## 

# Next stop: freedom.





## If we don't have it, we'll invent it for you.

For more than 20 years, our mission has been to offer mobility and a more fulfilling and enjoyable life to people with disabilities. We are driven by our passion to continuously develop new solutions, and by the positive feedback we receive from our customers, all in line with our motto of "Nothing is impossible." Today, PARAVAN is a modern research and development company with more than 160 employees and partners in many countries. The heart and soul of our company continues to reside in peaceful and tranquil Aichelau. Customers from all over Germany, and all over the world, visit our large mobility centre in the Swabian Alps, where they receive a warm and friendly welcome and outstanding all-round service. This is where you'll get exactly the help you need - from advice and driver training to technical service, all from a single source. We develop fully customised mobile solutions for every disability - and adapt these solutions to changes in your medical condition when necessary. Come visit us and let's work together to create your own personal path to mobility and freedom.

We'll be happy to help you!

Regards,

Roland Smold

Roland Arnold, founder & Managing Director of PARAVAN GmbH



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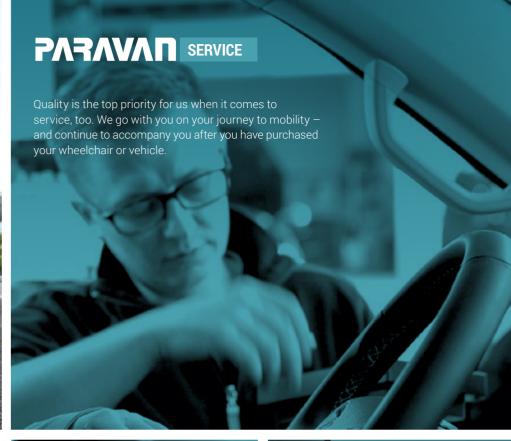
WE ARE INVENTORS, DEVELOPERS, MANUFACTURERS. BUT ABOVE ALL, WE ARE PEOPLE.

How does one become the world market leader for perfectly adapted mobility solutions for the disabled? By working hand in hand as a The 10 benefits for you team. Specialists in all kinds of fields contribute to the company's success with their personal expertise – including mechatronics experts, mechanical engineers and various other types of engineers • Integrated solutions from a single source and experts, as well as driving instructors, physical therapists, and software developers. We get further input from outside by visiting • Expertise in therapeutic needs and professional assessments hospitals, local authorities and health insurance companies, and • State-of-the-art production equipment and machinery by talking to scientists, medical professionals and the automotive for all requirements industry. And, last but not least, the feedback from our customers is always invaluable. • Pioneering patents for our unique innovations • Extremely strict quality and safety testing Long-standing local suppliers • Nationwide network of partners • Unbureaucratic and fast customer service • Any spare part can be delivered within 24 hours Global distribution network



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## **TOUCH SYSTEM/ VOICE CONTROL**

Brilliantly simple: operate secondary functions using your tablet or smartphone via the PARAVAN app or convenient voice control.



## **RAMP/LIFT SYSTEMS**

Getting into the car is effortless, with our extensive range of cable- or remote-controlled ramp and lift systems.



## **SPACE DRIVE TECHNOLOGY**

The only system of its kind in the world: the patented PARAVAN driving and steering system Space Drive II with drive-by-wire technology.



## DRIVING/ STEERING AIDS

You're in the driving seat: choose from hundreds of extra features and operating components - all ergonomically designed and technically perfect.



Practical aids for getting in and out: electric folding, swivelling and rotating seats and transfer seat bases from PARAVAN.



## WHEELCHAIR SECUREMENT

Perfectly connected: our clever fastening and tie-down solutions ensure that your wheelchair is securely fixed in the vehicle.



## **POWER WHEELCHAIRS**

Tailored for you: crash tested and TÜV-tested wheelchairs using our evolutionary PARAVAN technology.



## **DRIVING SCHOOL**

Officially tested: in the PARAVAN driving schools, qualified instructors will teach you how to handle your new vehicle.



## **CAR HIRE**

Temporary mobility: hire cars for disabled persons available from PARAVAN or through our AVIS partners across Germany.



## **CUSTOMER CARE**

Close to our customers: PARAVAN is a partner who is always at your side to answer all your questions.



## **TECHNICAL SERVICE**

In-house workshop: we're ready to help in all respects, we have all the spare parts in our warehouse and can adjust your vehicle for you if your illness progresses.

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arina Schömig from Hettstadt near Würzburg is mobile. This is thanks to her Ford Kuga, which was individually converted and adapted for her, including a bespoke joystick steering system. The young woman has been training as a teacher for two years In order to pursue her career later on (without always having to rely on people for help), the 19-year-old needs her own car.

Marina suffers from dysmelia - she was born with malformed arms. Above all, Marina needs technical support with steering and shifting gears, and also with using the secondary functions of a car. "Actually it was my father who discovered this," she says. At first she tried to cope with driving a normal car but in the driving school it soon became clear that she would need joystick steering. In PARAVAN she found a company that is technically capable of making the modifications she needs. An SUV seemed the best idea, because of its height. "I actually saw the Ford in a parking lot," remembers Marina Schömig. "Instead of 'Kuga,' I read it as 'Kiga' – as in kindergarten. Then I knew it was the one for me." Marina Schömig got her driving licence in the summer of 2017.

After a medical assessment that certified her fitness to drive. she passed the theory part of the driving test at home. She did the practical part of the test at the mobility centre in Aichelau. Joystick steering adapted specially for her hand was fitted in the driving school car. "Despite her condition, she has enough strength in her hand to steer a car," says PARAVAN driving instructor Ralf Buhmann. She completed the Space Drive training in just two and a half weeks. "It felt very strange," she remembers, "as it was a very big car." She soon got to grips with the technology. "I knew straightaway that it was the right thing to do, and on top of that, it was great fun." Among other things, the car features Space Drive steering, automatic door opening, a customised seat and seatbelt arrangement, and a voice control system. "You couldn't actually add much more in the way of electronics," says Joachim Glück, a representative for technological advice at PARAVAN GmbH.

## Anything that is done using the Touch Pad, she can do using the smartphone app.

This type of vehicle conversion takes a good 250 to 300 hours. In this case, the project was financed by an employment agency. "First of all, the whole interior of the car was scanned by the PARAVAN engineer, so that they could carry out the proposed adaptations in the best possible way," reports technician Bernhard Dank, who carried out the vehicle conversion. Marina Schömig will be able to open her car using a smartphone app or a button under the car sill. To this end, a motor was installed in the door and also a lap belt, as part of the belt system adapted for her, which also includes a strap system. Once the driver is seated in the car, the seat belts fasten at the touch of a button, and then

the uniquely adapted rotary knob and the PARAVAN Touch Pad moves into position. The future teacher steers the car with three fingers using the drive-by-wire system, Space Drive. She operates the accelerator and brakes with her feet. The indicators, windscreen wipers, automatic transmission, sun visor, and air conditioning are all controlled by voice - the PARAVAN Voice Control system, which can operate up to 100 secondary functions in the car. "The functions that can be controlled using the Touch Pad, right through to the seat adjustment, can all be operated using the smartphone app too," explains Bernhard Dank, Thanks to Marina's physical size, the belt system could be installed on the B-pillar. This enabled the two places on the back seat to be retained. This was important to Marina. "Now when we're going somewhere, I'll drive," she says. If the belt system were to be installed further back, she would be able to transport just two passengers. Any normal driver can sit in the specially adapted seat too. "In that case, the belt system is moved away and the Space Drive System is deactivated," says the technician.

## Globally, the Space Drive system has proven itself on over a billion kilometres on the road in the last 20 years.

The inclusive use of her car is important to Marina and to many other customers, if, for example, a family member needs to drive her car or when it is taken for a service. Final adjustments are made, for example to individually produced control elements or to the strap system for the seat belt, when the car is handed over to Marina. "Marina Schömig will be relatively tightly strapped in to the driver's seat, compared to the more traditional three-point seat belt. Therefore the system must be very precisely adapted for her," explains Dank. The electrical functions have also been highly personalized according to her wishes. The last stage is a final vehicle inspection test, in which Marina Schömig drives

In the future, she will no longer be reliant on help from others and she will be able to drive on her own to school. At the moment, Schömig travels every day by bus and she still needs to be accompanied. "I can't put down my bus pass or take off my rucksack," she explains. This means that she cannot hold on. It will be a great relief for her and her whole family. Next year she would like to go on a road trip with some friends for a couple of days, to give something back. "But first I have to do the 3-hour journey to my house," she says. She appreciates the difficulty of the long trip and has already arranged some help from her friends.

# Whether you're a driver or a passenger: welcome to independence!



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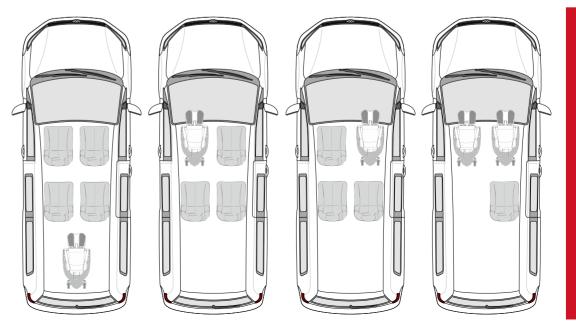
## MOBILE AGAIN AT LAST:

our experts can create a "made-to-measure suit on wheels" with the multi-variable PARAVAN Caddy. All kinds of customisable special features are available on request.

## THE BENEFITS TO YOU AT A GLANCE:

- Conversion approved by VW (clearance certificate)
- Lowered floor makes for extremely easy entry
- Wheelchair can be moved directly to the driver position
- Can carry up to two wheelchair users
- Electric rear ramp can be extended by remote control
- All the seats can be rearranged in next to no time (seats up to six people)
- Electric parking brake

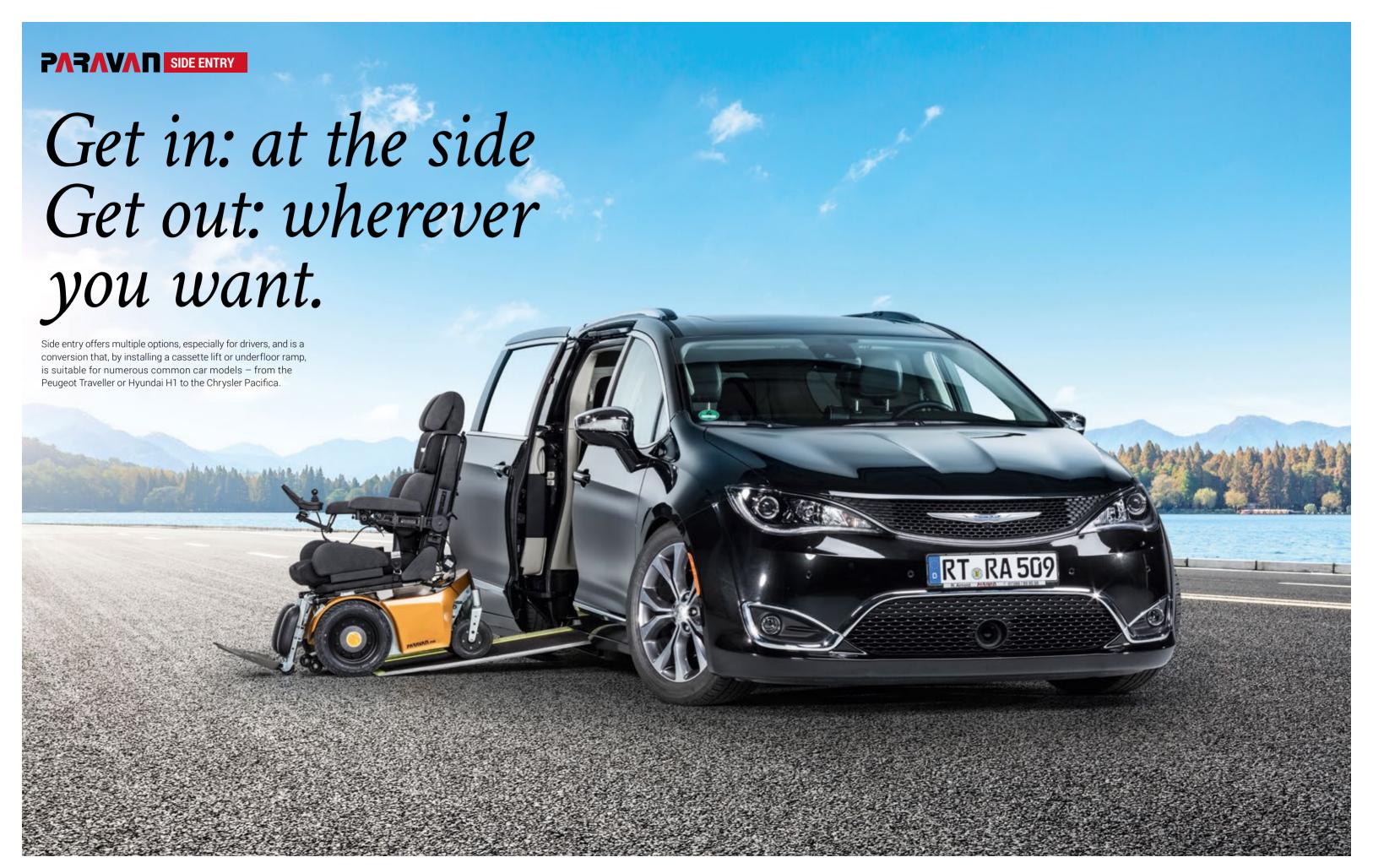




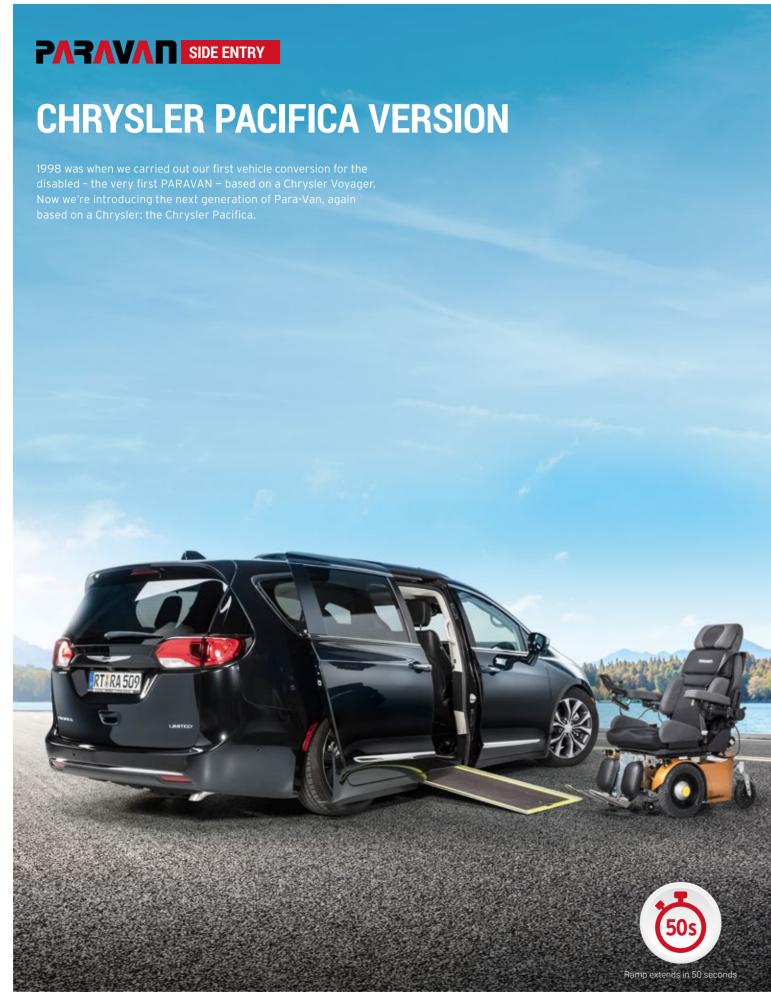
## ONE CONVERSION, NUMEROUS OPTIONS:

thanks to the flexible and variable PARAVAN seating concept, the interior arrangement can be changed in next to no time.

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22 PARAVAN SIDE ENTRY SIDE ENTRY





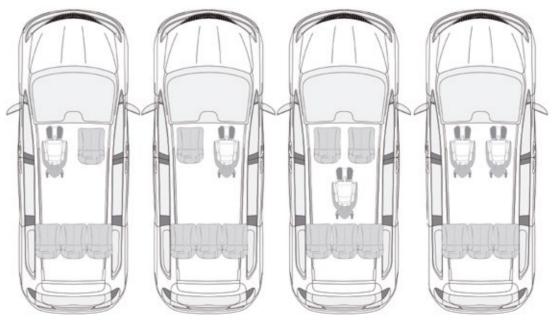
## EXPERIENCE A NEW DIMENSION IN MOBILE FREEDOM:

for drivers and passengers. Vehicle conversions from PARAVAN for the disabled are extremely flexible, convenient products of the highest quality.

## THE BENEFITS TO YOU AT A GLANCE:

- Driver and passenger seats can be used on either side
- Lower floor for more internal height and completely barrier-free access
- Customisable access solution via electric underfloor ramp or cassette lift
- Available on request as a complete mobility solution with docking station and Space Drive technology
- Optional: exclusive PARAVAN air suspension for maximum comfort

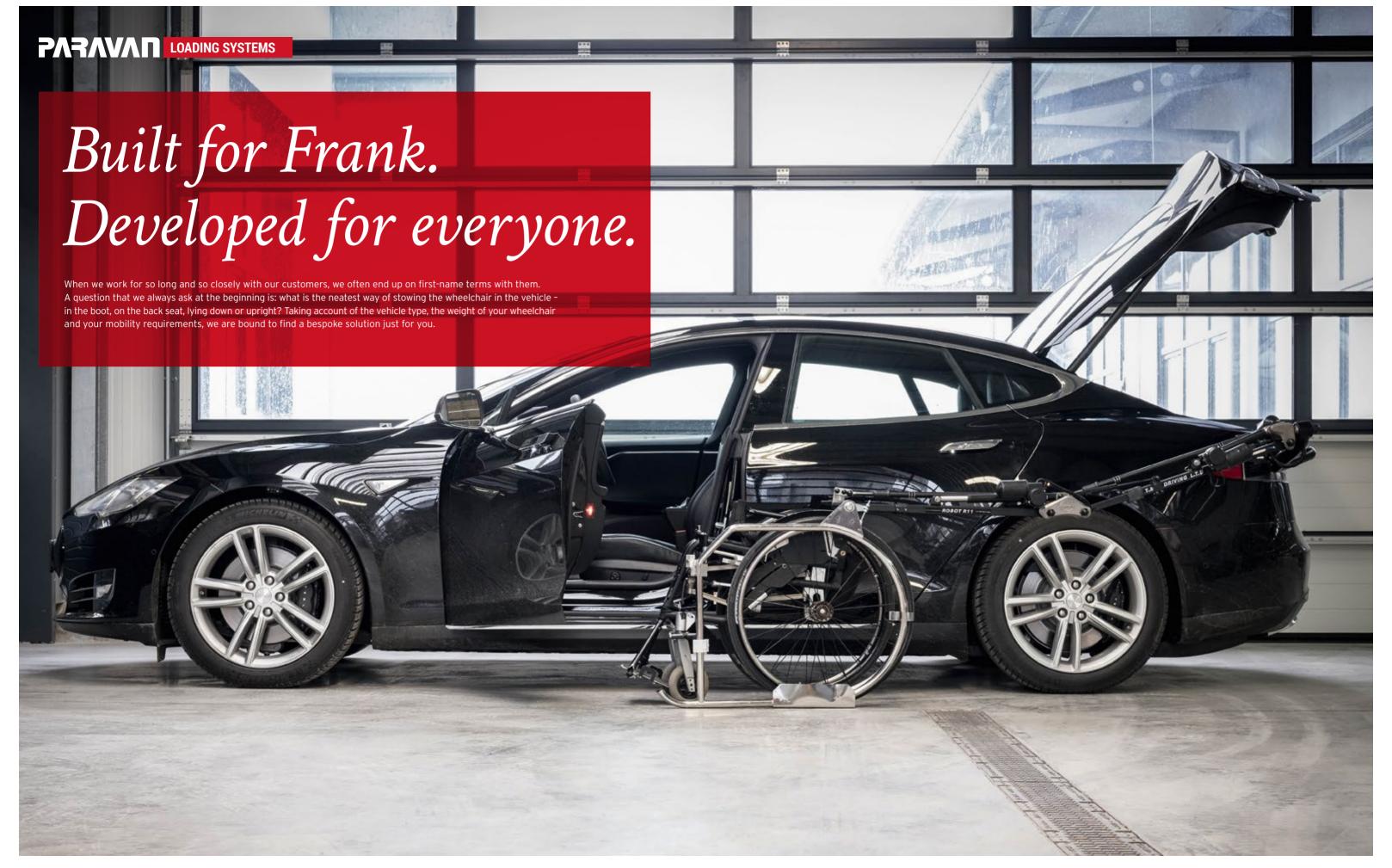




## **MAXIMUM VARIABILITY:**

in all PARAVAN conversions, it's quick and easy to switch between multiple ways of accommodating your wheelchair.

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## **ROBOT 3000 – WORKS IN THE TIGHTEST PARKING SPACES**

## ONE OPTION FOR LOADING YOUR WHEELCHAIR:

with the tried and tested "Robot 3000" technology, at the press of a button the wheelchair is collected from the driver's door and stowed in the boot of your car. The tail gate then closes automatically. Installation is possible in virtually any boot.







## THE BENEFITS TO YOU AT A GLANCE:

- Low-weight
- Fully automatic loading into the boot
- Controlled and guided by the latest microprocessors
- Easy to use from the driver's seat
- Can be installed in almost any boot
- No structural changes to the boot or other components
- Amount of seating space in the passenger compartment remains unchanged

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## **SPACE DRIVE**

HIGH-TECH MADE IN AICHELAU: THE SECOND GENERATION OF OUR PATENTED DRIVE-BY-WIRE TECHNOLOGY.

Our digital-electronic driving and steering system, Space Drive, is unrivalled worldwide – the software and hardware were all developed in Aichelau, the system is triple redundant and meets the highest safety standards. Thanks to Space Drive, even people with low residual strength, partial paralysis, minimum movement capabilities, or very severe or multiple disabilities can finally become mobile again. Drive-by-wire means that microprocessor-controlled driving aids send signals in milliseconds to servo motors for the brakes, fuel supply and steering.

Another revolutionary aspect of the system is that it is adapted to suit our customers exactly. With the touch system and voice control system, PARAVAN offers efficient and user-friendly options for controlling up to 100 secondary vehicle functions such as the indicators, cassette lift and

windscreen wipers. A specially developed app means that important functions such as opening the door or operating the lift can be controlled from outside the vehicle using a smartphone or tablet – so this is a single system for all the secondary functions that is simple to handle for people with all kinds of disabilities.

From a nippy roadster to a highly economical electric runaround: Space Drive paves the way for completely new concepts in driving and car interiors — and is already one of the key technologies in autonomous driving. Installed on the innovative "Schaeffler Mover" chassis platform, Space Drive is causing a furore at trendsetting international shows (more on this on pages 64-67).



DRIVING AND STEERING AIDS PARAVA



## **TOUCH SYSTEM**

## MOBILITY YOU CAN FEEL: SECONDARY SYSTEMS EASILY OPERATED WITH THE PARAVAN TOUCH APP.



Opening doors, extending the ramp, turning on the ignition, activating the indicator — all of this and more can now be done with just a simple touch. Simply open the PARAVAN Touch app on your smartphone or tablet, tap the desired command on the console, and your vehicle will open as if by magic.

You can utilise up to 100 different commands. Whether it's on your mobile device, permanently installed or combined with our Voice Control system, PARAVAN Touch recognises the command and synchronises it to all installed devices. That way, you're always in full control.



## **VOICE CONTROL**

## WHEN WORDS MOVE YOU: THE PARAVAN VOICE CONTROL SYSTEM.

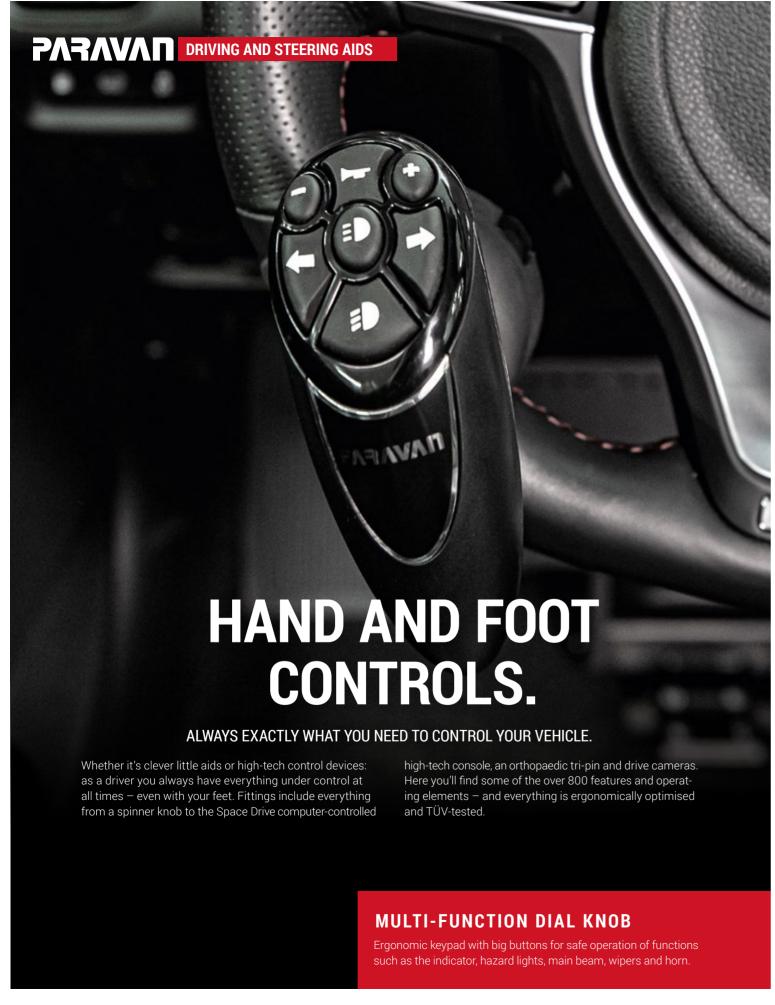
A multi-variable control unit allows for up to 100 freely programmable functions to cater for all requirements. With voice commands like "Indicate left", "Use the horn" or "Wash the windscreen", the commands are performed directly and immediately by the system. Individually and personally adapted.

Our combined package, consisting of PARAVAN Touch and PARAVAN Voice Control, perfectly combines the benefits of the two systems. The two systems are fully harmonised and synchronised. With the optional Wi-Fi package, everything can also be controlled using the PARAVAN app.



Instant confirmation of your voice command via a check LED or the PARAVAN Touch display.

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## CUSTOMISABLE MANUAL CONTROLS

We fit your own personal, manually controlled acceleration and braking system. Optionally also available with operation of secondary functions.

## **ACCELERATOR RING**

Use the accelerator by hand without letting go of the wheel? We make it possible: with an accelerator ring positioned above or below the steering wheel.





## SPECIAL MODIFICATIONS TO PEDALS

Whether it's a removable pedal-raising device, a prosthesis support or a pedal cover that prevents the pedals from being pressed inadvertently during manual operation – we will come up with the right solution for your needs.

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## PARAVAN RAMPS AND LIFTS

## **GETTING IN MADE EASY.**

Ramp, rear lift or a cassette lift? PARAVAN can offer you a wide range of convenient options to help you access your adapted vehicle. All of these options have one thing in common: They are fast and extremely easy to use.





## COMPACT LIFT

Thanks to its minimal external dimensions, this integrated lift offers easy access in narrow parking spaces or garages.

- Compact design
- Non-slip platform
- Load-bearing capacity of up to 200 kg

## **SWIVEL LIFT**

Once extended, this lift built into the side of the vehicle swivels 90° in the direction of travel. This means that only a small parking space is required for convenient entry/exiting.

- Space-saving solution
- Extends in less than a minute
- Load-bearing capacity of up to 300 kg



## **LINEAR LIFT**

The linear lift with a lifting platform and powerful lifting arms is the best choice for large and heavy power wheelchairs. Once folded up, the mesh platform offers good visibility through the rear window.

- Simple to use
- With automatic fold-up anti-rolling protection
- Available in many different versions
- For rear or side entry

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## **UNDERFLOOR RAMP**

Never spend time waiting next to your car again! The remote-controlled underfloor ramp makes it possible: activated from a distance of up to 300 metres, the ramp zooms out (fully or partially) in a very short time, and it also automatically adjusts to any type of ground.

- With anti-slip coating
- Disappears completely in the underfloor space
- Extends in 50 seconds
- Load-bearing capacity of up to 370 kg





## **FOLDING RAMP**

Attractive entry aid: the folding ramp is equipped with additional wheelchair entry aids that prevent wheelchairs from rolling backwards. Ramp ensures that you as a wheelchair user need to exert less energy when entering the vehicle.

- Suitable for use with many different types of vehicles
- Available only in combination with a vehicle conversion
- Load-bearing capacity of up to 250 kg

## **FLAP RAMP**

Compact and effective: the practical flap ramp for rear entry can be unfolded as far as needed in a very small space, making it a stable and robust entry aid for wheelchair users.

- Space-saving solution
- Easy to operate
- Load-bearing capacity of up to 350 kg





## SIMPLE ACCESS

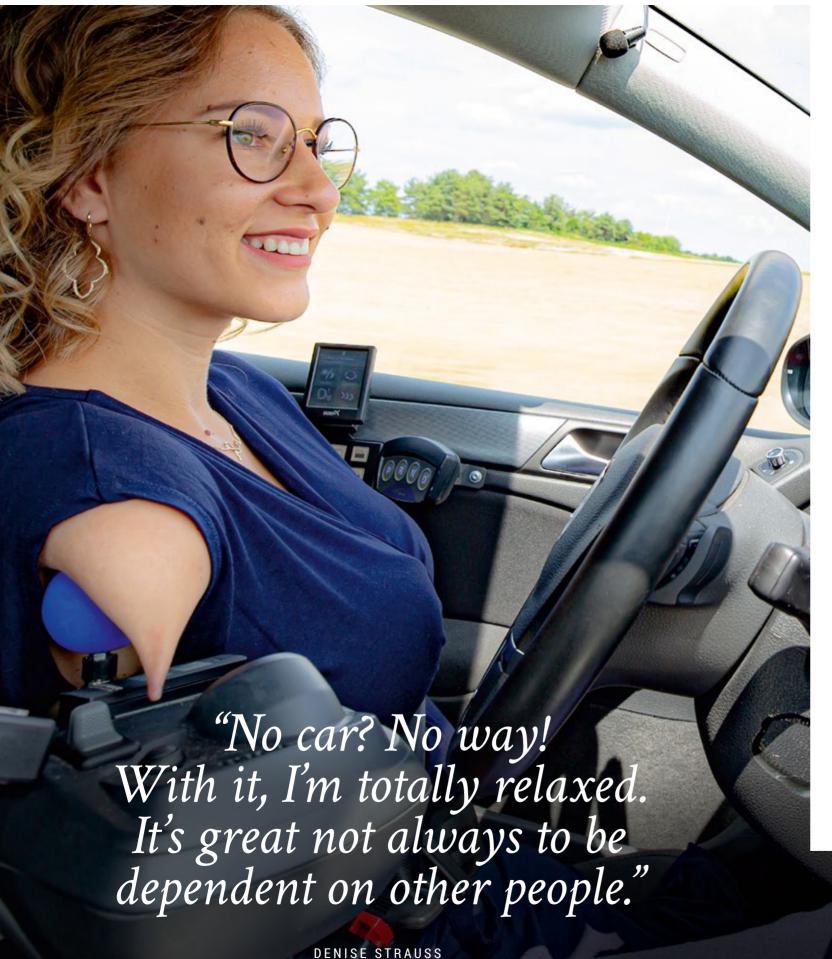
Lowering the vehicle by up to 5 cm significantly reduces the entry angle of the ramp, so allowing wheelchair users to enter the vehicle safely and easily. A robust, reliable air suspension system that is far superior to a conventional hydraulic solution.

## SIGNIFICANTLY MORE GROUND CLEARANCE

Greater ground clearance, a more enjoyable ride: PARAVAN's intelligent air suspension system lets you glide easily over high kerbs, speed bumps and steep inclines, e.g. when driving into underground garages.



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aving a car makes you a lot more independent", says Denise Strauß. Back in 2017. Denise, who is now 25. had to do without her car for three months. This was a huge adjustment for the human resources administrator, and it also posed a major challenge. "Heading home at 4 pm was a big headache for me", she recalls. "In these kinds of situations, you really notice how dependent you

Denise Strauß was born with no arms and only one leg. Her condition is a congenital genetic disorder known as dysmelia. But Denise manages very well with all day-to-day activities, including driving, working and shopping - all as a matter of course and with a remarkably cheerful attitude. When Denise was 11, she played "Kathrin" in the two-part film "Contergan", which was broadcast on German television. She actually originally wanted to be an actress, but, after finishing secondary school, she decided to first complete a training programme that offered good job prospects.

Her living environment and the things she needs to use are all perfectly tailored to her requirements. At work and in her kitchen she sits on a specially made chair at table height. "That's more comfortable. I actually do almost everything with my foot." When she drives, she only needs her right foot to brake and accelerate as normal. Denise drives a red VW Golf equipped with a joystick located under her right arm. She uses the PARAVAN Space Drive system to steer her vehicle. The joystick automatically moves into the right position after her seatbelt has been fastened. "That's the best and most comfortable option for me." On the operating panel next to the joystick she has direct access to the main functions such as start/stop and the air conditioning. The buttons for gear switching and various secondary systems, such as the automatic sun visor, are located on the driver's door. A loading system stows her wheelchair behind her when she's ready to drive.

Her car is also equipped with a beeper that allows her to use defined input codes to easily switch on main beam or activate the indicator. PARAVAN technicians provided her with just the right advice for outfitting her car. "I always wanted the horn on number 1 - that would have been a disaster," she recalls. The specialists told her that the main beam should be "1" and the indicators should be "2" and "3" - i.e. just as "2" is on the left and "3" is on the right in "23". "I'll never forget that", says Denise.

Denise Strauß has been driving her car since 2011. For her there was never any doubt about it: "One day. I was going to drive - and that was it. I just imagined at some point that I would drive a car, and now I do." Indeed, Denise copes well with many of the challenges of day-to-day life.

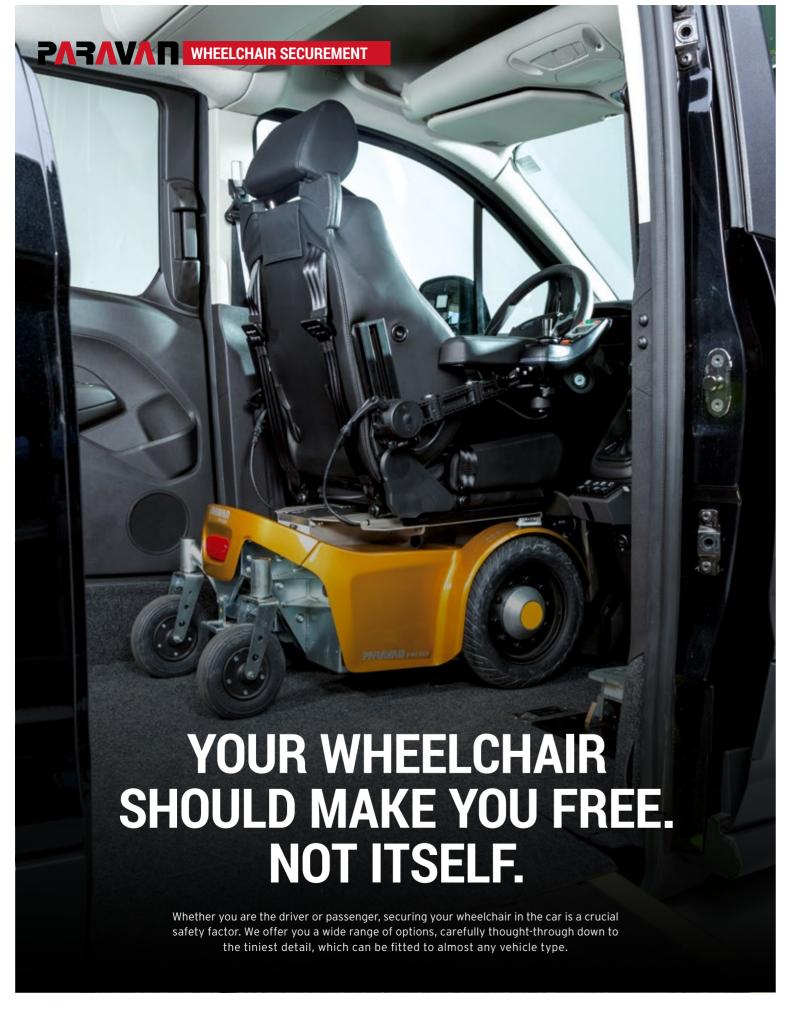


But the process wasn't always that simple. It was Denise's father who found out about PARAVAN. Denise visited the mobility centre in Aichelau for the first time when she was 16. "Getting all the necessary documents together was a complicated process." she recalls. Denise went on to get her driving licence when she was 17. although at that time she still needed to have someone in the car when she drove. After passing a medical-psychological evaluation, she was issued with special approval to drive alone and began driving from her home to school and back on her own.

Today, eight years later, she has nearly 100,000 kilometres of driving under her belt. Driving for two or two-and-a-half hours at a time is no problem for Denise, as she regularly takes trips to the Allgäu region or to friends in Munich on the spur of the moment. "When you're 18, you simply want to drive everywhere yourself." These days, however, she's sometimes happy to take the passenger seat and let her husband do the driving. "If I want to go somewhere, then I simply drive there", she explains. "I don't mind the traffic in cities either, and parking with the joystick is a breeze."

Now she is about to buy a new car. She's currently trying to decide which model she wants to buy. "I've had so many decisions to make over the last two years", she says. She doesn't want to make any major changes in terms of the equipment in the vehicle, even though she knows there are a lot of new options available now. "The fact is that I can't imagine what I would want to change", she explains. "I have absolutely no problems with what I've got now."

"If I want to go somewhere, then I simply drive there", she explains. "I don't mind the traffic in cities either, and parking with the joystick is a breeze."





## PARAVAN DOCKING STATION

When you sit behind the wheel in your wheelchair: in conjunction with the PARAVAN docking station, the PARAVAN PR 50 wheelchair is the world's first wheelchair to be approved as a driver's seat. The docking station makes a secure connection between the vehicle and the PR 50 – and also acts as a charger.



## **PARAVAN FIXTURES**

We have the right fixing and retaining system for every wheelchair and every vehicle. For PARAVAN, driving in your wheelchair means enjoying maximum mobility without the bother of transferring to a vehicle seat.





## PARAVAN HEADRESTS AND BACKRESTS

For drivers: our comprehensive, modular support system for the head, torso, and back gives you great stability, as well as keeping you safe and perfectly prepared to face the traffic. You also enjoy tremendous freedom of movement.

For passengers: unique in form and function — there is nothing similar on the market. The individually adjustable system guarantees that passengers also have complete freedom for their feet and legs.

46 PARAVAD WHEELCHAIR SECUREMENT PARAVAD 47





## SWIVEL SEAT: PATENTED PERFECTION

A modified orthopaedic seat that swivels, with its back, "in front of the door", to collect your passenger. With integrated, extendible footrest, adjustable for your specific vehicle.

## TRANSFER SEAT BASE: FROM YOUR WHEELCHAIR TO THE COCKPIT

The compact seat base on a free-floating rail incorporates reliable lifting and turning technology in three directions and can be fitted to many larger vehicles.



## "TURNY" SWIVELLING AND LIFTING SEAT: VARIABLE HEIGHT

Can be raised or lowered to exactly the required height for you to transfer from your wheelchair to the seat and back. Passengers can transfer from wheelchair to car seat with undreamt-of ease.

48 PARAVAN SEAT SYSTEMS PARAVAN 49



## ALL-ELECTRIC DRIVING: MORITZ SCHÖN

oritz Schön, 19, sits proudly behind the wheel of his modified Tesla Model 3. Moritz, who is training as an IT specialist, wanted an electric vehicle — not only because of environmental considerations but also because the car he ultimately chose has many assistance systems that make driving much easier for him. These systems include everything from a lightened power steering unit to proximity cruise control, a lane-keeping and lane-changing assistant, and cameras that continuously recalculate routes and suggest lane changes.

Due to complications that occurred during his birth, Moritz suffers from motor impairments and needs to use a wheelchair. After Moritz underwent a medical examination, it was confirmed that he would be able to operate a Tesla steering system. 8 Nm was the requirement, which the standard Tesla steering system meets in its comfort mode. Moritz Schön needs extra support from PARAVAN's Space Drive drive-by-wire system in order to operate the controls for acceleration and braking. His vehicle conversion was set up for him to steer with his left hand, and his steering is supported by a multifunctional spinner knob, which is mounted on the steering wheel. Moritz uses his right hand to operate an acceleration/brake lever, which is mounted on the centre console in the vehicle interior. "A mechanical device was no good. My right side is my weak side."

He moves to the rear of the vehicle with his wheelchair, which he then loads into the boot with a Ladeboy lift-and-load device. He then uses crutches to get himself to the driver's seat. His vehicle's "Easy Entry" feature greatly simplifies the process of seating himself behind the wheel. This feature works as follows: after he parks, the driver's seat and steering wheel automatically adjust their positions to make it easier for Moritz to exit the vehicle. After he gets back in, he pushes the brake lever and the driver's seat and steering wheel then automatically move back into the positions stored in the active driving profile.

The Schön family got their Tesla in February and have already driven well over 10,000 kilometres with it. Moritz has done most of the driving since the conversion work was completed. His training location is 15 kilometres from his home. "Theoretically, I could drive a whole week with a fully charged battery", says Moritz, who particularly appreciates the quiet and relaxing ride the Tesla offers, although he understands that others are more interested in the car's superior acceleration. After he took delivery of his vehicle in Aichelau, Moritz drove to a get-together for Tesla Model 3 owners in Fulda. His Tesla – the first-ever converted Model 3 with Space Drive – attracted the most attention at the event.

"I could drive almost any car – but the assistance systems make it a lot easier for me."



## **ELECTRIC MOBILITY, PROS AND CONS**

At the moment, we rarely have electric vehicles in our workshops. Still, the number of requests for such conversions is increasing. There are already a few models on the market in the compact car segment, and there has also been some interest in the minibus sector. Recent examples include the eSprinter and the eVito from Mercedes Benz. VW and other manufacturers will follow suit. Customers can certainly benefit from the new developments in technology and electronics — but not everyone.

- + Multiple assistance systems make driving easier
- + Environmentally-friendly alternative for early adopters
- + New transport concepts with autonomous solutions
- + Electronic control requires less physical strength
- + Automated driving functions are very practical on the motorway
- + Convenient charging at home
- Barrier-free access can only be achieved in a few vehicle types
- Compact cars only suitable for people transferring from a wheelchair who have a loading aid
- Few minibus solutions are available with sufficient range
- Still quite high acquisition costs at present

50 PARAVAN ALL-ELECTRIC DRIVING: MORITZ SCHÖN
ALL-ELECTRIC DRIVING: MORITZ SCHÖN PARAVAN 51



52 PARAVAN POWER WHEELCHAIRS PARAVAN 53



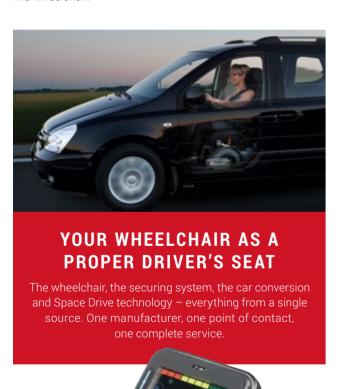
POWER WHEELCHAIRS PARAVAN 55

## THE PR SERIES

ERGONOMIC, INDIVIDUAL, INGENIOUS: OUR INTELLIGENT POWER WHEELCHAIRS.

The PARAVAN family of wheelchairs is characterised by high stability and unusual capabilities. From the PR Piccolino, which was developed to meet the special needs of disabled children, to the PARAVAN PR Biolution, the top-of-the-range biometric standing wheelchair for care and treatment. Every wheelchair has been developed by evolution and has multiple options for bespoke configuration. Our wheelchairs are designed in such a way that we can always adjust them to cater for a changing medical condition.

Whether they're used for leisure purposes, on rough terrain or at work – numerous technical features ensure that PARAVAN power wheelchairs can adapt to any environment. With the PR 50 - the first power wheelchair approved by the EU as a fully-fledged vehicle driver seat – it's now actually possible to drive a vehicle directly in a wheelchair.



That's a real milestone in the world of mobility for the disabled. PARAVAN modifies every wheelchair down to the last detail. This is ensured by our clever modular system with countless special parts and hundreds of adjustment options. The PR 50 is, for example, already equipped to take respiration apparatus, including special headrests and extra power supply. The wheelchair has a perfectly adapted special control system which makes it possible for even the most severely disabled to use it in a safe and controlled manner. Sometimes, it's time to chart a new course – as we did in developing our extremely flexible power wheelchair, the PR 40. This model combines for the first time the technical perfection of the PR 50 with the multifunctionality of the PR Biolution – and offers unbeatable value for money as well.



PARAVAD



## **ELECTRIC LIFT FUNCTION**

Developed in the best tradition of Swabian engineering: a strong, stable lift effortlessly raises your power wheelchair up to 80 cm up in the air.

## INTEGRATED TILTING FUNCTION

Tilt backwards by up to 50° and forwards by up to 20° to make breathing easier and prevent pressure sores, or simply for relaxation.



## **BIOMETRIC DESIGN**

Because of its biometric joints, the power wheelchair adapts perfectly to the human body, for example to reduce tensile and compressive forces.



wheelchairs for overweight individuals, people



Brilliantly multifunctional:

the PR Biolution standing wheelchair for care and treatment

Groundbreaking control unit: the R-Net control system gives wheelchair users an excellent overview of the currently selected functions at all times

with restricted growth or patients in need of portable respiration apparatus.



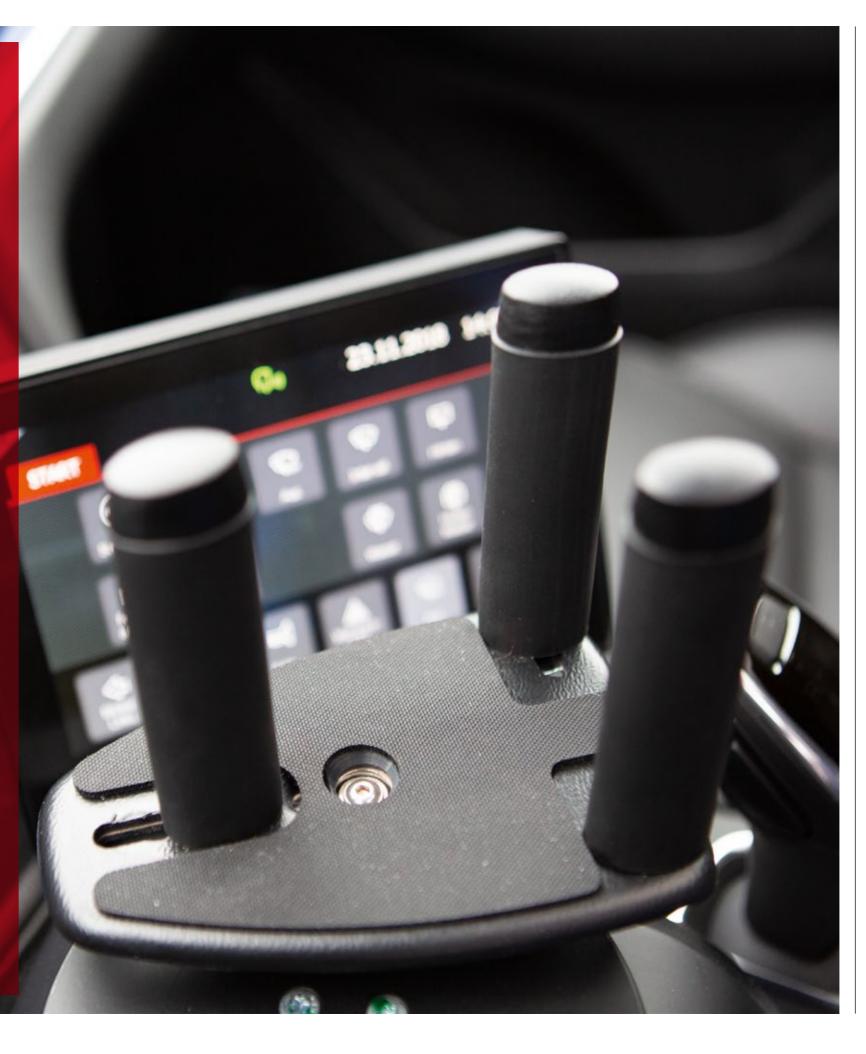
FROM PROTOTYPE TO PATENT

here's a good reason why so many people flock to our little hamlet of 270 souls in the Swabian Alps. Here at our mobility park in Aichelau, they can buy whatever they need to ensure their mobility and freedom – and all from one company.

We are not just vehicle converters – we are also developers and manufacturers. At PARAVAN, everything is from a single source: from software to electronics and mechanical engineering. We have everything under one roof.

It's because the path from development to manufacture is so short that we can be so innovative. Suggestions and experiences put forward by PARAVAN's customers are directly incorporated into our products by our software experts and engineers right away.

Thanks to the legendary Swabian ingenuity, ultra-modern production equipment and first-class workmanship, promising ideas are turned into fully-functioning products. Products that give you even more mobile freedom.



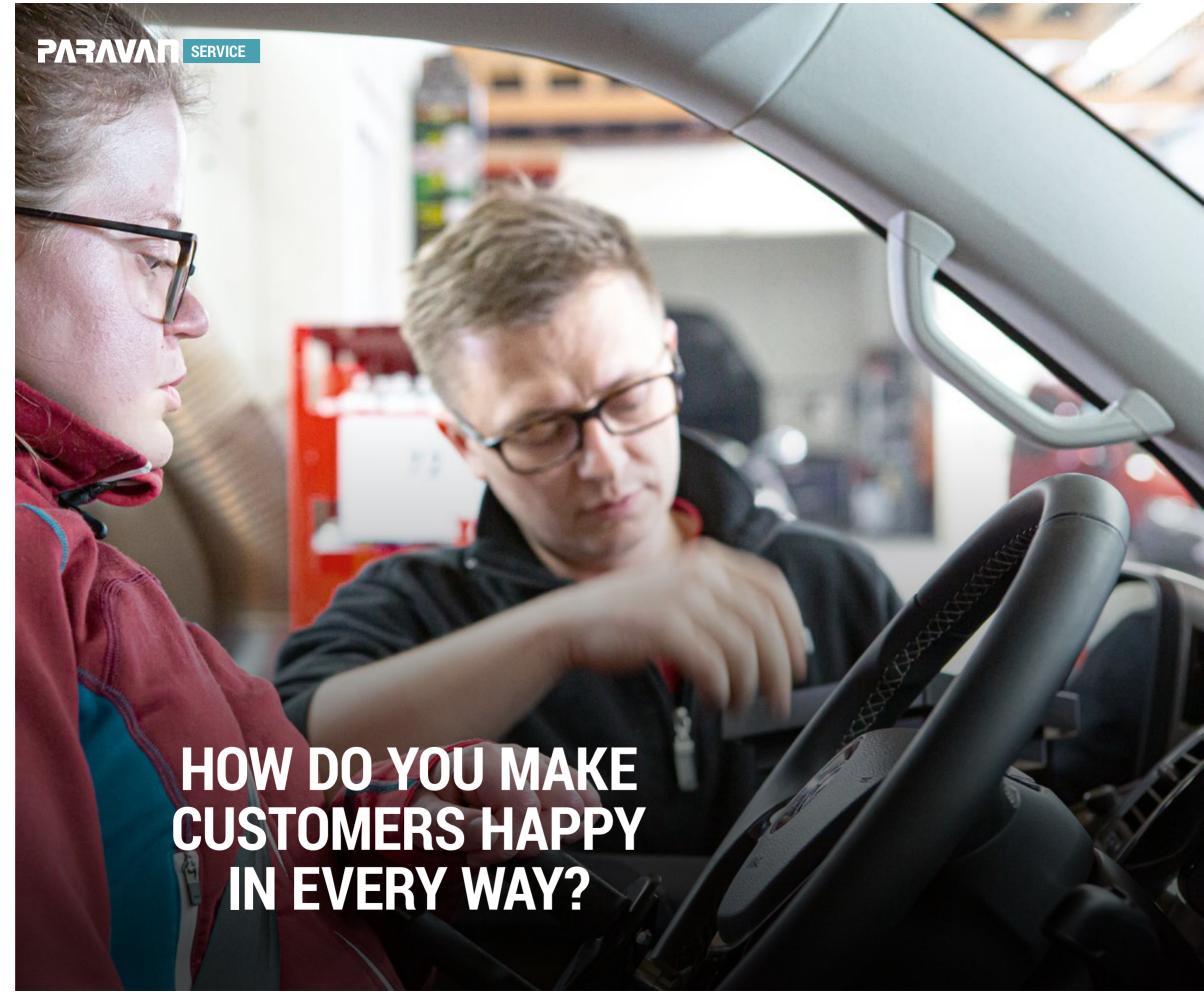


## **VISIONARY**

It all started in a small garage: Roland Arnold played around with his initial ideas on his brother's farm. Today, PARAVAN is an ultra-modern technology company.



Swabian hard work combined with a virtually limitless wealth of ideas: it was back in 2003 that PARAVAN took out its first patents and the first generation of Space Drive vehicles left the workshops. That was just the beginning. Over the years, more and more groundbreaking products took the market by storm. We are proud of our success, and it spurs us on to keep on cranking up the number of new patents we are granted.



# The answer is simple: with great all-round service.

e know that our customers often come to us with lots of questions, and sometimes also with worries and concerns. So at PARAVAN everything begins with a detailed consultation. We listen to you, ask questions, give you advice about therapeutic requirements or medical assessments.

Once we have an in-depth picture of your medical condition, we set to work. A multitude of experienced specialists will now work closely together to develop your personal mobility solution. At our "transparent factory", you can watch live as your product is created. As soon as your new wheelchair or vehicle is ready, it's your turn: you learn all about the products and their functions and test your vehicle extensively on our on-site training circuit. Do you feel comfortable and safe? Does a setting need to be changed or one component adjusted?

When the answer to all the questions is "yes", you simply take your test in our driving school – and nothing more stands in the way of your mobile freedom. If any more technical problems do occur, our workshop is always at your service. If necessary, we can send spare parts anywhere in Germany within 24 hours. And if your medical condition changes, our intelligent product systems enable us to readjust your product at any time.

Temporary mobility? That's no problem either. In our fleet, we have a wide range of hire cars for all persons with restricted mobility and all wheelchair users. And thanks to our partnership with AVIS, you can hire vehicles for the disabled from any of twelve branches all over Germany.

Wherever your journey takes you, we accompany you with the aim of ensuring that you are – and remain – completely satisfied in every way.





RIVING SCHOOL





CUSTOMER CARE

TECHNICAL SERVICE

60 PARAVAN ALL-ROUND SERVICE
ALL-ROUND SERVICE





SCHAEFFLER PARAVAN TECHNOLOGIE GMBH & CO. KG IS CONTINUING TO DEVELOP THE SPACE DRIVE TECHNOLOGY WHICH WILL BE ONE OF THE KEY TECHNOLOGIES FOR AUTONOMOUS DRIVING AT LEVELS 4 AND 5.

he Schaeffler Group has set up a joint venture with PARAVAN founder Roland Arnold (90 per cent Schaeffler and 10 per cent Roland Arnold) that has been operating since 2018 as Schaeffler Paravan Technologie GmbH & Co. KG. "I believe that Schaeffler is the perfect partner to continue the development of Space Drive, scale it up and industrialise it," says Roland Arnold. "What's really important for me in taking this step is that there is an understanding of what it means to be a family company. Both partners — Georg Schaeffler and I — have that understanding."

The future role of Schaeffler Paravan Technologie will be to continue the development of Space Drive and also develop mobility systems such as the Schaeffler Mover. The Space Drive drive-by-wire system has been completely transferred to the new company and is being developed on an industrial scale. Roland Arnold is the Chairman of the Board of Schaeffler Paravan Technologie, which is based in Herzogenaurach with a production site in Pfronstetten-Aichelau. Important advances are being made here in the development of the next generation of Space Drive and this will in turn directly benefit mobility for the disabled.

The next generation of Space Drive should be fully developed on an industrial scale by 2021. With a view to the self-driving vehicles of the future, the team is working on a "rolling chassis" with intelligent corner modules – including wheel hub motors, brakes, Space Drive steering

(90 degrees) and suspension all in one system. Another important step into a mobile future. A major area of business for the company is building prototypes and test vehicles for the industry, especially in connection with autonomous driving, where it's a question of identifying pioneering design concepts, building prototypes and one-off vehicles and coming up with industrial special solutions and applications.

PARAVAN GmbH continues to be an important provider of input and an exclusive partner, especially when it comes to developing highly customised mobility solutions for the disabled. Ultimately PARAVAN GmbH and its customers will also benefit from the recently agreed partnership.

"Schaeffler is the ideal partner to continue the development of Space Drive. What's really important for me is that there is an understanding of what it means to be a family company. PARAVAN and you will all benefit from this partnership."

Roland Arnold, Managing Director and founder of PARAVAN GmbH



Matthias Zink, from the Automotive OEM Board at Schaeffler AG.

## What benefits does the joint venture with PARAVAN bring you?

The Space Drive technology is the only system of its kind to be approved for road use worldwide and in addition it has the potential to be technically and commercially competitive in large-scale automotive production. About 8500 vehicles equipped with Space Drive are currently on the roads around the world and have covered over a billion kilometres with no accidents. The knowledge that has been gained from that will make it possible to get the key technologies for autonomous driving on the road even sooner.

## How important is Space Drive for Schaeffler AG?

Space Drive is the leading drive-by-wire technology. Unlike other systems of its kind, Space Drive has triple redundancy and is therefore currently the only system in the world to meet the highest quality and safety standards. With this key technology for autonomous driving, we want to establish ourselves as a "running gear integrator" in the chassis sector. We'll be building on our core competencies, so this will enable us to gain a technological foothold in the rapidly growing future market for autonomous driving and drive forward diversification between the powertrain and the chassis.

## When do you expect Space Drive/steer-by-wire to go into series production?

The system is due to go into series production in 2021. We're already involved with a number of clients on specific projects that are going to use the technologies that were introduced in the Schaeffler Mover, such as the Schaeffler Intelligent Corner Modules and Space Drive. If you look at the bus fleets and their routes in big cities, a fleet of Movers used flexibly on predefined routes could very rapidly increase the efficiency of local public transport. In that market, we could soon be talking about product numbers in four or five digits. We see ourselves as a running gear integrator, supplying the drive systems and drive control systems to a vehicle integrator downstream.



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SCHAEFFLER PARAVAN TECHNOLOGIE GMBH & CO. KG

## Testing the system in extreme conditions

riving at 240 km/h on the starting and finishing straight of the Nürburgring and all with no steering column: you can do it in an Audi R8 LMS GT3 fitted with the Space Drive drive-by-wire system. In summer 2019, Schaeffler Paravan Technologie introduced the first racing car of this kind to be licensed by the German Motor Sport Federation (DMSB). The Audi R8 LMS GT3 with Space Drive and a force feedback steering unit has no mechanical connection between the steering device and the steering gear. It is due to take part in the DMV GTC series for racing touring cars.

For motorsport, the technology needs to be tested in extreme conditions.

The focus is on the requirement for high speed and the ability of the system to react

perfect for the future development of Space Drive. This kind of technology will be essential in the further development of autonomous vehicles. Testing in race circuit conditions is absolutely critical if such systems are to go into series production.

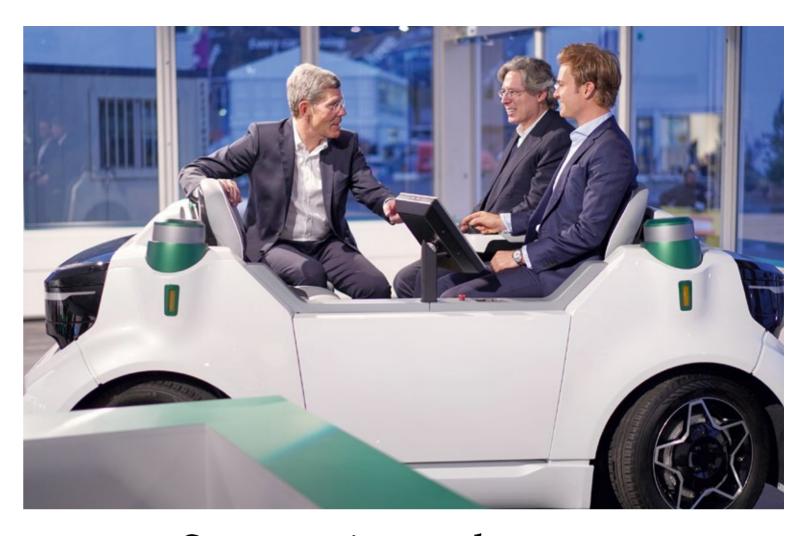
The technology has its origins in mobility for the disabled, and PARAVAN's customers have been helping with the continuing development of the system for years. Now they in turn are benefiting from findings made in motor racing. If Space Drive can survive under the extreme pressures of the race track, then users on the road can certainly feel safe.

The knowledge that has been gained will not only be used in the new, third generation of Space Drive. It is also feeding directly into the

production and maintenance processes for the current generation of Space Drive that is enabling mobility for the disabled.

"You have to react faster in a racing car than in a road car. That's what I was worried about. But the control system is incredibly fast and incredibly accurate."

Racing driver Markus Winkelhock



## Space-saving and compact: the Schaeffler Intelligent Corner Module

ccording to forecasts from the UN, by the year 2050 about two-thirds of the world's population will be living in cities. The question is how to give these people individual mobility. The concept of the Schaeffler Mover is already showing a clear vision of the future.

Self-driving cars will require new ideas.
One such is the compact drive module, the "Schaeffler Intelligent Corner Module".
All the components of the drive train and chassis are housed in one space-saving unit: wheel hub motor, wheel mounting including suspension and the electromechanical steering system. The latter comes in the form of an electromechanical drive-by-wire system and is controlled by Space Drive technology.

The technology platform of the Mover is so flexible that different vehicle bodies, from a robo-taxi to a self-driving delivery van, can

be fitted to it. The body can be quickly separated from the platform on which all the technology required to drive it is bundled. Only some of the sensors that are needed for autonomous driving are also incorporated in the body.

"Space Drive is a key technology in the biggest change since the invention of the motor car. If there is no steering column, vehicles can be controlled electronically and driven autonomously, and the interior can be entirely redesigned."

Roland Arnold, founder and Managing Director of PARAVAN GmbH and CEO of Schaeffler Paravan Technologie



SCHAEFFLER & PARAVAN PARAVAN 67



We are pleased and proud about the many prestigious awards that we have had the honour of accepting on behalf of our customers.



German Mobility Prize 2019 (Schaeffler-Paravan)

German Service Innovation Prize 2014

Premier Finalist – Grand Prix for Small and Medium-Sized Businesses 2013

ADAC's "Yellow Angel" award 2013

Top 5 in the Prize for Medium-Sized Businesses for Social Responsibility 2013

German Entrepreneur Award 2012

German Industry Prize 2012

Winner of n-tv award for medium-sized businesses "Hidden Champion" 2012

Bavarian State Prize 2012, 2008

"Golden Oscar" – Grand Prix for Small and Medium-Sized Businesses 2011

German Industry Innovation Award 2011

National winner of "Mutmacher der Nation" (Local Heroes) 2010

Baden-Württemberg 2010 Top 5

Franz Dotterweich Memorial Prize 2010

Enterprise Medal in Gold awarded to Roland Arnold for outstanding services to the economy of Baden-Württemberg

German Foreign Trade Award 2009

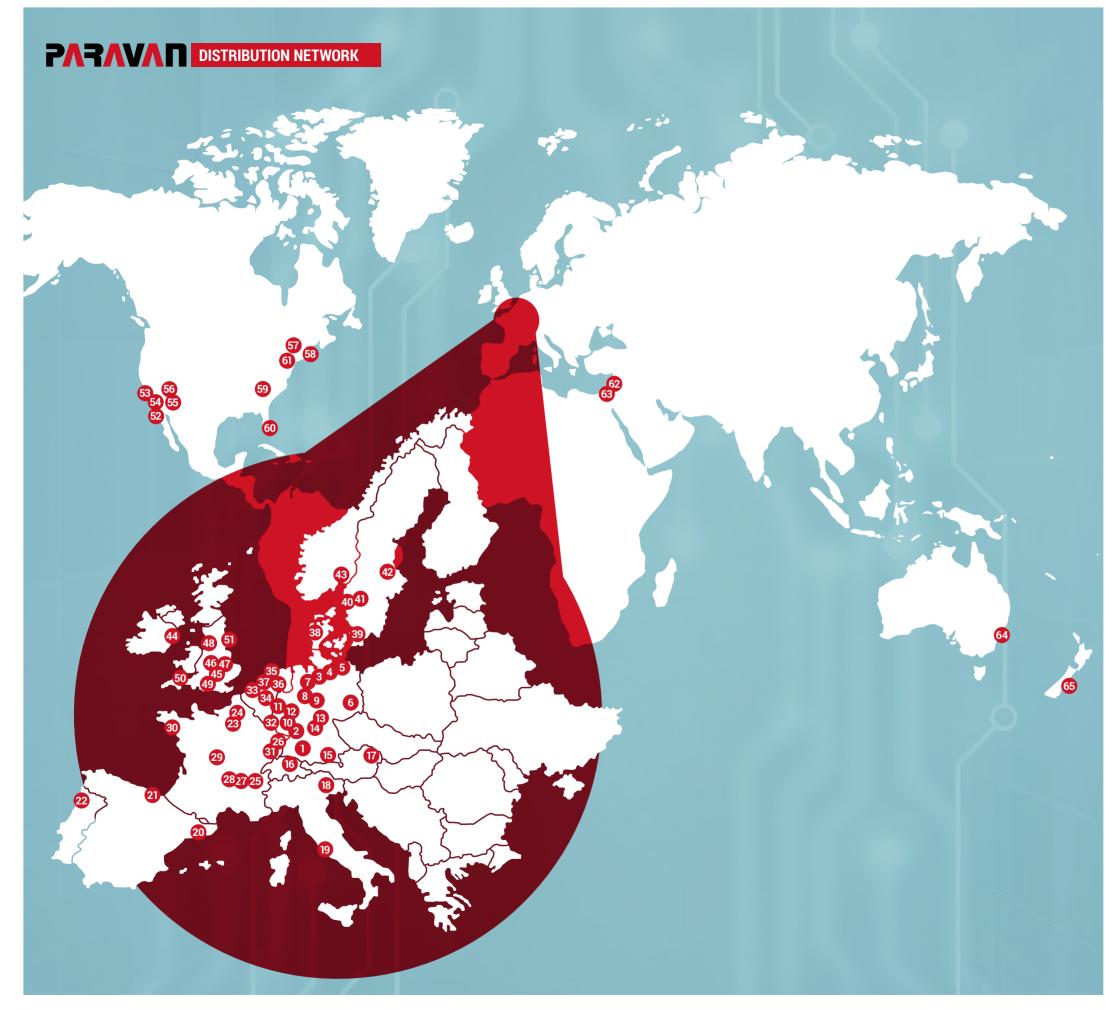
Selected location in 2009 for "Germany - Land of Ideas"

Dr. Rudolf Eberle Prize 2008 – Innovation Prize awarded by the Baden-Württemberg Ministry of the Economy

High-tech award "CyberOne" 2008

German Skilled Crafts Prize 2005

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## From Aichelau to Australia – worldwide mobility.

It's a wonderful feeling to be able to improve people's lives by your own work. The feeling of gratitude for being able to do something useful is also shared by our suppliers and partners. In Germany, we have built up a nationwide network of marketing and service partners over the years. We give all our partner companies intensive training to introduce them to our products.

Across the world, we are represented in the USA, Israel, Australia and New Zealand and at present in 16 countries in Europe. And because we want to help as many disabled people around the world as we can to improve their mobility, we are constantly expanding our market presence and are now focusing on Asia.

## **GERMANY**

- 1 Aichelau
- 2 Heidelberg
- 3 Bremen
- 4 Hamburg
- 5 Rostock
- 6 Hoyerswerda
- 7 Delmenhorst
- 8 Paderborn
- 9 Kassel
- 10 Neustadt
- 11 Wassenberg
- 12 Lindlar
- 13 Grossbreitenbach
- 14 Schönbrunn
- 15 Benediktbeuern

## **SWITZERLAND**

16 Oberentfelden

## **AUSTRIA**

17 Vienna

## ITALY

- 18 San Fior
- 19 Rome

### SPAIN

- 20 Barcelona
- 21 Bilbao

## **PORTUGAL**

22 Porto

## **FRANCE**

- 23 Paris 24 La Rue-Saint-Pierre
  - 25 Albens
  - 26 Geispolsheim
  - 27 Lyons
  - 28 Cosne-sur-Loire
  - 29 La Roche Blanche
  - 30 Larmor Plage
  - 31 Mulhouse

## **LUXEMBOURG**

32 Luxembourg

## **BELGIUM**

- 33 Kontich
- 34 Schoten

## **NETHERLANDS**

- 35 Hoorn
- 36 Amsterdam
- 37 Nieuw-Vennep

## **DENMARK**

38 Herning

## **SWEDEN**

- 39 Staffanstorp
- 40 Göteborg
- 41 Stenkullen
- 42 Hedemora

## **NORWAY**

43 Moss

## **IRELAND**

44 Ashbourne

## **GREAT BRITAIN**

- 45 Hemel Hempstead
- 46 Coventry
- 47 Leighton Buzzard
- 48 Accrington
- 49 Basingstoke
- 50 South Molton
- 51 Driffield

## **USA**

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- 53 San Luis Obispo, CA
- 54 Los Angeles, CA
- 55 Phoenix, AZ
- 56 Las Vegas, NV
- 57 Niagara Falls, NY
- 58 New York, NY
- 59 Conyers, GA
- 60 Miami, FL
- 61 Chantilly, VA

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63 Petach Tikva

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## 

## **PARAVAN GmbH**

Paravanstraße 5 - 10 72539 Pfronstetten-Aichelau Germany +49 (0)7388 999 5 91 info@paravan.com

www.paravan.com



