# solar outdoor lighting systems

SLI
Solar Lighting International

# X-SERIES LED

AMERICAN MADE X SERIES LED SOLAR LIGHTING SYSTEM:
X-35-LED-12000-360

| | |
|---|---|
| SYSTEM OUTPUT | 12000 LUMENS PER FIXTURE |
| SYSTEM VOLTAGE | INPUT 12/24 VDC – OUTPUT 12/24 VDC |
| SYSTEM CERTIFICATION | - UL compliant system to – UL 1598<br>- CAN/CSA C22.2 No. 250.0<br>- Dark Sky Compliant |
| OPERATIONAL TEMPERATURES | System is operational from -60° Celsius (with un-frozen batteries) to maximum temperature range of 60° Celsius with 90% humidity |
| SOLAR MODULES | - High efficiency UL, CUL, and CE listed 360 watts of panel Monocrystalline (if available)<br>- 20 year warranty<br>- Anti-corrosion- salt spray tested |
| BATTERY ENCLOSURE | - Aluminum battery enclosure<br>- Pre-wired and tested<br>- Designed for a harsh or marine environment<br>- Thermal resistant powder coated to resist salt water spray and sand<br>- Raised ridge rubber battery mat for thermal battery protection |
| ELECTRONICS | - Pre-wired and mounted in battery enclosure box<br>- Triple circuit breaker protected (no fuse replacement)<br>- Maximum Power Point Tracking (MPPT) charge controller is reverse polarity protected and cannot be damaged by wiring incorrectly<br>- Instant light test switch – no need to wait for sunset to confirm correct installation |
| LED LIGHT FIXTURE | - Dark Sky Compliant<br>- Glass cut off optics<br><br>Phillips Illumiled 5050 LED Chips 160-170 lumens per watt<br><br>Color Temperature Options:<br>□ 4300k (standard option) |
| TOP OR SIDE OF POLE SOLAR MOUNT | Aluminum solar array mounting system to provide multiple degrees of adjustments for more precise alignment with the sun |
| GEL PACK BATTERY | - Zero maintenance gel pack battery<br>- High capacity deep cycle<br>- 3+ days back up power<br>- Automatic low-voltage shutdown to protect battery<br>- Battery operating temperature: -60° Celsius to 60° Celsius |

Solar Lighting International

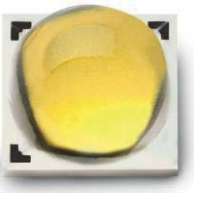
## Product Benefits

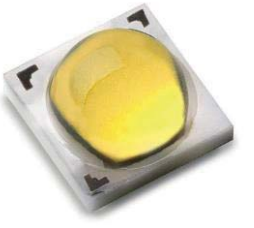
### PHILIPS LUMILEDS LED LUMINOUS SORUCE

The new SLI Series LED street light is utilizing PHILIPS LUXEON®T LED luminous source, providing excellent lumen output, long-lasting stability and splendid sight.

Each PHILIPS LUXEON® T chip owns eletrostatic protection compoent, maximally avoid the damage of eletrostatic.

More information about the PHILIPS LUXEON® Rebel ES and solid-state lighting technologies can be found at www.philipslumileds.com.





Superior efficacy

Leading lumen output

Ultimate design flexibility

LUXEON® NEVER BEFORE POSSIBLE

RoHS Compliant

### MEAN WELL LED DRIVER

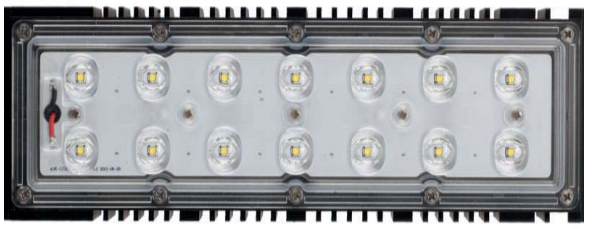
Full range SLI Series LED street light utilizing MeanWell HLG Series high-end driver. Providing great luminaire stability, lifespan and optimal performance status.

More information about the MeanWell HLG Series and LED driver technologies, please visit www.meanwell.com

TAIWAN EXCELLENCE 2011


### BRAND-NEW LED MODULE DESIGN

Exquisite design with powerful thermaloutput, with more reliable waterproof performance.



**Lancaster, SC USA**
**www.solarlightingitl.com**

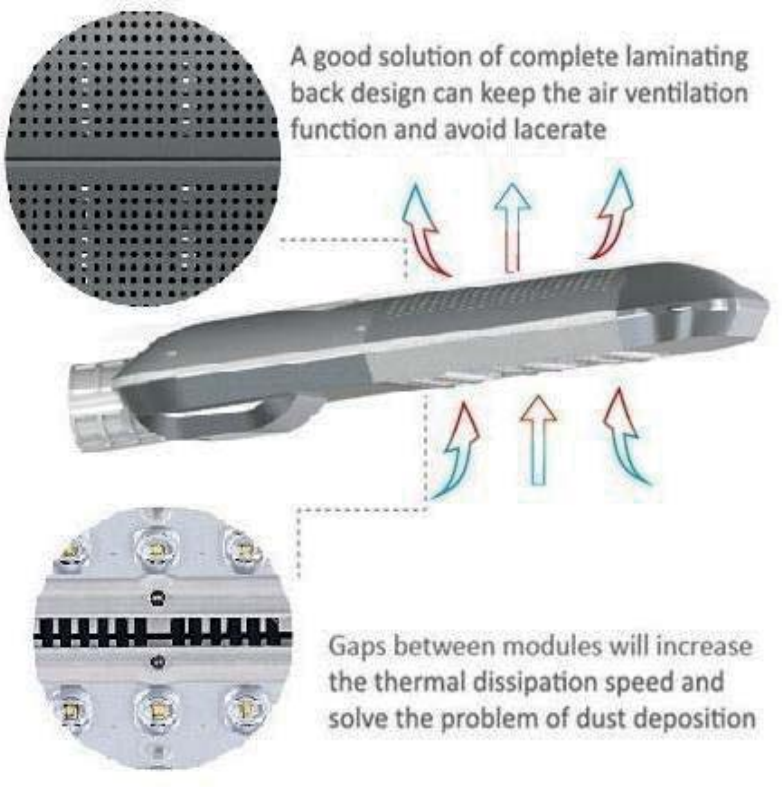
## XTREME LUMINAIRE DESIGN

Equipped with exceptional 3rd-generation LED module, the brand-new SLI Series LED street light will give best luminous output, stability and super long life, and build the most cost-effective LED street light ever.

SLI has its own R&D center, and it reserves all related patents for the SLI Series LED street light.

Easy assemble/disassemble, neat wiring & connection, up to 100-110lm/w luminaire light output, IP67 rated, 90% plus driver efficiency, 5 years warranty for the whole luminaire.

More information about the SLI Series LED street light and LED lighting technologies, please visit www.solarlightingitl.com




## FLEXIBLE INSTALLATION

**Lancaster, SC USA**
**www.solarlightingitl.com**

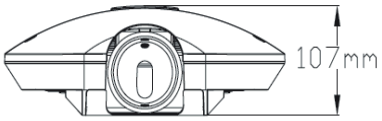
# SLI-75W

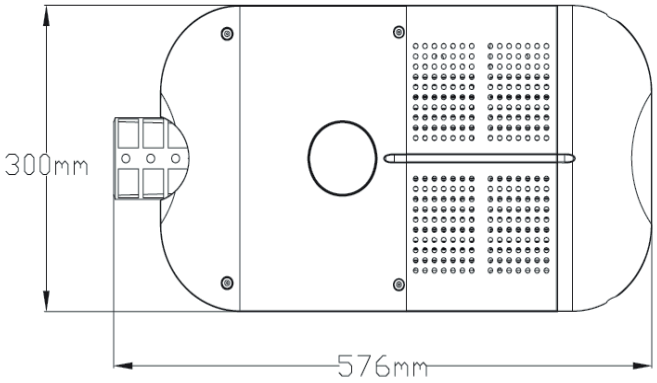
LED Street & Parking Light, 400W HID Replacement

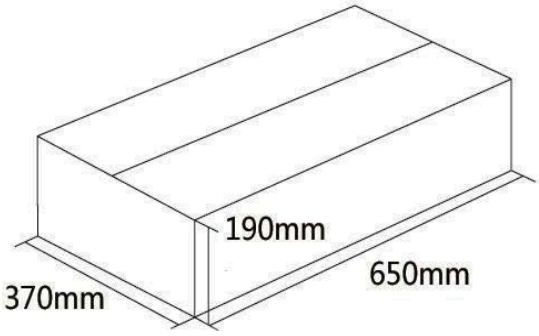


Black / white / silver / bronze color housing optional

1-10V / PWM / Resistance dimming optional




## Specifications

### Electrical Specifications

| | |
|---|---|
| Model No. | SLI-75W |
| Nominal Wattage | 75W |
| Nominal Voltage | 90-305/277-480VAC, 50/60Hz<br>24VDC |
| Maximum Current | AC 0.9A (max)<br>DC 0.3A (max) |
| Power Factor (PF) | >0.95 |
| Driver Efficiency | >92% |

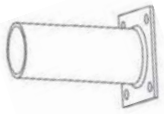
### Photometric Specifications

| | |
|---|---|
| Luminous Flux | +Lumen tolerance +/- 5%<br>12000lm |
| CRI | Ra>75 |
| CCT | 3000-6500K |
| Optional Beam Angle | 60*150° / 70*150° / 80*150° /<br>90*100° / 60° / 120° |

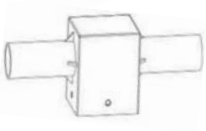
### Mechanical Specifications

| | |
|---|---|
| IP&IK Rating | IP66 & IK10 |
| Lifetime | 62000 hours - L70, @25°C |
| Heat Radiator | Anodized Aluminum |
| Lens | PC |
| Fixture Dimension | 576*300*107mm<br>22.7*11.8*4.2 inches |
| Net Weight | 7.5kg |
| Carton Dimension | 650*370*190mm |
| Gross Weight | 8.3kg |

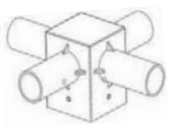
### Optional converters for different applications



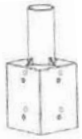
60mm to wall mount converter



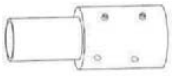
2 in 1 converter



4 in 1 converter

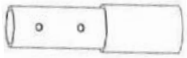


Round to square converter



80-60mm converter

wall mount converter



60-40mm converter

# HYUNDAI SOLAR MODULE

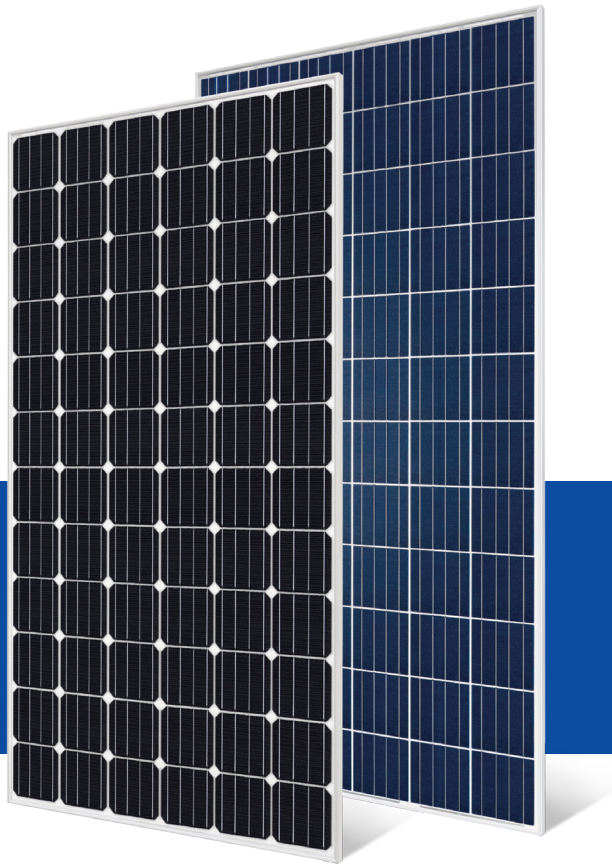
**RI SERIES**

**Multi-Crystalline Type**

HiS-M310RI HiS-M315RI HiS-M320RI

**Mono-Crystalline Type**

HiS-S330RI HiS-S335RI HiS-S340RI HiS-S345RI
HiS-S350RI HiS-S355RI HiS-S360RI



**72**
Cells

For Commercial & Utility Applications

More Power Generation In Low Light

MADE IN KOREA
Hyundai Cell, Made in Korea

## PERL Technology

PERL technology provides ultra-high efficiency with better performance in low irradiation. Maximizes installation capacity in limited space.

## Low LID / PID

Both LID(Light Induced Degradation) and PID(Potential Induced Degradation) are strictly eliminated to ensure higher actual yield during lifetime.

## Mechanical Strength

Tempered glass and reinforced frame design withstand rigorous weather conditions such as heavy snow and strong wind.

## Reliable Warranty

Global brand with powerful financial strength provide reliable 25-year warranty.

## Corrosion Resistant

Various tests under harsh environmental conditions such as ammonia and salt-mist passed.

## UL / VDE Test Labs

Hyundai's R&D center is an accredited test laboratory of both UL and VDE.

### Hyundai's Warranty Provisions

10 YEARS
- 10-Year Product Warranty
  - On materials and workmanship

25 YEARS
- 25-Year Performance Warranty
  - 90% of guaranteed min. power for 10 years
  - 80% of guaranteed min. power for 25 years

### About Hyundai Solar

Established in 1972, Hyundai Heavy Industries (HHI) is one of the most trusted names in the heavy industries sector with 48,000 employees and more than 40 Billion USD in annual sales (2015). As a global leader and innovator, Hyundai Heavy Industries is committed to building a future growth engine by developing and investing heavily in the field of renewable energy.

Started as a core business division of HHI, Hyundai Solar (Hyundai Heavy Industries Green Energy) now stands as an independent company and an affiliate of HHI as from December 2016. It is the largest and the longest standing PV cell and module manufacturer in South Korea with 800 MW of module production capacity. We have strong pride in providing high-quality solar PV products to more than 3,000 customers worldwide.

### Certification

HYUNDAI GREEN ENERGY

## Electrical Characteristics

| | | Multi-Crystalline Module (HiS-M___RI) | | | Mono-Crystalline Module (HiS-S____RI) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 310 | 315 | 320 | 330 | 335 | 340 | 345 | 350 | 355 | 360 |
| **Nominal Output** (Pmpp) | W | 310 | 315 | 320 | 330 | 335 | 340 | 345 | 350 | 355 | 360 |
| **Open Circuit Voltage** (Voc) | V | 45.3 | 45.3 | 45.5 | 46.3 | 46.5 | 46.7 | 46.9 | 47.1 | 47.3 | 47.4 |
| **Short Circuit Current** (Isc) | A | 8.9 | 9.0 | 9.0 | 9.3 | 9.4 | 9.5 | 9.6 | 9.6 | 9.7 | 9.8 |
| **Voltage at Pmax** (Vmpp) | V | 36.0 | 36.2 | 36.4 | 38.0 | 38.2 | 38.4 | 38.6 | 38.7 | 38.9 | 39.1 |
| **Current at Pmax** (Impp) | A | 8.6 | 8.7 | 8.8 | 8.7 | 8.8 | 8.9 | 9.0 | 9.0 | 9.1 | 9.2 |
| **Module Efficiency** | % | 15.8 | 16.1 | 16.4 | 16.9 | 17.1 | 17.4 | 17.6 | 17.9 | 18.1 | 18.4 |
| **Cell Type** | - | 6”, multi-crystalline silicon | | | 6”, mono-crystalline silicon | | | | | | |
| **Maximum System Voltage** | V | 1,000 | | | 1,000 | | | | | | |
| **Temperature coefficient of Pmax** | %/K | -0.41 | | | -0.40 | | | | | | |
| **Temperature coefficient of Voc** | %/K | -0.31 | | | -0.29 | | | | | | |
| **Temperature coefficient of Isc** | %/K | 0.039 | | | 0.039 | | | | | | |

*All data at STC (Standard Test Conditions). Above data may be changed without prior notice.

## Mechanical Characteristics

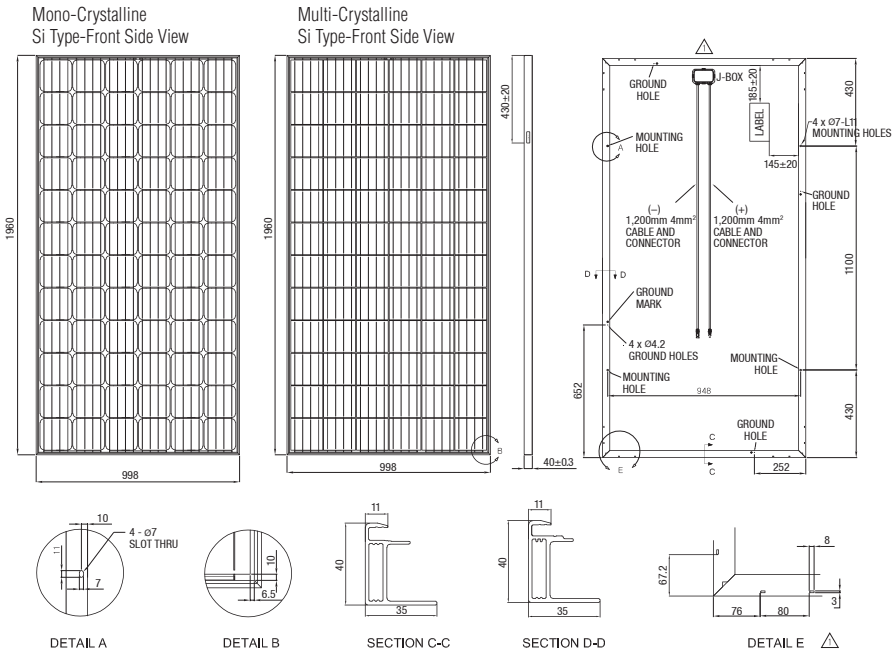
| | |
|---|---|
| **Dimensions** | 998 mm (39.29˝)(W) x 1,960 mm (77.17˝)(L) x 40 mm (1.57˝)(H) |
| **Weight** | Approx. 22.9 kg (50.5 lbs) |
| **Solar Cells** | 72 cells in series (6 × 12 matrix) (Hyundai cell, Made in Korea) |
| **Output Cables** | 4 mm² (12AWG) cables with polarized weatherproof connectors, IEC certified (UL listed and UL 4703 certified), Length 1.2 m (47.2˝) |
| **Junction Box** | IP67, weatherproof, IEC certified (UL listed) |
| **Bypass Diodes** | 3 bypass diodes to prevent power decrease by partial shade |
| **Construction** | Front : Anti-reflection coated glass, 3.2 mm (0.126˝)<br>Encapsulant : EVA I Back Sheet : Weatherproof film |
| **Frame** | Clear anodized aluminum alloy type 6063 |

## Installation Safety Guide

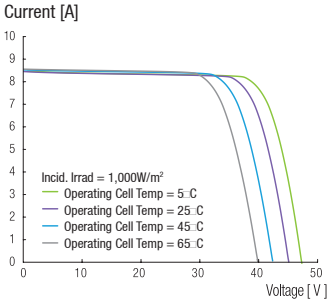
- Only qualified personnel should install or perform maintenance.
- Be aware of dangerous high DC voltage.
- Do not damage or scratch the rear surface of the module.
- Do not handle or install modules when they are wet.

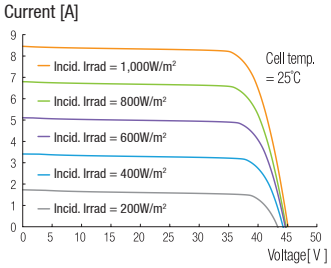
| | |
|---|---|
| **Nominal Operating Cell Temperature** | 46°C ± 2 |
| **Operating Temperature** | -40 – 85°C |
| **Maximum System Voltage** | DC 1,000 V (IEC)<br>DC 1,000 V (UL) |
| **Maximum Reverse Current** | **15A** (Up to 350W)<br>**20A** (Above 355W) |

## Module Diagram (unit : mm)




## I-V Curves




HYUNDAI GREEN ENERGY



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Printed Date : 05/2017

# MOUNTS: SLI-TX-2 series

## Top-of-Pole Mounting (TPM) :

SLI, Inc. manufactures and distributes a complete line of mounting kits to accommodate a wide range of off-grid applications. From single module top-of-pole mounts to complex multi-panel arrays, our mounting line has the flexibility to meet your mounting needs.

## Our Top-of-Pole Mounts Feature:

Rugged Materials and Construction,
Precision Engineering and Expert Support

SLI-TX-2Series:
- Available in 2",3",4" and 6" SCH 40 pipe

### Pole Selection:

- Determine solar panel or solar array area (SQ. FT)
- Select pole size based on selection guidelines in Table 1.
(Solar Lighting International, Inc. does not supply poles with our mounting kits).

### Top-of-Pole : Guidelines For Pole Selection

| Module Area | Pole Size | Depth In Ground | Height Above Ground | Hole Diameter |
|---|---|---|---|---|
| 15 SQ. FT. | 2" SCH40 (2-3/8" OD) | 30"-36" | 48"-72" | 8"-12" |
| 28 SQ. FT. | 3" SCH40 (3-1/2" OD) | 36"-42" | 48"-72" | 12"-16" |
| 35 SQ. FT. | 3" SCH40 (3-1/2" OD) | 38"-44" | 60"-72" | 12"-16" |
| 60 SQ. FT. | 4" SCH40 (4-1/2" OD) | 42"-48" | 60"-72" | 16"-24" |
| 90 SQ. FT. | 6" SCH40 (6-5/8" OD) | 48"-60" | 60"-84" | 24"-30" |
| 120 SQ. FT. | 6" SCH40 (6-5/8" OD) | 48"-72" | 72"-84" | 24"-30" |

Table 1

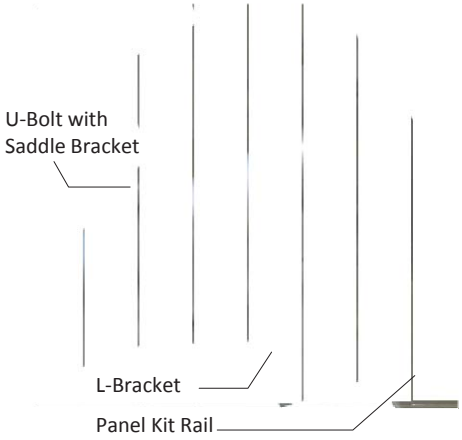
* Module Area (SQ. FT) = W (Panel Width in FT) x L (Panel Length in FT)
* Solar Array Area (SQ. FT) = W (Panel Width in FT) x L (Panel Length in FT) x Number of Panels per Array

Photographs are intended to portray typical enclosure appearance, actual appearance my vary.

1. Panel Kit Rail
2. Solar Panel
3. L-Bracket (Foot)
4. Cross Pipe
5. Pipe End Cap
6. U-Bolt with Saddle Bracket


Figure 1. Mounting kit components

## Attachment to Panel Kit Rail




## Attachment to Cross Pipe

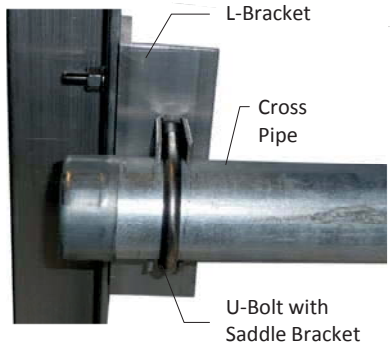
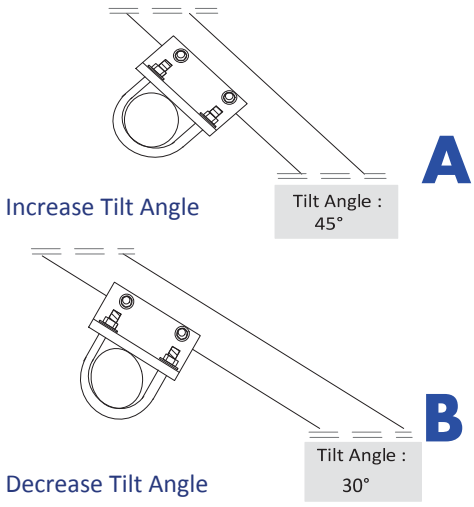



Figure 2. Use L-brackets to attach to the panel kit rails and to cross pipe.

## Array Tilt Angle Selection:

| SITE LATITUDE: ( In Degrees) | FIXED TILT ANGLE |
|---|---|
| 0° TO 15° | 15° |
| 15° TO 25° | SAME AS LATITUDE |
| 25° TO 30° | SAME AS LATITUDE +5° |
| 30° TO 35° | SAME AS LATITUDE +10° |
| 35° TO 40° | SAME AS LATITUDE +15° |
| 40° + | SAME AS LATITUDE +20° |

Table 2.



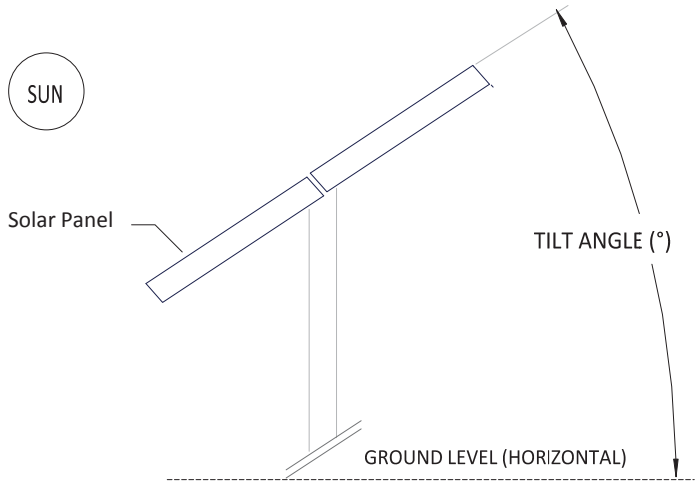




Figure 3. Tilt Angle Adjustments: Adjust PV Array Tilt Angle by rotating U-bolts to desired angle.

Locate array in an unshaded area facing equator and tilted from the horizontal at desired tilt angle (See Table 1).

Solar arrays in the Northen Hempisphere face South for optimum energy production. Solar Arrays in the Southern hemisphere face North.

When choosing a site, avoid trees, buildings or obstructions which could cast shadows on the solar modules. This is especially true during the winter months when the arc of the sun is lowest to the horizon.

# Fully Adjustable Solar Lighting Control

*Maximum Power Point Tracking Photovoltaic Charge Controller with available load control*

# SLI 3724iX

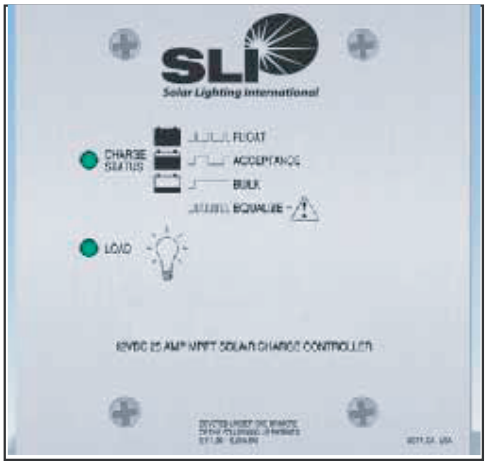
## Improve PV Module and Battery Performance with Maximum Power Point Tracking

Patented Maximum Power Point Tracking technology allows SLI's 3724iX to increase charge current up to 30% or more compared to conventional charge controllers. Don't waste your money by throwing PV power away! Get the power you paid for with a Solar Boost charge controller.

SLI's 3724ix's advanced fully automatic 3-stage charge control system will properly charge flooded lead-acid, AGM and Gell batteries② resulting in improved battery performance with less battery maintenance. The dual 15/20 amp rating will deliver up to 15 amps in 24 volt systems, or up to 20 amps in 12 volt systems. An automatic or manual② equalize function is also provided to periodically condition flooded lead-acid batteries. To further enhance versatility, a user configurable auxiliary output and Blue Sky Energy's advanced IPN™ network interface are also included.

The user configurable auxiliary output can serve as either a 15/20 amp load controller, or as a 2 amp auxiliary battery charger. The load control feature can be used to limit excessive battery discharge in unattended remote systems, whereas the auxiliary battery charge feature is ideal for charging a separate battery such as the engine start battery in a boat or RV. The auxiliary output can also provide fully adjustable dusk to dawn lighting control②.

Solar Lighting Intl's advanced Integrated Power Net™, or IPN Network, allows up to 8 IPN capable charge controllers to communicate with each other and operate as a single machine rather than separate charge controllers. The IPN network also allows networked controllers to share an optional battery temperature sensor and remote display. The IPN network does not require a display or other special hardware to operate.




**Patented MPPT Technology Increases Charge Current up to 30% Or More!**

- 15 Amp 24 Volt & 20 Amp 12 Volt Rating Supports A Wide Range Of Applications
- Optional IPN-ProRemote Display Provides Charge Control & Full-Featured Battery System Monitoring
- 3-Stage Charge Control with Filtered PWM Output Improves Battery Performance & Life While Minimizing Battery Maintenance
- Clear Anodized Faceplate, Galvanized Mounting Box & Conformal Coated Electronics Resist Corrosion
- Automatic or Manual② Equalization To Periodically Condition Flooded Lead-Acid Batteries
- IPN Network Interface Coordinates Multiple Controllers & Shares Optional Battery Temperature Sensor & Display
- Auxiliary Output Provides 15/20 Amp Load Control Or 2 Amp Auxiliary Battery Charge
- Lighting Control② Provides Separate Post-Dusk & Pre-Dawn timers
- Full 12 Month Limited Warranty

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www.solarlightingitl.com

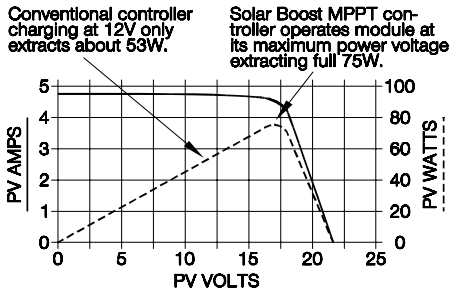
## ■ How Does SLI MPPT Charge Controllers Increase Charge Current?

SLI MPPT charge controllers increase charge current by harvesting more PV power. A conventional charge controller simply connects the PV module to the battery when the battery is discharged which can artificially limit how much power a PV module can deliver.

Patented SLI Inc. MPPT technology operates the PV module at it's optimum voltage where it can produce the greatest amount of power rather than at battery voltage. The higher power extracted from the module is then provided to the battery as increased charge current.

The actual charge current increase you will see varies primarily with module temperature and battery voltage. In comfortable temperatures, current increase typically varies between 10 to 25%, with 30% or more easily achieved with a discharged battery and cooler temperatures. What you can be sure of is that SLI MPPT charge controllers will deliver the highest charge current possible for a given set of operating conditions.

**Typical 75W PV Module Performance @ STC**




| SPECIFICATIONS | Solar Lighting International MPPT 3724 |
|---|---|
| Output Current Rating[3] | 20 amp maximum (12V battery & 12V PV's) • 15 amp maximum (battery or PV's > 12V nominal) |
| Nominal Battery Voltage | 12 / 24VDC |
| PV Input Voltage | 57VDC maximum (Recommend maximum $V_{OC}$ at STC ≤ 45.6VDC) |
| Power Consumption | 0.20W typical standby • plus 0.40W each for charge ON & Load ON |
| Charge Algorithm | 3-stage Bulk/Acceptance/Float • plus automatic Equalize |
| Acceptance Voltage | 14.2VDC[1] fixed (range 10.0 – 40.0VDC[2]) |
| Float Voltage | 13.2VDC[1] fixed (range 10.0 – 40.0VDC[2]) |
| Equalization Voltage | 15.2VDC[1] fixed (range 10.0 – 40.0VDC[2]) |
| Voltage Setpoint Limit | 15.5VDC[1] fixed (range 10.0 – 40.0VDC[2]) |
| Auxiliary Output Function | Single output configurable as either: 20 amp 12V / 15 amp 24V load controller –or– 2A auxiliary battery charger |
| • Aux. Battery charge | 2 Amp typical, same charge voltage as primary battery |
| • Load Control | 20 amp / 15 amp maximum, ON ≥12.6VDC[1] / OFF ≤11.5VDC[1] (Range 10.0 – 40.0VDC[2], or battery amp-hours from full[2]) |
| • Dusk-to-Dawn Cntrl[2] | Variable Post-Dusk and Pre-Dawn timers[2], Range 0.5 - 20.0 Hours |
| Temperature Compensation | Optional sensor adjusts charge voltage based on battery temperature<br>–5.00 mV/°C/cell correction factor (Range 0.00 to –8.00 mV/°C/cell[2]) • sensor range –60 to +80°C |
| Power Conversion Efficiency | 97% Typical @ 28 Volt 12 Amp Output |
| Physical Configuration and Dimensions | Open frame construction with conformal coated electronics mounted to rear of 5.3" x 5.3" (13.5cm x 13.5cm) clear anodized aluminum face plate. Mounts into standard 411/16" (11.9cm) square electrical box which is included. |
| Volt/Amp Accuracy/Range | Battery voltmeters 40.0VDC±0.50% FS • PV voltmeter 60.0VDC±0.50% FS<br>Ammeters 25.0A±0.50% FS |
| Communication | Solar Lighting International's proprietary IPN Network interface |
| Environmental | -40 to +50°C, 10 – 90% RH non-condensing |

As a part of our continuous improvement process specifications are subject to change without prior notice.

[1] Voltages double for 24V battery
[2] With IPN-ProRemote which may be used as a setup tool only. Charge voltage setpoints may require modification with IPN-ProRemote based on battery manufacturer's recommendations.
[3] Current rating and current limit are 20A when charging a 12V battery from nominal 12V PV modules. If PV VOC ever exceeds 30V (>12V nominal PV modules) current rating and current limit become 15A.

## ■ Available From:

Solar Lighting International

Solar Lighting International, Inc. 7073 Henry Harris Road Lancaster, SC 29720 Phone +1 803-233-3461 Fax +1 803-233-2096
www.solarlightingitl.com

# DC-145 (12V145Ah)

DC (Deep Cycle) series is specially designed for frequent cyclic discharge. By using strong grids and specially designed active material, the DC series battery offers 30% more cyclic life than the standby series. It is suitable for solar energy systems, marine and RV etc.

Solar Lighting International

## Specification

| | |
|---|---|
| **Cells Per Unit** | 6 |
| **Voltage Per Unit** | 12 |
| **Capacity** | 145h@10hr-rate, 165h@100hr to 1.80V per cell @25 C |
| **Weight** | Approx. 44.0 Kg (Tolerance ±1.5%) |
| **Max. Discharge Current** | 160 A (5 sec) |
| **Internal Resistance** | Approx. 4 mΩ |
| **Operating Temperature Range** | Discharge: -20℃~60℃<br>Charge: 0℃~50℃<br>Storage: -20℃~60℃ |
| **Normal Operating Temperature Range** | 25℃±5℃ |
| **Float charging Voltage** | 13.6 to 13.8 VDC/unit Average at 25℃ |
| **Recommended Maximum Charging Current** | 43.5 A |
| **Equalization and Cycle Service** | 14.6 to 14.8 VDC/unit Average at 25℃ |
| **Self Discharge** | SLI Valve Regulated Lead Acid (VRLA) batteries can be stored for more than 6 months at 25℃. Self-discharge ratio less than 3% per month at 25℃. Please charge batteries before using. |
| **Terminal** | Terminal F5/F12 |
| **Container Material** | A.B.S. UL94-HB, UL94-V0 Optional. |

MH28539

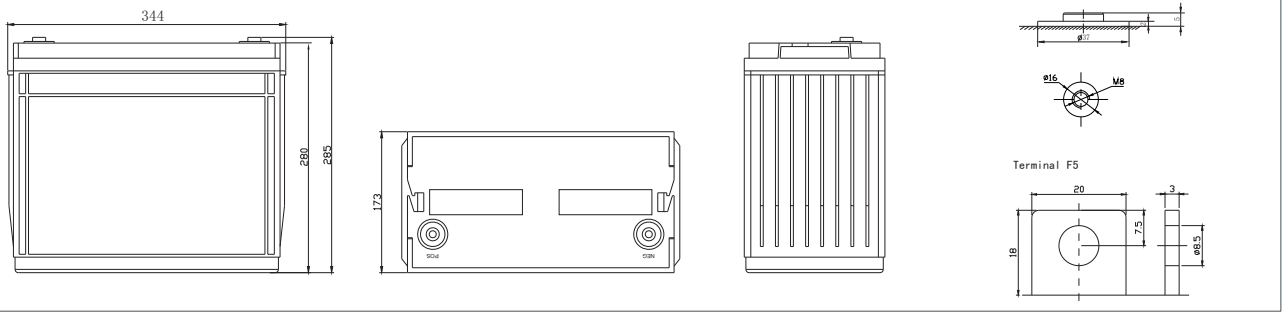
G4M20206-0910-E-16

IQNet CERTIFICATE
Postcode:421001 is in conformity with ISO 14001:2004 Standard

IQNet CERTIFICATE
Postcode:421001 is in conformity with OHSAS 18001:1999 Standard

## Dimensions

**Unit: mm** Dimension: 344(L)×173(W)×285(H)




### *Constant Current Discharge Characteristics: A (25℃)*

| F.V/Time | 5MIN | 10MIN | 15MIN | 30MIN | 1HR | 2HR | 3HR | 4HR | 5HR | 8HR | 10HR | 20HR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9.60V | 447.0 | 333.4 | 263.1 | 145.7 | 90.51 | 55.88 | 37.97 | 30.62 | 25.42 | 16.74 | 15.09 | 7.99 |
| 10.0V | 434.1 | 317.3 | 257.7 | 143.8 | 89.30 | 54.75 | 37.27 | 30.18 | 25.19 | 16.68 | 14.94 | 7.84 |
| 10.2V | 421.2 | 306.1 | 253.6 | 141.6 | 88.45 | 54.17 | 36.94 | 29.88 | 25.03 | 16.53 | 14.79 | 7.69 |
| 10.5V | 378.2 | 282.4 | 241.5 | 137.7 | 87.37 | 53.46 | 36.61 | 29.44 | 24.82 | 16.38 | 14.65 | 7.54 |
| 10.8V | 341.4 | 257.5 | 222.6 | 133.2 | 86.15 | 53.03 | 36.18 | 28.43 | 24.70 | 16.31 | 14.51 | 7.46 |
| 11.1V | 291.5 | 230.2 | 199.6 | 128.1 | 84.11 | 50.89 | 35.48 | 28.02 | 24.52 | 16.18 | 14.34 | 7.16 |

### *Constant Power Discharge Characteristics: W (25℃)*

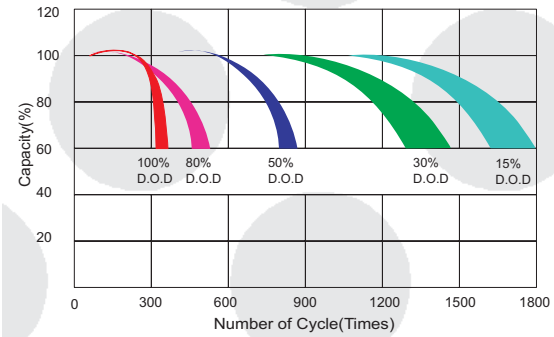
| F.V/Time | 5MIN | 10MIN | 15MIN | 30MIN | 1HR | 2HR | 3HR | 4HR | 5HR | 8HR | 10HR | 20HR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9.60V | 4623 | 3551 | 2894 | 1668 | 1049 | 654.8 | 447.1 | 366.5 | 304.5 | 200.5 | 180.9 | 96.22 |
| 10.0V | 4532 | 3442 | 2847 | 1650 | 1039 | 646.8 | 440.4 | 361.3 | 301.8 | 199.7 | 179.5 | 94.55 |
| 10.2V | 4481 | 3351 | 2815 | 1636 | 1033 | 642.2 | 438.5 | 358.0 | 299.9 | 198.2 | 177.9 | 92.80 |
| 10.5V | 4079 | 3121 | 2685 | 1603 | 1026 | 634.1 | 434.9 | 353.1 | 297.5 | 196.5 | 176.2 | 91.05 |
| 10.8V | 3715 | 2877 | 2482 | 1565 | 1013 | 629.4 | 430.0 | 341.2 | 296.2 | 195.7 | 174.4 | 90.17 |
| 11.1V | 3263 | 2601 | 2234 | 1522 | 998.1 | 605.8 | 422.8 | 336.3 | 295.1 | 194.3 | 172.5 | 86.95 |

All mentioned values are average values (Tolerance ±2%).

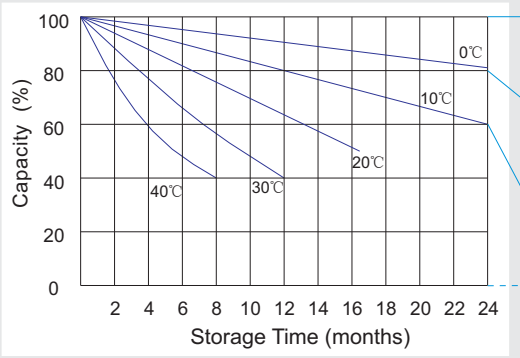
# DC-145

12V160Ah

## Life characteristics of cyclic use




## Storage characteristic



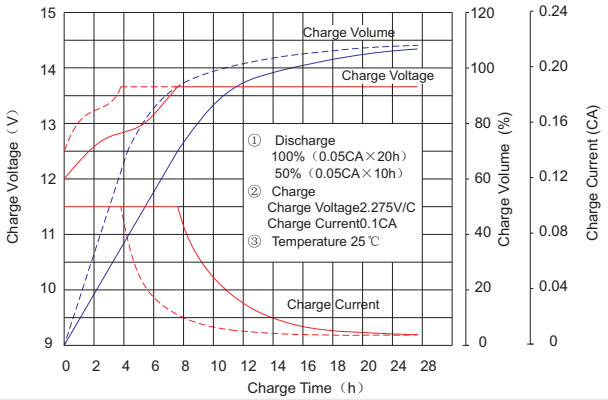

Supplementary charge required (Carry out supplementary charge before use if 100% capacity is requires)

Supplementary charge required before use. This supplementary charge will help to recover the capacity and should be made as early as possible.

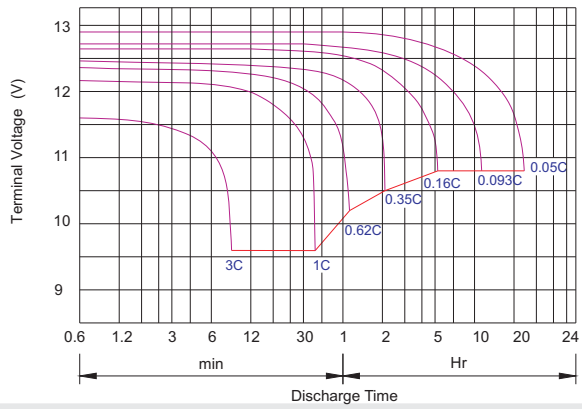
Supplementary charge may often fail to recover the capacity. The battery should never be left standing till this state is reached

Supplementary charge and storage guidelines

## Charge characteristic Curve for standby use




## Discharge characteristic Curve




## Capacity Factors With Different Temperature

| Battery Type | | -20℃ | -10℃ | 0℃ | 5℃ | 10℃ | 20℃ | 25℃ | 30℃ | 40℃ | 45℃ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| GEL Battery | 6V&12V | 50% | 70% | 83% | 85% | 90% | 98% | 100% | 102% | 104% | 105% |
| | 2V | 60% | 75% | 85% | 88% | 92% | 99% | 100% | 103% | 105% | 106% |
| AGM Battery | 6V&12V | 46% | 66% | 76% | 83% | 90% | 98% | 100% | 103% | 107% | 109% |
| | 2V | 55% | 70% | 80% | 85% | 92% | 99% | 100% | 104% | 108% | 110% |

### Discharge Current VS. Discharge Voltage

| Final Discharge Voltage V/cell | 1.75V | 1.70V | 1.60V |
|---|---|---|---|
| Discharge Current (A) | （A）≤0.2C | 0.2C＜（A）＜1.0C | （A）≥1.0C |

**Charge the batteries at least once every six months, if they are stored at 25℃.**

Charging Method:

| | |
|---|---|
| Constant Voltage | -0.2Cx2h+14.4-14.7Vx24h,Max. Current 0.3C |
| Constant Current | -0.2Cx2h+0.1Cx7h+0.05Cx4h |
| Fast | -0.2Cx2h+0.3Cx3h |

| Bolt | M5 | M6 | M8 |
|---|---|---|---|
| Terminal | F3 F4 F13 F18 T25 T26 | F8 F11 F12-1 F15 | F5 F9 F10 F12 F14 F16 |
| Torque | 6~7N-m | 8~10N-m | 10~12N-m |

## Maintenance & Cautions

**Cycle service**

※ Avoid battery over discharge, especially battery sereis connection use.

※ Charged with recommend voltage, ensure battery can be full recharged.

In general, recharge capacity should be 1.1-1.15 times discharge capacity.

※ Effect of temperature on cycle charge voltage: -4mV/℃/Cell.

※ There are a number of factors that will affect the length of cyclic service.

The most significant are depth of discharge, ambient temperature,

discharge rate, and the manner in which the battery is recharged.

Generally specking, the most important factors is depth of discharge.

SLI Solar Lighting International


**Solar Lighting International, Inc.**
**Phone 803-233-3461**
**www.solarlightingitl.com**

**QY Frame - Miniature Circuit Breakers**

Features:

- **Hydraulic-magnetic technology ensures reduced nuisance tripping with temperature variance**
- **Always hold 100% rated current**
- **Wide range of time delays & operating currents**
- **Current limiting capabilities**
- **Ultra compact - 13 mm width module**
- **Din, Mini-rail or Dual mountable**

| | |
|---|---|
| Poles: | **1, 2** |
| Max. Voltage: | **80 VDC** |
| Max. Interrupting Capacity: | **10 kA** |
| Current Rating: | **1 A** to **100 A** |
| Agency recognition of Approvals: | **IEC 60947-2**<br>**UL 489A**<br>**SANS VC8036** |

Solar Lighting International

Solar Lighting International, Inc. 7073 Henry Harris Road Lancaster, SC 29720 Phone +1 803-233-3461 Fax +1 803-233-2096
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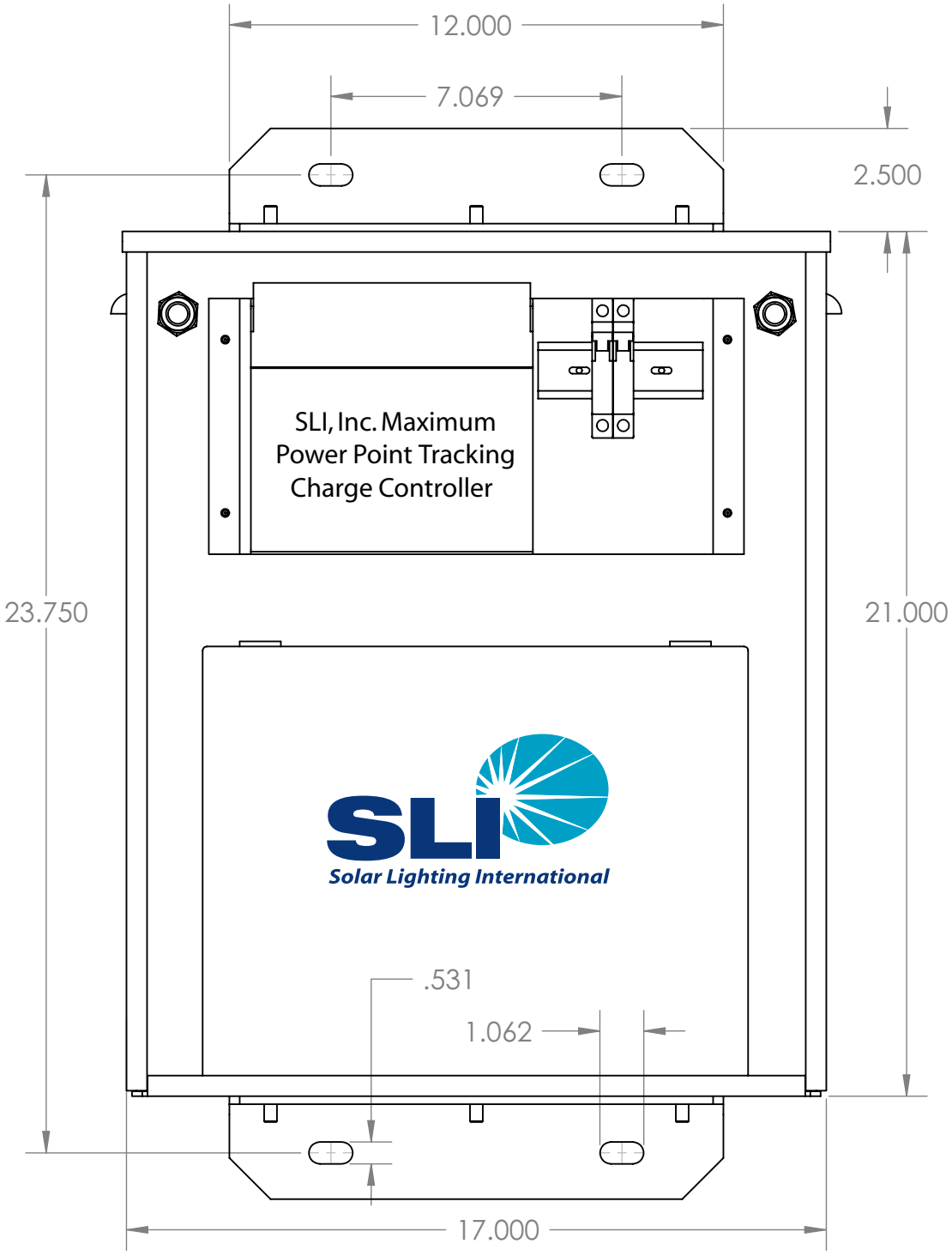


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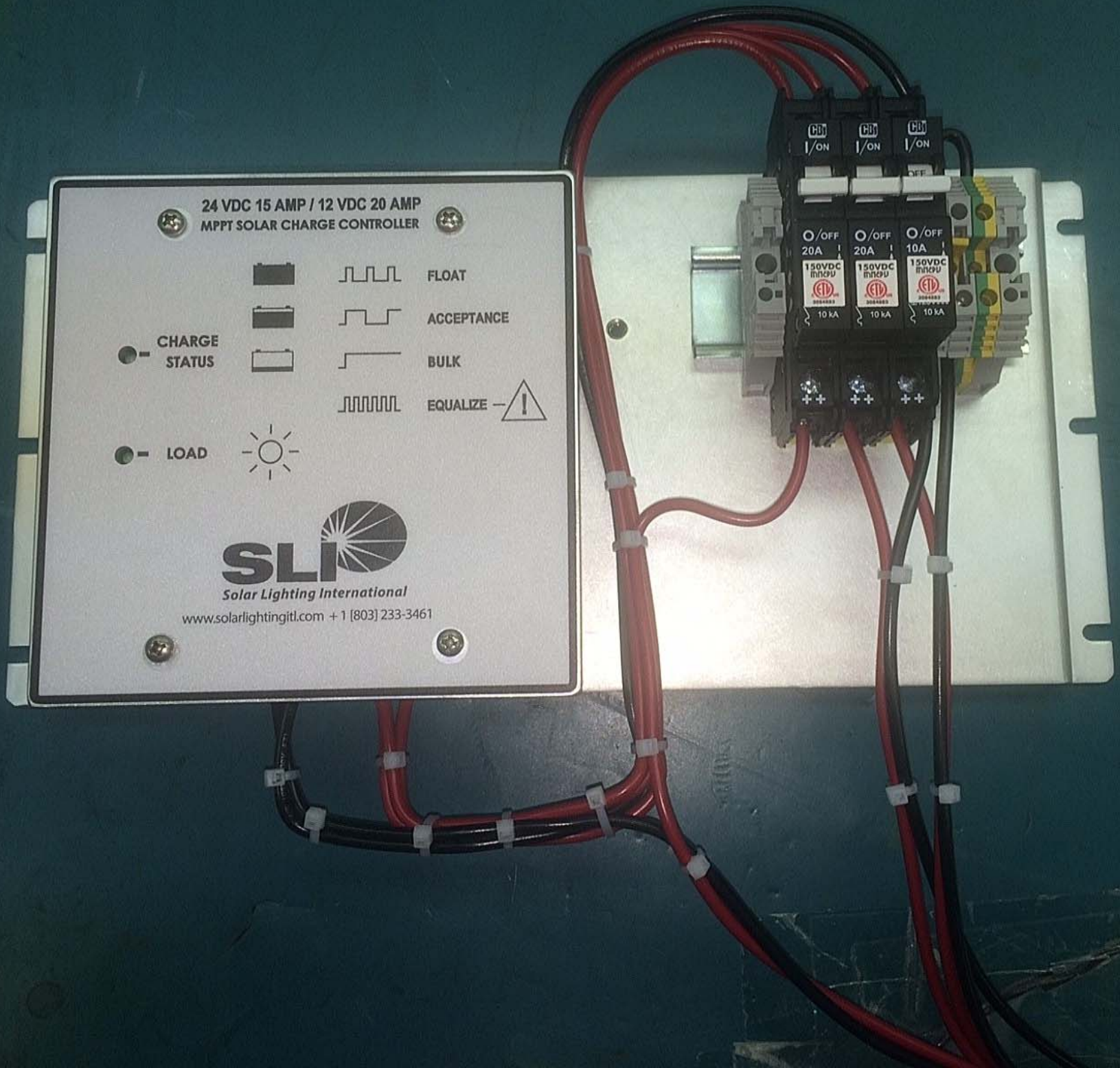
24 VDC 15 AMP / 12 VDC 20 AMP
MPPT SOLAR CHARGE CONTROLLER
CHARGE STATUS
FLOAT
ACCEPTANCE
BULK
EQUALIZE
LOAD
SLI
Solar Lighting International
www.solarlightingitl.com + 1 [803] 233-3461
ON
OFF
20A
20A
10A
150VDC
10 kA

# CERTIFICATE

This is to certify that

## Custom Manufacturing Services, Inc.

142 Brick Street
Princeton, WV 24740
United States of America

with the organizational units/sites as listed in the annex

has implemented and maintains a **Quality Management System**.

Scope:
The provision of custom metal fabrication and systems level integration of electro-mechanical assembly.

Through an audit, documented in a report, it was verified that the management system fulfills the requirements of the following standard:

## ISO 9001 : 2008

| | |
|---|---|
| Certificate registration no. | 10000410 QM08 |
| Date of original certification | 1995-02-27 |
| Date of certification | 2015-07-17 |
| Valid until | 2018-07-16 |

**UL DQS Inc.**

Ganesh Rao
Managing Director

## Annex to Certificate
## Registration No. 10000410 QM08

# Custom Manufacturing Services, Inc.

142 Brick Street
Princeton, WV 24740
United States of America

| Extended Location | Scope |
|---|---|
| **10002998**<br>**Custom Manufacturing Services, Inc.**<br>**400 Rogers Street**<br>**Princeton, WV 24740**<br>**United States of America** | The off-site at 400 Rogers Street, Princeton, WV performs the following primary functions: metal fabrication and assembly. |

This annex (edition: 2015-07-17) is only valid in connection with the above-mentioned certificate.

## Annex to Certificate
## Registration No. 10000410 QM08

# Custom Manufacturing Services, Inc.

142 Brick Street
Princeton, WV 24740
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| Extended Location | Scope |
|---|---|
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