



Avenio

The new generation of trams from Siemens

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SIEMENS



Avenio: For more attractive, flexible and economical mobility

The Avenio® is the new Siemens-built tram offering attractive mobility for your city – today and in the future. The Avenio is very impressive. It is the most advanced low-floor tram in the world. It gives your passengers a more comfortable ride and you, as operator, cost-efficient operation. See for yourself.





Your benefit: our experience

Siemens has been designing and building electric trams for over 125 years. With our wealth of knowledge and experience we have considerably advanced and developed this technology over the years. In 1996 we launched the first-ever modular tramcar, the Combino family with 100% low-floor design. It is ideally suited to urban transit where distance between stops are short, curves are tight, and passenger transfer times have to be kept short as well.

And today we are still leveraging the advantages of a modular vehicle platform: the Avenio with its optimized design principle based on welded steel body construction and a proven design approach into which we have poured our years of experience in the field. We have the capacity and expertise to respond to your needs and supply you with a customized vehicle that meets your individual requirements in terms of design, capacity, furnishings and performance. The result is: our next generation mass transit vehicle – safe, reliable and attractive. The added plus from Siemens.

More attractive service for your success

Dynamics, appearance, comfort: everything is right in the Avenio. Its hallmarks are its unique end module and wide double doors installed throughout the vehicle and behind the driver's cab. Together with the low-floor design they facilitate quick boarding and alighting, which translates into punctual service. It also offers quick, barrier-free access to passengers with limited mobility.

The modern, open-plan interior of Avenio invites your passengers to step aboard and sit on the comfortable seats. Numerous options regarding fittings and layout allow you to adapt the interior exactly to your requirements. Avenio: the most attractive connection on your rails.

Avenio: fit for the future

The Avenio is a tramcar that will impress not only your passengers but you as the transit operator. Flexibility, economy, comfort and usability are the focal points of its design and development. But, at the end of the day, you still need a vehicle that allows you to easily adapt to the changing traffic conditions of today and tomorrow. Thanks to its consistent modular design, this tram will cater to your future needs. In terms of passenger capacity, environmental friendliness, versatility and economy it is a truly superior mode of transportation. Avenio: customized vehicles from a modular platform, economical in small series too.

Avenio: Our expertise carries you a lot further

Siemens is the right partner for you and will support you in all matters, today and in the future. The experience we have gained from the Combino family since 1996 proves this. We have carried out many technical analyses to optimize the design. The revised Avenio design is the product of that experience.

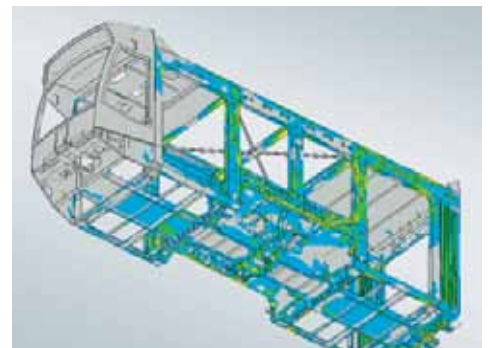


You benefit from a reliable partner

We are one of the world's largest technology corporations. As such, we can offer you long-term security for your investments – something you will not find anywhere else. We have the human and financial resources to assist you in all circumstances, for with Siemens you can be sure that your vehicles and systems will be serviced and supported in the future for your benefit. This is how we see ourselves as your reliable business partner.

In-depth analyses

When Siemens first launched the Combino back in 1996, it set new standards for low-floor trams. When, after a few years, problems arose concerning the service life of the carbody, we immediately took corrective action to find the cause of the overloading, and to correct it. Together with all our customers, we analyzed and evaluated optimization demands arising from day-to-day operations with this new technology. In the course of these analyses we were able to make use of the latest technical findings and incorporate them in the development of new engineering solutions.





Design benefits

The bogie arrangement means that greatly reduced lateral forces are exerted on the tracks compared with the conventional design of a multiple-articulation tram. Avenio has excellent running characteristics, even on worn rails. The benefits are maximum ride quality, minimal stressing of mechanical structure in curves and thus reduced wheel-on-rail wear. Avenio is a solution for the low-floor tram that sets standards.

Keeping the best, improving the rest

The Avenio is based on many revolutionary ideas that were used in the design of the first generation Combino tram. For example, drives with longitudinally-coupled wheels that can be removed at the side are easier to maintain. This means outstanding rolling resistance characteristics coupled with very low lifecycle costs. It features a low-wear brake design, i.e. braking on the Avenio is completely electrical (to standstill). We rely on our tried-and-tested drive and control systems to ensure the availability of your vehicles.





Trendsetting appearance

The visual appearance of a mass transit vehicle is the operator's calling card. All the more reason, therefore, to make Avenio look special. Naturally, this modular vehicle allows you to choose from a versatile construction kit. If you want, we can adapt the color scheme and the end module of the Avenio to harmonize with your cityscape. And we can satisfy your specific requirements in the interior, from seats and upholstery through seating arrangements to heating and air conditioning and a large selection of media for passenger information. Let your imagina-

tion run wild. Avenio offers you exactly what you want: a world-class vehicle that will impress your passengers and showcase the vital role played by mobility in your city on the strength of its appearance.

More doors for greater convenience

The end-to-end low floor of the Avenio is a plus point which allows you to offer your passengers greater convenience. Passengers with baby carriages or persons with mobility restrictions can get on and off more easily – with no steps, no dead ends. Consistent use of large double doors throughout, even to the right and left



Avenio: Ride more comfortably, get there faster

More comfort for your passengers

Your passengers will feel good about the Avenio. Because it is built to attract, offer a high degree of comfort, has a modern design and the latest technology that leaves nothing to be desired. Because a highly attractive vehicle means high public acceptance – and a successful means of transportation.

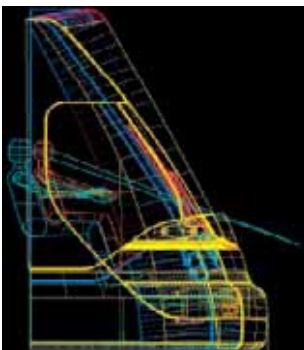
behind the driver's cab, make sure of that. Take advantage of the generous leeway offered by the flexible design of the Avenio when choosing the number of doors and their locations. You can use over 30% of the passenger area length. The benefits are obvious: a more comfortable and safer ride for your passengers, quicker boarding and exiting for shorter dwell times and faster trips.

Riding the Avenio: an experience!

Avenio combines the benefits of 100% low-floor design with good bogie running characteristics. The bogies create only low lateral forces in curves, which also means minimized wheel / rail noise. Consequently, you'll find the ride on Avenio significantly quieter and, thanks to the 3-stage suspension (rubber-sprung wheels, primary and secondary springs), very comfortable.

An attractive workplace

We have paid special attention to the design of the driver's cab. After all, your employees should enjoy driving the Avenio and be able to work in a pleasant environment. The adjustable automatic air-conditioning system is standard as well as the ergonomically optimized layout of the controls, which meet all the driver's needs.





Avenio: Our definition of flexibility

Optimum cost-efficiency with demand-oriented design

Vehicle length, vehicle width, uni-directional or bi-directional, different line voltages, configuration with multiple vehicles: Avenio offers you the right solution for every traffic requirement – today and in the future.

Width of vehicle	2.3 m	2.4 m	2.65 m
	105 Passengers	110 Passengers	120 Passengers
	165 Passengers	170 Passengers	180 Passengers
	225 Passengers	230 Passengers	250 Passengers
	285 Passengers	290 Passengers	310 Passengers
	340 Passengers	350 Passengers	380 Passengers
	400 Passengers	410 Passengers	450 Passengers
	460 Passengers	470 Passengers	510 Passengers

* 4 passengers/m², bi-directional operation

Take each case as it comes

In the very first designs for Avenio we went all out for flexibility. In the end, it is what determines the attractiveness of a tram as a means of transportation – for the passengers and for you as transit operator. Consequently, we developed Avenio as a family of modular vehicles to set a new standard. The uni-directional or bi-directional vehicles are assembled from 9-meter-long modules with trailing or motored bogies. Up to 100% motorization can be achieved.

Flexible configurations

Vehicle lengths on the order of 18 to 72 meters can be realized with the standardized 9-meter modules. This means you get the correctly dimensioned vehicle for every traffic volume. A number of trams can also be coupled together to form a multiple-tram train for very demanding situations. Vehicle widths of 2.30 m, 2.40 m and 2.65 m are available and there is a lot of freedom in arranging the doors. The trams can operate on 600 V DC, 750 V DC or 1500 V DC.

Designed for economy

A real platform vehicle, Avenio sets new standards on the commercial side as well: in procurement, in operation and in maintenance. For example, with a uniformly distributed axle load of less than 10 metric tons with a width of 2.65 m. Or take the bogies, for instance, which minimize wheel / rail forces and thus wear. And its service-friendly design: the drives can be removed from the side, without having to remove the bogies. Another positive impact of modularization is the large number of common parts used in Avenio. This means lower costs for your spare parts stores.

Our mission: Our customers' success

Your benefit: our commitment

Perfect solutions are developed from a global standpoint. That is why our commitment does not end with the delivery of your trams, but continues seamlessly through to our convincing service. A worldwide local presence you can rely on.



A reliable partner bound by tradition

Our service has substance. It is based on experience. Place your trust in us, a partner who has demonstrated and proven its comprehensive competence in project management over the decades. You and your passengers will benefit from wide-ranging corporate knowledge that has matured over 150 years.

Our pioneering all-embracing support

Pioneering vehicles are only as good as the integrated support that accompanies them. Our all-embracing support for the

optimal deployment of your vehicles ranges from technical care and maintenance through commercial financing models to the proof of return on investment and to preventive service and maintenance. Our mission: vehicles that are always ready for use. After all, it's the basis for your success.

Thoroughly put to the test

Be it quality and performance tests for production vehicles, individual components, or complete system tests – we test our products in our approved and certified test

Budapest, Hungary

Customer:	Budapesti Közlekedési Részvénytársaság (BKV Zrt.)
Number:	40 trams
Width:	2.40 m
Length:	54.00 m
Track gauge:	1,435 mm
Axle load:	< 10 t
Speed:	70 km/h
Passenger capacity:	352 at 4 passengers/m ²





center in Wegberg-Wildenrath, Germany under real service conditions to give you maximum benefits. Avenio: reliable technology, thoroughly tested and found to be good.

The best of references

Satisfied transit operators throughout Europe today rely on the diverse benefits of the Avenio design concept, from outstanding flexibility in service and fittings through low power consumption and low lifecycle costs to quick return on investment. Take, for example, the 24 vehicles

near Lisbon, Portugal and the 40 in Budapest, the capital of Hungary, where the longest low-floor trams in the world, namely 54-m-long Avenio vehicles, are in service today.

You, too, can benefit from Siemens as an expert and reliable business partner. For more economy, comfort and environmental compatibility. In Europe – and beyond. When can we expect you to come on board?



Sul do Tejo, Portugal

Customer:	Metro Sul do Tejo (MST)
Number:	24 trams
Width:	2.65 m
Length:	36.40 m
Track gauge:	1,435 mm
Axle load:	<10 t
Speed:	70 km/h
Passenger capacity:	232 at 4 passengers/m ²

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Public Transit
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The information in this document contains general descriptions of the technical options available, which do not always have to be present in individual cases. The required features should therefore be specified in each individual case at the time of closing the contract.

