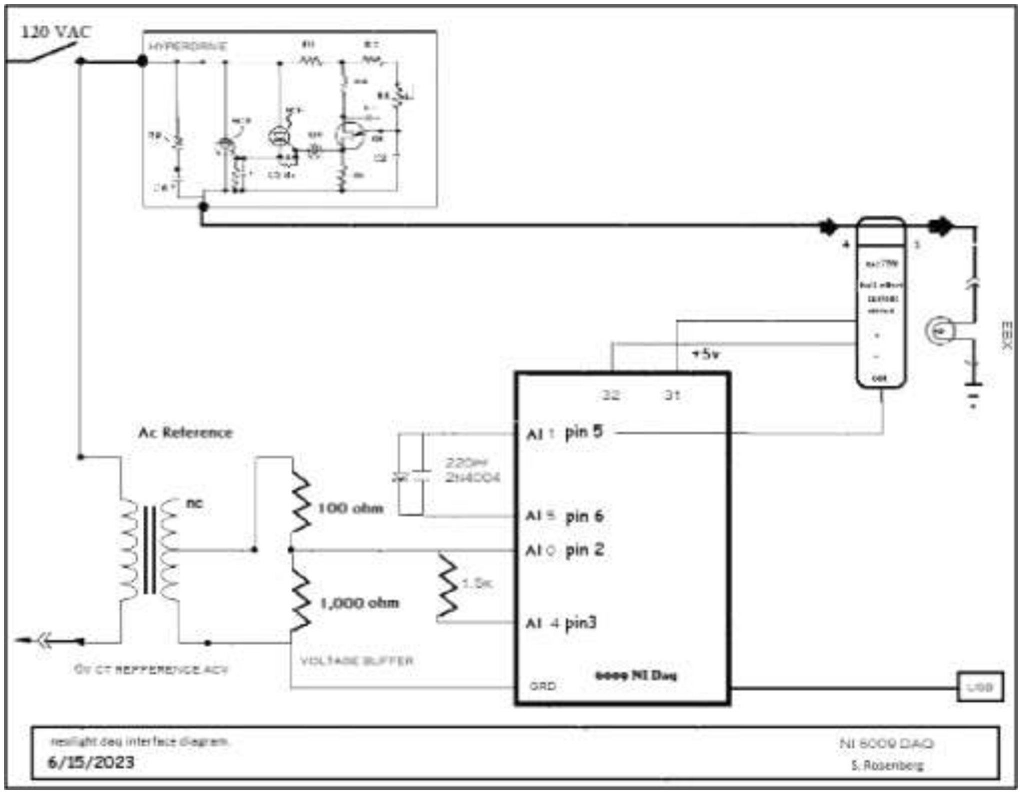
1. Connect Hall Effect current sensor to 6009 Daq terminal AI0.
2. Connect ac reference circuit output to Daq terminal AI1.
3. Connect ground to Daq terminal AIGND.
4. Connect EPS and lights, power on.
5. Measure transducer AC voltage, and EPS DC current with scope or multimeter. This step is critical. Applying voltage over 5v may permanently damage DAQ.
6. Ensure AC and Neolight pulse is in quarter cycle phase.
7. After transducer signals check out, connect to 6009 DAQ unit to pc with USB cable.

Neolight mini circuit board and components

Although small and inexpensive, the basic circuit can power up to 100 amps, or 50 lamps.

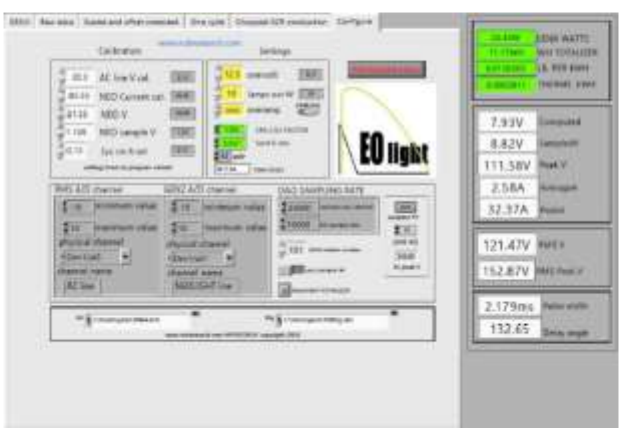


Design flexibility towards packaging and power ratings are available. Designed for digital age, any computer control can be connected. Mill spec. components throughout.



Circuit plan includes driver circuit, current sensing, and lamp connections. Transformer provides AC reference signal for timing and certain calculations to determine wattage. A 6009 Daq meets a 26ks/ps rate for industry standard sampling rate by digitally and software processed ac power measurement.

Neolight Programmable features

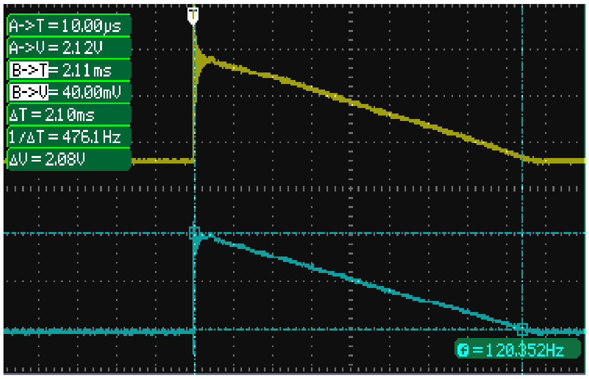


All *calibration* setting are critical, but allow a wide range of current sensors. Hall Effect and resistor current sensors all work, improving flexibility in kwh range.

Calibrate meter.

A. True RMS meter measure 120vac line voltage, adjust spin box so right side meter Readouts correspond with lab grade accuracy instruments. Turn on eps, measure current with meter, set spin boxes to match.

B. *Settings* are optional and can be set with meter operating. Once this is confirmed with instruments virtual data or the right become valid.



C. Connect digital cursor oscilloscope, measure pulse width and set meter so that they align.

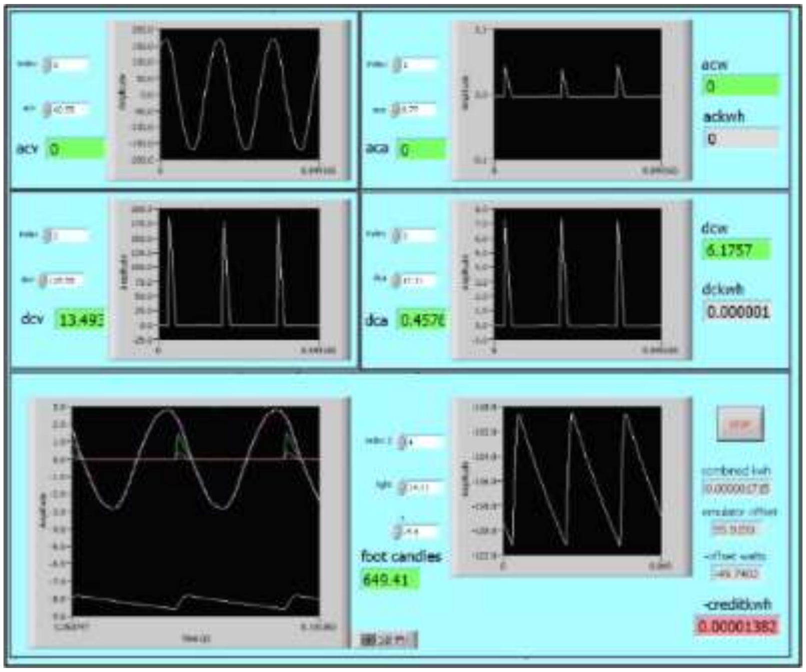
Start EPS calculator program, set pulse width values to Hyperdrive on test. Confirm values set match program readouts after restart. Use spin boxes final calibration. Program halt button is used to save settings. The new settings are applied when the program is restarted .ini file, saved in C: users\gen2.

SOFTWARE

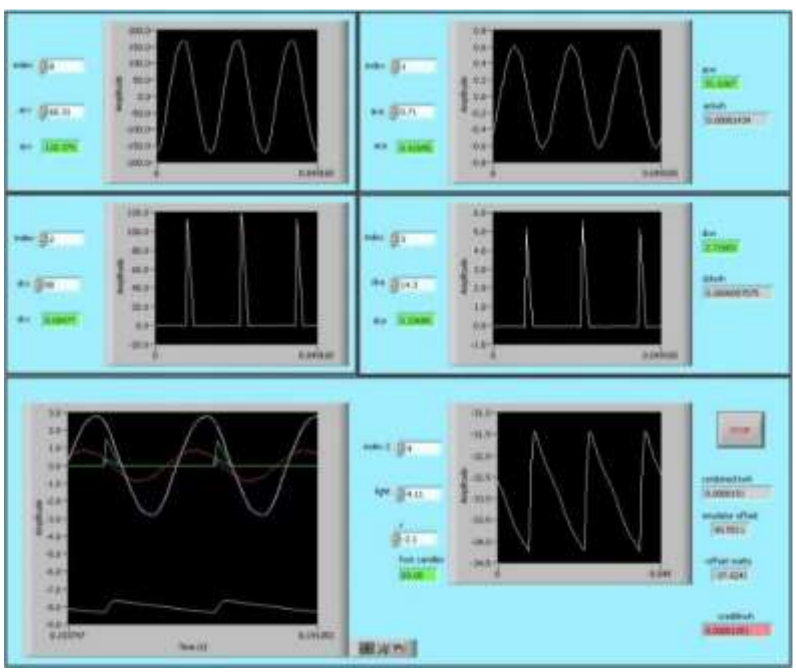
Instrumentation software collects and computes all the variables of lamp under test. System software is designed to acquire all necessary data for operation. Differentiated integral functions provide mean voltage and current for the purpose of computing true power, peak AC volts, CDA and other data required to insure the system is operating properly. Watts per second is processed to provide KWH measurement of quarter cycle and to produce a credit. Industry standard metering cannot measure these variables or correctly compute kilowatt hours without a major upgrade.

Software measurement of energy used here is to produce accuracy expected of standard Kilowatt hour meters, of which millions in use worldwide. Patented method measures AC parameters and DC parameters so a highly accurate kilowatt hour measurement can be made. Further, software can compute any expected error level produced by heritage instruments. Accurate measurement and correct billing information critical to the user. Labview software supports multiple configurations of analog data analysis and instrument panels. Net metering capable software instrumentation allows system functions to be viewed, operated, diagnosed, or operated over internet. Virtual instrumentation is used to visualize waveforms and measure with acceptable precision inputs and calculate data unavailable without software. CO2, therms, kilowatts are all instantaneously computed and made available for real time building management. Next we look at the light quality from Neolight.

¼ cycle analyzer
Displays operating characteristics of Neolight



Combined operations
This panel combines AC line and 1/4 cycle line KWH



High voltage AC Smart Meter Class 1+

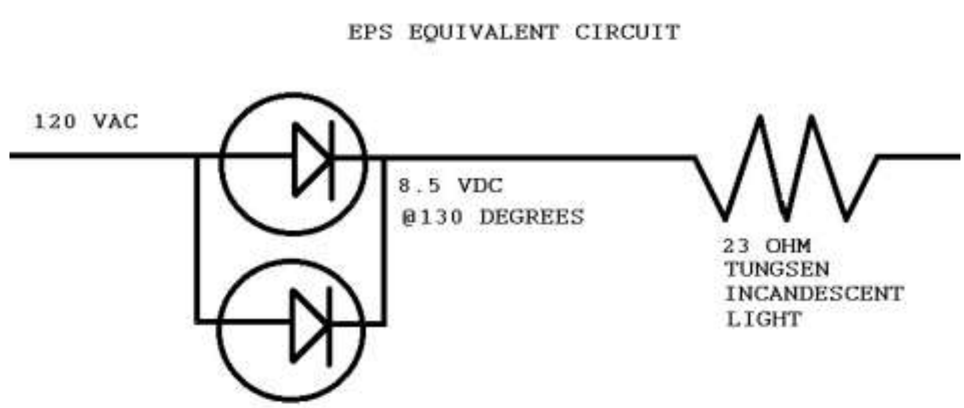
60 Hz AC power is processed to conduct a fraction of a half cycle. USS patents protect ¼ cycle power as it is novel and unique process. The benefits of ¼ cycle power is the vastly reduced operating voltage. This allows low resistance loads to be used improving efficiency, flexibility, supply designer light and modern cost performance.

Net metering software is a commercial ready package that allows operation by internet. National Instruments is the supplier of software for virtual instruments. The hardware requires AD converters a PC running Windows 10 and GenII software.

M100T2 main panel

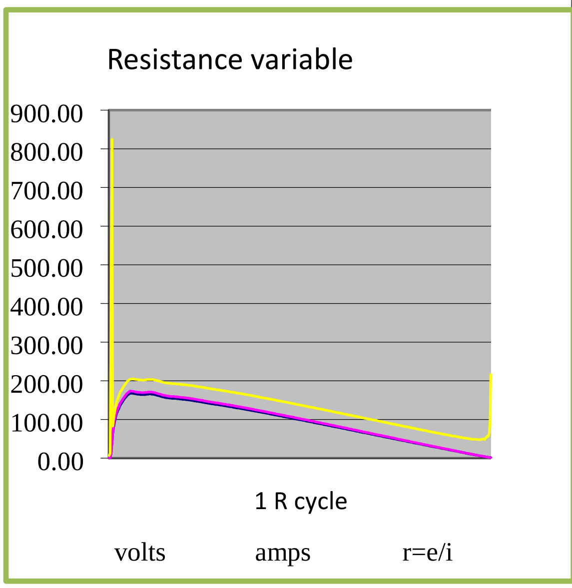
The main panel displays all readouts relevant to billing and invoicing. "G" code icon diagrams can be reviewed at www.rcdresearch.com/lvgcode.pdf AC line power, ¼ cycle line power, Kilo watt hours and optional negative credit to be applied to client's utility charges. This charge represents error that KWH meter chips make when measuring ¼ cycle power. Software instrumentation has been invaluable in determining the basic operating parameters of this system. Virtual instruments constructed for this purpose entirely exceed capabilities of other forms of measurement for aggressive tasks. Programmable features lead to robotic wide area lighting to precisely control energy demand and security. Remote systems allow complete control of meter over the internet. This core technology can be expanded to measure AC and so monitor and analyze any buildings energy use in a unified core technology computing platform.

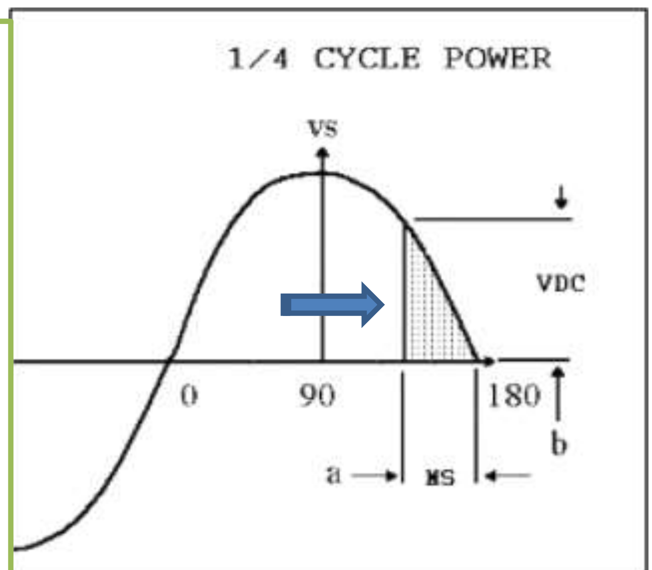
NEOLIGHT SPECIFICATIONS



Neolight Electronic Power System

1.Electronic Power Source equivalent circuit is diode supplying half cycle power to resistor. Half cycle conduction is controlled past 90deg. Patented quarter cycle power method energizes NEOLIGHT. R-cycle emits light at 60 cycles per second.
2.NEOLIGHT 23 ohm resistance limits power requirements.
3.100 AMP EPS energizes @ .35A, 50 Lamp line.
4.670 Peak Instantaneous watts per microsecond, for a period of 2 microseconds initiate Rosenberg cycle.
5.Electro dynamic cycle attenuates infrared intensity thus improves energy efficiency.
6.EPS operations do not contribute to AC crest factor power quality. The lamps are a resistance that does not produce damaging harmonic distortion in power lines.
7.1/4 cycle blanks over 75% of the ac cycle. This equivocates to freeing this output for other use. This actually may extend the amount of homes that can be supported on grid.
8.CO^2 is reduced over 90%, compared to full cycle service.
9.General thermal emissions from grid hardware is also reduced 90%, improving the demand durability of the equipment.





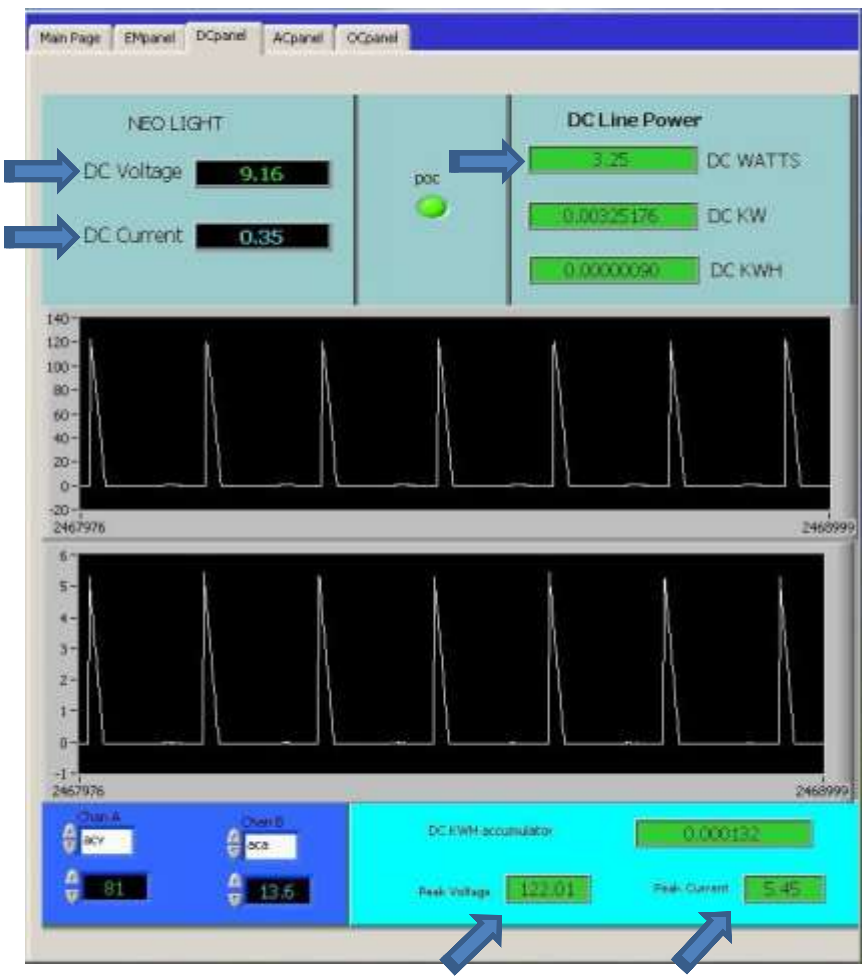
Electronic Power System NOMINAL RATINGS

1.INPUT VOLTAGE 120VAC 60HZ
2.EPS MAXIMUM ¼ CYCLE CURRENT RATING   18-50-100 AMPS DC
3.EPS ¼ CYCLE OUTPUT VOLTAGE   8.5 TO 11.5
4.EPS ¼ CYCLE OUTPUT CURRENT   .25 TO .5
5.EPS ¼ CYCLE PEAK CURRENT   5.5

6.EPS ¼ CYCLE PEAK VOLTAGE 122
7.EPS PEAK CURENT DURATION 1-2 MS
8.EPS WATT P/MS 670
9.EPS CONDUCTION DELAY ANGLE 130 DEGREES
10.LUMENS 600
11.LUMENS PER WATT 170

VIRTUAL INSTRUMENT ANALYSIS

Specialized measurement instrumentation is required to quantize quarter cycle energy. Neolight watt hour meter time base of 25KS/S meets current standard for utility power measurement. Patented design acquires voltage and current data sets for digital processing. EPS channel Integral watt/per second, WH, KWH, true RMS, CDA, and MS pulse duration.

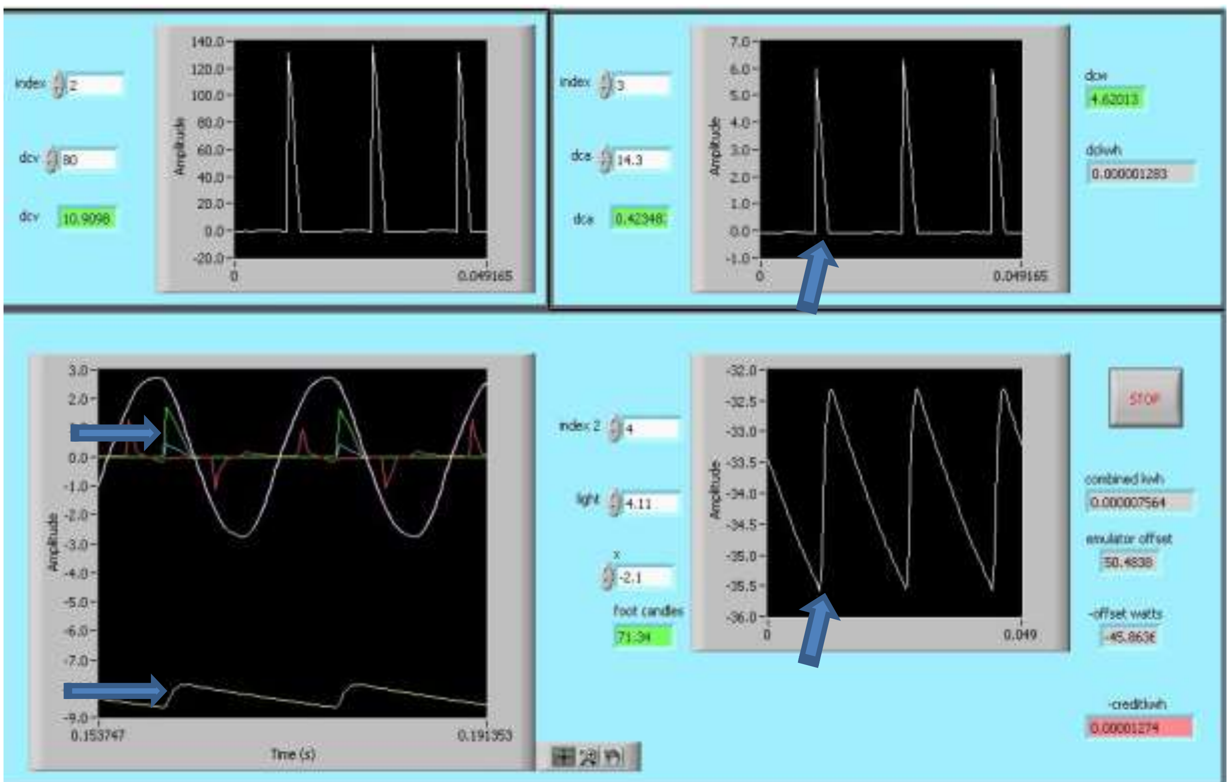


Neolight Tungsten lamp

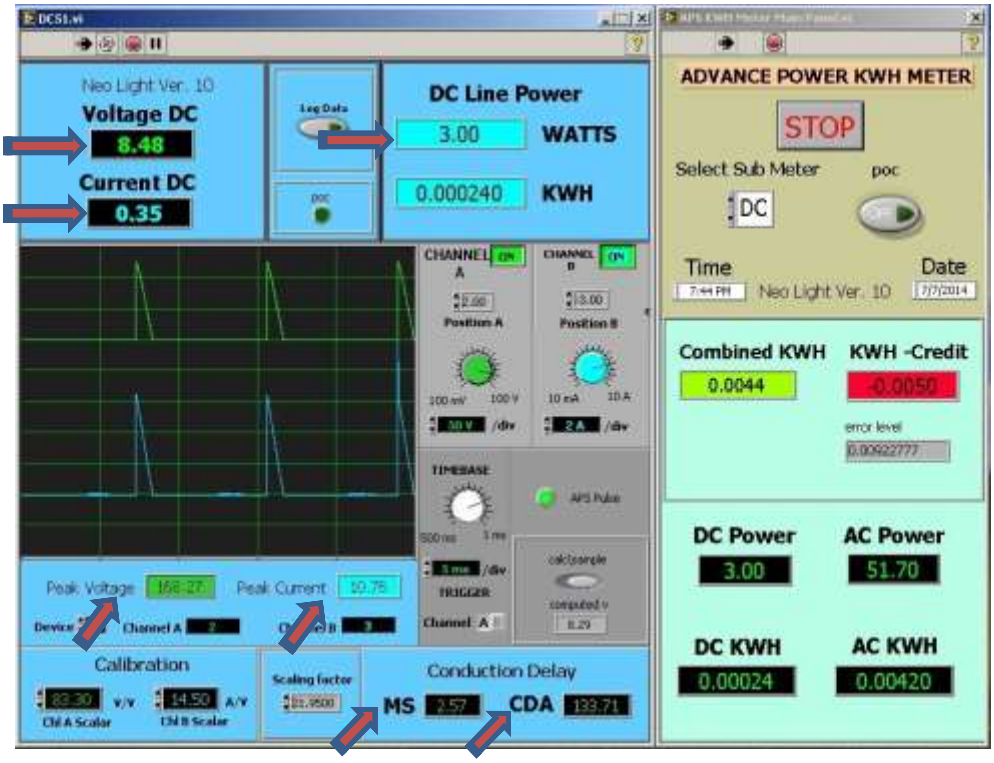
Incandescent light intensity is a function of peak power applied to the filament. Gen2 is energized with low voltage/high peak power. Reduction of filament resistance by 90% reduces lamp wattage. Light output is equivalent to predecessor incandescent lamps, fluorescent and LED lamps. Neolight cycle sets new lumens per watt standard.

Rosenberg Cycle Quantum theory

The period of EPS source and GENII output emission are distinctly different. Although they both initiate at the same time, the periods exhibit 1:8 ratio. R-Cycle quantum process extends light emission period. 60 frames per second of continuous light are produced as illustrated in Neolight analyzer. The difference is in the electrical power in the lamp. Being



discontinuous in nature specialized software was developed to compute variables relevant to KWH. Digital multiscope panel visually depicts all waveforms in the circuit.



NEOLIGHT EPS POWER ANALYZER

Early dual channel design independently measures AC and Neolight line, computes line wattage, stores billing registers in nonvolatile memory, and reloads billing resisters at boot up. RMS error correcting watt hour credit is included in this version.

Software additional features are; Pulse width MS. Conduction delay angle in degrees, log of acquired data on all channel, power on clear, computation of EPS voltage based on pulse width, mean EPS voltages and statistical peak.

Rosenberg Cycle incandescent lamp has been reviewed by Rutgers University, Stevens institute, electro industry experts and patent officials. The theories and application is sufficiently complex that expert level background in computer science and electronics is preferred to evaluate it. It is obvious from examination of the Rosenberg Cycles light wave that thermal-to-light momentum occurring is vastly greater than an AC powered light. This can be explained by examining the structure of cycle and spectrum of light.

Thermal analysis have conclusively revealed that R cycle lamp emit much less heat than regular lamps. Conclusion is R cycle light emissions are peaked or predominant in the visible range of the spectrum, while classic lamps emit strongly in the infrared region.

Examination of light wave shape is revealing. R cycle light wave is a triangle wave. AC lamps light wave closely follows input voltage. Surprisingly R cycle light wave demonstrates Electrodynamic momentum. The input pulse width is 2ms while light wave duration is 15ms.

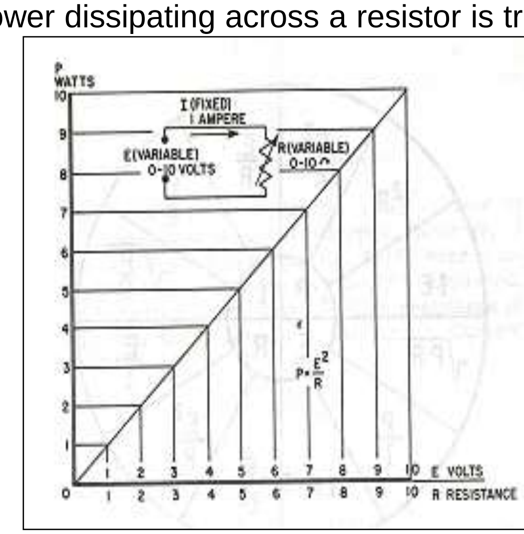
Looking at relationship of input pulse to light output some points are significant. Pulse has a rapid rise to peak voltage of about 105 volts DC with a dynamic of 1 ms. Filament resistance varies from a low of 2-ohms to operating resistance of 23 ohms. (chart) The resistance varies during heat up, and regarding Thevians theory, impedance is initially matched and varies to continue a matched resistance as voltage increases. Due to this filament does not overheat and vaporize as would be expected with a sine wave peak voltage 3x greater than rated operating voltage of approximately 30 volts. Variable Resistance Thermo-Luminescence operates with a relatively low resistance filament of 23 ohms. Minimal operating temperature of the lamp proves efficiency gains are substantial.

Collective Electrodynamics Collective Electrodynamics (C.A Mead, 2001 MIT press, p20,82,83) offers an explanation to high peak voltage and light emission momentum. Initial peak voltage is transferring a quantum of energy into filament matrix. Matrix is now in an excited state. As the rate of energy loss is proportional to the square of the amplitude, and that R cycle amplitude is proportionally greater for a 25-ohm resistance than for an AC 250-ohm resistance, radiation of photons continues until filament decay constant reaches base state.

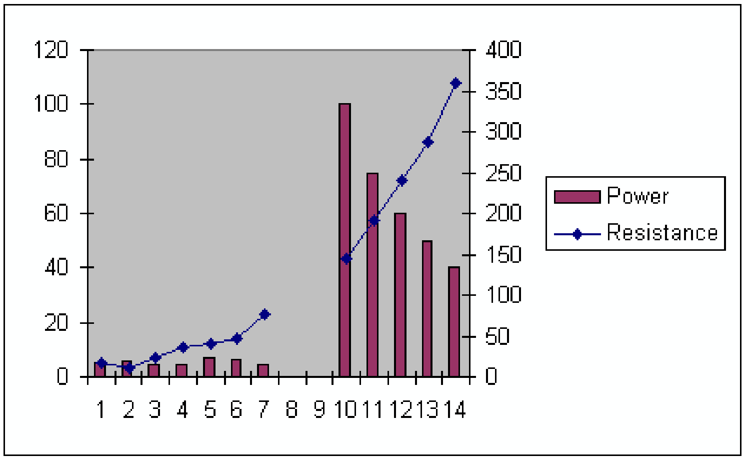
In conclusion, variable resistance during first microsecond of R-cycle pulse is transferring a proportionally large quantum of energy into filament. Filament emits photons predominantly in visible spectrum of light, and has a decay constant of approximately 14 microseconds. Conclusion is that a R cycle lamp consuming an integral of 2.5 watts of electronic power can force light emissions from a 25-ohm filament equivalent to a classic lamp of 250-ohms consuming 60 watts of electric power.

Electronic Low Resistance Load

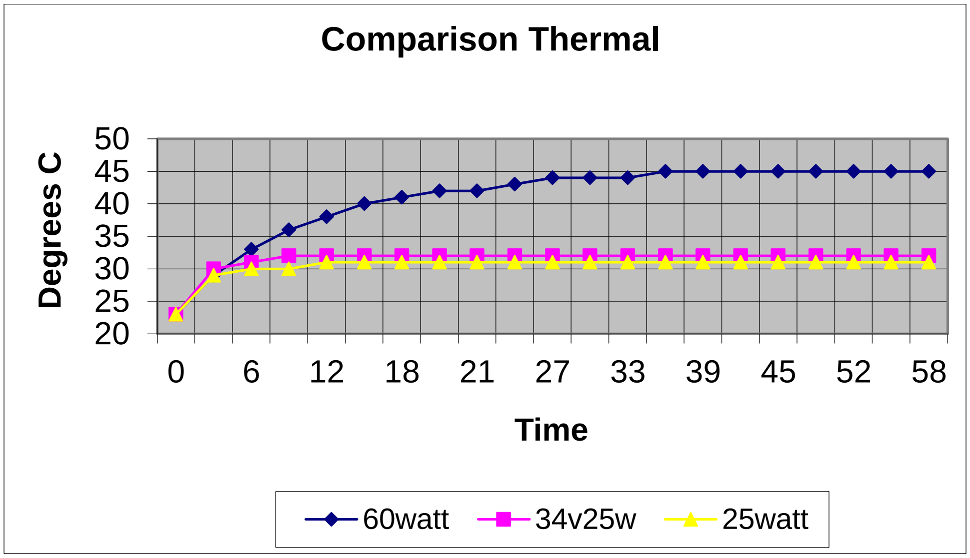
Supply a low voltage incandescent lamp with innovative 60 HZ DC power. Demand Side Management source wave is reduced to a demand side voltage pulse. A pulse, as a burst of current, voltage or power of a short interval with a well-defined wave shape is applied to a low resistance range load. Direct Current power dissipating across a resistor is true power. It has been long accepted that power must be dissipated as heat when operating at high voltage. The incandescent light bulb was accepted to dissipate most energy applied as heat. Remaining energy is radiated as light. This inefficiency has led to banning of these lamps. Standard lamps operating at 120 VAC have a resistance value in a range that can withstand high voltage. They also use power at a high voltage rate. Neolight lamps correct this inefficiency as they are in a low resistance range, pulse powered. However, this is not linear DC as expected when comparing DC to AC RMS



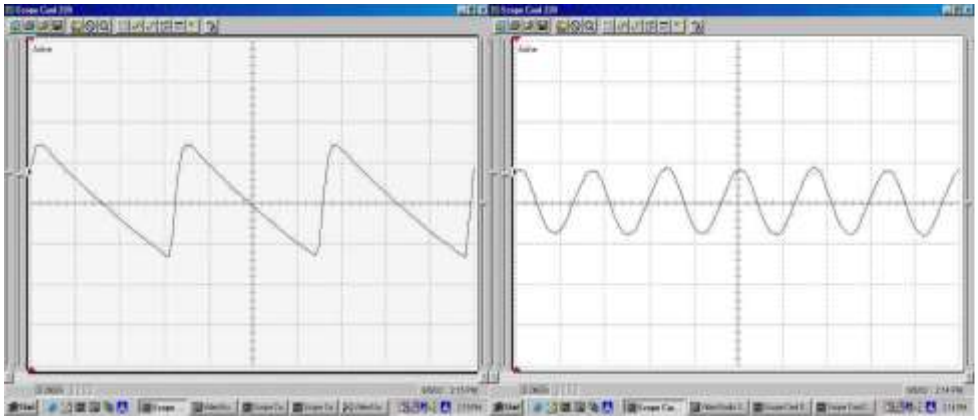
electricity. Finding power used by this lamp load is complicated and not supported by most Electrical Engineering training.



Comparison thermal graphing of Neolight powered lamp demonstrates a decrease in heat energy output. Light intensity is comparable to a 60-watt lamp but heat output is on par with a 25-watt lamp. This efficiency gain is typical of the improvements found with pulse powered lamps. Infrared spectrum of emitted radiation is reduced. This is the first pointer to quantum process at work.



For evaluation purposes assume four voltage peaks during one sine wave cycle. Voltage rising to AC peak is a peak and voltage decreasing from peak to zero is a peak. AC can now be compared with the pulse. AC cycle light intensity is estimated by first dividing the wave into 4 peaks (top) that occur during one Rosenberg cycle (bottom). Comparison photometry made with visible and infrared phototransistor.



Phototransistor light wave traces

Reverse Sawtooth wave on left is Neolight lamp. Right is standard 60watt lamp. Average lumens for both lamps are equal while measured with light meter as per IEE standard.

Analysis of light output from low resistance APS powered lamps.

Light Intensity I is computed with E as peak voltage: $I = \frac{E^2}{2\eta}$

η_o is the wave impedance and η is the impedance with refractive index of n.

Peak voltages are; pulse (106v) and AC (169v). Let n=1.

η_o = 23 ohms / 1 (34v 50w lamp) = 23 ohms.

$I=E^2/2\eta$

DC Pulse Vpeak is 106, lamp impedance is 23 ohms.

$106^2/46 = 244.26$ Intensity per Rosenberg cycle.

ACV peak is 169, lamp impedance is 220 ohms.

$169^2/440 = 64.91$ Intensity per half cycle x 4 = 259.64 Intensity per AC cycle.

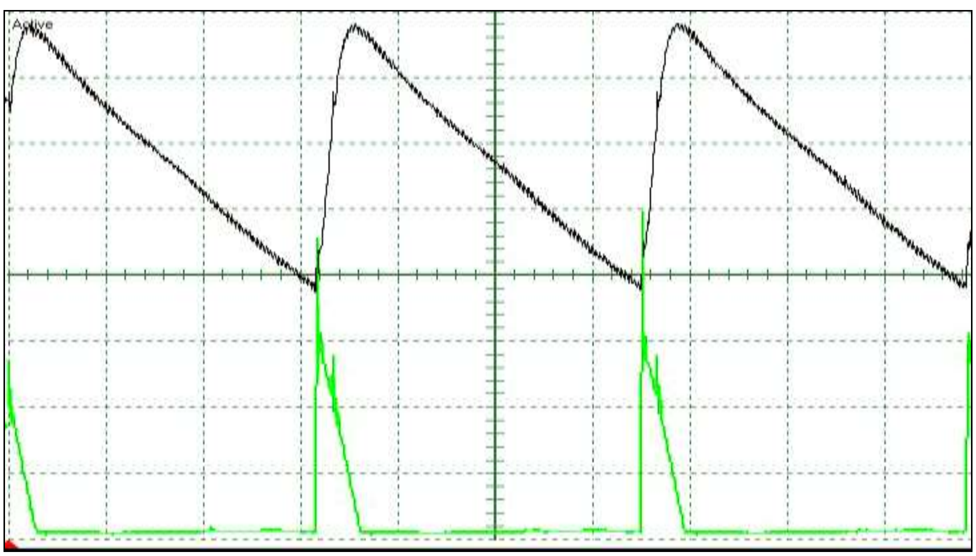
The preceding computation demonstrates equitable light output 244 vs. 259, at lower power. As these pulses are occurring at a very fast rate of 60 per second, the human eye perceives continuous illumination.

Collective Electrodynamics offers an explanation to the high peak voltage and light emission, energy momentum. The initial peak voltage is transferring a quantum of energy into the filaments matrix. As the rate of energy loss is proportional to the square of the amplitude, and, that the R cycle amplitude is proportionally greater for a 25-ohm resistance than the AC peak is for an 250-ohm resistance, the radiation of photons, or the loss of energy, is equivalent for the time period until the filament decay constant reaches base state. This suggests the cycle is radiating more light by a factor of 10.

Quantum theory process is called cold emission, to contrast it with thermal emission, which takes place when the electron acquires enough energy from random thermal motions to go over the barrier. This curve fits the radiation output of the Rosenberg cycle depicted.

Rosenberg Cycle

The above elements combine into a cycle in which light output continues after power application. This powers an incadescent lamp of a low resistance. The result is high light output, reduced heat output and reduced electric power levels. The electrodydnamic momentum ratio of the cycle is 1:8. Light is output for 16ms. following a 2-2.5ms. pulse. The energy in K space contiues to reach the surface, but in what apears to be a very long time delay to reach base state, when all energy is released as photons. A resistance shift during the first microsecond of the Rosenberg cycle pulse is transferring a proportional quantum of energy into the filament. Filament emits photons, and has a novel decay constant of approximately 15 microseconds and an electrodynamic momentum ratio of 1: 8.



The green trace is the pulse, black trace is the light output from the filament. There is a 15 ms. gap between the end of the pulse and the end of the light wave. In this case light cycle continues independent of the electrical pulse. The 15 ms. gap proves the Rosenberg cycle is discontinuous in its process of photon production.

Formula for computing Rcycle electric power

Average load voltage (Effective DC voltage) = Epeak / 2π (1+ cosine α).

ERMS = 120 VAC.

1.414 * ERMS =Epeak or 1.414 * 120 VAC = 169 Epeak.

Conduction delay α = 135.

E = 169/2π * (1 + cos. 135) = 26.9 * (1 - .7071) = 7.87 average volts DC.

Resistance = lamp voltage^2 / lamp watt or 24^2 / 50 = 11.52 Ω.

Power = E^2 / R or 61.923 / 11.52 = 5.37 watts.

(Epeak / 2π * (1+ cosine α) combined with $P = E^2/R$)

True Power of 60 HZ DC into a given resistance is solved as:

$$P = \frac{[Epeak/2\pi * (1+ \cos. \alpha)]^2}{R}$$

$$\frac{[169/2\pi * (1+ \cos. 135)]^2}{11.52} = \frac{61.93}{11.52} = 5.37 \text{ watts}$$

Instrument verification

Lamp load average volts and average amps can be measured in circuit. Results are 8.07 volts DC and .68 amps. P = 8.07 * .68 = 5.48 watts while light intensity is held constant to 60-watt lamp.

ABOUT LIGHT BULBS

The low power and high light seem to make a great product for consumers now that energy efficiency is big. Yes another issue arises. Class 1 KWH meters Utility companies furnish to consumers in the US cannot measure Neolight ¼ cycle power. A software upgrade to smart meter, has been suggested for Class One meters, so this form of electric circuit activity is measured properly when billing for KWH.

Classic incandescent had an advantage. 360 degree steradian emissions. Leds' do not have this feature and so operate in a narrow directional beam.

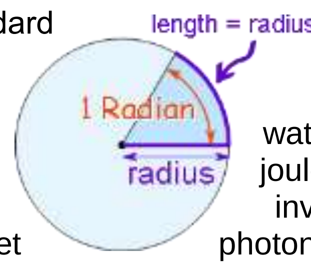
The steradian (symbol: sr) or square radian[1][2] is the unit of solid angle in the International System of Units (SI). It is used in three dimensional geometry, and is analogous to the radian, which quantifies planar angles. Whereas an angle in radians, projected onto a circle, gives a length of a circular arc on the circumference, a solid angle in steradians, projected onto a sphere, gives the area of a spherical cap on the surface.

The steradian is a dimensionless unit, the quotient of the area subtended and the square of its distance from the center. Both the numerator and denominator of this ratio have dimension length squared (i.e. $L2/L2 = 1$, dimensionless). It is useful, however, to distinguish between dimensionless quantities of a different kind, such as the radian (a ratio of quantities of dimension length), so the symbol "sr" is used to indicate a solid angle. For example, radiant intensity can be measured in watts per steradian ($W \cdot sr^{-1}$). The steradian was formerly an SI supplementary unit, but this category was abolished in 1995 and the steradian is now considered an SI derived unit.

A steradian is defined as the solid angle which, having its vertex at the center of the sphere, cuts off an area equal to the square of its radius. The number of steradians in a beam is equal to the projected area divided by the square of the distance.

The unit of luminous intensity is one lumen per steradian, which is the unit of solid angle there are 4π steradians about a point enclosed by a spherical surface. This unit of luminous intensity is also called the standard candle, or candela, one lumen per steradian. Radiant flux is a measure of radiometric power. Flux, expressed in watts, is a measure of the rate of energy flow, in joules per second. Since photon energy is inversely proportional to wavelength, ultraviolet photons are more powerful than visible or infrared.

Fig. 7.3 total flux output.



Luminous flux is a measure of the power of visible light. Photopic flux, expressed in lumens, is weighted to match the responsivity of the human eye, which is most sensitive to yellow-green. Scotopic flux is weighted to the sensitivity of the human eye in the dark adapted state.

A Radian "cuts out" a length of a circle's circumference equal to the radius.

Measures of Illumination

Radiant power (P) is the rate at which light energy is transmitted, and is measured as energy (photons) per unit time, in Watts.

Power at a Point

Flux is the radiant power crossing a particular surface.

Flux density (Φ) is the radiant power per unit area of the surface, measured in Watts per unit area. At a point, x , surrounded by an infinitesimal surface, dx , the flux density is

$$\Phi(x) = \frac{dP}{dx}.$$

Incident flux density is the flux density of particles arriving at a surface from all directions. It is also called irradiance (E).

Exitant flux density is the flux density of particles leaving a surface in all directions. It is also called radiosity (B).

Power in a Direction

Consider a point light source. Its radiant intensity (I) is the power radiated per unit solid angle, and is measured in Watts per steradian.

In a particular direction, ω , surrounded by an infinitesimal solid angle, $d\omega$, the radiant intensity is

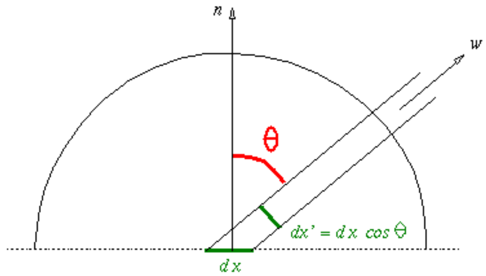
$$I(\omega) = \frac{dP}{d\omega}.$$

Power at a Point, in a Direction

Radiance (L) is the flux density at a point, x , in a direction, ω . Sometimes, the direction is given by two angles: elevation θ (from the surface normal, n) and azimuth "phi" (from a given direction on the surface).

The flux density is measured with respect to a surface perpendicular to the direction. If the surface at x is not perpendicular to direction ω , it is projected onto a surface that is.

The figure below shows the radiance at x as the flux density across the surface dx' in the direction ω :



Path Conservation of Radiance

Given two points, x and y , the radiance shot from x toward y is equal to that received by y from the direction of x . Radiance is not attenuated with distance.

As a consequence, all we need in order to render an image is the radiance, in the direction of the eye, leaving each point of the scene.

The solid angle is the three-dimensional size of the light cone. If a luminaire emits light, the angle of the emitted light is three-dimensional. The unit of the solid angle is the steradian (sr). The light intensity indicates the amount of light that a light source emits per solid angle. The solid angle is calculated by dividing the area (A) by the radius (r^2).

The color temperature of a lamp determines whether the light gives a warm or cool impression. The color temperature is given in Kelvin and can be assessed on a scale. The lower the color temperature, the warmer and darker the light appears. The higher the color temperature, the cooler and brighter the light appears.

The color temperature influences the room atmosphere. For living rooms, a lower color temperature is preferred, for laboratories or factories, light with a higher color temperature. The scale below shows the color temperature and its three ranges: Warm white, neutral white and daylight white. Color temperature can be measured with a colorimeter. Besides color temperature, the color rendering index is also significant for the spatial atmosphere.

LAMP COMPARISON MATRIX

Lamp Type	Lamp Watts	Foot Candles	Revenue Meter A	Revenue Meter B	**True Power Computed**	Load Voltage	Load Amps	Lamp Ohms
Incand.	100w	260fc	95w	95w	99.6w	120	0.83	144Ω
Incand.	75w	175fc	74w	74w	75w	120	0.625	192Ω
Incand.	60w	144fc	56w	57w	60w	120	0.5	240Ω
Incand.	50w	114fc	49w	50w	49.5w	120	0.41	288Ω
Incand.	40w	84fc	37w	38w	39.6w	120	0.33	360Ω
CFL	15w	137fc	14w	14w	14.4w	120	0.12	na
CFL	13w	133fc	12w	13w	12w	120	0.1	na
G2	24v25w	140fc	23w	33w	3.42w	9.5v	.36a	23.04Ω
G2	34v25w	140fc	26w	34w	4.818w	14.6v	.33a	46.24Ω
G2	34v50w	140fc	26w	48w	5.376w	11.2v	.48a	23.12Ω
G2	24v50wc	140fc	25w	61w	5.4876w	8.07v	.68a	11.52Ω
G2	24v50wr	140fc	30w	66w	8.91w	14.85v	.6a	11.52Ω
G2	32v100	140fc	25w	51w	4.992w	9.6v	.52a	10.24Ω
G2	24v100q	140fc	26w	76w	5.661w	5.55v	1.02a	5.75Ω

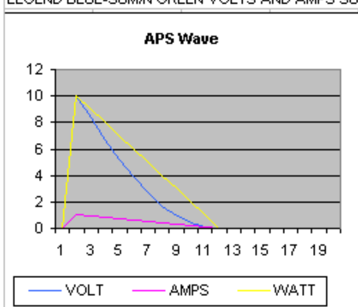
Red indicates (non-differentiated) wattmeter error

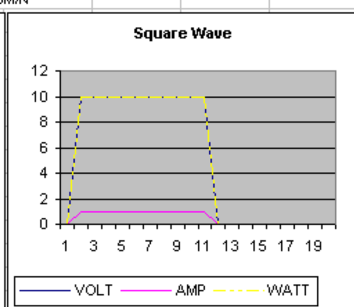
Meter A is an Analog Devices sampling meter, meter B is a Lutron Watt meter

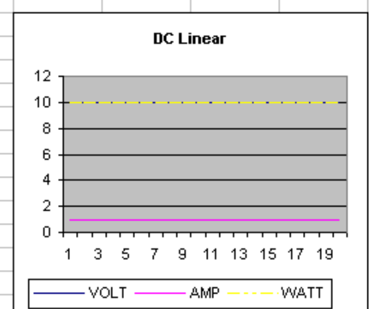
The Volt-Ampere-Hour meter, also known as a Watt-hour meter, measure energy used by an electrical products over time. AC (line voltage) Watts are a product of the integral of RMS current over a period of time under the assumption that the voltage is linear. The integral (load power) produced by watt-hour meters, requires a full cycle of AC voltage. When less than a quarter of a cycle of voltage is conducted, as in the GenII system, classic RMS meters can make large errors. The magnitude of error is as high as x10. Example; the RMS line voltage is 117 volts AC. DC load voltage is 17 volts DC. The current is the same. The 117 is substituted for 17 in the P=ExI formula. A large error thusly occurs.

Digital method computing integral as V x I product per sample / N samples differentiation must be applied for nonlinear measurement. A typical chart analyzing different areas under the curve with simple integrals demonstrate the magnitude of the error encountered when differentiation is not applied.

ANALYSIS OF LINEAR OR NON-LINEAR POWER SYSTEM MODELS.												
APS		R=10	NONLINEAR	Square		R=10		LINEAR	DC		R=10	
VOLT	AMP	V*A	V & I	VOLT	AMP	V*A		V & I	VOLT	AMP	V*A	
0	0	0		0	0	0			10	1	10	
10	1	10		10	1	10			10	1	10	
9	0.93	8.37		10	1	10			10	1	10	
8	0.83	6.64		10	1	10			10	1	10	
7	0.74	5.18		10	1	10			10	1	10	
6	0.64	3.84		10	1	10			10	1	10	
5	0.54	2.7		10	1	10			10	1	10	
4	0.424	1.696		10	1	10			10	1	10	
3	0.324	0.972		10	1	10			10	1	10	
2	0.23	0.46		10	1	10			10	1	10	
1	0.13	0.13		10	1	10			10	1	10	
0	0	0		0	0	0			10	1	10	
0	0	0		0	0	0			10	1	10	
0	0	0		0	0	0			10	1	10	
0	0	0		0	0	0			10	1	10	
0	0	0		0	0	0			10	1	10	
0	0	0		0	0	0			10	1	10	
0	0	0		0	0	0			10	1	10	
0	0	0		0	0	0			10	1	10	
0	0	0		0	0	0			10	1	10	
55	5.788	39.988	SUM	100	10	100	SUM		200	20	200	SUM
2.75	0.2894	1.9994	WATT	5	0.5	5	WATT		10	1	10	WATT
I*E=P	.2894*2.75=.795 WATT			I*E=P	.5*5=2.5 WATT					I*E=P	10	WATT
E^2/R=P	7.95/10=.795 WATT			E^2/R=P	25/10=2.5 WATT					E^2/R=P	100/10=10	WATT
I^2*R=P	.0795*10=.795WATT			I^2*R=P	.25*10=2.5 WATT					I^2*R=P	1*10=10	WATT
LEGEND BLUE-SUM/N GREEN VOLTS AND AMPS SUM/N												







LINEAR POWER (DC) INTEGRAL AS SUM/N OF SAMPLES SAME AS E*I.
NONLINEAR POWER INTEGRAL OF SUM/N OF SAMPLES DOES NOT MATCH E*I.
REAL POWER IS VERIFIED BY I*E=p, E^2/r=p, I^2*r=p.

Purpose of this analysis is to determine correct method of digital sampling of NEOLIGHT voltage and load current. Unit charge per second theory of electricity is a guiding theory. Independent calculations are performed to voltage and current channels resulting in a measurement update each second. Samples are evaluated as Mean of the samples. Process calculates an integral of DC Volts and Amps independently computing DC watts integral. Watts are divided by 1,000 each minuet for Kilowatt accumulator. True power and KWH are calculated electronically resulting in a measurement of verified accuracy. Commercial use KWH meter specifically designed with proprietary computer algorithms to actually obtain a monetary benefit from the use of this method of RMS Demand Side energy management.

Fuel consumption with a small gas powered generator

Inverter load power measurement of a 60-watt lamp and GenII lamp is compared. A Wagen square wave inverter powered this test. At 225 lux, the lamp used 3.04 amps while the 60-watt used 4.93 amps. The inverter has an idle current of .38 amps. To find the load power, compute load amps minus idle amps.

The 40 watt is 4.93a - .38a = 4.55 amps DC. Neolight is 3.04a - .38a = 2.66 amps DC. In watts the 60-watt lamp used 12v x 4.55a = 54.6 Watts. The GenII lamp used 12v x 2.66a = 31.92 watts. The trace shows much distortion in the inverter reducing efficiency. The improvement in fuel efficiency is 42%.

Environmental and economic impact

National Energy Savings projection from conservation connected to lighting costs:

Residential annual average electric use per year	=	$82.704	Billion
90% Reduction	=	$8.270	Billion
Typical annual market	=	$75.00	Billion
Commercial annual average electric use per year	=	$71.856	Billion
90% Reduction	=	$7.185	Billion
Typical annual market	=	$64.671	Billion

Combined market value is $65b + $75b = $140 Billion

Estimated national annual energy use for lighting is $1,400 Billion. 90% reduction is a new $140 Billion dollar market. International demand is assumed to be equal or greater than US demand and the world market is estimated over 300 billion. This hypothetical model is ideal case of course. Real world market forces such as fluorescent and LED makers are now poised to fill this need. However these competing products lack Earth friendly features GenII/Neolight light delivers.

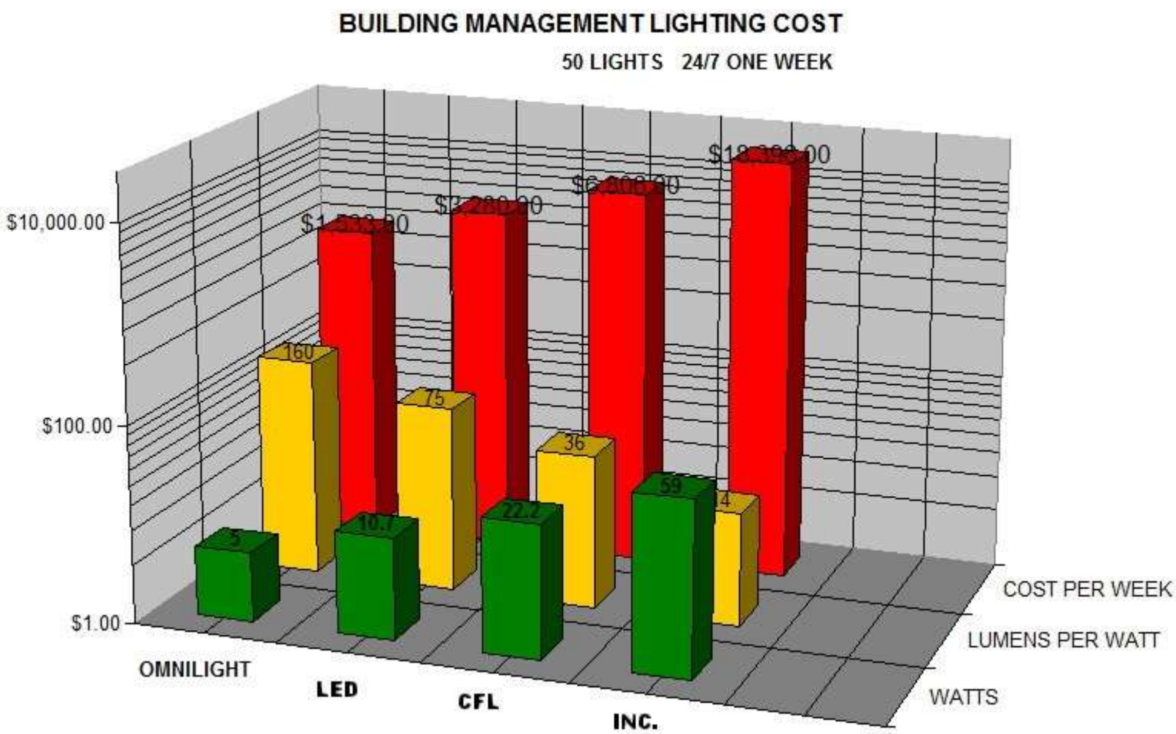
The US legislature has identified traditional Incandescent lamps' poor efficiency is costing US consumers dollars. Solutions to eliminate this problem is to legislatively restrict these lamps and replace them with better performing lamps, fluorescent and LED (in development). The public wants low cost lights that are easy to use and non-toxic. APS improved quantum efficiency lamps have features the public demands and appear identical to light bulbs the public has accepted for many years.

Rosenberg Cycle is an applied Quantum physics method that improves efficiency of traditional filament lamps. The cycle works to reduce waste heat energy, thus increasing efficiency. Technically this is known as electro dynamic momentum of energy. Lamps energized by this patented method do not incandesce, but emit 60 bursts of light per second.

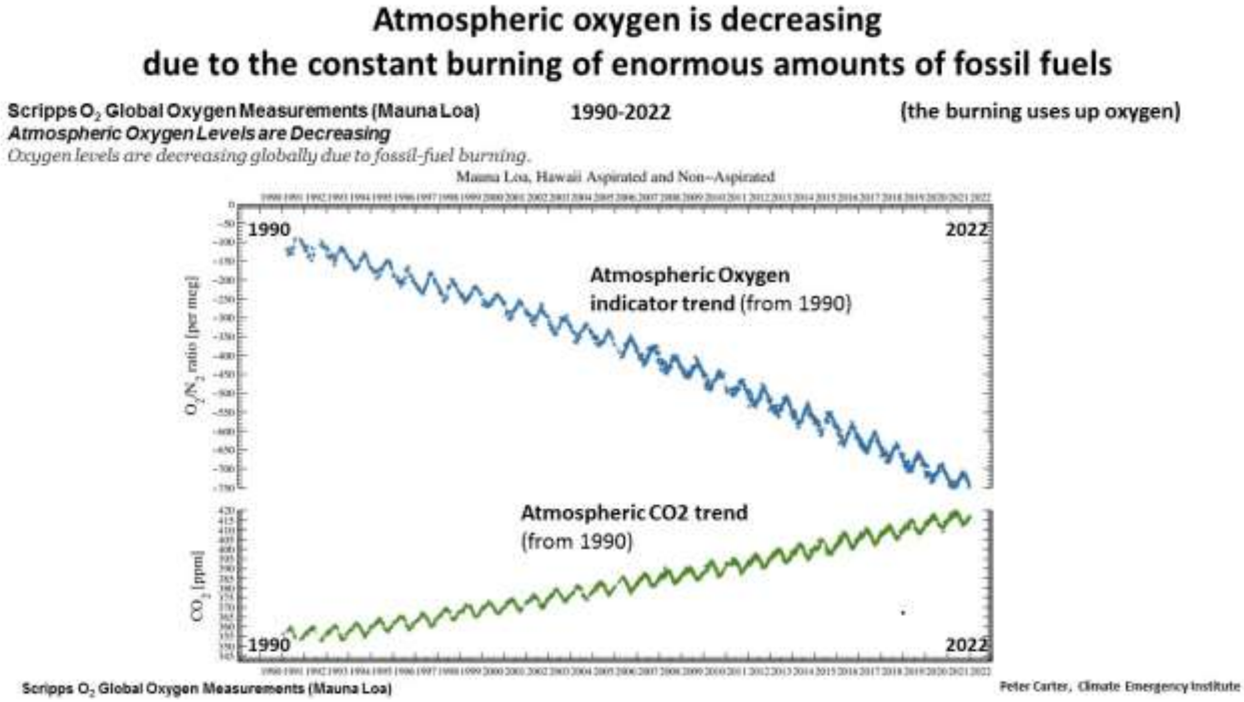
Full-scale production will provide Americans with a new, yet familiar means to conserve energy, without compromise. The resulting benefits are low light bulb cost, reduced manufacturing method is old, high development costs experienced with other technologies is avoided. Essentially it is feasible to produce vast numbers of lamps in the near future.

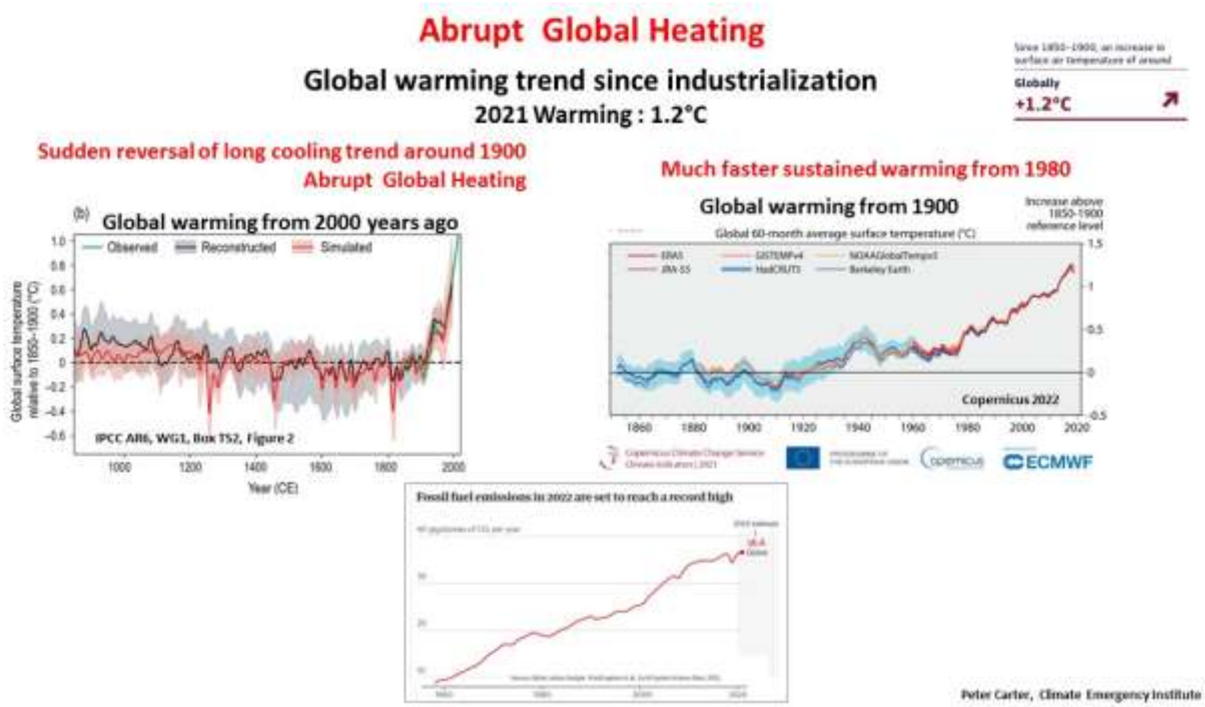
Summary for Members of Congress

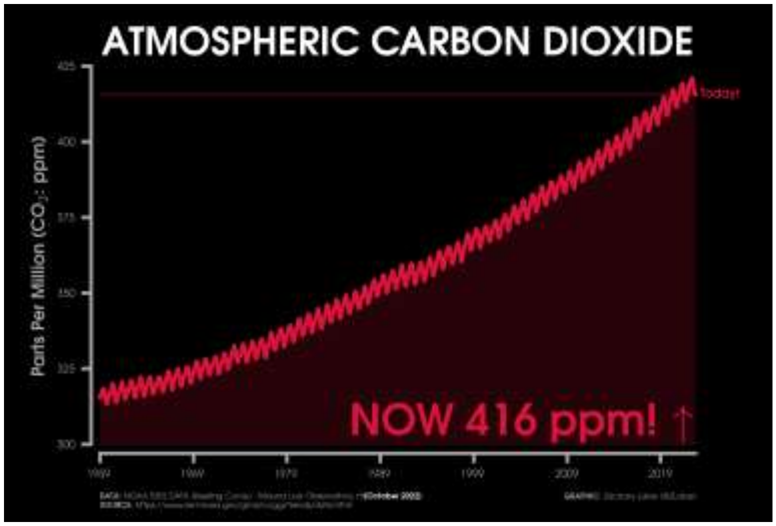
DOE lighting project creates a new energy efficiency technology that all Americans can use to help achieve energy independence. This new technology can reduce lighting costs, grid thermal losses and carbon emission comprising 10-20 percent of total electric use in our nation.



Environmental impact

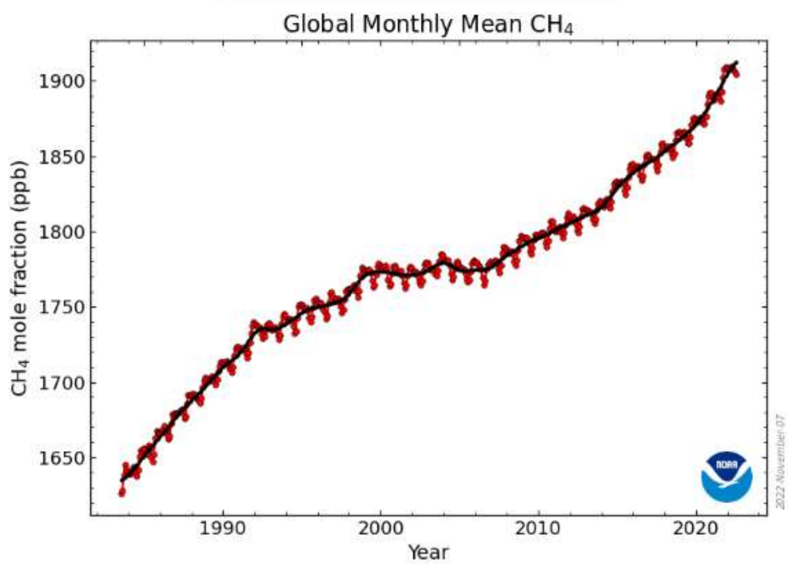


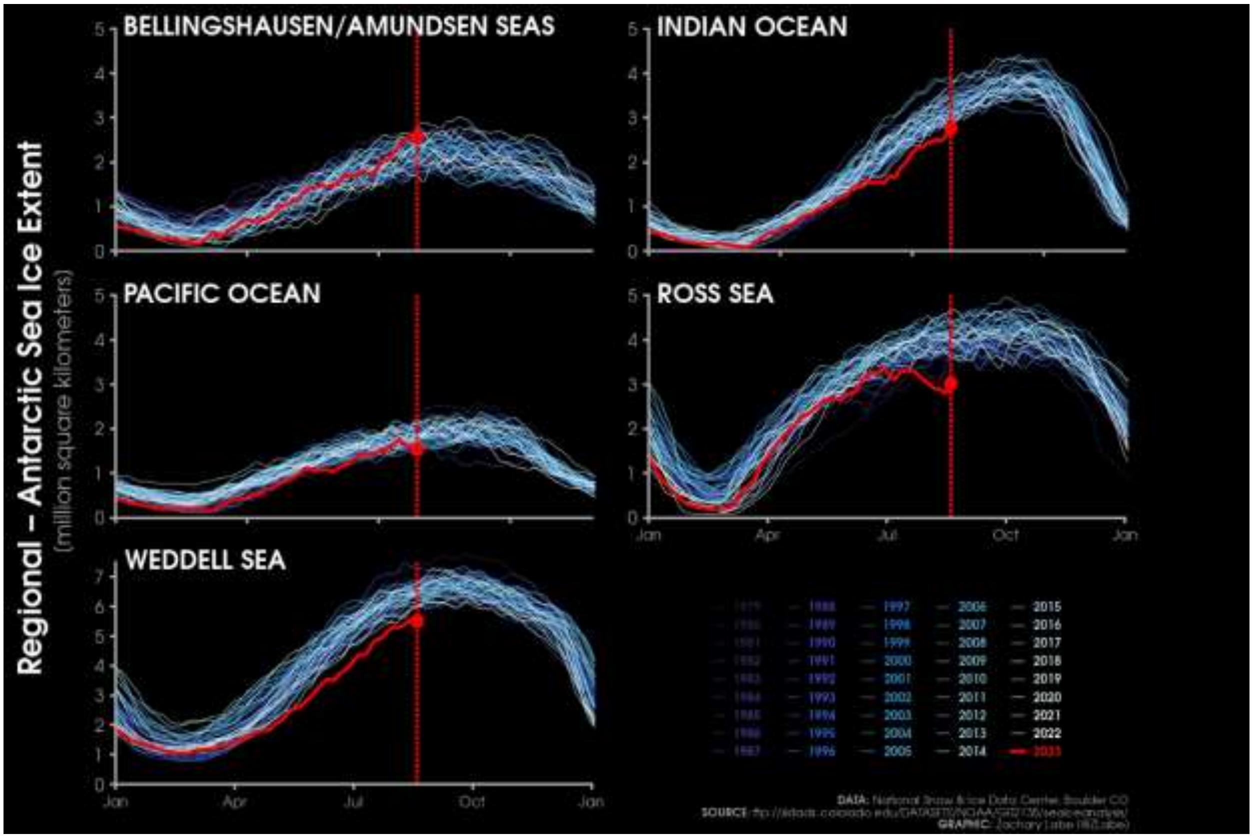




Global CH_4 Monthly Means

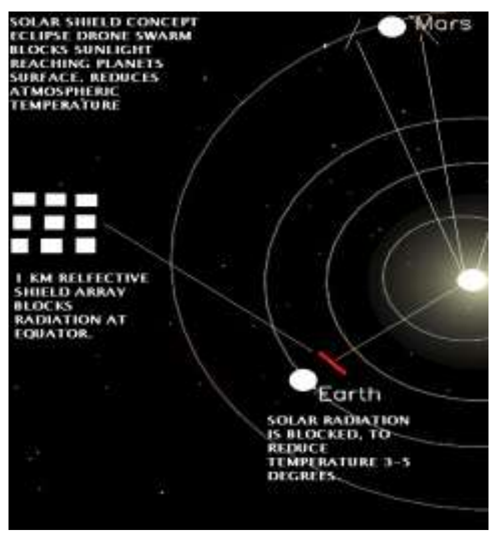
July 2022: 1904.52 ppb
July 2021: 1886.37 ppb
Last updated: Nov 07, 2022





Scientific community has presented evidence that electrical grid is losing huge amounts of THERMAL energy, into our atmosphere, heating it faster than natural cooling effects can compensate. Solve for zero philosophy sums this up as, if generating terawatts of energy, then terawatts must be removed from the atmosphere. This suggests possible way to do this is to use space structures to block out a terawatts of solar radiation, resulting in a net thermal gain of zero. Technology solving technology problems.

CO^2 and other gasses retain heat and can be reduced with progress. The source of electrical grid terawatts heat per day, cannot be reduced. Solar powered craft can be deployed in large numbers with today's launch capacity. These space craft can easily protect us from overheating the earth. There isn't any risk to the air as nothing is added as some suggest is the solution.



About the Author

Steven Rosenberg BSC. Cume laud Sociology
Research methods
Alumni American University, Washington DC
School of government
Kane College computer science department PBM computer science
Chub Institute
Infrastructure Engineering NJ Transit Signal Technician, Retired

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Popular Electronics 1997
popular electronics

Development Back story

Specification sheets

USER GUIDE

NI USB-6008/6009

Bus-Powered Multifunction DAQ USB Device

`ni.com/manuals`

The National Instruments USB-6008/6009 devices provide eight single-ended analog input (AI) channels, two analog output (AO) channels, 12 DIO channels, and a 32-bit counter with a full-speed USB interface. This user guide describes how to use these devices.

For specifications, refer to the *NI USB-6008 Device Specifications* and the *NI USB-6009 Device Specifications* available at `ni.com/manuals`.

The following table compares the NI USB-6008 and NI USB-6009 devices.

Table 1. NI USB-6008 and NI USB-6009 Comparison

Feature	NI USB-6008	NI USB-6009
AI resolution	12 bits differential, 11 bits single-ended	14 bits differential, 13 bits single-ended
Maximum AI sample rate, single channel[1]	10 kS/s	48 kS/s
Maximum AI sample rate, multiple channels (aggregate)[1]	10 kS/s	48 kS/s
DIO configuration	Open collector[2]	Each channel individually programmable as open collector or active drive[2]

The following figure shows key functional components of the NI USB-6008/6009.

[1] System-dependent.

[2] This document uses NI-DAQmx naming conventions. Open-drain is called open collector and push-pull is called active drive.

KP2000A Phase Control Thyristor

- Full diffusion process,capsule type ceramic package
- Amplifying gates
- Double sided cooling

Typical Application

- High power transmission
- DC and AC motor control,Controlied rectifier
- AC DC switch,phase-controlied rectifying
- Active and reactive invresion

$I_{T(AV)}$ 2000A V_{DRM}/V_{RRM} 100-6500V I_{TSM} 25KA i^2t 6125 10^3a^2s SYMBOL	CHARCTERISTIC	TEST CONDITIONS	TJ (�)	VALUE Min		UNIT Max
$I_{T(AV)}$	Mean on-state current	180�half sine wawe 50Hz Double side cooled, THS=97�	125		2000	A
$I_{T(AV)}$	Mean on-state current	180�half sine wawe 50Hz Double side cooled, THS=55�	125		2418	A
V_{DRM} V_{RRM}	Repetitive peak off-state voltage Repettive peak reverse voltage	V_{DRM}&V_{RRM} tp=10ms V_{DSM}&V_{RSM}=V_{DRM}&V_{RRM}+100 V	125	100	6500	V
I_{DRM} I_{RRM}	Repetitive peak current	V_{DM}=V_{DRM} V_{RM}=V_{RRM}	125		200	mA
I_{TSM}	Surge on-state current	10ms half sine wave	125		25	KA
I_{2t}	I_{2t} for fusing coordination	V_R=0.6V_{RRM}			6125	A_{2S}*10
V_{TO}	Threshold voltage		125		0.87	V
rT	On-state slop resistance				0.14	m�
V_{TM}	Peak on-state voltage	I_{TM}=5000A,F=15KN	25		2.4	V
dv/dt	Critical rate of rise of-state voltage	V_{DM}=0.67V_{DRM}	125		1000	V/us

di/dt	Critical rate of rise of on-state current	V_{DM}=67�V_{DRM} TO 1000A, Gate pulse tr�0.5us I_{GM}=1.5A	125		250	A/us
I_{TM}	Reverse recovery current	I_{TM}=5000A�tq=1000us			170	A
t_{rr}	Reverse recovery time	Di/dt=-20A/us.	125		20	us
Q_{rr}	Recovery charge	V_r=50V			1700	uC
I_{GT}	Gate trigger current			40	300	mA
V_{GT}	Gate trigger voltage	V_A=12V,I_A=1A	25	0.8	3.0	V
IH	Holding current			20	300	mA
V_{GD}	Npn-trigger gate voltage	V_{DM}=0.67V_{DRM}	125	0.3		V
$R_{th(j-h)}$	Thermal resistance Junction to heat sink	At180�sine double side cooled Clamping force 5.0kn			0.011	�/W
FM	Mounting force			35	47	KN
T_{stq}	Stored temperature			-40	140	�
Wt	Weight					g
Outline						

<u>Satco5020 A19 lamps</u>

Thermally Enhanced, Fully Integrated, Hall Effect-Based High Precision Linear Current Sensor IC with 100 μΩ Current Conductor

FEATURES AND BENEFITS

- Industry-leading total output accuracy achieved with new piecewise linear digital temperature compensation of offset and sensitivity
- Industry-leading noise performance through proprietary amplifier and filter design techniques
- 120 kHz typical bandwidth
- 4.1 μs output rise time in response to step input current
- Integrated shield greatly reduces capacitive coupling from current conductor to die due to high dV/dt signals, and prevents offset drift in high-side, high voltage applications
- Greatly improved total output error through digitally programmed and compensated gain and offset over the full operating temperature range
- Small package size, with easy mounting capability
- Monolithic Hall IC for high reliability
- Ultra-low power loss: 100 μΩ internal conductor resistance
- Galvanic isolation allows use in economical, high-side current sensing in high voltage systems
- 4.5 to 5.5 V, single supply operation
- Output voltage proportional to AC or DC currents
- Factory-trimmed for accuracy
- Extremely stable output offset voltage

Continued on the next page…

Package: 5-pin package (suffix CB)

PFF Leadform PSF Leadform

TÜV America Certificate Number: U8V 14 05 54214 028

Additional leadforms available for qualifying volumes

DESCRIPTION

The Allegro™ ACS770 family of current sensor ICs provides economical and precise solutions for AC or DC current sensing. Typical applications include motor control, load detection and management, power supply and DC-to-DC converter control, inverter control, and overcurrent fault detection.

The device consists of a precision, low-offset linear Hall circuit with a copper conduction path located near the die. Applied current flowing through this copper conduction path generates a magnetic field that is concentrated by a low magnetic hysteresis core, then converted by the Hall IC into a proportional voltage. Device accuracy is optimized through the close proximity of the magnetic signal to the Hall transducer. A precise, proportional output voltage is provided by the low-offset, chopper-stabilized BiCMOS Hall IC, which is programmed for accuracy at the factory. Proprietary digital temperature compensation technology greatly improves the IC accuracy and temperature stability without influencing the high bandwidth operation of the analog output.

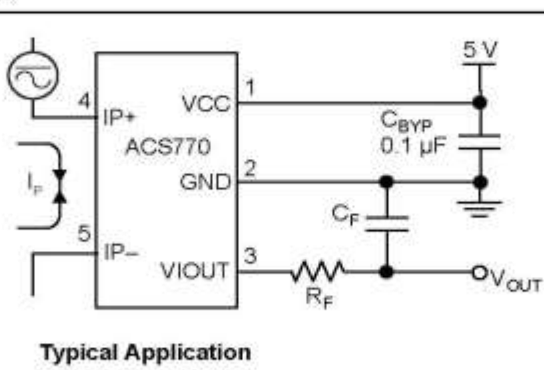
High level immunity to current conductor dV/dt and stray electric fields is offered by Allegro proprietary integrated shield technology for low output voltage ripple and low offset drift in high-side, high voltage applications.

The output of the device has a positive slope (>$V_{CC}/2$ for bidirectional devices) when an increasing current flows through the primary copper conduction path (from terminal 4 to terminal 5), which is the path used for current sampling. The internal resistance of this conductive path is 100 μΩ typical, providing low power loss.

The thickness of the copper conductor allows survival of the device at high overcurrent conditions. The terminals of the

Continued on the next page…

Application 1: the ACS770 outputs an analog signal, V_{OUT}, that varies linearly with the bidirectional AC or DC primary sampled current, I_P, within the range specified. R_F and C_F are for optimal noise management, with values that depend on the application.



Typical Application