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CONNECTING THE WORLD'S ASSETS

CASE STUDY

Reefer genset innovator Genmark incorporates advanced telematics capabilities from ORBCOMM

Dutch innovator Genmark has developed a range of lightweight, easy-to-operate, fuel-efficient and environmentally friendly reefer container gensets, including a world-first design for use on extending road chassis. And it has turned to ORBCOMM telematics as an integral part of the solution.

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There are over 40,000 generator sets (gensets) in active service around the world today, providing mobile power to keep reefer container shipments cool where no fixed electricity supply exists. Used in rail, road, barge, port, depot and DC operations, the importance of the genset to the containerized cold chain should not be underestimated. Keeping units on power maintains cold chain integrity, safeguarding temperature-controlled shipments and ensuring compliance with food and pharmaceutical regulations, such as FSMA and GDP.

The Company and Concept

Founded in 2014 as a daughter company of Trademark Leasing & Trading B.V., Netherlands-based Genmark B.V. has developed a new generation of generator sets for use with refrigerated shipping containers (reefers).

Drawing on many decades' hands-on experience in the design, operation and maintenance of refrigerated transport equipment, the Genmark team, led by company founder and owner Eric Breddels, set out to innovate the humble genset with a range of lightweight, fuel-efficient and easy-to-use machines.

The 'user-centric' designs respond to the real-world challenges facing operators and service technicians every day out in the field. That includes, for instance, mounting and dismounting units on chassis and reefer containers, operating and servicing the microprocessor controllers time pressure, poor weather conditions, busy facilities and operatives who may not be 100% familiar with the

Over-the-road operators also need to optimize payload while complying with road vehicle weight and axle loading limits: the heavier the genset, the less the cargo carrying capacity. Then there are the increasingly tough laws governing noise and air pollution from commercial transport operations and vehicles, especially in built-up urban environments.

Innovative thinking and technology

These considerations and challenges were top of mind during the extensive R&D process. All of the resulting models share common design features and principals to maximise performance and sustainability while optimizing total cost of ownership.

To start with, units are simple to operate, with a straightforward microprocessor controller. "Gensets really don't need fancy electronics," says Breddels. In fact, the units can run entirely without electronics in emergency cases. As well as making operations easier, the simpler controller aids in-field troubleshooting and servicing.

Fuel consumption is reduced by running at lower rpm, made possible by the of a permanent-magnet alternator designed especially for the transportation industry. The improved fuel efficiency has also allowed Genmark to reduce the tank size (although larger fuel tanks can be supplied as an option.) Along with other design and engineering modifications, and selection of materials, the reduced tank size has helped Genmark produce a much more compact and lightweight genset.

The engine-alternator combination offers 94-95% efficiency compared to standard generators which typically only achieve 80-86%, explains Genmark. The lower operating rpm has a direct impact on noise levels, too. Finally, off-the-shelf parts, such as filters, are used to reduce operational costs and make M&R easier.

Today, Genmark offers four main standard variants:

The clip-on model, which fits onto the 'nose' of a refrigerated container (hence also sometimes known as a nose-mount)

The undermount model (also known as 'underslung'), which fits underneath a road chassis. A new undermount model was introduced in May this year, giving users the option to fit the controller unit onto the chassis and offering even lower weight, fuel consumption and noise https://www.linkedin.com/pulse/new-genmark-undermount-eric-breddels

The modular design, a unique genset which "can fit almost any kind of chassis" and was specially designed for use with flexible/extending container chassis - where none of the standard generator sets will fit. The modular unit is ultra-low weight and soundproofed, adds Genmark, making it highly suitable for use in urban/domestic areas.

The truck model, designed to fit onto the truck itself, rather than the container chassis. This new unit, on trial since May 2016 for full commercial launch in Q3 2017, is an alternative to traditional power take-off (PTO) systems. With limited options for plugging into independent electric power, it's not uncommon for truck drivers in Europe to leave their trucks idling and use PTO to keepreefer containers running when they are not on the road, for instance overnight at truck stops. This practice eats extra fuel and puts undue stress on the truck, says Breddels, and new EURO 6/VI emission rules now forbid idling in night time rest hours. The TR4 has been designed to fit onto container haulage tractors as an alternative to PTO use or for mounting onto road transport refrigeration trucks. The unit works independently from the truck engine and can supply power both to the reefer unit and to the truck cab. Using the truck-mounted option, adds Breddels, companies who change chassis often also will not need a genset to be fitted on each new chassis, giving them greater flexibility to haul reefer containers.

> "We designed our gensets with telemetry in mind and the ORBCOMM solution is a perfect fit for us" says Genmark's Eric Breddels.

As well as its standard range, Genmark designs and builds bespoke units to meet specific customer needs. The company also continues with R&D work to develop innovative solutions for changing market demands - such as its new TR4 design - not least to reduce noise and air pollution in line with tougher rules on diesel equipment including Euro 6/VI in the EU and the California Air Resources Board (CARB) TIER IV regulations in the US. The company is continuing work with chassis builders, too, to perfect the genset/chassis marriage and deliver the lightest possible weight without compromising robustness.

Partnering for remote intelligence and control

While Genmark adopted a 'keep it simple' approach to electronics in its genset designs, it also wanted to provide remote operational intelligence and control functionality. The company found its solution in ORBCOMM's XT 4760 GPRS/GSM telematics device.

The XT 4760 is a rugged, compact 'plug-and-play' device that enables two-way monitoring and control of chassis, gensets, flatbeds and other powered assets. As an economical alternative to more sophisticated tracking solutions, it offers a flexible messaging schedule that provides up-to-date reports and real-time alerts on asset status, location (including geo-fencing) and history. In regular operation, the device is powered by the genset, but will keep transmitting for up to 90 days when it is off power – helping to track down mislaid or stolen gensets.

The device used by Genmark is also equipped with sensors to monitor fuel levels, helping to optimize fuel usage and detect fuel fraud and theft. It detects when gensets are in motion and can be used to monitor and control engine activation and deactivation, sensing the current condition and giving authorised users the ability to remotely turn the genset on or off.

Operators can also ascertain 'reefer connected' status, allowing them to track whether the genset is actually connected to, and powering, a reefer container. Conversely, this function allows them to identify when a unit is not hooked up and running, but should be i.e. someone forgot to connect the reefer box to a genset. This is a not uncommon issue in busy ports and yards and one which can lead to cargo damage and claims.

Information from the telematics devices can be viewed and actioned via CargoWatch, one of ORBCOMM's SaaS applications, which allows authorised users to monitor real-time status, alerts and alarms from any internet-connected device.

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From tracking the precise location of gensets on the move and on the ground in ports and other facilities, to monitoring fuel levels and usage, remotely detecting and controlling whether units are on or off, whether they are connected to a reefer container, and if there is any equipment malfunction, telematics deliver multiple benefits and return on investment (ROI) in improved asset utilisation, operational efficiency, M&R management and regulatory compliance.

Contact us today at sales@orbcomm.com or 1-800-ORBCOMM to see how our solutions portfolio can enhance the way you do business, or visit us at www.orbcomm.com for more information.

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