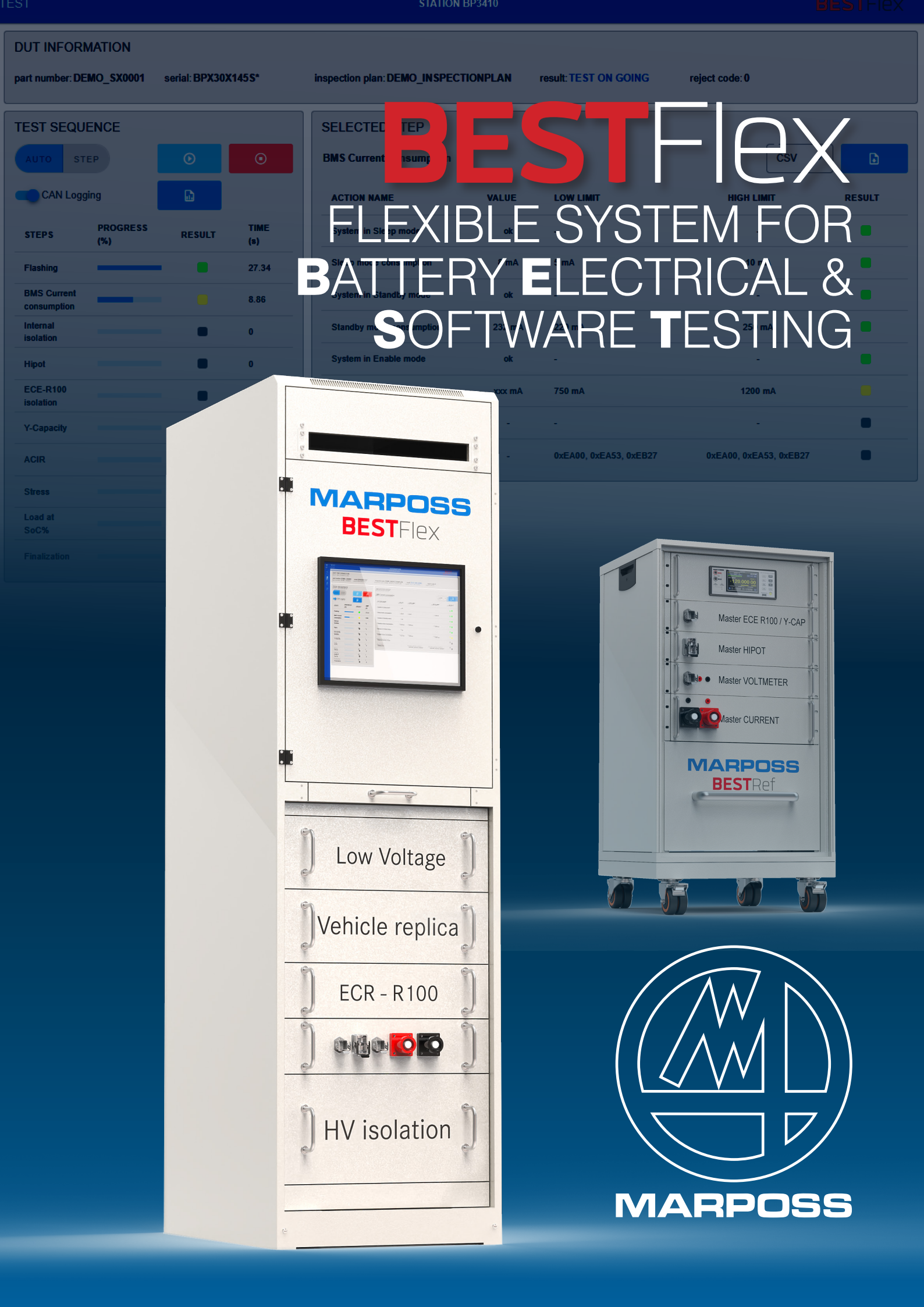
BESTFlex

FLEXIBLE SYSTEM FOR BATTERY ELECTRICAL & SOFTWARE TESTING



INTRODUCTION

The automotive industry is undergoing a radical transformation, with industrial processes progressively shifting from internal combustion propulsion systems towards electric traction solutions. In this new technological landscape, lithium-ion battery modules and packs have taken on a central role, setting new standards for testing, monitoring and traceability throughout the production process.
To meet these evolving demands, the BESTFlex system has been developed: a modular solution that can be seamlessly integrated into production lines for the automated testing of battery packs' functionality and safety. BESTRef is a mobile trolley that supports this system by enabling the periodic verification of measurements and instruments integrated in BESTFlex without requiring disassembly. This ensures measurement reliability and regulatory compliance while avoiding production downtime and optimising metrological maintenance.

DESCRIPTION

BESTFlex is a scalable testing architecture designed to evolve alongside industry standards. This comprehensive hardware and software solution is designed to deliver maximum adaptability, traceability and space optimisation in modern production environments.

Modular and Professional Design	→ A unified design for different types of test makes integration and maintenance easier while improving project scalability and giving it a robust and refined appearance.
No-Code Software Architecture	→ The integrated software features a graphical, node-based interface that enables users to easily and intuitively create and customise test sequences, without requiring any programming skills. This enables testing processes to be rapidly adapted to new battery models or customer specifications. It also includes integrated cybersecurity features.
Multilingual Online Help Supported by Artificial Intelligence	→ An integrated multilingual support system enhanced by AI-powered assistance enables users to access contextual help, troubleshooting guidance and support with test configurations in real time and in their preferred language.
Space Saving	→ Its high component density in a footprint that is 50% smaller makes it ideal for compact production lines.
No Constraints on Control Technology	→ The system is independent of the control platform and is compatible with both PC- and PLC-based architectures. It can also interface with any MES system.
No Integrative Technical Compromises	→ A unified 'black box' system that is ready to use and has been tested across multiple application scenarios. It has been built through standardised processes and is still highly adaptable and customisable, with no dependency on pre-existing standards.
Quick Replacement of Faulty Modules	→ Each module is functionally independent and can be easily replaced, which drastically reduces maintenance time.
Advanced Traceability	→ Every module has a unique serial number and is fully integrated into the line's traceability systems.

The available module types are tailored to customer specifications and may include the following, among the most common:

- **Performance tests (DCIR and ACIR) with temperature compensation.**
- **Insulation tests (ECE R100, HiPot and Y-Capacity)**
- **Voltage tests (up to 1500V) and Current tests (up to 1kA).**
- **Power Supply Source/Sink from 500 W to 2 MW in separate cabinets for HV and LV systems. Precharging function.**
- **Communication Protocol Testing: CAN, Ethernet, LIN, SPI, I2C, UART; including UDS, Free, Modbus, CCP/XCP protocols.**

The BESTRef trolley can be used to verify each of the above test modules.
BESTFlex and BESTRef enable manufacturers to achieve a new level of efficiency, reliability and compliance in battery testing and verification without compromising on flexibility or control.