

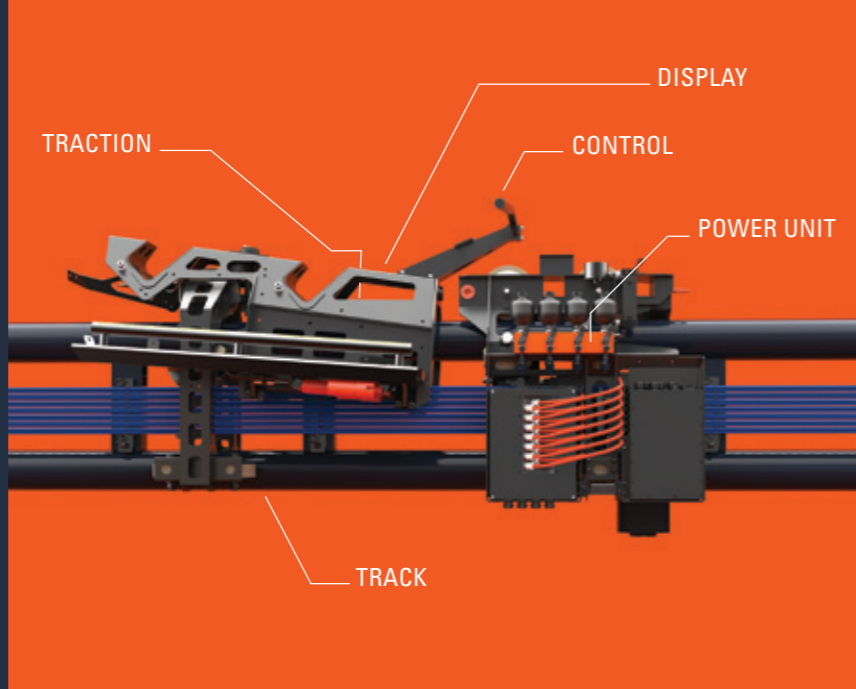


SPIKE[®] RACING

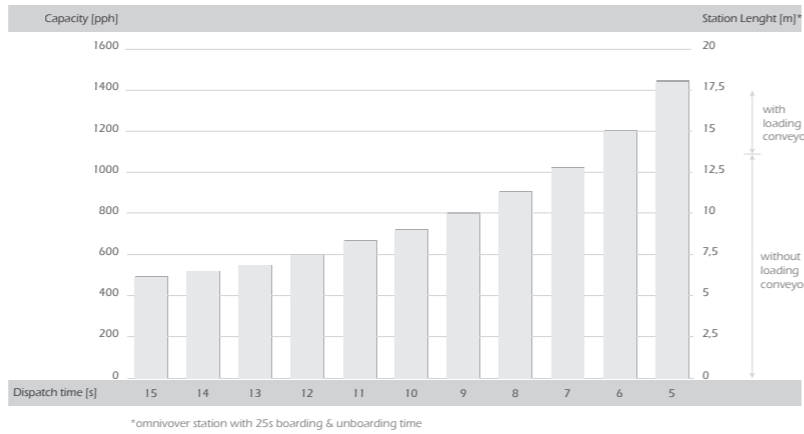
World's first interactive Racing Coaster



SPIKE® FULL TRACTION TRANSPORT



EVEN WHEN USING SINGLE TWO-SEATER VEHICLES, CAPACITIES OF 1000 PPH CAN BE ACHIEVED.



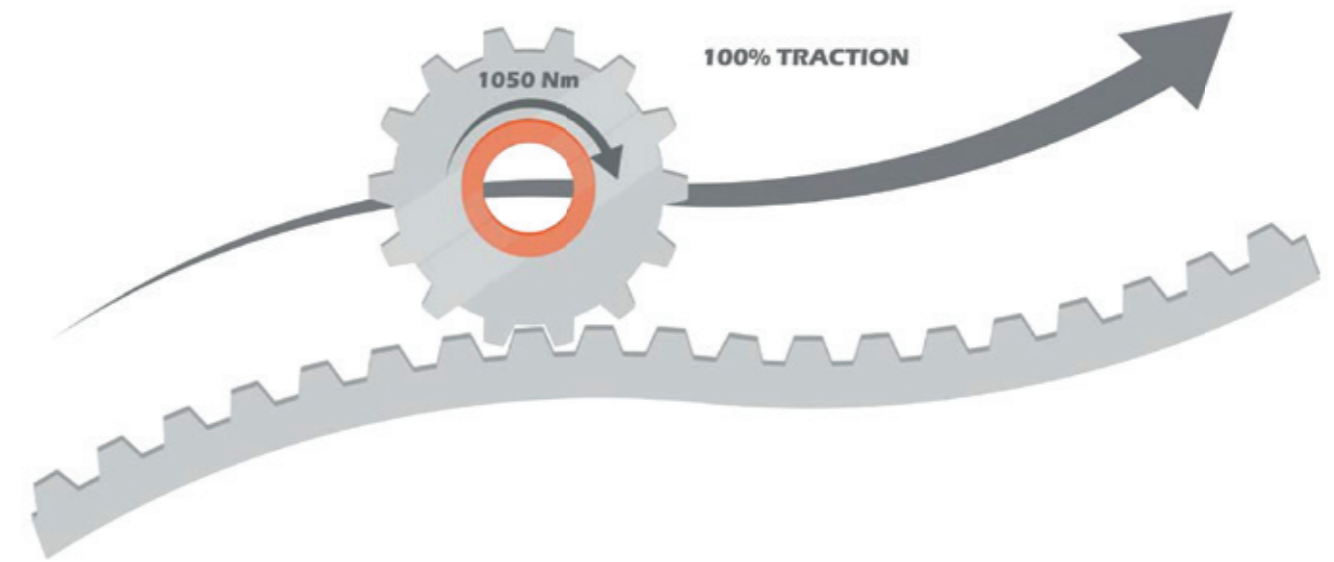
SPIKE® is a milestone in rail-guided transportation. A unique patented tooth system allows the electromotive driving force to be transferred to the rail slip-free and with 100% traction, ensuring an absolutely silent and calm riding experience even at high speeds.

The toothed rack, which is attached to the rail, flexibly conforms to all radii and twists of the rail, as does the power rail which has been developed specially for high speeds. This allows full design freedom when planning the route. Hence, this allows constant propulsion to be delivered even in the tightest curves, and even all the way up vertical route segments.

Spike® Coasters defy the physical limits experienced by conventional roller coasters due to gravity. The previous limits imposed by the complex interaction between potential and kinetic energy are completely suspended with Spike's driving force. **100% traction** allows for propulsion exceeding **1 g**, allowing for acceleration even on layout segments leading vertically upwards.



SPIKE®,
WINNER OF:
BEST NEW PRODUCT AWARD
IAAPA Attractions
Expo 2017
- First Place -



INTERACTIVITY

YOU CAN'T EXPERIENCE SPEED ANY MORE INTENSIVELY.



SPIKE® IS THE ONLY REAL ROLLER COASTER THAT PROVIDES THE RIDER WITH INTERACTIVE CONTROL OVER THE VEHICLE. USING A THROTTLE-GRIP, BOOST BUTTON AND TOUCH SCREEN MANY DIFFERENT EXPERIENCES ARE POSSIBLE.

INTERACTIVE RIDE

SPIKE® Race offers an experience that makes it possible for anyone to experience the rush of action sports without any risk. Feeling the brute force of over **1000 Nm** of torque is one thing, but turning the throttle to intentionally accelerate with over **1 g** – as fast as a Formula 1 race car – is a completely different sensation.

In addition, there is also the lowest seat position ever implemented on a roller coaster, the rail between your legs, and a feeling of freedom akin to being on a motorbike, limited only by a hip belt. You can't experience speed any more intensely.



REAL COMPETITION: WORLD'S FIRST INTERACTIVE DUELING COASTER

The „Ducati World“, a new themed area dedicated entirely to the Italian motorcycle manufacturer, is part of Mirabilandia Park, Ravenna (Italy) since 2019. The main attraction is, Desmo Race, an interactive SPIKE® coaster in which passengers become a Ducati Panigale V4 Superbike rider. With its two tracks a real race between two vehicles is possible and only the best and fastest wins.

SPIKE® turns roller coasters into a sports vehicle as well as a real-life computer game experience. Comparisons with other drivers and the incentive to learn to better master the equipment in order to get even faster and push the limits and fan the fires of competition. Active driving is necessary, and turns the ride into an unforgettable experience, both for lone drivers as well as group events.

SPIKES ability to be controlled by riders allows riders to time their own rides.

This makes competitions possible. Leader boards can be installed to show guests photos and their driving times, either in the queue line or the exit to the ride.

With the push of the boost button, riders accelerate even quicker for a specific amount of time.

The “boost tank” empties and can only be used again after a specific time. With this button, other actions can be performed to fit a storyline.

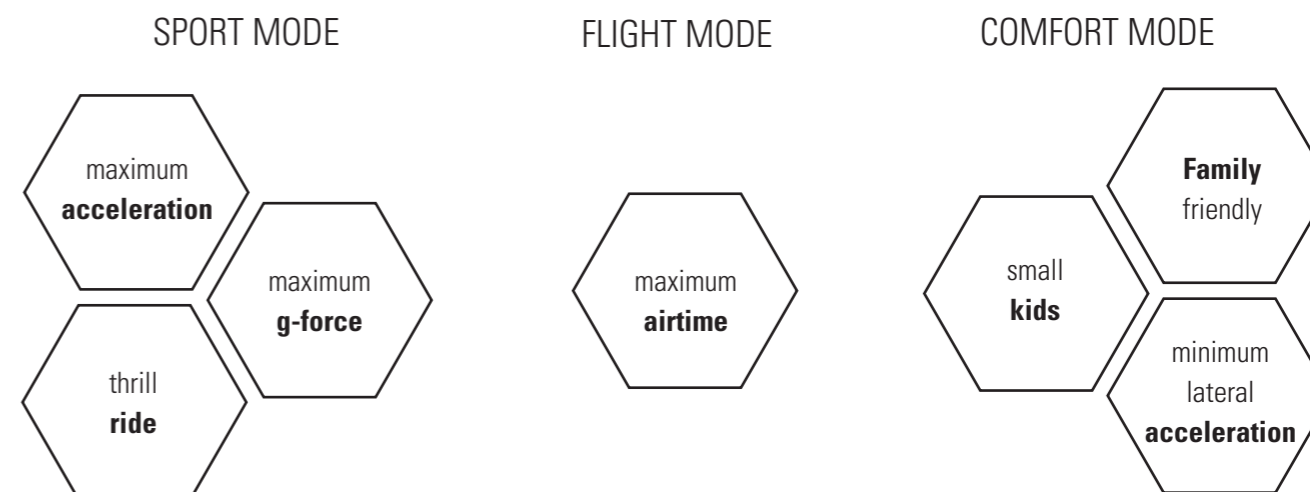
Multiple ride experiences are possible.

These can be fitted to various stories or quicker speeds when selected by riders. For example, a Family attraction during the day or a thrilling attraction at night.

Interactive sections can alternate with automatically controlled sections. Encounters between the vehicles are just as easy to configure as the variations between slow and high-speed trips. Hence, it is not only the pre-show but the entire installation which becomes part of the story told, with extreme after extreme, and suspense, surprise, and overwhelming impressions create a truly **unique experience.**



ONE COASTER - ONE LAYOUT - ENDLESS POSSIBILITIES



LAYOUT FREEDOM

DRAFT YOUR TRACKS - FREE OF PHYSICS AND TECHNOLOGY.



PLAN UNLIMITED

With a layout that can be planned practically without any restrictions, the term custom-designed takes on an entirely new meaning, allowing all of the wishes and requests in the customer's design to be implemented exactly as envisioned.

Never before has it been possible to adapt track layouts so exactly to the requirements of each particular project, allowing them to be turned into unique attractions while fulfilling so many aspects at once.

SPIKE® Racing defies the physical limits experienced by conventional roller coasters due to gravity.

The previous limits imposed by the complex interaction between potential and kinetic energy are completely suspended with SPIKES driving force.

The technology covers a large scope of possible applications for:

THEME PARKS, DARK RIDES, FEC, RACING CIRCUITS, CRUISE SHIPS, MOUNTAINS, HOTELS, ARCHITECTURE, SHOPPING MALLS

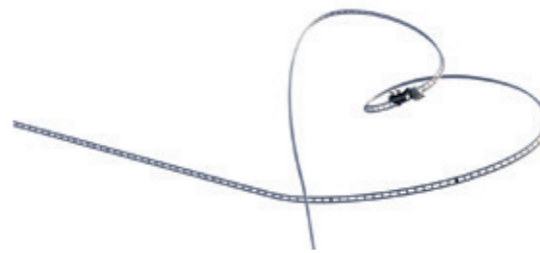
The **unlimited energy reservoir** transforms even flat stretches into a special attraction. Closely adapting to the terrain or navigating tight corridors between buildings, an impressive track height loses its meaning. With the massive power of the SPIKE® drive constantly available, the vehicle is accelerated out of a steep curve while still in the radius, giving a sensation never experienced before. Power and dynamics are felt along the entire route with all five senses, and the intensity and fascination only end when the ride does.

Tight radii, up to **3 m** (10 ft) **horizontally** and **5 m** (16 ft) **vertically**, are possible at any point in the layout. The speed of the vehicle is adapted while on the move by the control system, ensuring that predetermined lateral or compressive forces are not exceeded.

The innovative belt restraint system gives the passenger maximum feeling of freedom and, with the highest safety class 5 according to EN and ASTM standards, enables lifting forces and enormous airtime.

UNUSUAL AND UNIQUE TRACK SHAPES ENSURE THAT EVERY SPIKE® COASTER IS UNMISTAKABLE, AND OPEN UP A WHOLE WORLD OF POSSIBILITIES FOR ROLLER COASTER CONSTRUCTION. DESIGNERS CAN TRULY GIVE THEIR CREATIVITY FREE REIN WHEN DESIGNING NEW, INNOVATIVE TRACK SHAPES.

HEART



Decelerating for the small radius in the middle of the figure, only to thrust off again with full acceleration over the steeply banking tight curve of the ride element.

PRETZEL



Closely intertwined with constantly interweaving tracks, this ride figure provides a breathtaking series of bends in an extremely tight space: The carousel, re-imagined.

FUNNEL



Passengers accelerate up a widening corkscrew with increasing velocity to an astonishing height, before speeding down along a wide curve.

FIRST-EVER ROLLER COASTER AT SEA

Get ready to ride! In another industry first, Carnival Cruise Line and Maurer Rides present the first-ever roller coaster at sea. The line's newest and most innovative ship Mardi Gras™ provides an unforgettable and unique open-air thrill ride. Built by Munich-based Maurer Rides, BOLT™: Ultimate Sea Coaster™ is a heart-pounding rush of adrenaline offering nearly **220m of exhilarating twists**, turns and drops with riders reaching speeds of nearly **60km/h**.

With 100% traction, more than enough torque and the best corrosion protection for all parts, the vehicle is ready for operation even in extreme environmental conditions and high winds.

The lightweight construction of the entire ride permits an integration on the ship's structure.



MAXIMUM FUN!
MAXIMUM SAFETY!

ACCELERATE!

POWER. DYNAMIC. SPEED.



PUSH THE LIMITS

The fascination motor sports hold lies in the firsthand sensation of unbridled machine power that is tamed by the skill of the driver and transformed into raw speed.

SPIKE® brings this experience to the tracks, making possible interactively controlled fun rides that push the limits of technology.

POWER The powerful motors and 100 % traction allow the vehicle to accelerate with over 1g, putting it on par with superbikes. This power is available everywhere on the track, even in curves and can be controlled precisely for exciting effects

SAFETY The integrated dynamic block system continuously ensures that the necessary safety clearances are observed. The dispatch interval is calculated in such a way that the slowest vehicle cannot catch the fastest one during the entire ride.

Each SPIKE® vehicle is equipped with its **own decentralized safety control system**, via which all relevant data is constantly exchanged with the central control system and those of the other vehicles. This allows vehicles to be located down to the centimeter and speeds and acceleration to be regulated precisely every step of the way -tooth by tooth.

Located near the engine brake, each vehicle has a hydraulic **emergency brake**. This can decelerate the vehicle from its top speed to 0 in less than 2 seconds.

EFFICIENCY The energy saved by regenerative braking is used for the next vehicle.

CAPACITY The form-locking and hence weather-insensitive safety braking system, which is integrated into the vehicle, allows for short **dispatch times of less than 10 seconds** and high capacities of 1000 pph.

FLEXIBILITY Because the vehicles are freely controllable, it allows unusual ride experiences such as traveling forwards and backwards, short, exciting stops, and the easy integration of show areas. An attractive side effect is a hitherto unsurpassed number of vehicles which are traveling all together, thus making the installation appear exciting and full of new adventures from the outside.

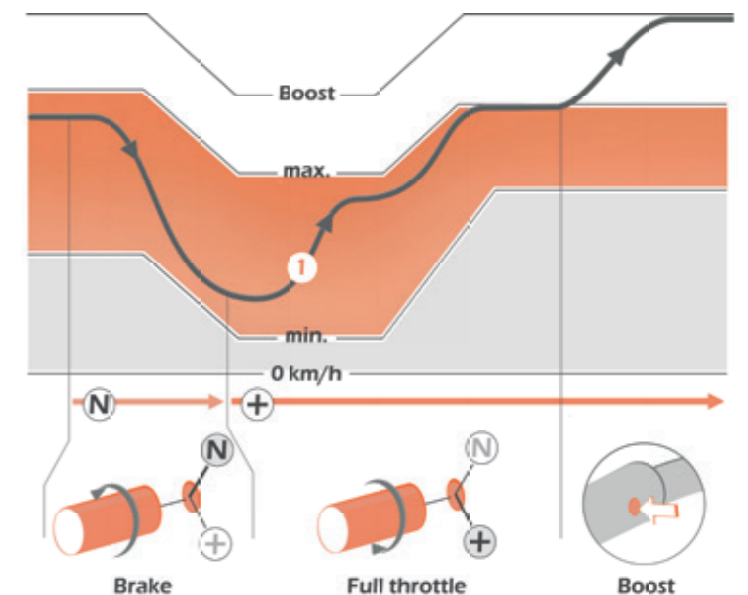
INDIVIDUAL FUN The speed range within which drivers can ride their vehicle is pre-programmed for each particular track layout. The predetermined minimum route speed ensures a reliable transportation capacity, while at the same time ensuring a suitably fun experience even for beginners with a careful driving style. Simply going at top speed without braking in time before a bend, leads to a loss of time, such that it is primarily training, intuition and courage which decide who gets the best times.



SPEED CONTROL, IN YOUR HANDS

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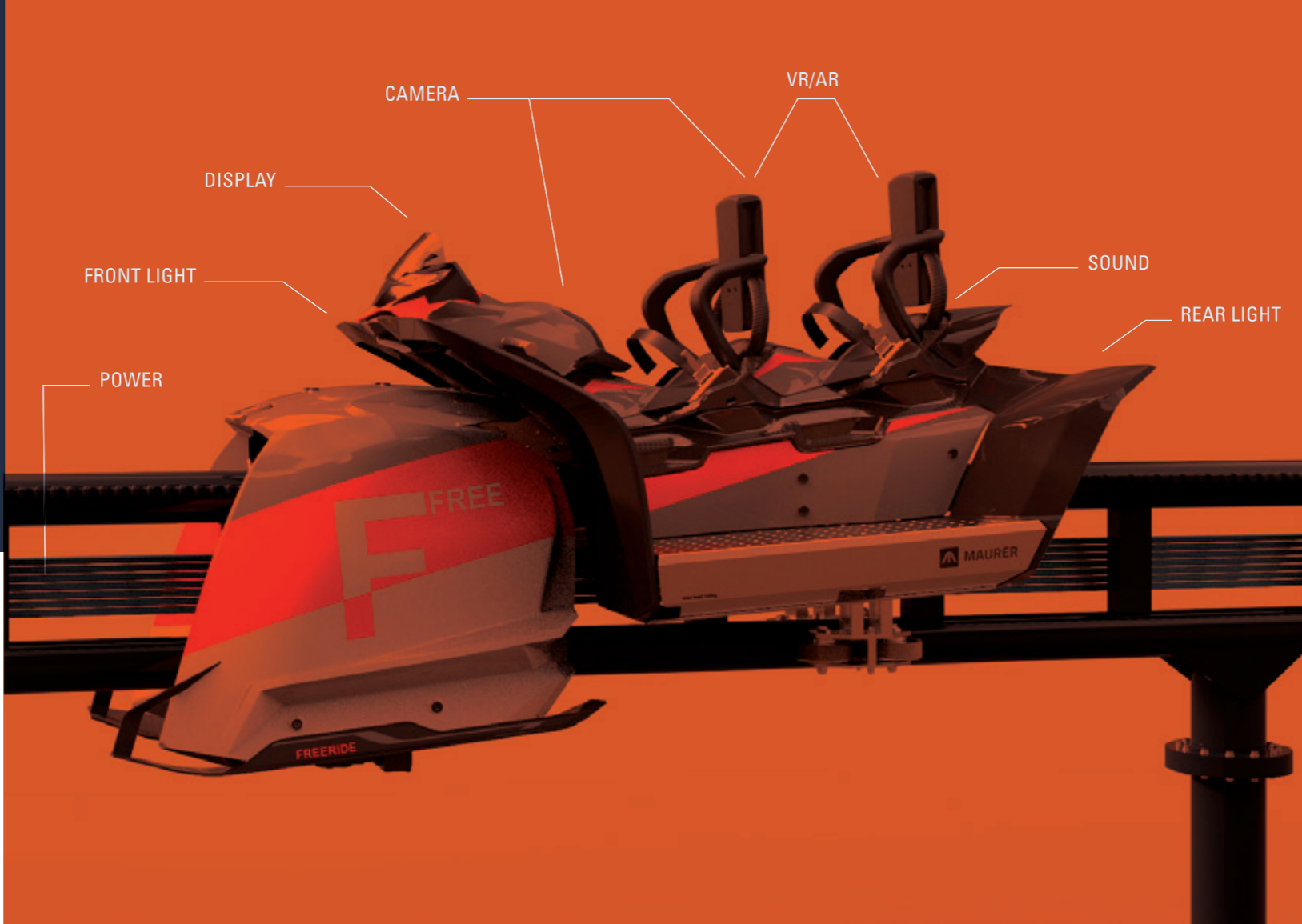
POWERFUL SAFETY

RIDE UNLIMITED

MEDIA INCULDED

THE NEW GENERATION OF COASTER VEHICLES

A throttle and boost button for additional thrust, brake lamps that light up, speed-dependent, freely configurable ride sounds, on-board video and a touchscreen display—you can't squeeze any more equipment in. Make the Spike Race car a high-tech vehicle that is unrivaled in its class. Thanks to onboard electric supply; further systems, including AR/VR, can easily be powered.



LIMITLESS DESIGN

Speakers and displays are already integrated into the ride vehicle with no need for battery power.

The pre-selection of electronically generated, **speed-dependent vehicle sounds** ranges from the deep roaring of a large motorbike engine to futuristic spaceship sounds.

A high-performance **multimedia PC** integrated in the vehicle enables impressive high-resolution VR and AR applications.

Onboard cameras and cameras placed around the track take videos of the ride. These are automatically cut, rendered and generated as a **Full HD Video with sound, speed data and riding time**.

Additional **game elements** which participants will be familiar with from video games, such as boosters, tank fills and even attacking other players, can also be integrated as optional extras, further augmenting the experience.



LIMITLESS CONNECTIVITY

Using the SPIKE APP, the Full HD video can be bought and downloaded right after finishing the ride.

Videos are easily sharable with Facebook and Youtube, thereby creating free advertisement for parks.

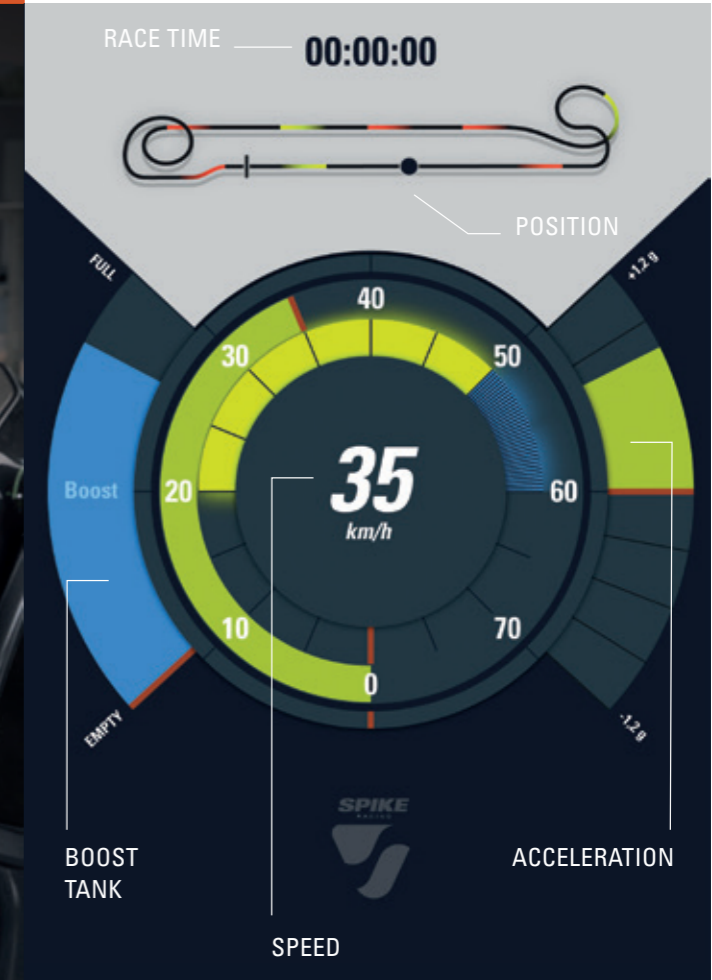


INTEGRATED
2 X 250W SPEAKER



CAMERA FOR
CO-DRIVER

CAMERA FOR
DRIVER



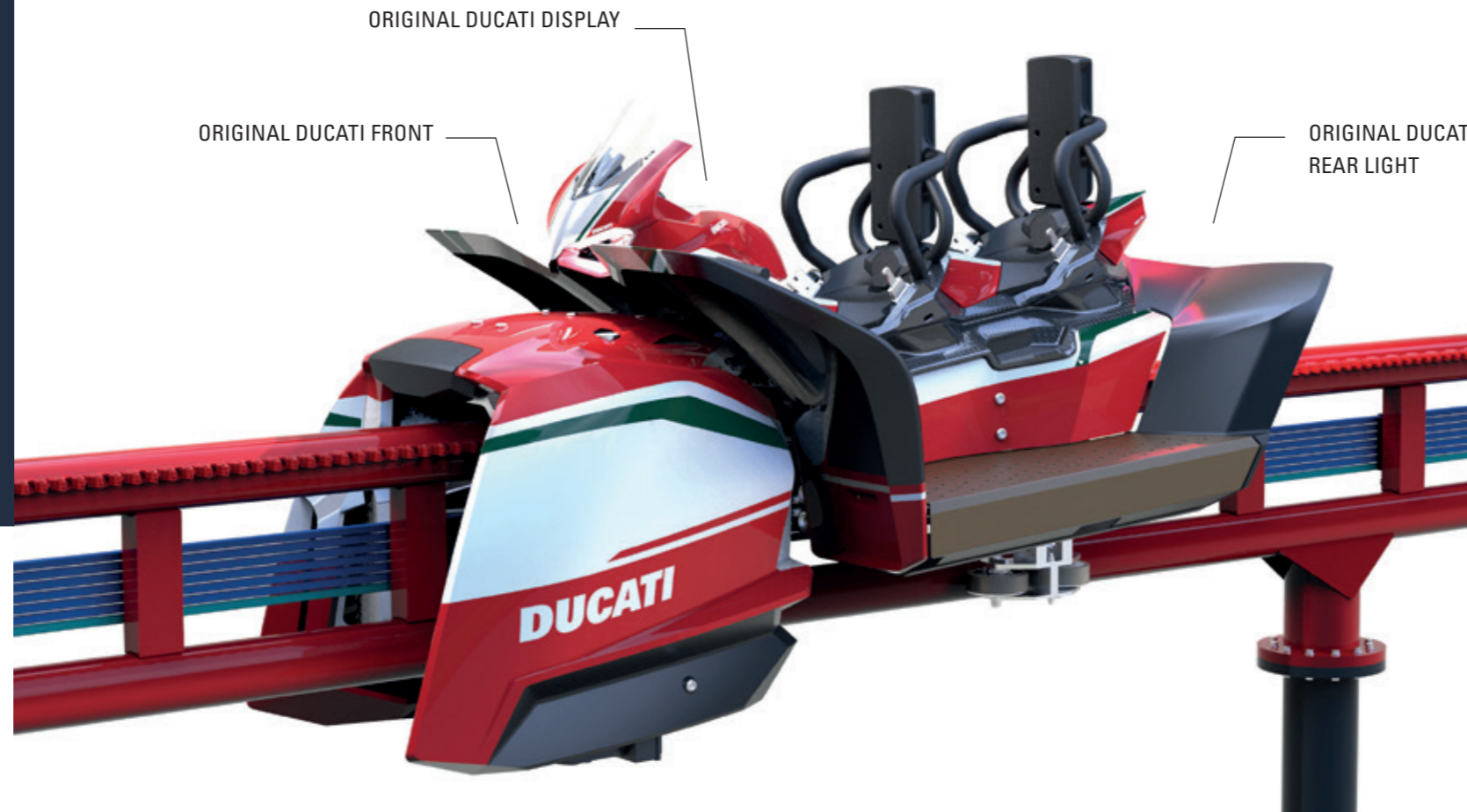
JETSKI, SKIDOO,
SUPERBIKE, RACECAR,
TRACTOR, HORSE OR DRAGON

– DESIGN CREATES
AUTHENTICITY

SUPERBIKE „PANIGALE V4“
Design for Ducati World,
Mirabilandia, IT

To ensure that the design of the vehicles was as realistic as possible, we worked for the „Desmo Race“ closely with Ducati so that original elements such as the front of the motorcycle and the display with gear and speed indicator could be integrated.

INDIVIDUAL THEMING



TURN ANY STORY INTO A BREATH-taking ADVENTURE.

CAR Race. As a powered SPIKE® system, Car Race fulfills the highest capacity requirements with its short launch times. The vehicles continue moving slowly while passengers get on and off, thereby minimizing the length of the station. Exact control of the vehicles replaces all station drives, additional sensors, and other built-in rail structures.

The overall systems remain simple. In the same manner, sudden speed changes can be programmed at any location during the ride without any technical effort, allowing **any story to be turned into a breathtaking adventure.**



CHARIOT - RACE

CAR - RACE

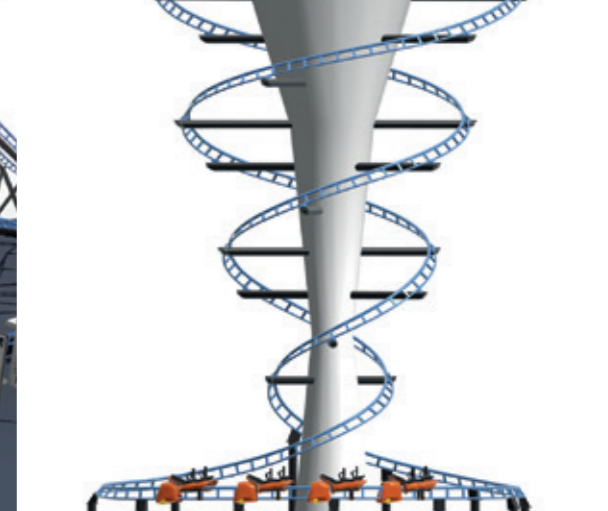
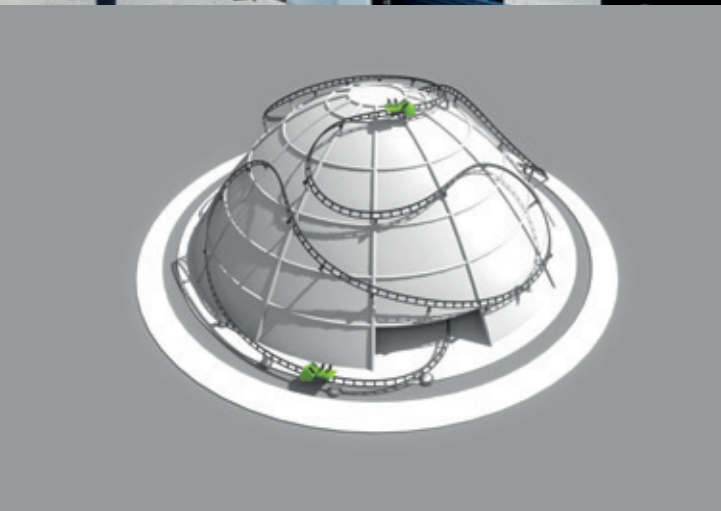


JET-SKI



LAYOUTS UNLIMITED

CUSTOMIZED LAYOUTS AS WELL AS VARIOUS STANDARDS AVAILABLE



SPIKE® DOM

Starting from a height of 17 m (55 ft) with approx. 40 m (131 ft) diameter, this dome concept shows how easily an architecturally interesting structure can be combined with a SPIKE layout. Forces are optimally transferred through the steel construction which functions as both a ride support element and an additional attraction. A themed enclosure can transform the area below into a station, dark ride, maintenance area, or merchandising shop.

Track length: 290 m (951 ft)
Base area: 43 m x 43 m (141 ft x 141 ft)
Capacity: 300 - 700 pph

SPIKE® RACER

The new SPIKE „Racer“ layout is even more sporty and interactive with a new Moto GP style. Five straight-aways allow the riders to accelerate through with the full 1.2 g in order to really get into the curve and to fully accelerate out again.

Track length: 270m (886 ft)
Base area: 55 m x 40 m (180 ft x 131 ft)
Capacity: 400 pph

SPIKE® AIRTIMER

For off-road competition, we developed an interactive motocross variant based on our SPIKE® Airtimer. Now it is not just about the best lap times, but also the air-time intensity is recorded! During the jumps, the LED running light activates on the supporting arch.

Track length: 306 m (1004 ft)
Base area: 65 m x 25 m (213 ft x 82 ft)
Capacity: 400 pph

SPIKE® TORNADO TOWER

The Spike Tornado Tower swirls the riders with impressive power to a height of 30m. The more you dare to accelerate, the stronger you are pressed outwards.

Track length: 206 m (676 ft)
Base area: 22 m x 20 m (72 ft x 65 ft)
Capacity: 300 pph

DESMO RACE SPIKE® – COMPETITION

Two parallel tracks allow you to challenge yourself and to hurtle in a side by side path. So, hop on, listen to the rumbling motor and become a rider!

Park: Mirabilandia, Ravenna, IT
Track length: 2 x 525 m (1722 ft)
Base area: 225 m x 60 m (738 ft x 196 ft)
Rides Time: 60 s
Vehicles: 12
Capacity: 1000 pph
Speed: 80 km/h (50 mph)

SPIKE® TECHNOLOGY COVERS A
LARGE SCOPE OF POSSIBLE
APPLICATIONS, AND IS OFFERED
IN THE PRODUCT GROUPS RACING,
TRANSPORT, AND CARGO, IN
WHICH VARIOUS VEHICLES AND
RAIL TYPES ARE USED.



MAURER RIDES GmbH

Frankfurter Ring 193
80807 Munich

PO Box 440145
80750 Munich

Phone +49 89 215 4030 30
Fax +49 89 215 4030 99

info@maurer-rides.de
www.maurer-rides.de

www.spike.de