

egtsTM
electric
 **taxiing**
system



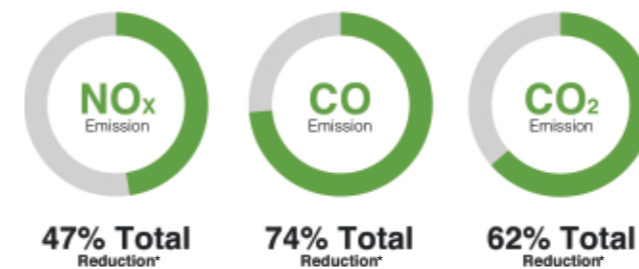
**A DEPARTURE
FROM EVERYTHING
WE KNOW**

AN INNOVATION THE AIRLINE WORLD IS TURNING TO

EGTS™ electric taxiing system can significantly improve airline operational efficiency and slash carbon emissions

With rising operating costs, squeezed budgets and environmental concerns at the top of the agenda for many airlines, a viable solution to achieving higher efficiency and greener operations is urgently needed. No wonder the industry is turning to EGTS.

Developed by a joint venture between Honeywell and Safran, this revolutionary system will reduce fuel burn, improve operational efficiency and help to protect the environment by slashing carbon and other emissions created during runway taxi operations. This also contributes to a significant positive effect on aircraft Direct Maintenance Costs for airlines.



*Emission reduction for typical EGTS cycle compared to dual engine taxi





360° THINKING

Today's turbofan engines are optimized for flying, not for powering aircraft on the ground. Every time an airliner taxis, it burns a disproportionate amount of fuel between the gate and the runway. This becomes even more of an issue for short and medium-haul aircraft, which spend a relatively long time taxiing between runway and gate, compared to the actual length of the flight.

With electric motors located on the main landing gear and powered by the Auxiliary Power Unit (APU) generator, EGTS allows aircraft to pushback from the gate without a tug tractor, and taxi without the use of engines. In other words, the aircraft taxis using only electric power until just a few minutes before take off – and then again a few minutes after landing, respecting the necessary warm up and cool down time of the engines.



EGTS is optimized for short or medium-haul flights operating out of busy airports

LOWER FUEL BURN, GREATER SAVINGS



When taxiing, today's global short-haul aircraft fleet can burn as much as five million tons of fuel per year. Using EGTS instead of engines for taxiing will result in a significant reduction in fuel consumption – a breath of fresh air for carriers looking to minimize their annual fuel bills. For an Airbus A320 making a 500 nautical mile flight, estimated savings will be around 3 to 4%, compared to standard taxiing procedures.

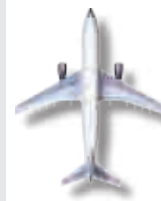


**EGTS can deliver
up to 4% savings of
total block fuel
consumption**



Increased performance, less congestion

Another key advantage of EGTS is that aircraft equipped with the system will be able to 'pushback and go' more quickly than they are able to do at present. This will have a positive knock-on effect – reducing both gate and tarmac congestion, as well as improve on-time departure performance and ultimately airport gate capacity. Good news for airports, airlines and their passengers.



Pushbacks. A huge step forward

Because EGTS makes the aircraft completely autonomous on the ground, aircraft departure from the gate will no longer be dependent upon the availability of the tug tractor, thus improving on-time departure performance.

Less noise, less pollution

With no engines running, ground crew will be able to operate in a much healthier and safer environment. This new technology will also have a significant impact on airport noise and emissions pollution, offering a reduction of up to 75% in carbon and up to 50% in Nitrogen Oxide (NO_x) emissions compared to current levels.

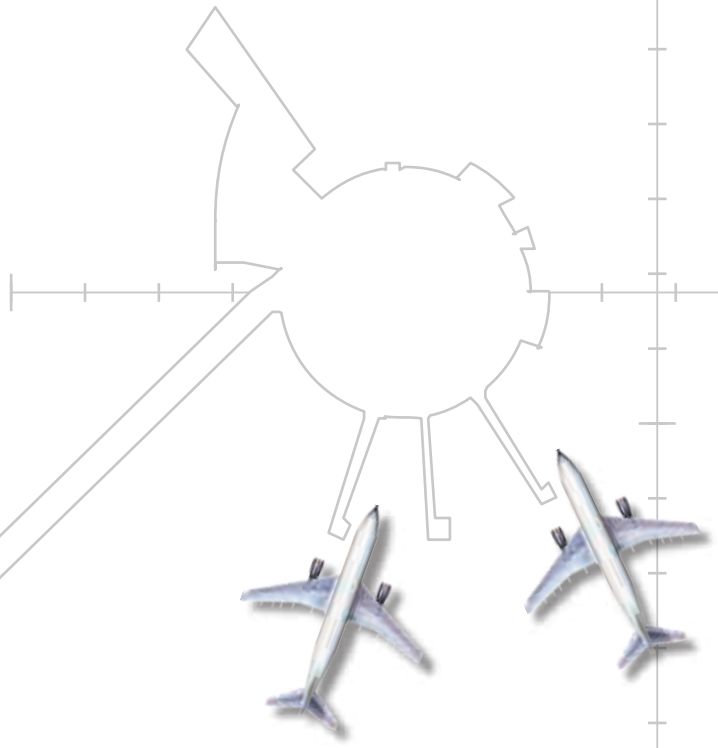


**50%-75%
IN TAXI
EMISSIONS
REDUCTION
AT AIRPORTS**

AN INNOVATION THE AIRLINE WORLD IS TURNING TO

'EGTS CAN SIGNIFICANTLY IMPROVE OPERATIONAL EFFICIENCY AND SLASH CARBON EMISSIONS.'

INCREASED PERFORMANCE, LESS CONGESTION



LOWER FUEL BURN, GREATER SAVINGS



'EGTS IS OPTIMIZED FOR SHORT OPERATING OUT OF BUSY AIRPORTS'



'GREEN TAXIING CAN RESULT IN ANNUAL FUEL BURN SAVINGS OF UP TO 4%'



RESULT THE BEST OF BOTH WORLDS

THE LAST WORD IN EFFICIENCY

'EQUIPPING EGTS ON SINGLE-AISLE AIRCRAFT IS EQUIVALENT TO REMOVING 400 CARS FROM THE ROADS IN TERMS OF FUEL AND CO2 EMISSIONS.'

LESS NOISE, LESS POLLUTION

'50%-75% IN EMISSIONS REDUCTIONS AT AIRPORTS'



THE RIGHT SYSTEM AT THE RIGHT TIME

A HUGE STEP FORWARD



ANNUAL RATE OF CHANGE 0.1°E

Pilot Interface Unit

Allows the pilot to switch on EGTS and order the desired aircraft motion (forward or backwards).

EGTS Controller

Receives and converts actions into orders to the power electronics.

Wheel Actuator

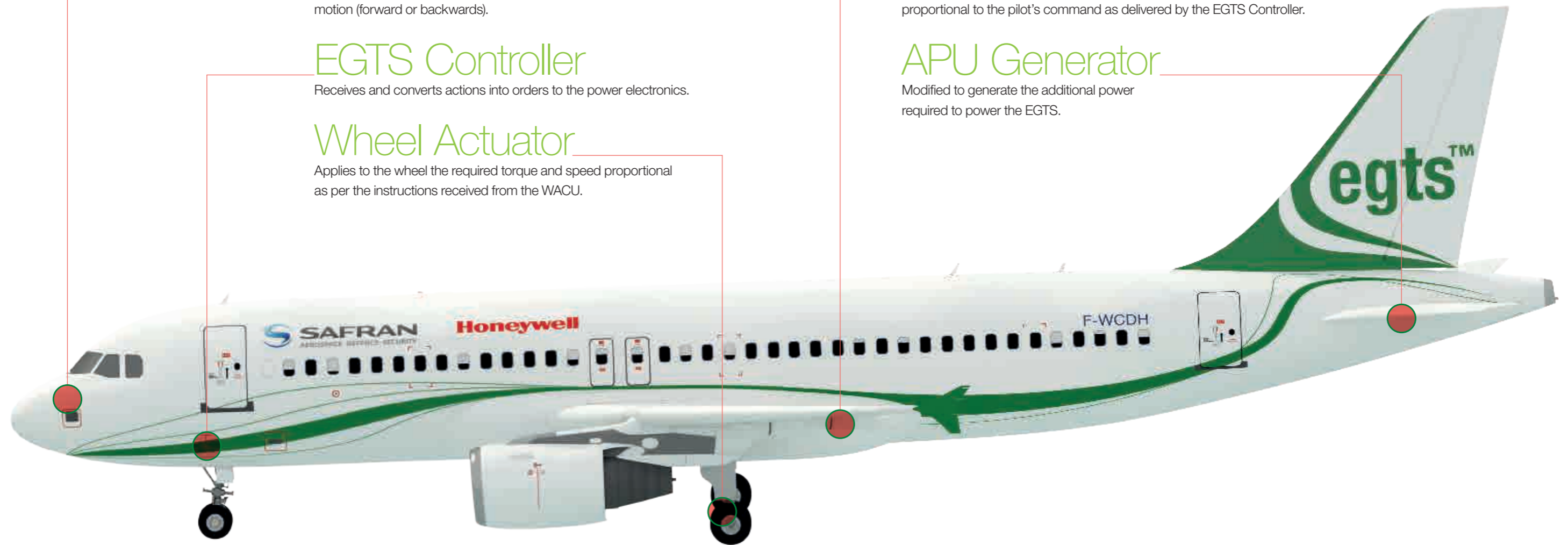
Applies to the wheel the required torque and speed proportional as per the instructions received from the WACU.

Wheel Actuator Controller Unit (WACU)

The WACU converts current into instructions to the electrical motor proportional to the pilot's command as delivered by the EGTS Controller.

APU Generator

Modified to generate the additional power required to power the EGTS.



EGTS: HOW IT WORKS

Airlines are seeking innovative ways of reducing their carbon footprint and operating costs, so this technology is of great interest.

The facts:

- Eliminates the need for tractors/tugs for ground operations
- Improves On Time Performance with 'pushback and go'
- Increases safety for ground personnel
- Limits Foreign Object Debris (FOD) damage on the main engines
- Reduces noise at the gate area

The figures:

- Up to **4%** in fuel block savings, meaning on average more than **\$200,000** savings per aircraft, per year
- **60%** reduction in pushback time
- Up to **50%** reduction in NO_x emissions
- Up to **75%** reduction in carbon emissions



FIRST-CLASS PARTNERS

A growing number of the world's leading operators of single aisle aircraft have signed up to support the advancement of EGTS. Our partners will provide valuable assistance in refining estimated savings due to the system and quantifying other operational benefits.





THE RIGHT SYSTEM AT THE RIGHT TIME

EGTS is targeting entry into service on the next generation of single-aisle aircraft, shortly followed by a retrofit option.

Electrical energy generation and management is an increasingly important factor in tomorrow's aircraft. This revolutionary system will deliver improved efficiency, greater cost savings and help meet new noise and emissions regulations.

Don't get left behind.
Fit the future.
Fit EGTS.



**THE BEST OF
BOTH WORLDS**

Honeywell

 **SAFRAN**
AEROSPACE · DEFENCE · SECURITY

EGTS™ was born out of a partnership of two of the biggest names in aviation innovation – Honeywell and Safran. Honeywell's experience and expertise lies in the design and manufacture of APUs and avionics, whilst Safran is an acknowledged world leader in landing systems. In addition, both companies have complementary capabilities in electric power systems and systems integration.

egts™

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