

## AEROSPACE

*Application: A380 Aircraft Door Actuation*



The Airbus A380 is a double-deck, wide-body, four-engine jet airliner manufactured by Airbus. It is the world's largest passenger airliner. The A380 entered commercial service in October 2007 with Singapore Airlines. The A380's upper deck extends along the entire length of the fuselage. This gives the A380-800's cabin 478 square meters of usable floor space, 40% more than the next largest airliner, the Boeing 747-8 and provides seating for up to 853 people in an all-economy class configuration. The A380-800 has a design range of 15,700 km sufficient to fly nonstop from Dallas to Sydney, and a cruising speed of about 900 km/h at cruising altitude.

### *Project: Aircraft Door Actuation*

The A380 has a large number of passenger doors. They are heavy and would require a high number of cabin staff to operate them. The A380 passenger aircraft doors were therefore the first to be operated automatically. Three actuators are involved: "Lift" to lift the door out of its cabin-pressure security position, "Swivel" to open the door, even in a crash situation, when the aircraft is lying on its side, and "Lock". These actuators are fully autonomous; the mechanics, electric motors, controllers and power supply needed to operate them are integrated into the door. This ensures that they can operate even when the main electrical supply of the aircraft fails.

### *MACCON contribution:*

For this project MACCON designed the prototype actuators and controls. The Lift and Swivel actuators employed special torque motors with HD-gearbox reduction; the Lock actuator a linear ball-screw. Position feedback was provided by resolvers.

Motor and position control was implemented with MACCON SWM controllers. The doors can be commanded locally; communication was implemented via CAN-Aerospace. Local power is supplied by a 24V accumulator.

