



Case Study IE-Soar™ 650W

MetaVista's liquid hydrogen powered UAV

MetaVista Inc is a South Korean based liquid hydrogen specialist. The company has developed an ultra-light weight liquid hydrogen storage tank. The MetaVista liquid hydrogen system coupled with IE-Soar™ 650W, provides a significant 1865Wh/kg energy density.

MetaVista set a new record with a 10 hour and 50 minute flight to demonstrate the capability of its hydrogen liquid fuelled multi-copter. The test flight used 390g of liquid hydrogen inside a specially designed 6L cylinder.

MetaVista's core technology and expertise were showcased

in many aspects of the test flight, including liquid hydrogen production and an ultra-light liquid hydrogen tank. Due to the efficient insulation for such a small drone tank, MetaVista had to develop a new cryogenic technology for optimised liquid hydrogen storage.

MetaVista integrated the IE-Soar™ 650W with the support of the Intelligent Energy team.

Intelligent Energy's IE-Soar™ modules provide a unique solution to extend flight times to UAVs, something that is currently constrained by the limitations of batteries.

“Our aim was to significantly increase the flight time for commercial UAV operators. Using the lightweight IE-Soar™ 650W, we have been able to achieve this. The Intelligent Energy team has worked closely with us and we are delighted to be working with them. Together with our liquid hydrogen production and storage expertise, it has proved to be a successful partnership.”

Dr Jong Baik, CEO of MetaVista Inc

Intelligent Energy's air cooled fuel cell systems run on hydrogen and ambient air to produce clean DC power in a simple, cost-effective, robust and lightweight package. They have a higher energy to mass ratio than battery based systems and can be refuelled in a few minutes.

Intelligent Energy's hydrogen fuel cell technology enables your UAV fleet to fly significantly longer and can improve the run-time of other mass sensitive electrically powered technology. The IE-Soar™ can be integrated into a variety of UAVs including motor rotor and fixed wing. They can directly replace the battery in most existing applications.

MetaVista Zero features

- Highly extended flight times (up to 10 hours+)
- Multi-fuel system (LH₂, GH₂)
- Flexible tank design for accommodating customer requirements
- Super insulated LH₂ storage tank
- Ultra-light weight
- Facile control of hydrogen boil-off gas
- Adjustable insulation performance
- Easy adaptation to various fuel cell systems

Technical specification

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| • Flight time | ~10 hours+ (variable) |
| • Payload | Variable |
| • Volume of LH ₂ storage tank | Variable |

IE-Soar™ 650W

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|----------------------------|----------------------|
| • Maximum continuous power | 650W |
| • Maximum peak power | 1000W |
| • Output voltage | 19.6V–25.2V |
| • System lifetime | 1000h (non-decaying) |
| • Hybrid battery | 1300mAh |

Features of IE-Soar™

- Higher energy to mass ratio than batteries
- Lightweight
- Can be refuelled in minutes
- Modular, scalable systems
- Simple balance-of-plant
- Zero emission
- Can be retro-fitted onto existing UAV or built into proprietary design
- FCC and CE certified

Applications for IE-Soar™

- Survey and inspection
- Search and rescue
- High quality aerial photography
- Precision agriculture
- Parcel delivery
- Warehouse inventory
- Law enforcement
- Military
- Robotics
- Portable power



+44 (0) 1509 271 271
sales@intelligent-energy.com
intelligent-energy.com

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