SOFTRONIC
Innovation on rails, power without limits!

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SOFTRONIC

# About Us

Founded in 1999 in Craiova, Romania, with the primary goal of modernizing locomotives and producing railway safety equipment, Softronic has established itself as a leader in railway rolling stock construction.

With over 25 years of experience on the market, we are the only manufacturer in Southeastern Europe of multiunit electric trains and electric locomotives equipped with asynchronous motors.

Considering the significant growth in freight transport by rail as a sustainable mobility alternative, Softronic plays a key role in supporting the development of the manufacturing industry, which is on an upward path.

The company provides innovative products to clients in various regulatory environments tailored to the specific requirements of each country.

Thus, Softronic ensures solutions that reduce maintenance costs, generate energy savings, and extend lifespan.

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We aim to be a European leader in the manufacturing of electric locomotives, maintenance of railway equipment, and development of safety and monitoring systems.

Guided by the spirit of development, we contribute to the design of smart, digitalized mobility solutions while maintaining a balance between performance and environmental protection.

We are committed to:

- Manufacturing and supplying products and services that meet the highest standards of customer expectations.
- Increasing the company's profitability in an environment of intensified competition.
- Maintaining a high level of efficiency and performance in production processes, monitored through the Quality Management System.
- Complying with environmental protection standards by implementing an organizational culture that brings benefits and a positive impact on the environment.
- Providing a safe and supportive work environment for employees, to prevent workplace accidents and diseases.

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# MISSION

Meeting customer requirements is essential for us.
We listen carefully to their needs, using them as a guide for innovation and continuous improvement.

Feedback helps us deliver high-quality solutions, perfectly tailored to expectations, strengthening trust-based relationships and long-lasting partnerships.

# VISION

Softronic aims to become a European leader in the manufacturing of electric locomotives, passenger transport, and maintenance.

Through continuous innovation, we develop modern, digitally integrated solutions with a reduced environmental impact. We contribute to a more efficient, sustainable, and connected railway future, revolutionizing the transport industry.

# SUSTAINABLE DEVELOPMENT

The products manufactured by Softronic are designed to support sustainable mobility, having a significant positive impact on reducing energy consumption and improving the efficiency of goods and passenger transport. These innovative solutions contribute on enhancing the quality of transport services while minimizing negative effects on the environment and human health, both in transport activities and related infrastructures. By integrating these technologies, Softronic supports the development of more sustainable and responsible transportation.

Softronic implements a rigorous quality management system following the EN ISO 9000:2015 standard, which allows continuous monitoring of internal processes.

Through this system, we ensure that the products and services we offer are of the highest quality. Our goal is to maximize customer satisfaction on the medium and long term.

In this way, we are committed to continuously improving performance and meeting the most demanding market requirements.

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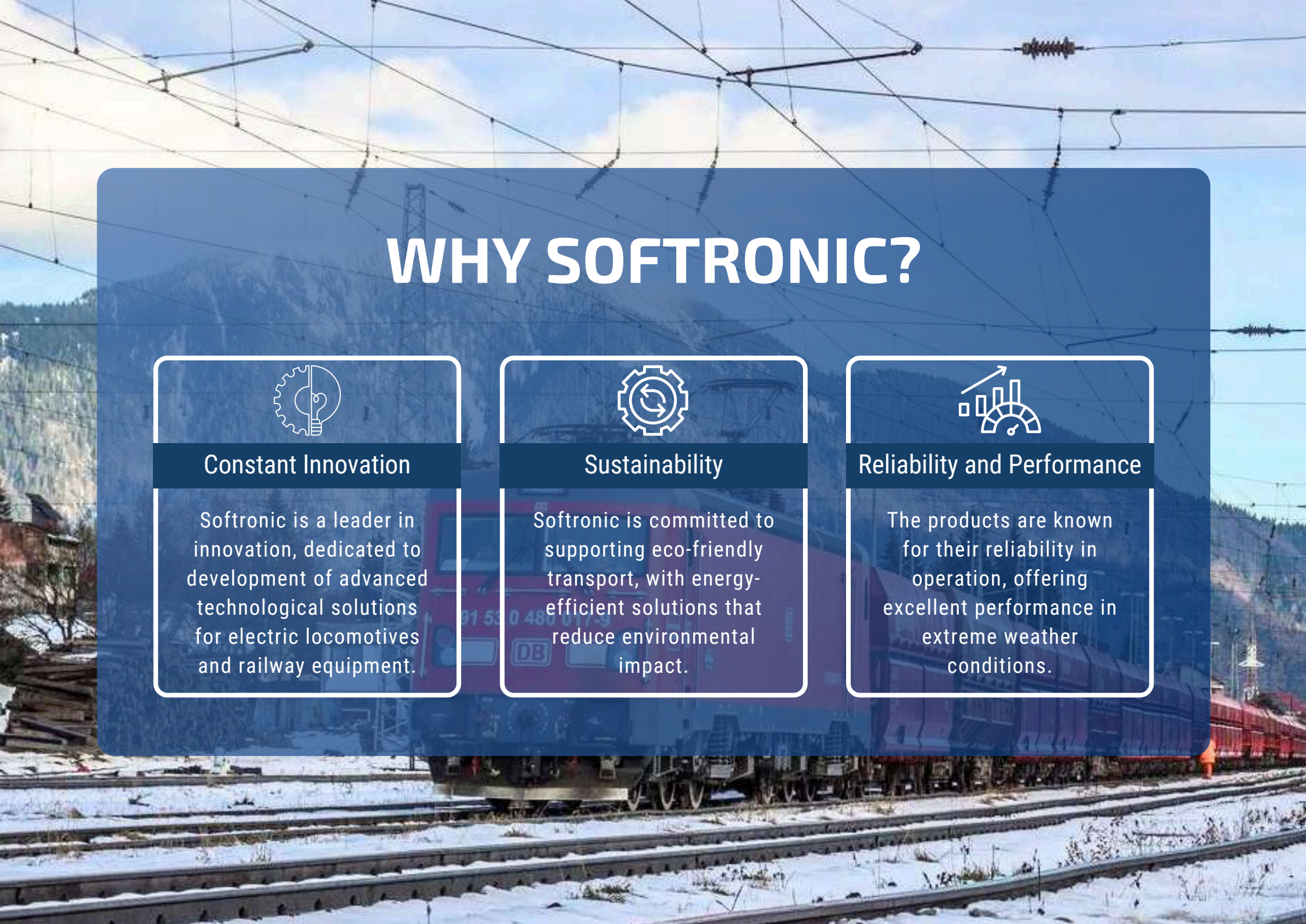
# QUALITY MANAGEMENT SYSTEM

# WHY SOFTRONIC?



## Constant Innovation

Softronic is a leader in innovation, dedicated to development of advanced technological solutions for electric locomotives and railway equipment.

## Sustainability

Softronic is committed to supporting eco-friendly transport, with energy-efficient solutions that reduce environmental impact.

## Reliability and Performance

The products are known for their reliability in operation, offering excellent performance in extreme weather conditions.

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## Long-Term Collaboration

Softronic builds strong partnerships, focusing on trust, transparency, and continuous development.

## Over 25 Years of Expertise

With extensive industry experience, the company guarantees superior quality products and services tailored to the needs of the international market.

## Premium Quality

Softronic is committed to delivering products and services of the highest quality, in compliance with the strictest international standards.

**25**
**Years of experience**

**+90**
**Manufactured locomotives**

**+75**
**Satisfied customers**

**+500**
**Employees**

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# PASSION FOR INNOVATION, TRADITION IN EXCELLENCE

So far, Softronic has redefined the railway industry through cutting-edge technologies and sustainable solutions. Discover our journey and the achievements that have built what we are today – one of the leaders in railway transport!

**1999**

Founded in 1999 in Craiova, Romania, Softronic carries forward over 50 years of local tradition in electric locomotive manufacturing, combining innovation and expertise to meet today's railway demands and future challenges.

**2002**

Founded in 2002, Softrans was created as a strategic partner to develop, test, and validate innovative technologies for Softronic, supporting ongoing research and product improvement.

**2003**

Just a year after its founding, Softrans locomotives entered freight service, delivering reliable performance and quickly gaining the trust of customers across multiple sectors.

**2008**

In 2008, Softronic Craiova launched "PHOENIX," its first newly built electric locomotive, showcasing the team's technical expertise and reinforcing the company's position in the locomotive manufacturing industry.

**2010**

In 2010, Softronic launched TRANSMONTANA, Romania's first electric locomotive with asynchronous traction motors—an innovation that marked a key milestone in both the company's evolution and regional railway technology, reflecting a strong commitment to performance and reliability.

**2013**

In 2013, Softronic developed the RES electric multiple unit, a bi-system model capable of operating under both 25 kV AC and 3 kV DC, showcasing advanced adaptability and setting new benchmarks in railway innovation.

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**2014**

Softronic reached a new milestone with the 14th TRANSMONTANA—its first bi-system model—enhancing the series' versatility by enabling efficient operation under both 25 kV AC and 3 kV DC.

**2014**

In 2014, Softronic introduced the TM017 – version 2.0, a fully redesigned model featuring a modernized look and major technical upgrades, marking a significant leap in performance and efficiency.

**2018**

The first Green Cargo locomotives (models 32 and 33) entered final testing ahead of delivery to Sweden. Redesigned for extreme conditions down to -40°C and equipped with a 1500 kN coupling system, they mark a major advance in performance, safety, and adaptability.

**2020**

In October 2020, Softronic and Green Cargo signed a major framework agreement for the delivery of 100 high-performance locomotives by 2030, tailored to meet strict technological and environmental standards.

**2022**

The signing of the contract with LTE for the acquisition of locomotives equipped with the ETCS system.

**2024**

Softronic Craiova celebrates 25 years of excellence in the railway industry, standing out as a leader in electric locomotive manufacturing and modern railway solutions that have helped transform infrastructure in Romania and across Europe.

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# TODAY

We continue to deliver innovation
on rails and power without limits!

# Partners who trust Softronic

## Eduard Iancu

CEO DB Cargo Romania & Head of DB Cargo
Business South-East Companies

Softronic has demonstrated over the years a desire to continuously improve and innovate their product and I believe this is the foundation of the success they have today, alongside a team of professionals with solid experience at the European level. Congratulations and best of luck moving forward!

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# TRANSMONTANA

Produced in Craiova, Romania, the locomotive provides traction from the Arctic Circle to the highest railway stations in the Carpathian Mountains and through the warm plains of Romania.

These powerful locomotives, with 6 axles for heavy freight trains, guarantee optimal performance on any type of railway track, regardless of terrain configuration.

Transmontana locomotives, equipped with asynchronous traction motors, are produced in Romania and use 6000 kW through the most efficient traction and control equipment developed by Softronic Craiova.

The Transmontana is designed primarily for freight transport, with a maximum traction force of 425 kN. It is adapted to the most challenging traction and weather conditions while also providing the maximum permissible towing capacity.

Transmontana can also be used for passenger trains, capable of towing very long trains at speeds of up to 160 km/h, ensuring all safety conditions are fulfilled.

Whether it's passenger trains or heavy freight trains connecting cities through mountain routes with steep slopes, Transmontana is ready for any challenge.

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# TRANSMONTANA EFFCIENCY AND TRACTION POWER ON 6 AXLES

- The locomotive is STI certified for freight trains with a maximum speed of 120 km/h.
- Resistant to temperatures of up to -40°C.
- The most advanced electric locomotive built in Eastern Europe.
- Equipped with a new metallic structure, asynchronous traction motors, and regenerative braking.
- Built to Perform. Capable of hauling long trains.

LTE Rail Romania, a subsidiary of LTE Group Austria, is also a core customer of Softronic, operating 7 Transmontana locomotives. The last batch of 2 units is authorized to operate in Romania, Hungary and Slovakia, being the first batch of locomotives equipped with ETCS system from Thales, with NTC's MIREL and PZB. This is the second project of Softronic to implement ETCS on its locomotives, since two years ago EBICAB 2000 system supplied by Alstom (former Bombardier Transportation) was installed and certified on locomotives LEMA 6000 kW produced for Green Cargo company in Sweden

## TRANSMONTANA EQUIPPED WITH ETCS

# LEMA 6000 KW Locomotive

| TECHNICAL DATA | SPECIFICATIONS |
|---|---|
| Axle configuration | Co'Co |
| Supply voltage | 25 kV / 50 Hz<br>15 kV / 16,7 Hz |
| Continuous power | 6000 kV |
| Maximum train weight | 4050 t |
| Maximum speed | 160 km/h |
| Starting tractive effort | 425 kN |
| Train speed depending on total mass (800t), loaded freight wagons, on a profile (0‰) | 160 km/h |
| Train speed depending on total mass (2500t), loaded freight wagons, on a profile (0‰) | 105 km/h |
| Train speed depending on total mass (2500t), loaded freight wagons, on a profile (5‰) | 80 km/h |
| Track width | 1435 mm |
| Service weight | 126 t |
| Maximum axle load | 21.4 t |
| Nominal wheel tread diameter | 1250 mm |
| Locomotive length with buffers | 20700 mm |
| Clearance gauge | G2 according to EN 15273-2 |

# TRANSMONTANA MEANS POWER AND SAFETY

The main transformer with a nominal power of 8100 kVA, suitable for 25 kV/50 Hz and 15 kV/16.7 Hz networks, is manufactured by Hitachi (formerly ABB).

Transmontana means:

- 6 asynchronous traction motors of 1000 kW, each controlled by its own traction converter, developed and produced by Softronic.
- A safe and reliable braking system manufactured by Knorr-Bremse.
- The driver's cabin tested for collision safety.

Transmontana locomotives are used for hauling 3,600–3,800-ton steel trains at speeds of 80–100 km/h between Luleå and Borlänge on mountain railways with steep gradients. This type of locomotive has become the most efficient asset in Sweden's state-owned freight fleet.

The locomotive's ability to operate at temperatures as low as -40°C, combined with efficient traction on 6 axles, encouraged Green Cargo to start the authorization procedures in Norway and perform tests with Transmontana in single traction for freight trains.

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# MODEL CONFIGURATIONS

| Technical Data | Freight Transport | Specifications | Passenger Transport |
|---|---|---|---|
| Axle formula | - | Co-Co | - |
| Clearance Gauge | - | 1435 mm | - |
| Nominal Load | 126 t | - | 120 t |
| Supply Voltage | 25 Kv / 50 Hz<br>15kV / 16 2 / 3 Hz | - | 25 Kv / 50 Hz |
| Nominal Power | - | 6000kW | - |
| Maximum speed | 120 km/h | - | 160 km/h |
| Brake Type | - | KE-GPR-Mz-E | - |
| Electric Brake | - | Regenerative | - |
| Parking Brake | - | Spring-loaded mechanism for axles 3 and 4 | - |

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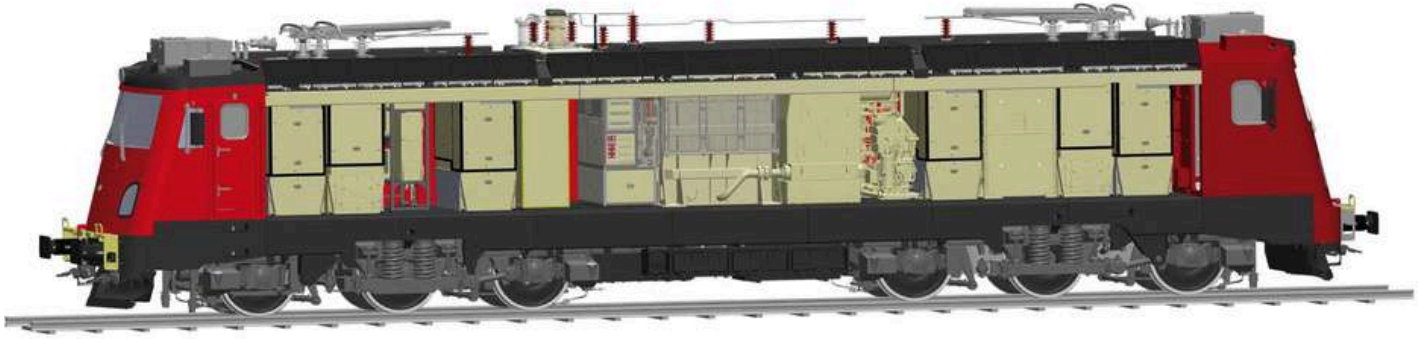


# From Craiova to the Polar Circle – Green Cargo

Starting 2017, Softronic Craiova signed several contracts with Green Cargo Sweden, which led to a total of 16 locomotives delivered by 2020. Also, in 2020 a framework agreement was signed for the purchase of 100 locomotives. By now Green Cargo owns 22 Transmontana locomotives.

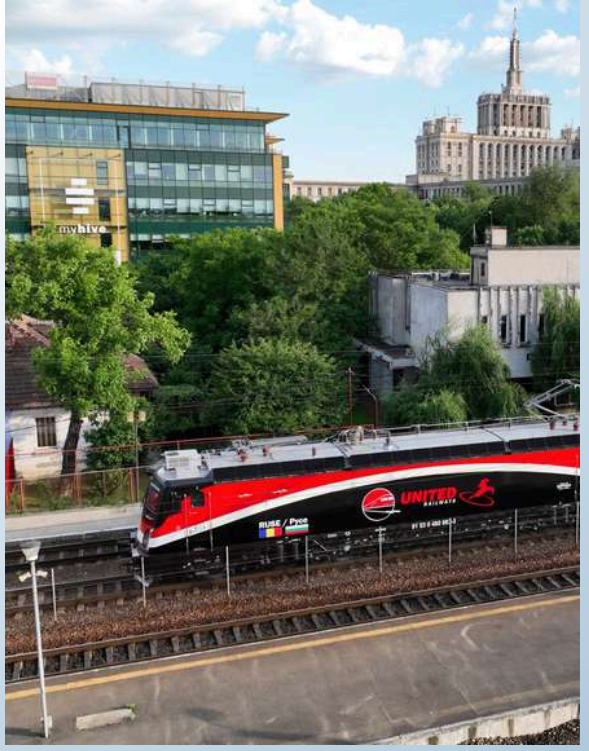
Transmontana locomotives are used to haul rolled steel trains of 3,600-3,800 tones at speeds of 80-100 km/h between Luleå and Borlänge, on hill and mountain railways. This type of locomotive became the most e cient asset in the Swedish state freight fleet. The ability of locomotives to operate in temperatures of -40 °C or lower, combined with e cient traction on 6 axles encouraged Green Cargo to start authorization procedures in Norway and carry out tests with Transmontana in simple traction for freight trains.

# Transmontana – a trusted partner for DB Cargo

DB Cargo Romania is Softronic's main client, with a fleet of over 30 Transmontana locomotives. Locomotives operate in Romania and Hungary, providing traction for trains crossing the mountains Carpathians and the Romanian plain, towards Constanța Seaport and various industrial points.

From the light trains transporting cars, to heavy coal and iron ore trains, DB Cargo relies its business on the reliability of locomotives produced by Softronic. Deutsche Bahn Cargo Romania, subsidiary of the largest rail freight carrier in Europe – DB Cargo AG – has been present on the local market since 2000, o ering services to clients from various industries, shunting rail freight and training schools for railway personnel.

DB Cargo manages a fleet of almost 3,000 locomotives and 90,000 wagons in more than 15 countries, both leased and group owned.


UNITED
RAILWAYS

green
cargo

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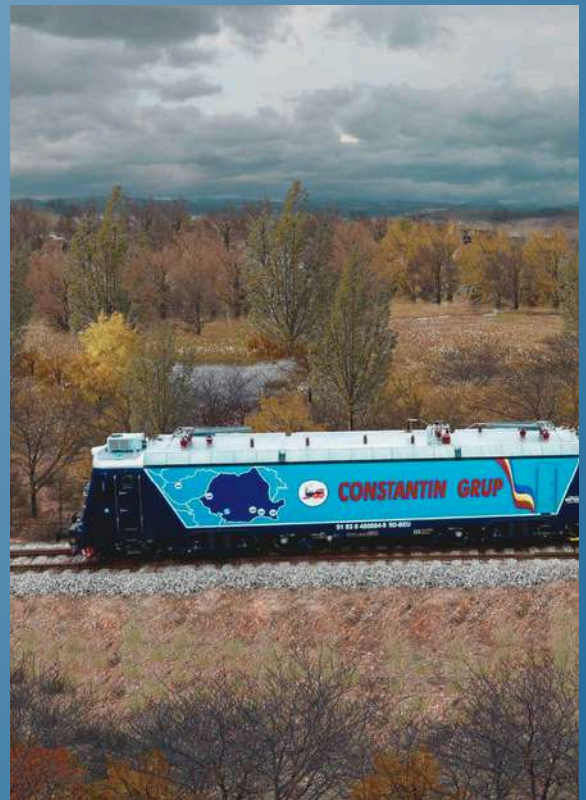
DB


CONSTANTIN GRUP

SOFTRONIC

# Locomotives Modernization

In an industry that is constantly evolving, modernization plays a key role in enhancing the efficiency, safety, and sustainability of railway transport.

By replacing outdated components with the latest technologies, the performance of locomotives is improved, reducing energy consumption and operational costs.

The locomotives we modernize were originally developed with traditional direct-current electric motors, which have supported railway transport for decades. While robust and efficient by the standards of their time, many locomotives now require significant upgrades to meet today's technological and environmental requirements.

Today, most of the locomotives we modernize are equipped with the European Train Control System (ETCS), a European standard that guarantees safety within the railway network. This means that the locomotives can operate smoothly on various European lines, helping integrate Romania into the international transport network.

## The majority of locomotives are equipped with:

- Modern traction control units, ensuring smooth and optimized acceleration.
- Advanced inverters that convert electrical energy with remarkable efficiency.
- Regenerative braking systems that reduce energy consumption and contribute to more sustainable transport.

The modernization process includes equipping railway vehicles with more efficient traction systems, implementing advanced safety and automation solutions and improving comfort for operating personnel and passengers.

Moreover, adapting locomotives to current environmental standards promotes more eco-friendly and efficient transport.

Through modernization, the lifespan of rolling stock is extended, and compliance with European standards is ensured, offering a sustainable and competitive solution for the future of railway transport.

# Modernization of 19 EA 5100 kW locomotives for CFR Călători

**From the classic locomotive produced by Electroputere Craiova to the modern asynchronous locomotive developed by Softronic Craiova.**

Started at the beginning of 2024, the modernization process of the 19 EA 5100 kW locomotives, originally produced at Electroputere Craiova, represents a challenge for Softronic, both technically, due to the nearly complete reconstruction of the locomotive, and logistically, with the project having a completion deadline of 2026.

Technically, the modernization project was designed by using the asynchronous traction package, whose reliability has already been proven with over 90 successful Transmontana locomotives, as well as the implementation of a certified structural solution tested for all operating conditions, including all crash-absorber standards.

Thus, from the original locomotive, only the central chassis structure was kept, which was cut and treated to extend its lifecycle. This structure integrates the new construction of the locomotive with a body adapted to house the new heavy equipment, such as the new transformer, inverters, and control systems, along with the new wiring and piping circuits connecting them.

The driver's cabs have also been reconstructed following the Transmontana model, meeting all TSI standards and providing a 21st-century working environment for both the train operators and maintenance personnel.

The locomotive integrates into the European interoperable landscape by being equipped with the ETCS – European Train Control System, which will allow efficient operation on the newly modernized railway sections, part of the Curtici – Bucharest – Constanța corridor.

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CFR

RO-SNTFC

91 53 0481 001-2
RO-SNTFC
Planul Național de Redresare și Reziliență

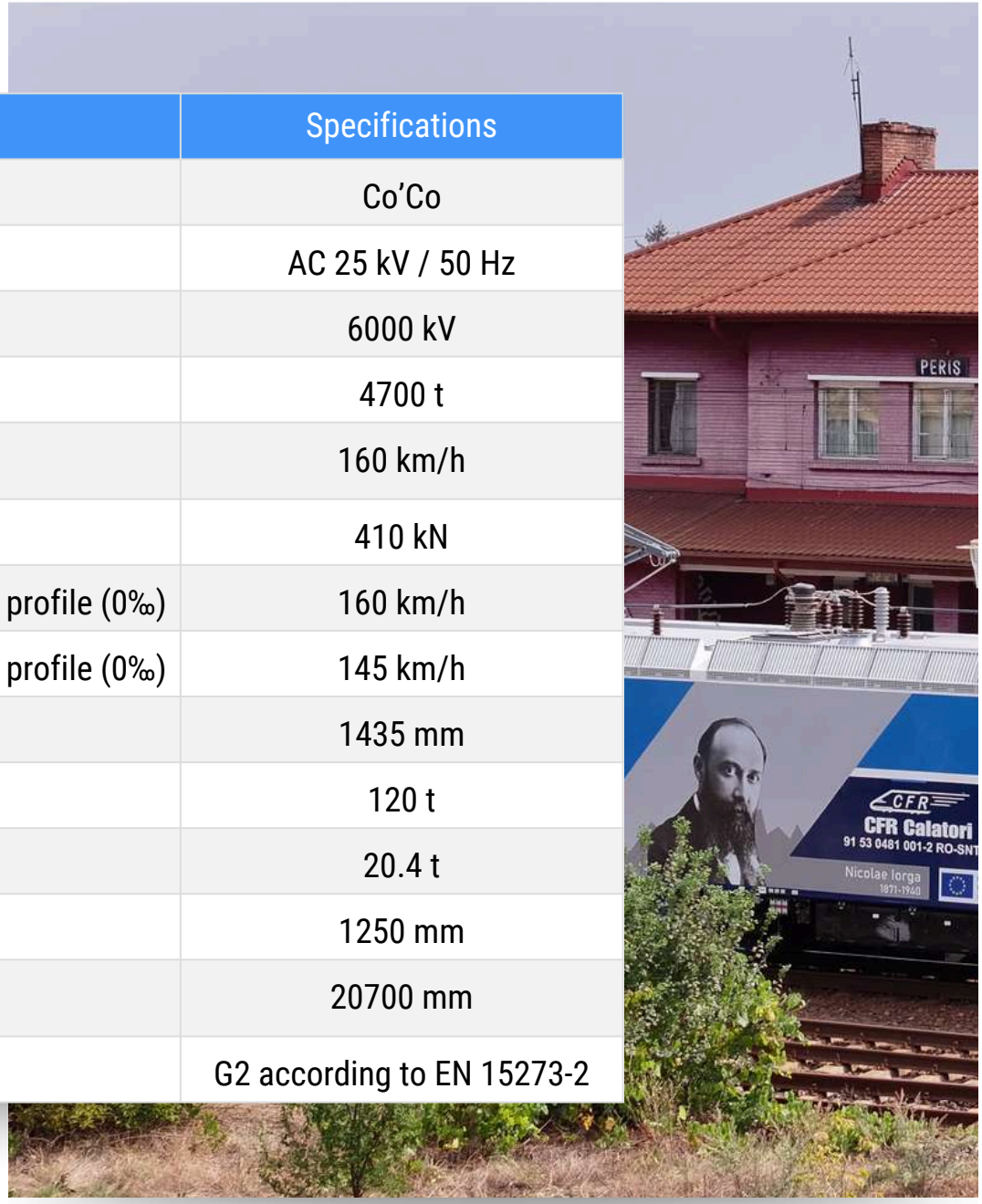
CFR
CFR Calatori
91 53 0481 001-2 RO-SNTFC
Nicolae Iorga
1871-1940

MAERSK
msc

msc

# MODERNIZED LOCOMOTIVE LE 5100 KW CFR CALATORI

| Technical Data | Specifications |
|---|---|
| Axle configuration | Co'Co |
| Supply voltage | AC 25 kV / 50 Hz |
| Continuous power | 6000 kV |
| Maximum train weight | 4700 t |
| Maximum speed | 160 km/h |
| Starting tractive effort | 410 kN |
| Train speed depending on total mass (1550t), new passenger cars, on a profile (0‰) | 160 km/h |
| Train speed depending on total mass (2000t), new passenger cars, on a profile (0‰) | 145 km/h |
| Track width | 1435 mm |
| Service weight | 120 t |
| Maximum axle load | 20.4 t |
| Nominal wheel tread diameter | 1250 mm |
| Clearance gauge | 20700 mm |
| Clearance gauge | G2 according to EN 15273-2 |

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# Locomotives Maintenance

Softronic provides comprehensive maintenance and repair services for railway rolling stock, ensuring long-term performance and reliability.

We handle the maintenance of electric locomotives, including Transmontana models, as well as the Hyperion electric units, using cutting-edge technologies and high-quality components.

Softronic also offers full support and monitoring, with a dedicated and experienced team available 24/7.

## Top-tier technical expertise

Our team have extensive experience in the maintenance and repair of locomotives, ensuring maximum performance and operational safety.

## Quick diagnostics and interventions

We use advanced technologies to rapidly identify issues and perform efficient interventions, minimizing downtime.

## Predictive and preventive maintenance

We implement customized maintenance programs to prevent defects and reduce unexpected repair costs.

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# Maintenance centers

## Softronic Craiova

Calea Severinului, No. 40,
County Dolj, Craiova, Romania

## Softronic Curtici

Street A.I. CUZA, No. 2,
Curtici, County Arad, Romania

## Softronic Borlänge

Sweden, BANGARDSGATAN 8,
Borlange

## Softronic Luleå

Sweden, Lokstallsvagen 2,
Luleå

## Softronic Bucharest

Street Halta Grivița, Bucharest
Romania

# MCCT LABORATORY

The Mechanical and Climatic Calibration and Testing Laboratory was established within Softronic Craiova to meet the requirements for accredited, authorized, and certified calibration and testing.

It plays a key role in assessing the functional performance of both Softronic's own vehicles and railway equipment, as well as for partners in the railway sector. The laboratory's activities cover a wide range of specializations, including length, pressure, force, vibration, noise measurements, and climatic tests.

MCCT represents the result of a sustained applied research process carried out by the management team within the National Research and Development Programs, starting in 2012.

Through this initiative, Softronic contributes to the development and optimization of railway technologies, offering modern and reliable solutions for the railway transport industry.

Within Softronic, organizationally, MCCT Laboratory is directly subordinated to the Board of Directors, and the activities carried out in the laboratory are entirely separate from Softronic's design, manufacturing, control, commercial, and financial operations, both in terms of organizational structure and personnel, locations, measuring equipment, calibration, and testing.

MCCT Laboratory has developed and implemented its own Quality Management System, in which it explicitly states that in calibration and testing activities performed in the laboratory, any influence or pressure on the staff, activities, and results exerted by external persons or organizations is eliminated.

MCCT Laboratory complies with the requirements of SR EN ISO/IEC 17025, is independent, impartial, and is not subject to any commercial, financial, or other pressures that could influence its technical reasoning and decisions. It is not involved in activities that could endanger the trust in its independence, confidentiality of decisions, reasoning, or integrity about calibration and testing activities.

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**The Mechanical and Climatic Calibration and Testing Laboratory is divided into two laboratories as follows:**

The Mechanical and Climatic Testing Laboratory, which consists of three sections:

- Mechanical Testing Section;
- Vibration and Shock Testing Section;
- Climatic Testing Section.

The Calibration Laboratory, which includes the following sections:

- Force Calibration Section;
- Pressure Calibration Section;
- Length Calibration Section;
- Acceleration Calibration Section.

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