Power management for Rail

Introducing power management, regenerative braking, and propulsion system capabilities for rail applications

Mature power management and propulsion technologies demonstrated in military and commercial applications reduce risk and time to market for rail operators.

BAE Systems’ power management technologies are used in the rail market on more than 8,000 locomotives, in the mass transit industry on more than 3,000 hybrid buses, and on various combat and tactical military vehicles.

These products can be used in conjunction with diesel electric trains (diesel multiple units, or DMU, type), electric-powered trains (electric multiple units, or EMU, type), and in light rail on trams, streetcars, and subways.

When used in a DMU, a high-power-density, liquid-cooled, permanent-magnet generator supplies power to an electric traction motor and an energy storage system. When used in an EMU, the catenary — or main propulsion power line — supplies power to the electric traction motor and the energy storage system.

The electric motor turns the propulsion wheels, giving the train smoother acceleration with no sudden jerks. When the train slows, the motor acts as a generator to recapture energy for later use.

The energy storage system provides power during acceleration and to supplement the traction system. The lithium-ion batteries in the HybriDrive propulsion system are lighter, longer-lasting, easier to maintain, and more efficient than competing alternatives.

The propulsion control system — a liquid-cooled, insulated-gate, bipolar, transistor-based, high-power-density power converter — directs the flow of energy to the right loads at the right time. For example, when the train needs to accelerate quickly, it draws power from the energy storage system and generator to drive the traction motor.

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For more information and specifications on BAE Systems’ full range of rail products, including power management systems, see our technical detail supplement.