



KIGHT

OFF GRID
SOLUTIONS

KIGHT_{LTD.}



KV3

KIGHT LTD.

Off-Grid Hybrid Solar Wind Communication platform - Product Specifications (KV3)

Our off-grid communications platform has been designed to enable IoT communications and smart city functionality in locations where grid connected power is not available.

The KV3 has been designed as a standalone off-grid platform, powering a range of LoRaWAN and proprietary gateways, to enable smart sensor-based solutions. Our off-grid solution utilises hybrid solar PV, Wind Turbine, solar charge controller and battery storage.

KV3 has been designed to be deployed across multiple verticals, including agriculture and farming, active travel, car parks, waste solutions and estate management.

Technical Specifications

- 1. **Solar PV cells** - 2.6W / 125x125mm / Relative efficiency at low light 97.3% / Si Polycrystalline / 0.4% annual degradation
- 2. **Solar Charge Controller** - MPPT / 99% efficiency
- 3. **Battery Storage** - 192Ah of useable energy / 95% Round Trip Efficiency / li-ion / 1% annual degradation
- 4. **Wind Turbine** – KLE-300
- 5. **Gateway options:** Multitech, TTOG, Lorix, Tektelic & proprietary gateways

Case study - Remote monitoring of livestock in rural Scotland

Figure 1 – Map showing the location of the site



The table below shows the generation of solar and wind generation. This shows how many days during the year are not covered by generation from the wind & solar and stored in the battery.

Table 10 – West of Huntley 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	1,397.15	21,148.50	22,545.65	21,204.18	5,952.00	15,252.18	0	100%	0
Feb	2,279.19	13,687.66	15,966.85	15,016.82	5,376.00	9,640.82	1	96%	0
Mar	4,388.17	15,054.79	19,442.96	18,286.11	5,952.00	12,334.11	0	91%	0
Apr	6,591.12	9,966.16	16,557.28	15,572.12	5,760.00	9,812.12	0	93%	0
May	7,895.06	8,524.73	16,419.78	15,442.81	5,952.00	9,490.81	0	94%	0
Jun	7,247.50	5,076.48	12,323.98	11,590.70	5,760.00	5,830.70	1	58%	0
Jul	6,944.37	5,994.03	12,938.40	12,168.57	5,952.00	6,216.57	0	54%	0
Aug	5,364.26	8,222.68	13,586.94	12,778.52	5,952.00	6,826.52	1	55%	0
Sep	4,782.70	11,281.75	16,064.44	15,108.61	5,760.00	9,348.61	0	56%	0
Oct	2,928.74	13,022.99	15,951.74	15,002.61	5,952.00	9,050.61	0	57%	0
Nov	1,593.83	16,371.77	17,965.60	16,896.65	5,760.00	11,136.65	0	59%	0
Dec	980.37	16,618.08	17,598.45	16,551.34	5,952.00	10,599.34	0	60%	0
							3		0

Table 10 shows the combined generation of the solar PV, wind energy, and battery stored energy.

Total annual battery backup requirement is well within acceptable limits at 19%, thereby confirming the system has sufficient energy available throughout the year to provide a continuous LoRaWAN communications platform.

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