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SIEMENS
Ingenuity for life



Mireo

The train that intelligently combines it all

Mireo® is a registered trademark of Siemens Mobility GmbH.

[siemens.com/mireo](https://www.siemens.com/mireo)



Perhaps more than any other factor, mobility is shaping our globalized society. Between 1990 and 2010, passenger traffic in EU countries grew by one-third to an impressive 6.5 trillion passenger kilometers per year. A further increase of 29 percent is expected by 2030*. This growth is pushing urban centers to their limits. Traffic jams, construction sites, and a shortage of parking spaces are all slowing down the number-one means of transportation: the car.

Rail traffic is becoming increasingly important. By 2030, up to ten million people will be traveling by rail every day in Germany alone. Demographic changes and high passenger volumes are increasing the demands on local public transport. Passengers want room and comfort – and to arrive at their destinations even more quickly. Operators need economical purchase prices and have to meet high safety requirements. And investors require flexible train configurations that comply with ever-stricter regulations.

Mireo® is the commuter train that intelligently combines all of these requirements of operators, buyers, and passengers. Based on their many years of experience in high-capacity passenger transport as well as vehicle platforms and regional multi-unit trains, the engineers at Siemens have created an innovative platform for premium-class commuter and regional transit that is at once energy-efficient, flexible, available for quick delivery, and profitable: the Mireo.

*<https://www.zukunftsinstitut.de/artikel/aufbruch-in-ein-neues-zeitalter-der-mobilitaet>

How can you combine competitiveness with environmental compatibility?

Energy efficiency all along the line

i HIGHLIGHTS

- ▶ Consistently reduce your energy costs.
- ▶ Reduce resource use, emissions, and noise.
- ▶ Improve your corporate image with low-emission mobility.
- ▶ Contribute to sustainability.

Rising emission levels, resources that are becoming scarcer, stricter regulations: For train operators, efficiently using energy is increasingly a key competitive factor. How can you position yourself as a provider of sustainable mobility and reduce energy costs?

Mireo stands for energy efficiency all along the line – from production to low-emission operation. During the planning phase, engineers at Siemens checked every component with a view to saving as much energy as possible by means of intelligent modifications.

The Mireo's foundation is its lightweight welded integral aluminum monocoque construction. However, the improved aerodynamics, the energy efficiency of the components, and the intelligent onboard network management system also contribute to less resource use, lower emissions, and reduced noise. Even at the end of its life cycle, Mireo is still both competitive and environmentally friendly: It has a recycling rate of over 95 percent.



-25%

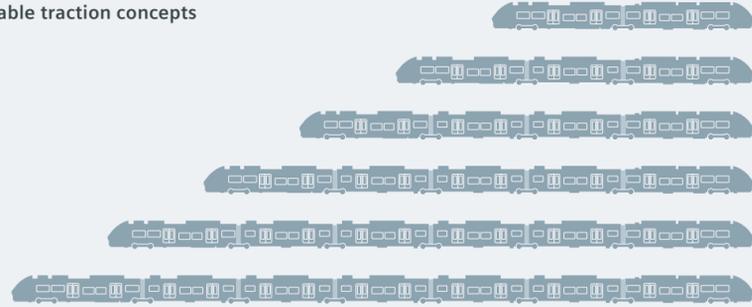
Mireo's lightweight construction, energy-efficient components, and intelligent onboard network management system reduce energy consumption by up to 25 percent compared to trains with similar capacities.



Passengers need the good sense to take responsibility for nature. The Mireo sets standards in the matter of environmental performance and sustainability.

Flexible applications due to variable traction concepts

Flexibly adaptable capacity due to different car body lengths and train configurations



How can you provide more usable space inside a shorter vehicle?

Uncompromising flexibility

As a train operator, you know that every centimeter counts. A growing number of passengers are requiring transport, and bicycles, strollers, and wheelchairs must also be accommodated. At the same time, trains operating outside of peak periods cannot be empty of passengers if they're to remain viable.

That's why the new Mireo relies on uncompromising flexibility. This means maximum capacity on a train of the same length with a higher number of seats, or the same number of seats on a shorter train – as needed. You can also repeatedly adapt your fleet to changing requirements.

This flexibility is made possible by the intelligent concept of the "empty tube": As much as possible, components have been installed underfloor or on the roof. The interior area is fully available for passengers with space for bicycles, strollers, and wheelchairs as required. The interior can be converted again and again with minimal effort. And the cantilever seating design permits cost-effective cleaning of the passenger area.

i HIGHLIGHTS

- ▶ Increase your profitability with more usable area in a smaller space.
- ▶ Continuously adapt the train length to meet current requirements.
- ▶ Take advantage of an abundance of utilization and design options.
- ▶ Reduce your conversion and cleaning costs.



How does timelessness become the future?

Mireo's attractive design



Timeless yet modern and forward-looking – that's the design of the new Mireo. The front of the vehicle has been aerodynamically optimized in a streamlined, compact design that creates an attractive impression from a distance.

Mireo is designed to allow you total freedom. Configure Mireo as desired – both the interior and exterior – in accordance with the specifications of the TSI PRM standard and in line with your corporate design, to give your brand a strong presence!

Interior design

Your passengers will immediately appreciate the well-lit, uncluttered, comfortable overall impression made by the new Mireo. The passenger area is characterized by openness and bright, friendly colors and was designed as much as possible as a continuous open space. Sharp corners and edges in the interior design were avoided. The transparent interior structure ensures a comfortable travel environment.

Orientation in the train

- ▶ Color-coded floor covering
- ▶ Easy-to-understand pictograms

Orientation in an emergency

- ▶ Emergency control devices identified by color
- ▶ Exposed control elements

Orientation in traffic

- ▶ Easy-to-read passenger information display from virtually any position
- ▶ More optional displays available for passenger information and entertainment

Vandalism-resistant

- ▶ Color and material design based on proven materials
- ▶ Durability and ease of maintenance already proven throughout many years of use

Mireo Plus

Our solution for electrified and non-electrified lines

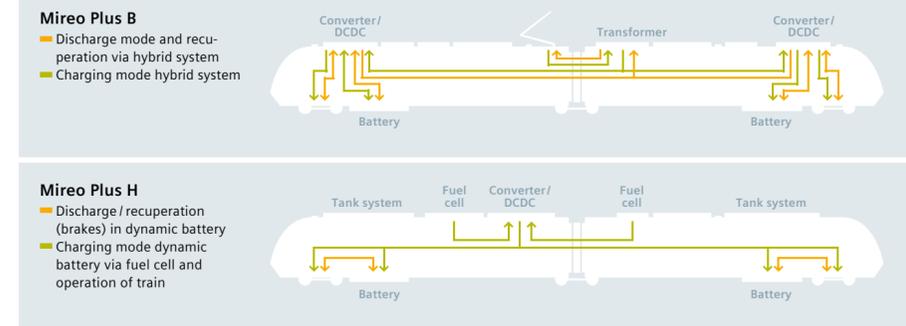
With rising fuel prices or stricter emission standards for noise or CO₂, demand is steadily increasing for hybrid solutions as well as alternatives to Diesel Multiple Units (DMU). Especially since 40 percent of the rail lines in Germany are not electrified.

Also in terms of operating plans and life-cycle costs, the currently available fuel cells do not meet the requirements: What's needed is a flexible system design and storage-based solutions for fluctuating grid capacities due to renewable energy production.

Mireo Plus already offers answers today to the regional transport challenges of tomorrow.

Mireo Plus – the next generation of hybridization.

Mireo Plus – schematic energy flow diagram



Mireo

The train that intelligently combines it all

- Energy efficiency
- Flexibility
- Fast delivery time
- Profitability

Articulated train concept

Modular design (minimal internal variation in components with maximum external variation in configurations)

Empty tube: components installed underfloor or on the roof

Intelligent on-board management and driver advisory system

SIBAS PN, innovative railway automation system

Intelligent cabling

CCTV safety monitoring

Adaptable passenger capacity with different car body lengths and train configurations (two- to seven-part train-set possible, ~ 50-140 m), scalable traction concept with ECO, Midi, and Speedy options (Vmax 140/160 km/h) – for commuter trains, Regio, InterRegio

„Always Connected“ – comprehensive information for traction unit drivers, railway and service personnel, and passengers

Entrance heights of 600 and 800 mm that can be subsequently adapted

Fast and accurate recording of vehicle data for diagnostics and maintenance

Optimized aerodynamics

Transformer with increased efficiency level

Lightweight integral aluminum monocoque construction

Maximum utilization of ED brake

Predefined and tested solutions and modules

Fewer components, standard interfaces

Bogie with inside bearings

How can one component intelligently meet all the requirements?

Innovative bogie with inside bearings

The Mireo – a train that intelligently combines all the requirements. Take, for example, the innovative bogie with inside bearings. Our engineers rigorously refined the proven bogie to create the SF 7500-type bogie with inside bearings.

Greater energy efficiency: Lighter weight, upgraded for axle loads, wheel disc brakes, greater tractive power, excellent curving performance

More flexibility: Electromagnetic track brakes integratable as end-motor bogie as well as Jakobs-type motor and trailer bogie – depending on requirements like route or operation

Predictable profitability: Low wear-and-tear on wheels and tracks, long service life, maintenance- and track-friendly



Additional bogie features

Rail guard

- Removes smaller objects lying on the tracks

Wheel flange lubrication system

- Reduziert Verschleiß zwischen Spurkranz und Schiene
- Prevents disturbing noise, especially on tighter curve radii

Bogie diagnostics

- Permits an optimized maintenance strategy for customer-specific circulation of the fleet

How can you connect standards with individuality?

Faster delivery time

i HIGHLIGHTS

- *From now on, hit the tracks more quickly.*
- *Meet demands whenever they arise.*
- *Shorten time to market.*
- *Reduce your procurement costs.*

The demands on railway operators and investors – both in terms of compliance and customer requirements – are constantly changing. The need for variable traction concepts is also growing. The unpredictability of the market demands a fast response time in order to succeed against the competition.

With Mireo, you can expect a faster delivery time. That's because Mireo is designed for efficient, cost-effective implementation. From now on, you can hit the rails more quickly and meet demands whenever they arise.

A faster delivery time is facilitated by Mireo's intelligent, modular system and standard components. Nevertheless, thanks to its variable configuration, you can still customize the design to meet your individual needs and requirements. The traction concept means that it can be expanded at any time. You benefit from a shorter time to market while at the same time reducing your procurement costs.





How can you combine profitability with safety?

Predictable profitability

The demands on operators are extreme: They need to guarantee profitability as well as maximum safety, and so maintenance must be thorough in order to prevent break-downs. Trains are cost-effective only when they're on the track.

Mireo sets new standards in the areas of vehicle diagnostics and ease of maintenance. The robust, low-maintenance components reduce maintenance outlay. The "always connected" system not only provides comprehensive information on board, it also supplies maintenance-related notifications that predict component wear ahead of time.

This concept is supplemented by detailed tests performed by the vehicle software and a precise recording of safety-related data for diagnostics, maintenance, and vehicle control. With our Rail Services, you're always supported by a team of experts with many years of experience in maintaining fleets. This means both predictable profitability and increased safety for your fleet.

i HIGHLIGHTS

- ▶ Increase the availability of your fleet.
- ▶ Reduce maintenance costs and time.
- ▶ Optimize safety.
- ▶ Future-proof your investment.



24 trains

Mireo Rheintal

2017



57 trains

Mireo SRN

2017



44 trains

Mireo Augsburg

2019



6 trains

Mireo Mittelrheinbahn

2019

What do rail solutions for the 21st century look like?

Vehicles, service, and financing from a single source

A holistic approach from the very beginning – because Siemens offers comprehensive solutions from a single source. We're with you every step of the way, from the initial feasibility study through the operational handover all the way to after-sales service. Our complete rail solution experts are also at your side when it comes to financing concepts, project management, system integration, commissioning, training, and Mobility Services.



Financing concepts:

Find financing partners

We'll support you in your search for qualified financing partners and credit insurance companies, or we can review your options for a public-private partnership, where you'll benefit from a clearly defined distribution of responsibility and risks.

Project management:

Profit from efficient project execution

Siemens stands for efficient project execution using minimal resources. This includes reliable time scheduling, sophisticated organization, fewer interfaces, precisely defined qualifications, and a standardized organizational model – for projects that succeed.

System integration: Ensure availability

Integrate us into your planning to ensure maximum availability. We guarantee seamless synchronization of the different interfaces and the merging of all control and communication systems. This prevents system disruptions and communication failures from the very start.

Commissioning and training:

Rely on trained personnel

All vehicles and systems are thoroughly tested before commissioning: for example, at our Wegberg-Wildenrath Test and Validation Center. We also offer flexibly applicable modular training elements, provide initial training for your operating and maintenance staff, and guarantee the expert operation and maintenance of your train.

Mobility Services: Benefit from a comprehensive service portfolio

With Siemens Mobility Services, you benefit from a complete range of products and services for rail traffic: Maintenance Services, Spare Part Services, Digital Services, Upgrade Services, Qualification Services, and Operation Services. With this comprehensive service portfolio, we help you to transport the world.