



KIGHT

OFF GRID
SOLUTIONS

KIGHT_{LTD.}



KV2

KIGHT LTD.

Off-Grid Hybrid Solar Wind Street Lighting - Product Specifications (KV2)

The KV2 has been designed as a standalone DC, off grid, LED Street Lighting Luminaire coupled with Hybrid solar PV, wind turbine, solar charge controller, battery storage and smart lighting control & monitoring.

Our range of standalone, off-grid solutions have many unique selling propositions, such as our patented solar holder. Our unique design means that our solar panels sit vertically down the column shaft and can be stacked to provide additional renewable energy generation and increase the output power of the lantern, to meet various operational requirements. The positioning of the solar holder also ensures it captures the maximum available solar radiation, especially during winter days, when the sun is low in the sky.

Our innovative design means that our solar panels require no maintenance, as they are self-cleaning, do not collect dust or snow like traditionally mounted solar panels, ensuring sufficient solar generation, without large solar panels sticking out of the column, whilst at the same time guaranteeing the lantern is operational throughout the year.

In operational deployment our solutions measured lumen output and lighting spread outperforms traditional grid connected, comparable street lanterns, from both an output and spread perspective. In addition, our lantern and solar holder are both rotary moulded from recycled plastic, which can also be fully recycled at the end of its very long life, making our solutions truly green.

The nature of the construction of our lanterns and solar holder means that they are extremely robust, exceeding the IK10 specifications, making our solution vandal proof and perfect for city wide, off-grid and coastal deployment. In addition, being rotary moulded, means our lanterns and solar holders do not require powder coating, ensuring our solutions maintain their appearance without degrading throughout their very long lifetime.

Technical Specifications

- Solar PV cells** - 2.6W / 125x125mm / Relative efficiency at low light 97.3% / Si Polycrystalline / 0.4% annual degradation
- Solar Charge Controller** - MPPT / 99% efficiency
- Battery Storage** - 192Ah of useable energy / 95% Round Trip Efficiency / li-ion / 1% annual degradation
- Wind Turbine** – KLE-300
- Luminaire** - Rotary Moulded 12v, producing 183 lumens per watt. (Total Lumen 2200)

Turbine	Rated Power [W]	Hub Height [m]	Peak Power Coefficient [C _p]	Valid Power Curve Air Density [kg/m ³]
KLE-300	300	5	0.34	1.23

Tables 1, 2 & 3 demonstrate KV2 operational effectiveness across three locations in the UK, Plymouth, Birmingham & Glasgow

Plymouth Table 1 – Plymouth wind plus solar PV results

Month	Generation PV (Wh)	Generation Wind (Wh)	Generation (Wh)	Available Energy	Demand	Gen < Demand	Days - Gen < Demand	Average SOC	Days - Storage < Demand
Jan	2,273.45	29,784.06	32,057.51	30,150.09	4,656.00	25,494.09	0	100%	0
Feb	2,545.34	21,162.38	23,707.72	22,297.11	3,936.00	18,361.11	0	100%	0
Mar	5,069.55	19,067.67	24,137.22	22,701.06	3,636.00	19,065.06	0	100%	0
Apr	6,961.82	11,367.03	18,328.85	17,238.28	2,724.00	14,514.28	0	100%	0
May	7,808.02	12,839.39	20,647.42	19,418.89	2,016.00	17,402.89	0	100%	0
Jun	7,816.29	9,065.72	16,882.01	15,877.53	1,440.00	14,437.53	0	100%	0
Jul	7,182.91	9,888.04	17,070.95	16,055.23	1,728.00	14,327.23	0	100%	0
Aug	6,161.02	10,520.22	16,681.24	15,688.70	2,520.00	13,168.70	0	100%	0
Sep	5,478.62	11,351.10	16,829.72	15,828.35	3,192.00	12,636.35	0	100%	0
Oct	3,677.12	17,553.22	21,230.33	19,967.13	4,056.00	15,911.13	0	100%	0
Nov	2,688.08	24,818.64	27,506.73	25,870.08	4,572.00	21,298.08	0	100%	0
Dec	1,960.76	29,235.46	31,196.22	29,340.05	4,836.00	24,504.05	0	100%	0
							0		0

Birmingham Table 2 – Birmingham wind plus solar PV results

Month	Generation PV (Wh)	Generation Wind (Wh)	Generation (Wh)	Available Energy	Demand	Gen < Demand	Days - Gen < Demand	Average SOC	Days - Storage < Demand
Jan	2,428.03	8,782.50	11,210.53	10,543.50	4,776.00	5,767.50	0	100%	0
Feb	2,356.23	6,381.06	8,737.29	8,217.42	3,924.00	4,293.42	1	100%	0
Mar	4,942.30	6,197.75	11,140.04	10,477.21	3,588.00	6,889.21	0	100%	0
Apr	6,719.45	3,571.99	10,291.45	9,679.10	2,688.00	6,991.10	0	100%	0
May	6,859.90	4,953.65	11,813.55	11,110.64	1,788.00	9,322.64	0	100%	0
Jun	7,441.19	2,728.51	10,169.69	9,564.59	1,080.00	8,484.59	0	100%	0
Jul	7,104.92	3,059.25	10,164.17	9,559.40	1,464.00	8,095.40	0	100%	0
Aug	5,666.89	3,291.50	8,958.39	8,425.37	2,364.00	6,061.37	0	100%	0
Sep	5,359.24	3,587.32	8,946.56	8,414.24	3,156.00	5,258.24	0	100%	0
Oct	3,450.03	4,686.06	8,136.09	7,652.00	4,080.00	3,572.00	1	100%	0
Nov	2,456.41	6,459.79	8,916.20	8,385.69	4,560.00	3,825.69	2	100%	0
Dec	2,124.73	7,496.56	9,621.28	9,048.82	4,836.00	4,212.82	1	100%	0
							5		0

Glasgow Table 3 – Glasgow wind plus solar PV results

Month	Generation PV (Wh)	Generation Wind (Wh)	Generation (Wh)	Available Energy	Demand	Gen < Demand	Days - Gen < Demand	Average SOC	Days - Storage < Demand
Jan	1,452.94	10,567.00	12,019.94	11,304.75	4,992.00	6,312.75	1	100%	0
Feb	2,539.24	6,158.02	8,697.26	8,179.78	3,936.00	4,243.78	2	99%	0
Mar	4,539.78	7,697.46	12,237.24	11,509.12	3,492.00	8,017.12	0	100%	0
Apr	6,596.58	4,733.00	11,329.58	10,655.47	2,448.00	8,207.47	0	100%	0
May	8,009.58	4,900.89	12,910.47	12,142.29	1,344.00	10,798.29	0	100%	0
Jun	7,461.22	2,270.82	9,732.05	9,152.99	720.00	8,432.99	0	100%	0
Jul	7,423.14	2,459.13	9,882.26	9,294.27	1,008.00	8,286.27	0	100%	0
Aug	6,246.58	3,278.56	9,525.14	8,958.39	2,064.00	6,894.39	0	100%	0
Sep	4,651.53	5,307.28	9,958.81	9,366.27	3,036.00	6,330.27	0	100%	0
Oct	3,085.65	5,739.68	8,825.33	8,300.22	4,020.00	4,280.22	2	99%	0
Nov	1,937.51	7,118.47	9,055.98	8,517.15	4,668.00	3,849.15	2	99%	0
Dec	1,226.39	8,259.48	9,485.87	8,921.46	5,100.00	3,821.46	2	98%	0
							9		0

Tables 1, 2 & 3 demonstrate that KV2 generates sufficient energy to be operational 365 days of the year, with only 9 days throughout the year where the battery is required to provide backup power.

For further enquiries please contact:

Dan Goodman

M: +44(0)7931 559 958

E: dan@kight-ogs.co.uk