

First 36 Flirt-type electric trains for MÁV-START equipped with Alstom's ETCS Level 2 train control system enter into service

- Alstom's digital control solution makes MÁV-START's Flirt electric trains safer and faster with a train control system that meets European standards
- Premiere for Hungary: the first retrofitting of electric trains with an ETCS train control system
- Alstom will equip a total of 59 Flirt electric trains with ETCS Level 2 and the project is expected to be completed in September 2023

20 February 2023 – Alstom, a global leader in smart and sustainable mobility, has reached an important milestone in the fleet modernisation project of the Flirt-type electric trains of MÁV-START - with European Train Control System (ETCS) Level 2, designed to increase the speed and safety.

The first 36 of 59 units have received the market authorisation license and are now back in passenger traffic equipped by Alstom's Atlas ETCS Level 2 L2 train control equipment that meets the strict European requirements. The entire project is scheduled for completion in September 2023, following a certification procedure involving extensive testing and verifications. Alstom was awarded this project through a public procurement process.

"In the history of Hungarian rail transport, this is the first case of electric trains being retrofitted with an ETCS train control system. The results confirm that this project successfully improves traffic safety and efficiency. Moreover, it was particularly important for us, as a company committed to the development of Hungarian railways, to install the equipment in MÁV START's Flirt electric fleet in Hungary, thanks to the work at our Szolnok site," says Gáspár Balázs, CEO of Alstom Transport Hungary.

The primary purpose of the European Train Control System (ETCS) is to monitor the movement of trains and enhance the safety of rail traffic in various operational situations. The system continuously calculates warning, operating and emergency braking speed profiles, and also monitors the authorised speed for both the train and the track. In full supervision mode, it is practically impossible for a driver to mistakenly ignore a red warning signal. The enhanced ETCS Level 2 provides continuous monitoring via GSM-R (the rail version of GSM).

Ultimately, ETCS Level 2 system improves traffic efficiency by allowing upgraded trains to circulate at higher speeds on lines where the track conditions allow, such as the Budapest-Székesfehérvár line, thus increasing the speed to a maximum of 160 km/h, compared to the previous speed of 120 km/h.

The first milestone of this complex project occurred three years ago, in January 2020, when Alstom obtained the conversion license for the Flirt electric multiple units. The production of the prototypes was followed by testing: the specifications required the trains to run 250,000 km without failure. Alstom was authorised by the Railways Authority to carry out type-approval durability tests on 5 prototypes. In

parallel with this process, pre-fitting started, followed by a final fitting in January 2022. The type-approval of the vehicle, which required an independent certification body to verify that the design, manufacture, and assembly of the vehicle complies with all European and national standards, was granted by the National Rail Authority in December 2022.

Alstom offers leading expertise in mainline signalling standards with over 120 ETCS projects worldwide, 19,200 onboard units and 13,300 km of equipped lines. In Europe, Alstom delivered 70% of ETCS-equipped trains in service.

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Leading societies to a low carbon future, Alstom develops and markets mobility solutions that provide sustainable foundations for the future of transportation. From high-speed trains, metros, monorails, trams, to turnkey systems, services, infrastructure, signalling and digital mobility, Alstom offers its diverse customers the broadest portfolio in the industry. 150,000 vehicles in commercial service worldwide attest to the company's proven expertise in project management, innovation, design and technology. In 2022, the company was included in the Dow Jones Sustainability Indices, World and Europe, for the 12th consecutive time. Headquartered in France and present in 70 countries, Alstom employs more than 74,000 people. The Group posted revenues of €15.5 billion for the fiscal year ending on 31 March 2022.

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