

LED FLOODLIGHTING

Christy Floodlighting Ltd Dukes park Industrial Estate Chelmsford Essex CM2 6UW 01245-451212 sales@christyuk.com

CHRISTY LIGHTING MASTS



Newhall School 350 lux Hockey Pitch

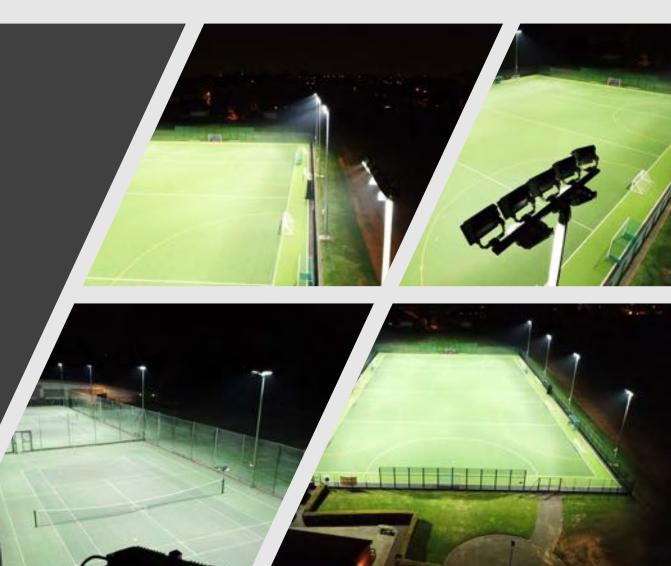
- Latest generation LED floodlighting scheme installed on existing hockey pitch
- 350 lux from just 40A per phase
- Reduced spill lighting
- 30KVA compared to 65KVA for metal halide
- Costs savings of up to £106,000 over the lifetime of the installation
- CO₂ Savings of 221,600 Kg





James Allen Girls School Sports Centre 350 Lux Hockey Pitch & 2 No. Tennis Courts

- Upgrade of existing metal halide floodlights on hockey pitch and 2 tennis courts to latest generation LED floodlights
- Improved lighting
- 10 year manufactures guarantee on floodlights and drivers
- Up to £125,000 cost savings in running costs and lamp replacements over lifetime of installation
- CO₂ savings of over 283,200 Kg



St Teresa's School - Effingham 350 Lux Hockey Pitch

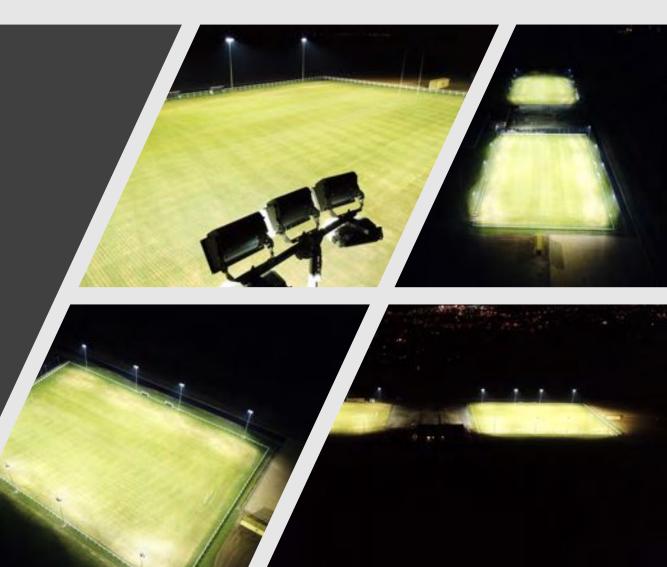
- New floodlighting system to existing hockey pitch
- Lit to 350 lux
- Requires just 38A per phase
- Tight spill lighting control
- Costs savings of up to £107,000 over lifetime of installation after additional cost of LED compared to metal halide
- CO₂ savings of up to 218,800Kg compared to metal halide





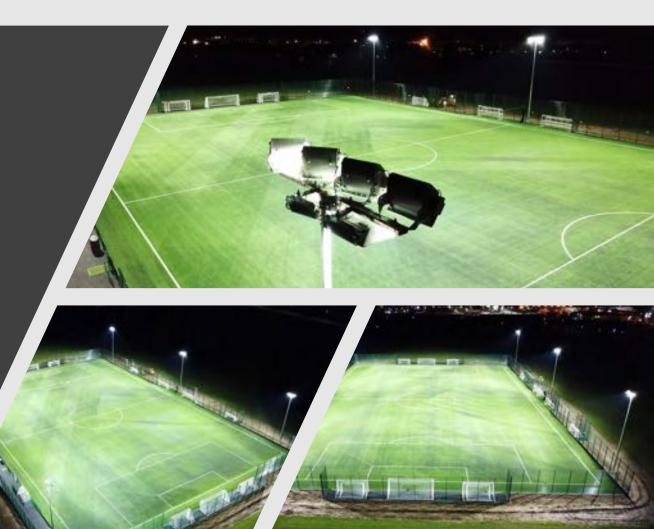
Wymondham Rugby Club 200 Lux and 100 Lux Rugby Pitches

- New installation of latest generation LED floodlights to a 200 lux grass rugby pitch and a 100 lux grass training rugby pitch
- Improved lighting
- 10 year manufactures guarantee on floodlights and drivers
- Up to £86,600 cost savings in running costs and lamp replacements
- Tight spill control
- CO₂ savings of up to 80,700 Kg



Ketts Park 200 Lux Football Pitch

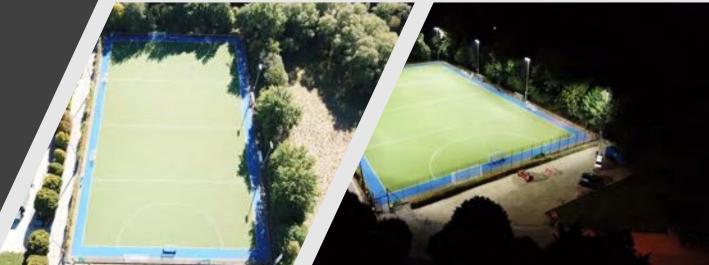
- New football pitch
- Lit to 200 lux with latest generation floodlights
- Requires just 38A per phase
- Tight spill lighting control
- Costs savings of up to £62,000 over lifetime of installation compared to metal halide
- CO₂ savings of up to 157,100Kg compared to metal halide



Oxford University - Iffley Road Sports Ground 350 Lux Hockey Pitch

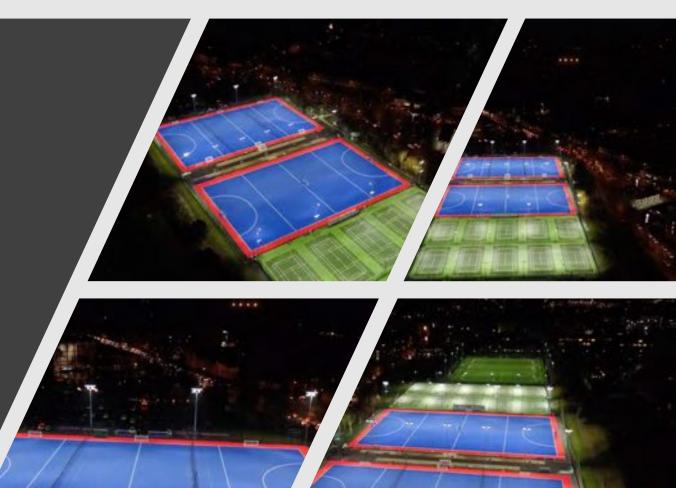
- Replacement of existing metal halide floodlights to a 350 lux hockey pitch
- Improved lighting
- 10 year manufactures guarantee on floodlights and drivers
- Significant cost savings in running costs and lamp replacements
- Tight spill control
- Cost savings of up to £126,000
- CO₂ Savings of up to 294,800 Kg





Birmingham University - Sports Ground 2 no. 500 Lux Hockey Pitches 10 no. Tennis Courts & 1 no. 200 lux Rugby Pitch

- Install LED floodlights to newly built pitches
- 10 year manufactures guarantee on floodlights and drivers
- Significant cost savings in running costs and lamp replacements
- Tight spill control
- Cost savings of up to £506,720
- CO₂ Savings of up to 872,000 Kg



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350 LUX HOCKEY PITCH

- Just ??A per phase compared to ??A per phase for metal halide
- ??KVA Compared to ??KVA for metal halide
- Cost savings of up to £??,??? over the lifetime of the installation
- CO₂ Savings of ???,???Kg

All columns designed and manufactured in the UK by Christy Lighting Masts





GigaTera

MEETS ENVIRONMENTAL ZONE E2



CHRISTY LIGHTING MASTS LTD

Giga**Tera**

James Allen Girls School

Tennis Courts

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CHRISTY LIGHTING MASTS LTD



400 LUX TENNIS COURTS

- Just 11A per phase compared to 23A per phase for metal halide
- 5KVA compared to 10.3KVA for metal halide
- Cost savings of up to £45,500 over the lifetime of the installation
- CO₂ Savings of 67,200KG
- 10 Year manufacturers guarantee on floodlights and drivers

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CHRISTY LIGHTING MASTS LTD

GigaTera Latest Generation 3 LED Floodlights As Used In 2018 Winter Olympics



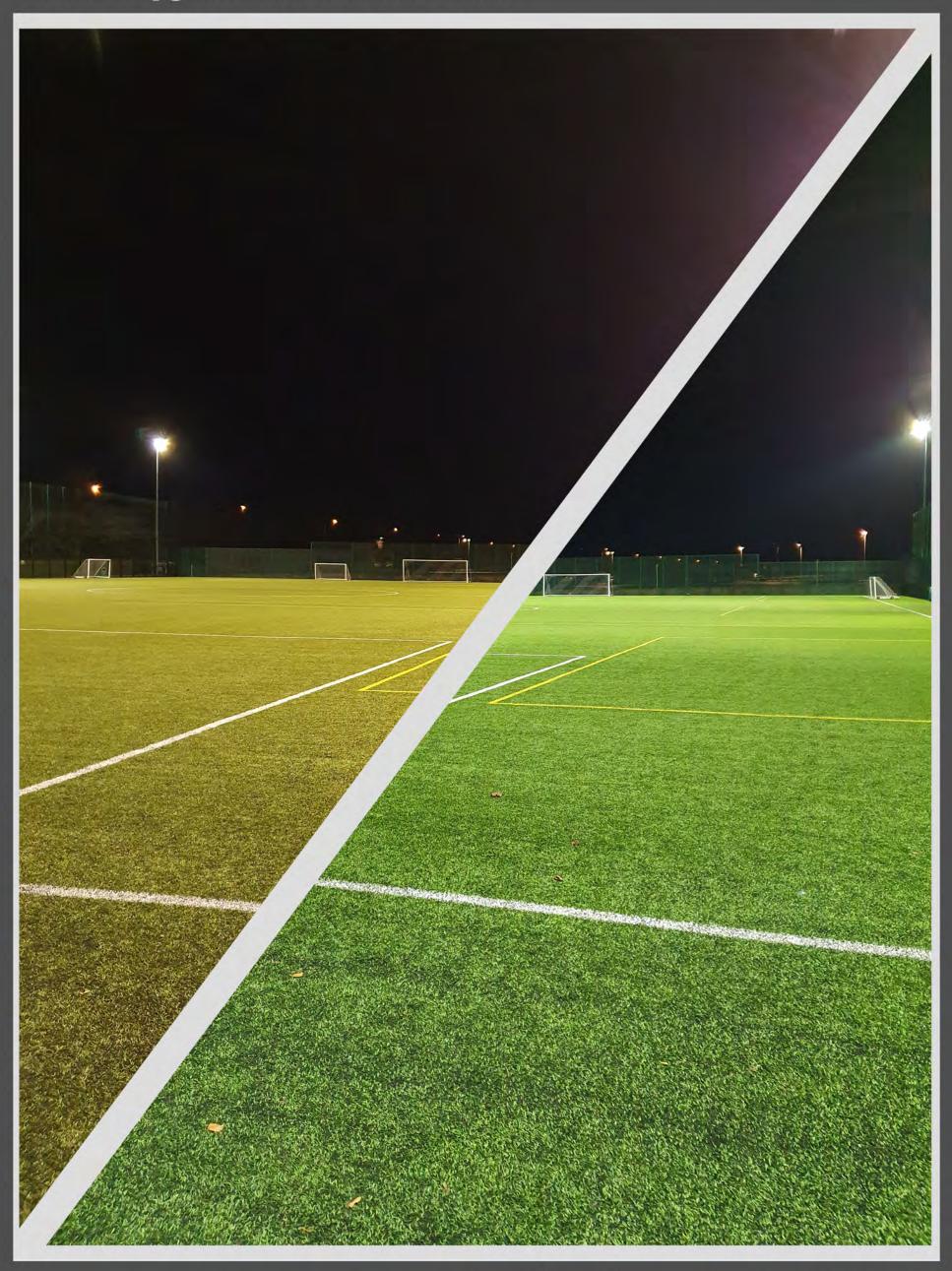


CHRISTY LIGHTING MASTS LTD



CHRISTY LED UPGRADE

Before Upgrade - 2kW Metal Halide - 200lux



Post Upgrade - GigaTera MAF800 - 2001ux

GigaTera LED floodlights provide significant improvment to visual impact

CHRISTY LIGHTING MASTS LTD GigaTera

CHRISTY FLOODLIGHTING UK Agent for GIGATERA LED. LED. Lighting Solution Football & Sports Field

AIMED AT PERFECTION IN LED SPORTS LIGHTING !!

- MINIMUM LIGHT POLLUTION & PSYCHOLOGICAL GLARE IMPACT TO NEIGHBORING AREA
- REDUCE POLE HEIGHT, LUMINAIRE QUANTITY & PROJECT COST THANKS TO ADVANCED OPTIC DESIGN
- FLICKER-FREE, HIGH UNIFORMITY FOR VIDEO RECORDING, BROADCASTING & PLAYERS
- COMPACT SIZE, LESS WEIGHT & WIND LOAD ENABLING RESUE OF EXISTING POLES & STRUCTURE
- SMART CONTROL & DYNAMIC LIGHTING EVENT
- SUPERIOR HEAT MANAGEMENT & LUMINAIRE LIFE TIME
- MAXIMUM ENERGY SAVING & FASTER ROI



GigaTera Lighting

GigaTera Lighting's holding company, KMW Inc., was founded on January 10, 1991 and a publicly traded company (KOSDOQ in Korean stock market) based in Hwasung City, South Korea.

KMW is the global market leader in the 5G wireless infrastructure market and LED lighting segment.

- Over 2000 employees worldwide & annual turnover around USD 700 millions in FY2019 consolidated.
- Research and development center in South Korea, California in USA and Shaanxi Province in China to support worldwide customers
- Manufacturing presence in South Korea, China and Vietnam.
- Over 10 customers are listed in Fortune 500 companies
- LED lighting business started from 2010 with its own brand name "GigaTera Lighting".

GigaTera Lighting's core LED lighting solutions are flood lighting in sports and industrial application as well as street lighting and high bay. GigaTera LED products are field proven quality from many global project references and also provide unique & smart light control solutions combined with advanced network system technology.





WHO WE ARE

The world leader in LED sports lighting industry

GigaTera Lighting is a world-class Total Lighting Solution provider with high power LED lighting(sports, harbor, and industrial). Our proprietary "Narrow Multi-Beam Forming" application is leading the market with cutting-edge manufacturing technology with the highest efficiency, reliability and most competitive price.

WHAT WE OFFER

Sports Lighting / Global lead of IoT Total Solution

GigaTera Lighting has been providing customers with non-flicker technology, superior color quality guarantee, and various event / entertainment solutions for the UHD broadcasting, which is based on communication technology for 25 years.

We are also taking the lead in building a smart safe city that can secure various kinds of disaster, crime safety and golden time by integrating IoT / ICT technology of smart lighting with image detection and sound source detection.

FACILITIES

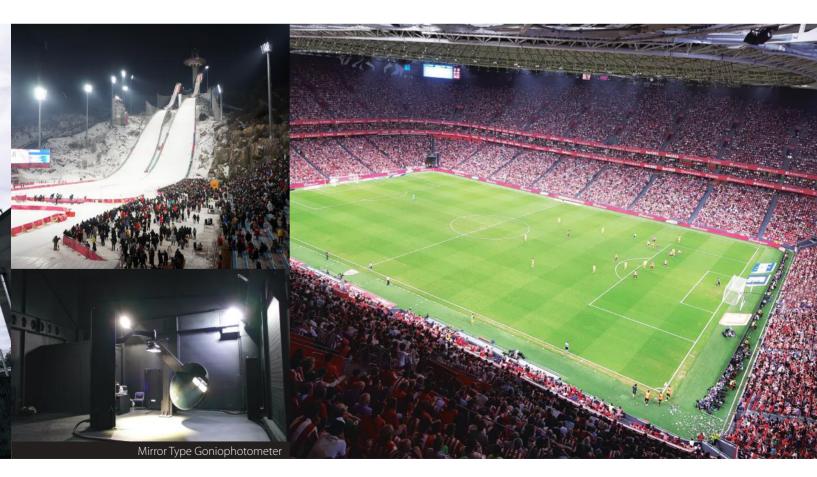
Manufacturing and R&D facilities in Korea and World wide. GigaTera Lighting produces high-quality LED products with state-of-the-art production, equipment and innovative engineering.

WHAT WE OWN

Build vertical integration system from R&D to mass production

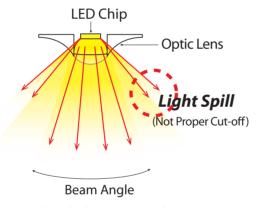
GigaTera Lighting has built up a vertical sequencing system from R&D to mass production, with over 260 patents and registered top engineers (CRAZY LAB).

In addition, GigaTera Lighting has state-of-the-art reliability equipment, large chamber facilities, innovative manufacturing lines and technologies. We are also building global networks such as USA, Europe, Japan, India, Middle East and Southeast Asia.

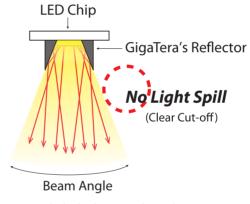


What differentiated GigaTera Lighting?

- MINIMUM LIGHT POLLUTION & GLARE TO PLAYERS & NEIGHBORING AREA
- NO NEED (OR MINIMUM USE) OF BAFFLE & VISOR ONTO POLE OR FIXTURE
- NO IMPACT TO POLE STRUCTURE & WIND LOAD
- COST-EFFICIENT, FAST, EASY REPLACEMENT & CONSTRUCTION



▲ light leakage causes glare



▲ no light leakage and no glare

✓ Advanced Full Cut-Off Technology

GigaTera Lighting's optic design has a structure that features full cut-off beam applying the unique reflector technology. This solution minimizes the light spill, while maximizing the useful lumens to the field, which ensures that the athletes can focus on the game and the spectators can enjoy a comfortable viewing experience. Also, it helps to reduce pole height and minimize total project costs including pole and installation, while complying with the strengthened local regulation in light pollution or psychological glare impact in neighboring area without use of baffle or visor onto the pole or luminaire.

Thus, GigaTera LED flood lighting solution is the best choice to not only minimize the cost, but also minimize the concern about the pole structure and wind load in both replacement and new construction of the sports field lighting.

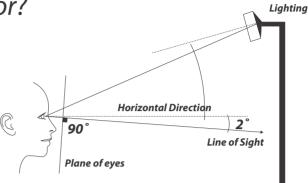




Glare Rating Requirement < 50° (In Simulation) Traditional requirement is based on Viewer's Aspect up to 30° from horizontal line of sight ($\Delta \le 30^\circ$)

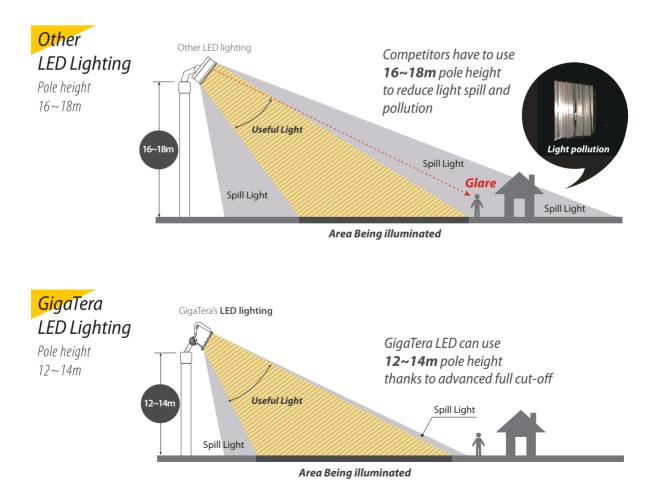
Glare causes a distraction in the game!

Players look beyond 30° (In Reality) In a sports game, players always look upwards beyond the horizontal line of sight ($\Delta \ge 30^\circ$)



✓ Why GigaTera LED solution can Save total project Cost ?

Other LED lightings using normal lens optic must use 16~18m pole height to avoid glare and light pollution. However, GigaTera's advanced optic solution enables to use only 12~14m pole height, which can realize significant savings in total project costs.



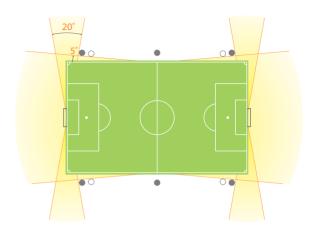




The design should eliminate momentarily strong, glaring light as much as possible and increase the overall uniformity.

Shadows and inadequate vertical plane luminance impede athletes and spectators and these issues should be solved through the design.

The design must prevent light pollution by taking account of the surrounding environment.



Recommendation of Minimum Lighting Levels

Sport	Illuminance Level (Em. Horizontal) Lux * (Non CTV)									
	Clas	ss II	ClassIII							
	Em (Lux)	Uo (Min/ave)	Em (Lux)	Uo (Min/ave)	Em (Lux)	Uo (Min/ave)				
Football	200	0.6	100	0.5	75	0.5				

※ EN 12193

- Class I : Top Level Competition

- Class II : Intermediate Level Competition

- Class III: Lower Level Competition & Suspervised Training

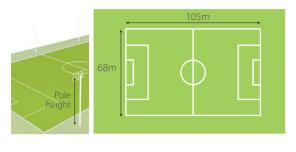
* Em is the Maintained Illuminance Level (specification level) and is the design illuminance level, below which the lighting should not be allowed to fall during the period to planned maintenance.

Required Quantities by Products

	Lux		75 lux			100 lux			150 lux			200 lux	
Heigh	nt of pole	12m	14m	16m	12m	14m	16m	12m	14m	16m	12m	14m	16m
4	SMA600	12	12	12	16	16		24	24		32	32	
pole	МАН900						12			16			20
	МАН600			*12(1)									
	SMA600	12	12	*12(2)	16			24			32		
6 pole	MAH800						*12(1)						
r	MAH900								18	18			
	MAH1K0					12	*12(2)					18	18
	SMA600	12	12		16	16		24			32		
8	MAH800			8			12						
pole	MAH900								16	16			
	MAH1K0											16	16

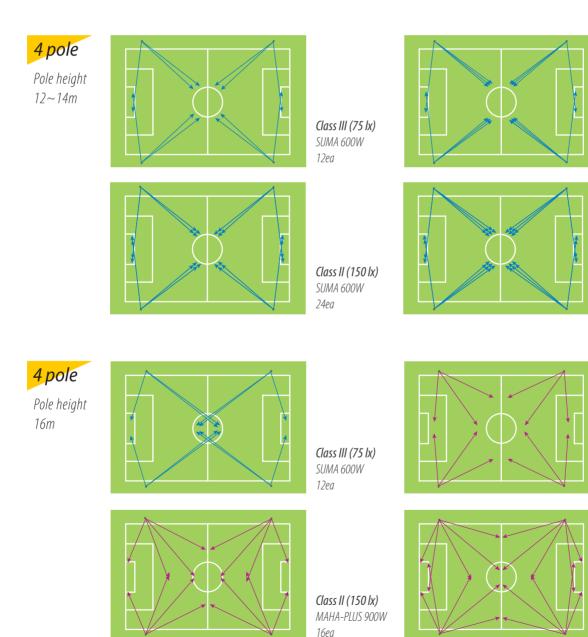
* (1), (2) : options

✓ Football field LED Design & Product Guide



Football field conditions

Installation products : SUMA / MAHA-PLUS series Football field size : 105m x 68m Pole q'ty : 6 pole / 4 pole LLF(maintenance factor) : 0.8



Class III (100 lx) SUMA 600W 16ea

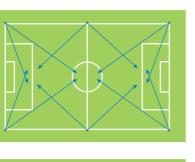
Class II (200 lx) SUMA 600W 32ea

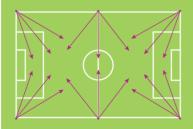
Class III (100 lx) MAHA-PLUS 900W 12ea

Class II (200 lx) MAHA-PLUS 900W 20ea



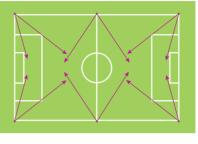
6 pole Pole height 16m





Class III (75 lx) SUMA 600W 12ea





Class III (100 lx) MAHA-PLUS 1000W 12ea

Class II (200 lx)

18ea

MAHA-PLUS 1000W





MAHA-PLUS

Outstanding Asymmetric Light Distribution Excellent luminous efficacy 150 lm/W Optimized design for flood light Smart lighting control using wireless or receptacle

Remote & Built-in Driver type

Model	Power	Luminous Efficacy	Luminous Flux	Color Temperature	CRI
MAH1KO	1000W	125 /m ////	135,000 lm		
MAH900	900W	135 lm/W	121,500 lm	4000K	70Ra or 80Ra
MAH800	800W	120 lm/W	96,000 lm	5000K	
MAH600	600W	150 lm/W	90,000 lm		80Ra





SUMA

Light Distribution to Far Area High luminous efficacy 120 lm/W Full Cut-off & Minimized Glare Outstanding Cooling Technology

Remote & Built-in Driver type

Model	Power	Luminous Efficacy	Luminous Flux	Color Temperature	CRI
SMA600	600W	120 lm /W/	72,000 lm	4000K	700 a
SMA400	400W	120 lm/W	48,000 lm	5000K	70Ra



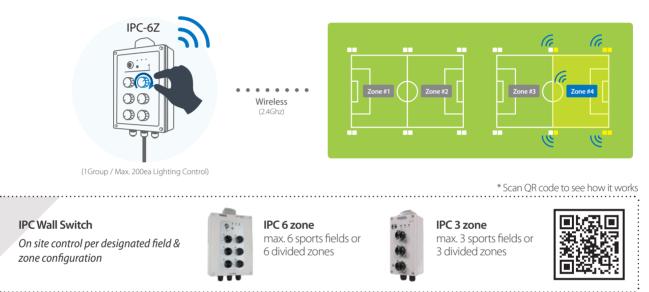
✓ GigaTera Lighting Smart Control for Sports Field



On site control using Intelligent wireless wall switch

Cost-efficient, easy & simple manual control (Scan QR code to see how it works)

- Additional energy saving by dimming for unoccupied field
- Intelligent Wireless Control unit (IPC Wall Switch) to be installed with AC power nearby sports field (Example : Maintenance Office, Security Post etc)
- Independent light control per each training field (Example : Control Knob No. 1 can control Field No. 1)



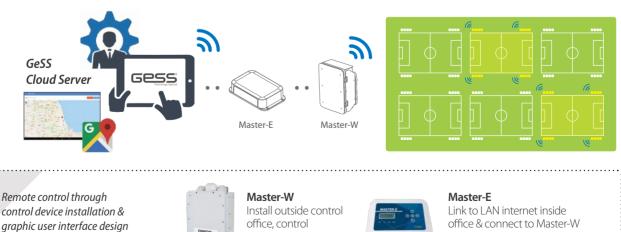


Remote control using Cloud Service & Smart phone

GESS

Highly efficient & value-added remote control targeting facility management

- Control the LED lighting by Mobile Tablet via Cloud Server operated by GigaTera
- Support to Several Control Mode which are User ON/OFF Time, Sunrise/Sunset and Manual Mode.
- Support to Google Map API Control

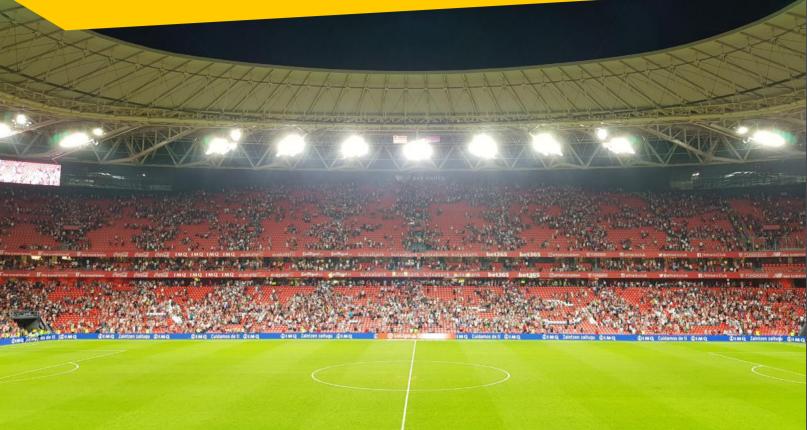


max. 200 LED fixtures

with cable

GigaTera GigaTera

Reference



San mames Stadium, Bilbao / Spain



Birmingham University, Rugby & Football field / UK



Oxford University, Rugby & Football field / UK



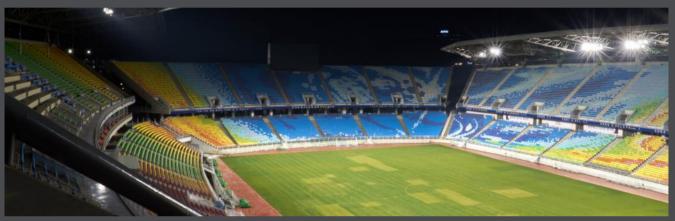
Football Field, Freiburg / Germany



Kyeongju Football Field / Korea



NY Yankees Stadium / USA



Suwon Wolrdcup Stadium / Korea



Football Field in Groeninger / Netherlands



Yangpyeong Sports Facility / Korea



Polo & Equestrian Field, Dubai / UAE



Footsal Field / Japan



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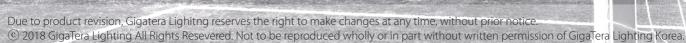
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Gigatera Latest Generation LED Floodlights

Giga Tera '

LED Flood Lighting - Area Flood Lighting

SMA SUMA

CB ⊕ C€

Excellent light distribution even at long distance

 High luminous efficacy 105 lm/W Tilting structure for optimized aimIng (Upward : 90°, Downward : 90°) · Wired/Wireless dimming controls Outstanding cooling technology and durability



Specifications	
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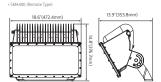
Application

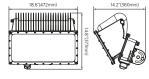
specino	ations								* Tolerance : ± 5%
Driver Type	Model	Power	*Luminous Efficacy	*Luminous Flux	Color Temperature	CRI	Weight	Input Voltage	Operation Temperature
Built-in	SMA400	400W	105 lm/W	42.000 lm	5000K (3000K, 4000K	70 Ra	12.5 kg / 27.6 lb	AC200~240V AC200~277V	-30°C~55°C
Remote	SMA400	40077	TUS INVW	42,000 IIII	available)	70 ha	10.3 kg / 22.7 lb	DC100V (RED)	-22°F~131°F

Body Cover Cast Aluminum Tempered Glass 4T (Clear) Finish Powder Coating

Mounting Option Swivel Bracket Light Distribution Asymmetric Wide Remote Type - Wired (RS-485) / Built-in Type - Wireless Control System 体 more details of Remote Driver(RED)

Dimensions







The above specifications were updated in July 2018 / The content may be subject to change without notice.





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Asymme 1 on 1 re Outstan Excellen Smart lig	eplacement f nding cooling nt light distrik ighting contro on	istributior for HID flo g technolo bution and rol using w	n enabling o ood light ogy and dura d minimized vireless or Re	d glare	our, Yard	ł	IP 66		. <u>MAH600</u>
pecificat Driver		Power	*Luminous Efficacy	*Luminous Flux	Color Temperature	CRI	Weight	Input Voltage	* Tolerance : ± 5% Operation Temperature
Type Built-in	MAH600	600W	150 lm/W	90,000 lm			20.0 kg / 44.0 lb	AC220~240 V AC200 ~277 V AC347~480 V	-22°F~131°F -30°C~55°C
	MAH500	500W	150 lm/W	75,000 lm			15.0 kg / 33.1 lb	AC220~240 V AC200 ~277 V	-22°F~122°F -30°C~50°C
	MAH400	400W	150 lm/W	60,000 lm			15.0 kg / 33.1 lb	AC100~240 V AC120~277 V AC347~480 V	-22°F~131°F -30°C~55°C
	MAH250	250W	150 lm/W	37,500 lm	5000K (3000K, 4000K, 5700K available)	80 Ra	7.5 kg / 16.6 lb	AC220~240 V AC200~277 V AC347~480 V	-22°F~131°F -30°C~55°C
	MAH200	200W	150 lm/W	30,000 im	J ours around any		7.5 kg / 16.6 lb	AC100~240 V AC120~277 V AC347~480 V	-22ºF~131ºF -30°C~55°C
	MAH150	150W	145 lm/W	21,750 lm			7.5 kg / 16.6 lb	AC100~240V AC100~277V	-30°C~60°C -22°F~140°F
Remote	MAH500	500W	150 lm/W	75,000 lm			11.3 kg / 24.9 lb	DC100V (RED)	-22°F~131°F -30°C~55°C
	MAH400 Cast Aluminum Tempered Glass Powder Coating	4T (Clear)	Ligi	60,000 lm punting Option ght Distribution introl System	Swivel Bracket / Pole / Asymmetric Wide Wireless / NEMA-7 Rec Wimore details of Remote D	ceptacle / W		e Driver Type Only)	
Cover									

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