EUROCITY IN NEW SPLENDOR
EXTENSIVE REFIT OF SBB

MEGACITY SÃO PAULO
EXPANSION OF PUBLIC TRANSPORT

SMARTVIEW
THE NEW SMA SERVICE INTERFACE
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DEAR READER,

2009 was a very successful year for SMA Railway Technology GmbH. We were able to approach many national and international projects and achieve record results with sales of 30 million euros and incoming orders of more than 50 million euros, which reassure us of having taken the right path.

We are therefore especially happy that our longtime customers always choose SMA again for new projects – not least because of the close partnership and cooperation, which is very important to us in all projects. At the same time, we were able to win over new customers for co-operations, most of whom are located outside of Germany.

The percentage of products we export directly has increased rapidly: we develop and produce more than 50 % of our products for our international customer base, which has grown considerably within just a few years. If you include the vehicles built in Germany and exported afterwards, the number of SMA auxiliary power converters used abroad is even higher.

In order to handle the large amount of orders on hand, SMA has continuously expanded existing resources. We will secure our competitive edge by investing and additionally staffing all corporate areas.

We have also paved the way for a successful future in technical terms. The successful conclusion of several development projects allowed us to expand our product portfolio. Therefore we will again invest in technological developments in order to continue our success story.

Hoping you enjoy this latest edition of RAILFOCUS,

Dirk Wimmer
Managing Director of SMA Railway Technology GmbH
SMA HONORED AGAIN

SMA is again among Germany’s top-rated employers this year. The company ranked second in the medium-size company category in the nationwide Great Place to Work® competition. In addition, SMA won the “Lifelong Learning” special award, just as in the previous year. The German Great Place to Work® Institute determines the best employers in Germany every year. The award stands for credible and fair management, employee identification and team spirit in the company. Next to rating the companies’ human resources activities, an extensive anonymous employee survey also assesses cooperation, leadership, career opportunities, remuneration and workplace satisfaction. The award ceremony took place in Berlin on February 24, 2010.

SALES FORCE STRENGTHENED!

Cornelia Braun has been supporting the sales department at SMA Railway Technology since July 2009. As a sales assistant, she supports sales engineers and is also responsible for organizing trade fair presentations.

AUXILIARY POWER CONVERTERS FOR CORADIA NORDIC

The Swedish public transport company Norrtåg AB commissioned Alstom with delivering eleven four-car X62 model Coradia Nordic trains in October 2008. Unlike the previous X60 and X61 models, these trains can reach top speeds of up to 180 km/h partly in tunnels and have a bistro section. They are used in northern Sweden and run the northernmost route via Kiruna to Narvik in northern Norway. The 11 auxiliary power converters will be delivered from early 2010 to mid 2012.
MEE-NTSD AUXILIARY POWER CONVERTERS FOR DDZ

After the MEE-NTSD auxiliary power converter for the ICM, SMA will also supply the systems for the DDZ. The DDZ is a four- to six-unit bilevel railcar that is used as an InterCity train by Netherlands Railway. As part of a comprehensive modernization, every DDZ will be fitted with a new redundant with a higher power energy supply system, which will be realized by two independent MEE-NTSD auxiliary power converters mounted in a shared mounting frame in the railcar. The modernization of the trains is being carried out by NedTrain in Haarlem (the Netherlands).

MEE-NTSD FOR ISTANBUL METRO

The Spanish railway vehicles manufacturer CAF has commissioned SMA with delivering 60 auxiliary power converters for the new trains of the Istanbul metro (Turkey). The MEE-NTSD auxiliary power converters for Istanbul are based on tried and tested devices that were already delivered for the São Paolo metro. The deliveries will begin in July 2010.

AUXILIARY POWER CONVERTERS FOR REGIO CITADIS

After successfully introducing the Regio CITADIS (RegioTram) in Kassel and the Hague (Den Haag), the company Alstom received another order for 18 vehicles from the Dutch operator RANDSTADRAIL for the metropolitan region of the Hague. As in the past, SMA is supplying the auxiliary power converters for this double-system vehicle, which safely transports passengers throughout the local streetcar network and the surrounding region with different supply voltages. Next to the standard auxiliary power converter, a second converter system for supplying the air conditioning system will be delivered. The converters will be shipped to the French Alstom location Reichshoffen from June 2010.
EUROCITY IN NEW SPLENDOR

EXTENSIVE REFIT OF SBB

The SBB is undertaking an extensive project for refitting its 236 EuroCity (EC) cars at its industrial plant in Olten.

Traveling more comfortably

Around 140 million Swiss francs will be invested in order to allow the EC rail cars to continue meeting the domestic transport requirements even in 20 years. The fleet, which was deployed internationally to this point, will not only comply with the Disability Equalization Act (effective from 2014), but also meet increased passenger requirements in terms of technology and comfort. The refitted cars will be shipped gradually until the end of 2013. The cars will be refitted at the Olten industrial plant, where the car roofs will be sandblasted and primed, the cars receive new linoleum or carpet floors and also undergo various welding works. The most apparent change will be that the formerly two restrooms at the end of each car will be merged into a single restroom that is fully accessible for handicapped people. The newly won space will be used to install ski and bicycle holders.
EuroCity with SMA auxiliary power converters

In addition, the vehicles will be equipped with new auxiliary power converters. MEE-NTLD auxiliary power converters developed and produced by SMA will be employed, which can be adapted to the individual requirements of the car thanks to their modular structure. The system consists of one high-voltage converter which generates a galvanically isolated intermediate circuit of +/-400 V DC from the different input voltages of up to 5,000 V DC. This intermediate circuit voltage supplies a downstream battery charger in the EC railcar in order to charge the 36 V car battery and supply the DC consumers, an inverter module for fixed-frequency supply of electric auxiliary consumers as well as an inverter module for variable-frequency supply of the air conditioning system.

First cars already in service

In September 2009, the first modernized car commenced operations - the new SMA auxiliary power converter is a solution that makes it ready for the future.

Technical data

<table>
<thead>
<tr>
<th>Auxiliary power converter for SBB EuroCity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input voltage</td>
</tr>
<tr>
<td>700 V AC ... 5,000 V DC</td>
</tr>
<tr>
<td>AC output 1</td>
</tr>
<tr>
<td>3x230/400 V AC, 59 Hz, 22 kVA</td>
</tr>
<tr>
<td>DC output 2</td>
</tr>
<tr>
<td>3x0 ... 520 V AC, 0 ... 100 Hz, 35 kVA</td>
</tr>
<tr>
<td>DC output</td>
</tr>
<tr>
<td>36 V DC, 16 kW</td>
</tr>
</tbody>
</table>

Joachim.Bierschenk@SMA-Railway.com

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MEGACITY SÃO PAULO

EXPANSION OF PUBLIC TRANSPORT

Vibrant center of commerce

Endless – this is probably the first impression visitors have of São Paulo. Houses extend all the way to the horizon. Finding your way around is especially hard in the beginning. São Paulo is not only Brazil’s largest city but also – with 10 million inhabitants in the city and the same amount in the metro region - the largest city in the Southern Hemisphere.

Nevertheless, the Brazilian center of commerce has an outstanding significance, especially for German companies. Around 1,000 German companies are established here and employ some 700,000 people. It is the largest agglomeration of German companies outside of Germany.

Crowded streets

Most traffic runs through the streets. Buses are the most important public transport vehicles. Despite great efforts, traffic jams continue to occur regularly, and it is hard to predict if you will reach your destination in 30 minutes or an hour.

After all, São Paulo already has a highly efficient metro and suburban railway network today. Trains run at high frequencies on the existing railway lines and it is easy to find your way in the metro. The metro will see massive expansion and modernization over the next years. The existing lines will be equipped with modernized and new vehicles and new lines will create a close-meshed network.
SMA on-board converters will be used in the new vehicles delivered by Spanish manufacturer CAF for the expansion of lines 1 and 3 of the São Paulo metro. The devices are part of the MEE-NTSD series, which has been tried and tested across the globe.

**SMA auxiliary power converters for the São Paulo Metro**

Especially the 2014 FIFA World Cup and the Olympic Games two years later mean that all efforts need to be intensified. Rail-bound public transport has a special significance when it comes to preventing a collapse of road traffic during major sporting events.

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**Technical data**

**Auxiliary power converters for the São Paulo metro**

<table>
<thead>
<tr>
<th>Input voltage</th>
<th>750 V DC</th>
</tr>
</thead>
<tbody>
<tr>
<td>AC output</td>
<td>3x220/380 V AC, 60 Hz, 135 kVA</td>
</tr>
<tr>
<td>DC output</td>
<td>1 x 72 V DC, 14 kW</td>
</tr>
<tr>
<td>Weight</td>
<td>850 kg</td>
</tr>
</tbody>
</table>
Background

The new SMARTview interface makes it possible to diagnose SMA auxiliary power converters without any additional software. Simply connect your laptop and SMARTview with a network cable, start a standard web browser - done!

Separate module

While developing SMARTview, we chose a separate module over Ethernet integration. This gives you higher flexibility for your projects. For example, a separate module also allows you to use SMARTview on older devices. SMARTview records the data through the serial RS232 interface or via CAN. Usually the previously used serial diagnosis interface is used for this.

Within SMARTview’s core is a powerful microprocessor that prepares the recorded data and stores them in the SMARTview ROM. The size of this memory can be adjusted to meet individual requirements. The stored data is presented in a standard web browser. The data processing is structured according to the previous MEEcontrol diagnosis software.

Easier software updates

Updates of the appropriate device software and the SMARTview software are performed using standard SD memory cards - simply insert the memory card and the software will be updated automatically. This way, replacements in the field are easy to perform even without a laptop. It is also possible, e.g., when commissioning or during test runs, to use this memory card for long-term data storage.
The commercially available memory cards allow for endless storage capacities.

**Diagnosis data with time stamp**

Finally, the operating and diagnosis data is also marked with a time stamp. For this, we have added a real-time clock to SMARTview. This real-time clock has a battery buffer; the battery is usually installed in the easily accessible area behind the service access cover of the respective energy supply system. This makes it easy to quickly access and replace the battery. The real-time clock makes it possible to employ SMARTview for alternative, slightly non-standard purposes. Technical systems in the railway sector often lack ability for time-stamping operating data. SMARTview provides the time function, so that the date and time are available through the numerous interfaces.

Do not hesitate to contact us for further questions regarding SMARTview in particular and Ethernet in general.
Amsterdam is a city of bicycles. Most Dutch people travel by bicycle; 550,000 bikes are purported to be in Amsterdam alone. About one third of the inhabitants of Amsterdam travel by “fiets” in any weather - it is simply the best means of transport in this compact city, which is plagued by constant traffic jams and lack of parking spaces. Bicyclists are allowed to do pretty much everything - even ride next to each other or take passengers on their racks. Most bikes are in a pitiful state. This is just a trick, though: if a bike looks too expensive, it will be stolen in no time.

Popular travel destination

Amsterdam is a popular destination for visitors from all over the world, not just because of its landmarked historic town center, but also because of the open and friendly nature of its inhabitants. Amsterdam is charming at any time of year - in summer, when cafés put their tables on the street and an almost Mediterranean atmosphere will spread, or in winter, when veils of mist hang over the grachten and the bridges are ceremoniously illuminated.
Technical Data

Auxiliary power converter for line 77

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<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Input voltage</td>
<td>700 V AC ... 5,000 V DC</td>
</tr>
<tr>
<td>AC output</td>
<td>3x230/400 V AC, 50 Hz, 35 kVA</td>
</tr>
<tr>
<td>DC output</td>
<td>24 V DC, 6,6 kW</td>
</tr>
</tbody>
</table>
The new SMA Solar Technology inverter factory sets benchmarks in every respect: with a floor space of 18,000 square meters and yearly production capacities of up to four gigawatts, it is the world’s largest solar inverter factory.

Innovative building concept

Two goals were paramount while planning the new factory: reducing energy consumption as far as possible and exploiting the employed energy as efficiently as possible. This was achieved by introducing, among others, efficiency measures in the production process, which led to a reduction in energy consumption of production and testing facilities. Optimal daylight utilization, intelligent ventilation, as well as heat and cold accumulators are other important characteristics of the structure, which, among others, meets low-energy building standards.

Maximum energy savings thanks to regenerative energy sources

Power and heat consumption is covered through renewable energies: a building-integrated PV plant with around 1.1 megawatts of power and a biogas-fueled combined heat and power station generate carbon-neutral power. Green power is additionally fed in in order to cover the entire power consumption of the production facilities. In the long run, however, the carbon balance is supposed to be equalized by building additional PV plants in the region. The required heat is generated through the biogas-fueled combined heat and power station. At the same time, the waste heat of the compressor that provides the pressurized air for tools and lifting devices in the production department is used. Any additional heat consumption is covered through district heating from the nearby waste incineration plant. Sufficient cooling is also provided: an absorption refrigerator uses heat from the combined heat and power station for cooling.
Production for SMA Railway as well

Even if production is geared towards solar inverters, SMA Railway also procures all electronic assemblies for its auxiliary power converters from the carbon neutral plant. Therefore, our customers help protect the environment in a dual sense when purchasing SMA products: energy is not only saved when operating the high-efficiency auxiliary power converters, it is already saved during the environmentally friendly production process at the carbon neutral inverter factory.

Daniela.Wagner@SMA-Railway.com
Service

Our competent Service Line support staff is available for all your questions from Mondays to Fridays from 7:30 a.m. to 4:00 p.m.

Service Line:
Tel. +49 561 506346600

If you have questions or need support, we will be glad to receive your emails.

Service E-Mail:
Service@SMA-Railway.com

Trade Fair Dates

InnoTrans 2010
Sep. 21 to Sep. 24, 2010
International trade fair for transport technology, ICC Exhibition Center
Berlin, Germany

Business on Rails
Nov. 09 to Nov. 11, 2010
International trade fair for rail technology, Expo Center Norte
São Paulo, Brazil

APTA EXPO 2011
Oct. 03 to Oct. 05, 2011
International Public Transportation Expo,
Ernest N. Morial Convention Center,
Booth No. 5849
New Orleans, USA

Mass-Trans Innovation Japan 2010
Nov. 10 to Nov. 12, 2010
International trade fair for “rail” technology, Makuhari Fair
Chiba, Japan
Monorails as an alternative

Monorails are single-rail trains that are based on technical concepts from the 1940s. Merely 10 years later, the first test track was built near Cologne. However, so far the monorail concept has rarely expanded past amusement parks. This is likely to change over the next years – they represent a viable alternative for new public transport systems with a medium number of passengers. We will present monorails in the next issue and provide information about the SMA auxiliary power converters for the Mumbai monorail.

Istanbul by metro

Istanbul has developed into a flourishing metropolis over the past years. The economic growth also increases the need for a well-developed traffic network, not least because of Istanbul’s international significance as a logistics hub. In 2000, for example, the Istanbul metro, whose network is continuously being expanded, commenced operations.

In the next issue we will report in detail about the 2010 European Capital of Culture and present our auxiliary power converters for the new vehicles of the Istanbul metro.