

**MONTECH**

**MONTRAC**



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With more than 10 years of experience and 1300 systems installed worldwide, Montrac is the world leader in self-propelled transport systems.

Montech has been pioneering advances in the automation industry since 1963. Superior flexibility and exceptional commitment to customers are the company's fundamental principles. This international player based in Switzerland achieved its most significant market breakthrough with Montrac, the most revolutionary transport system available. Montrac embodies absolute flexibility and virtually unlimited possibilities, coupled with an overall system design which is simple and user-friendly.

BASED ON THE PROVEN MONORAIL CONCEPT

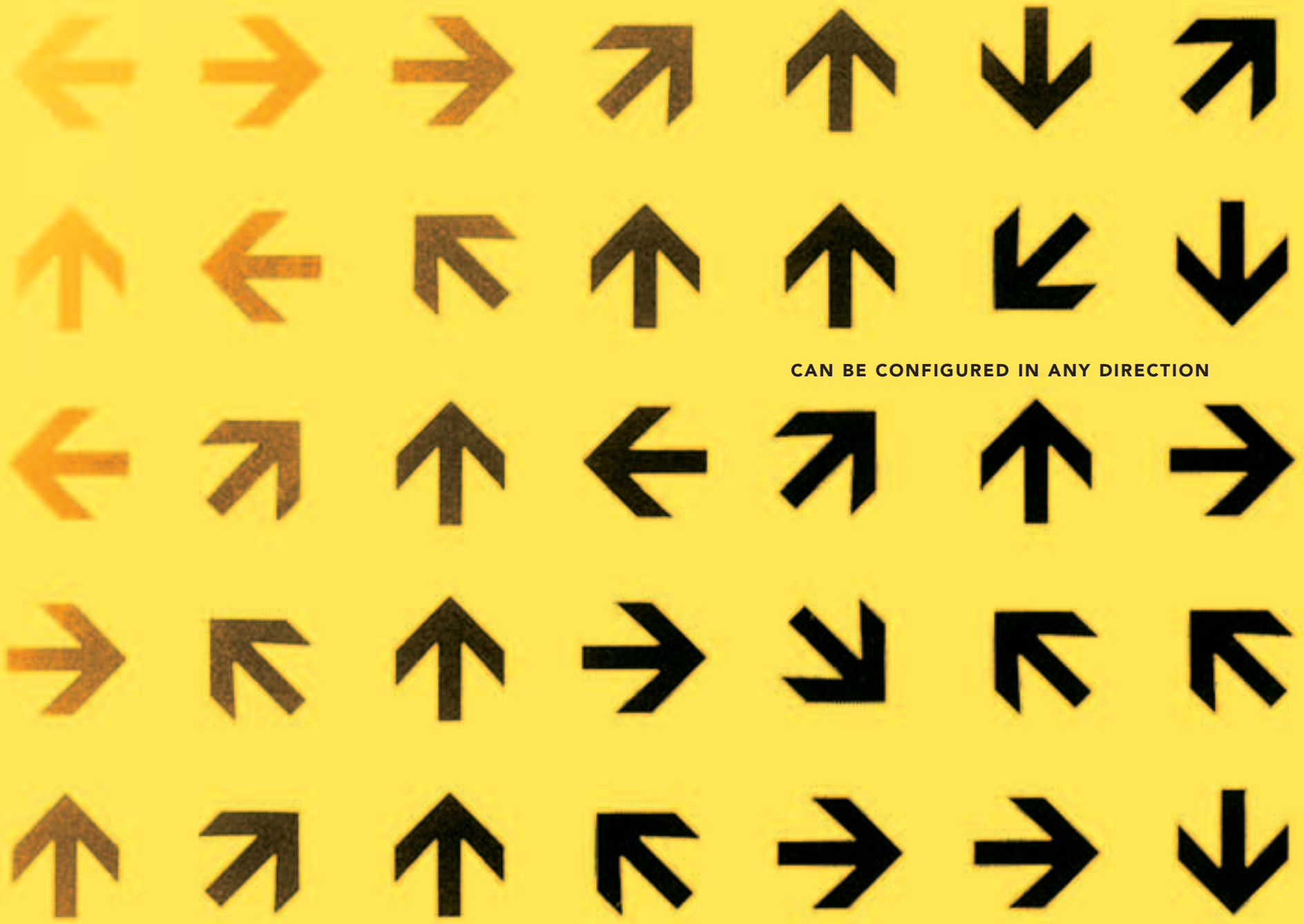




**SIMPLE BUILDING COMPONENTS  
ALLOW EASY RECONFIGURATION**



**SPACE IS OPTIMIZED**

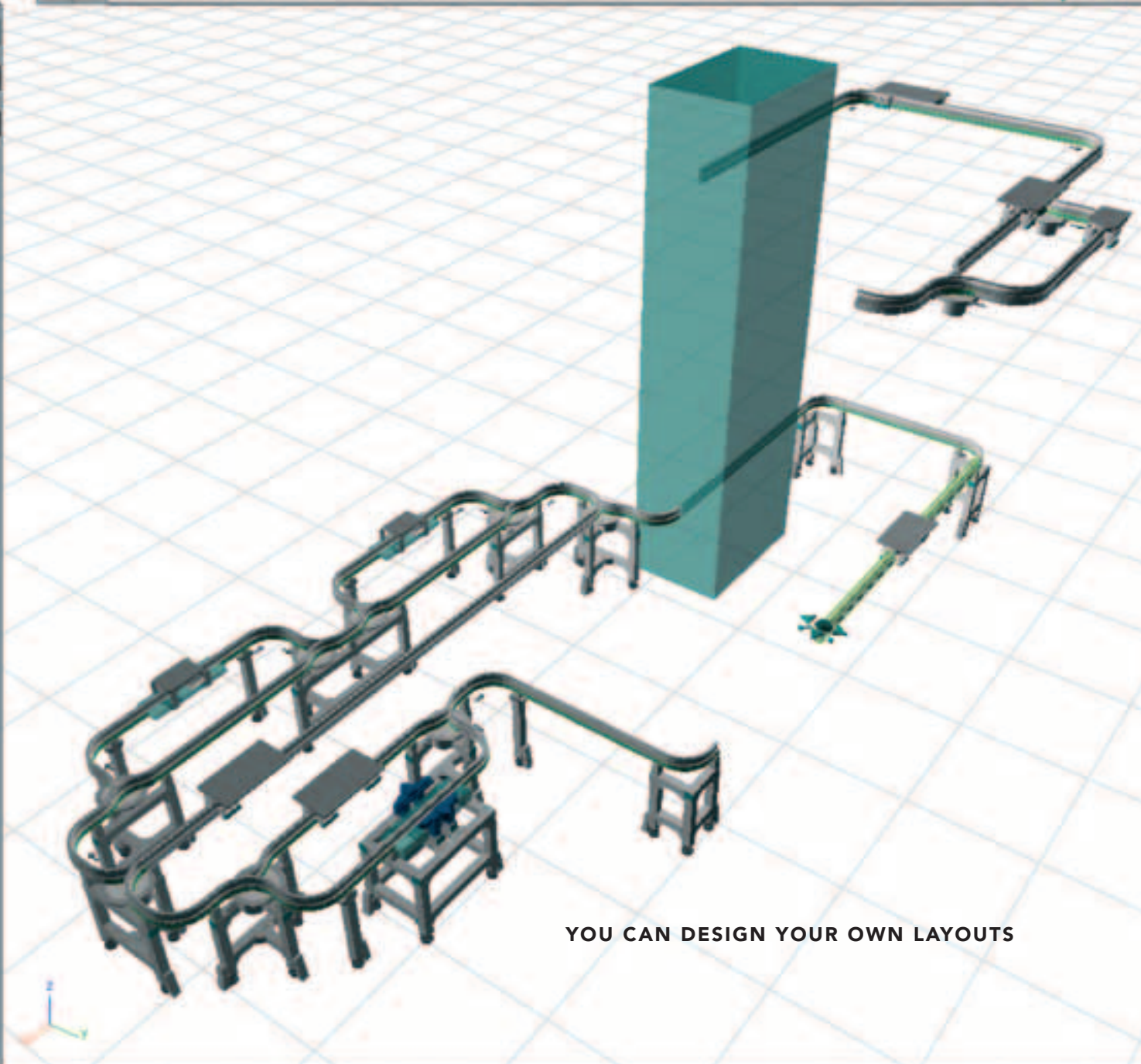


CAN BE CONFIGURED IN ANY DIRECTION



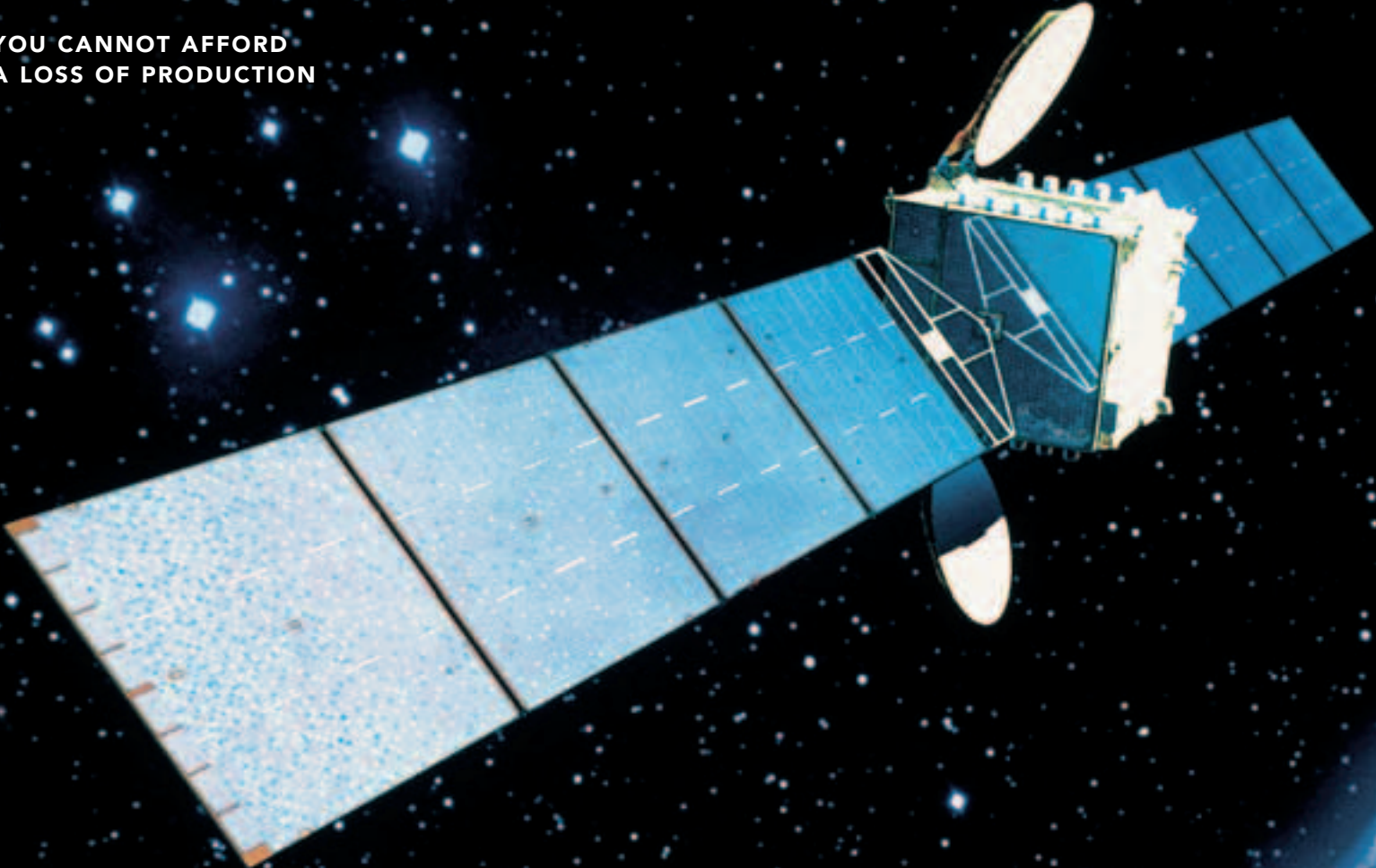
EXPAND AND ADAPT ON DEMAND

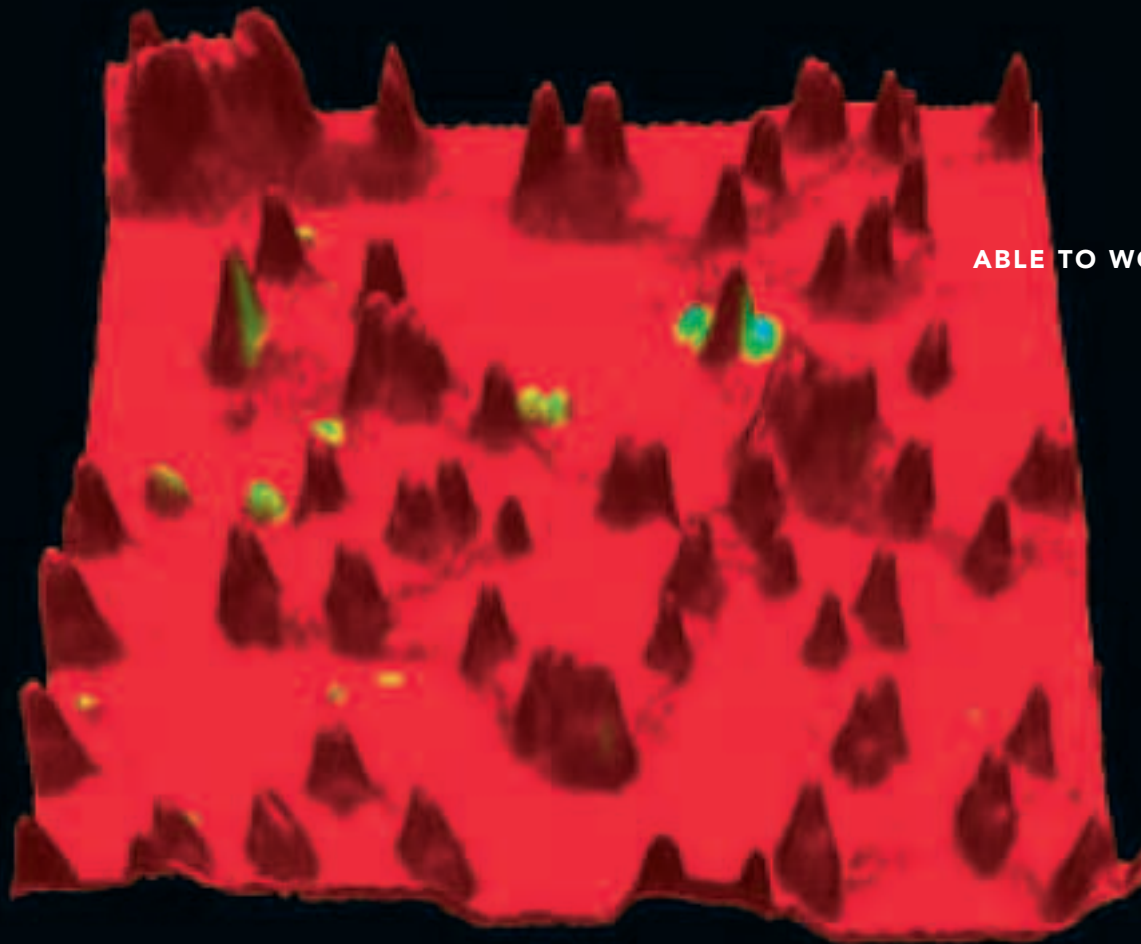
Monte	GL-Unterkufen	Sverliger	
1	Monte		
Fahrspur	Stufe	Modul	Zufuhr
1.1	Fahrspur		
Trac	Kurve	Wende	Erneuerung
1.1.1	Trac		
Trac			



YOU CAN DESIGN YOUR OWN LAYOUTS

**YOU CANNOT AFFORD  
A LOSS OF PRODUCTION**

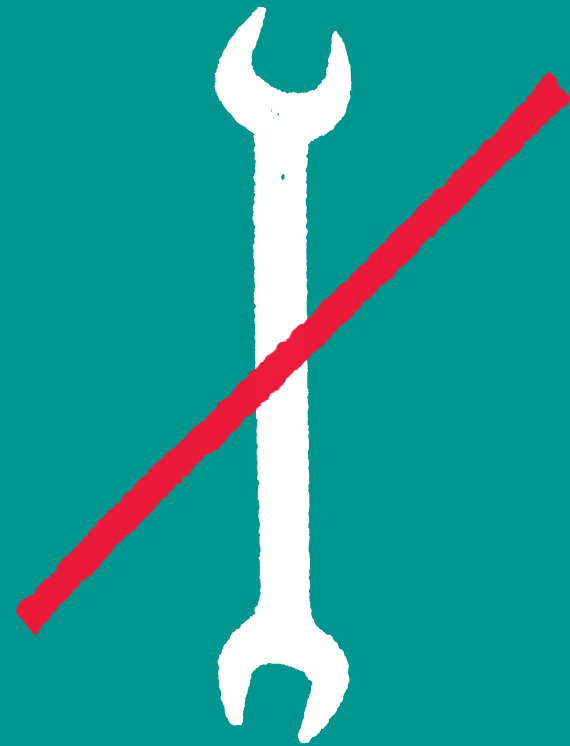




ABLE TO WORK IN CLEANROOMS



DESIGNED TO BE



MAINTENANCE FREE



ECONOMIC FOR SIMPLE  
OR COMPLEX MANUFACTURING  
AND LOGISTIC SYSTEMS



MONTRAC CAN NAVIGATE  
WITHOUT CONTROL SYSTEM

THANKS TO CHAOS TECHNOLOGY,  
YOUR PRODUCTS KNOW WHERE TO GO  
AND HOW TO GET THERE



A man in a dark pinstriped suit, light pink shirt, and purple patterned tie is seated at a wooden table on a train. He is holding a mobile phone to his ear with his right hand. A laptop is open on the table in front of him. The background shows the interior of a train car with other passengers blurred. The lighting is soft, coming from the windows.

TRANSPORTATION TIME  
BECOMES PRODUCTION TIME

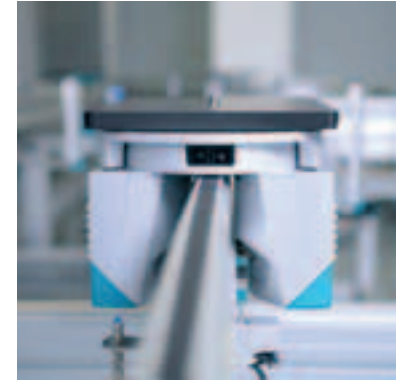
**GET ON THE RIGHT TRAC, MONTRAC.  
FLEXIBILITY FOR INNOVATORS ONLY**

**MONTECH**



## THE ADVANTAGES OF MONTRAC

**RELIABILITY** "One of the most compelling advantages of the Montrac system is that none of the wear items are single points of failure." A shuttle can be removed at anytime so that Montrac runs at anytime with no single point of failure. The Trac itself is a passive element and not subject to failure. The shuttle was designed to be maintenance free.



"... an internal investigation of Montrac revealed a reliability of 99.97%..."

Robert Pleye, Hörmann KG Antriebstechnik

**SIMPLICITY** Montrac was designed to be extraordinarily simple. It is comprised of very few components, making design and assembly easy. The Trac components are quick to assemble. Other than a straight cut, there are no machining processes required. The exclusive use of electronic components eliminates the need for pneumatic connections and complicated wiring. Chaos Technology greatly reduces the cabling and programming. You will benefit from this simplicity not only during assembly but also when changing or expanding your system.





**FLEXIBILITY** Do your products have to keep pace with constantly changing designs and technological developments? Montrac is well suited for rolling changeover, chaotic manufacturing, high-mix/low volume, planned expansion, phased integration, short product life, and many other applications that are not generally considered suitable for transport systems. Montrac is flexible in many ways. Mechanically, it is modular construction with very few interchangeable parts, so it can easily be reconfigured. Organic layouts can be adapted to meet the needs of your processes. Curves have a tight radius so that Montrac can fit in small spaces and maneuver around obstacles. From a design standpoint, Montrac's configuration tool allows you to expand, modify or adapt your system as you wish almost effortlessly! When it comes to controls, Chaos Technology has revolutionized the way products navigate a system.

**PROFITABILITY/EFFICIENCY** Montrac offers multiple opportunities to quickly get a return on your investment. It reduces cycle time and improves the utilization of production capacities. Montrac fits in a smaller footprint, optimizing real estate. Powering parts while in transit may allow you to capitalize on idle time. Montrac consumes 95% less electricity and no compressed air when compared to traditional systems. The simplicity of Montrac means considerably less time spent designing, installing, and programming.

Montrac likewise provides benefits that are less quantifiable. For example, Montrac virtually excludes the possibility of a system failure. There is almost no maintenance cost. Montrac is grounded at all times and it is impact-free so products are not damaged by the transport system. Montrac is an efficient solution for complex and expandable production systems, but it is also competitive in smaller/simpler layouts. Montech is also willing to lease shuttles to reduce initial investment.

“...after 16 months, Montrac paid for itself...”

Franz-Georg Osdiek, Manufacturing manager,  
Hella KGaA Hueck & Co.

**NO MAINTENANCE** Montrac is the only transport system requiring absolutely no maintenance! Mechanical components constitute a tiny portion of the overall system and were developed with longevity in mind. The Trac itself is a passive element and is not subject to wear. The shuttle is self-propelled by a brushless DC motor. All bearings are sealed and lubricated for life. The components are preset and meet the most exacting quality standards. Modular design means that the unlikely minor repair can be made easily. Since all components comply with EMC and ESD requirements, they are not a potential source of faults. A decision for Montrac is a decision for the most carefree system of all.



“Order is simplistic;  
Chaos requires Montrac.”

**CHAOS TECHNOLOGY** The concept of chaotic production is well-known but certainly is not the standard. However, it is becoming more popular. Today, products must be changed frequently. Increasingly, changes must occur without interrupting production. Variations can be numerous, and, in extreme cases, lot sizes can be reduced to one piece. When making a variety of products, some process may be common to all products while other processes are dedicated to a specific product. It may also be that different products require processes in different order. This makes writing a centralized logistic program nearly impossible. With Chaos Technology, products can easily navigate through chaotic production processes without a centralized control system. Chaos Technology is based on the simple principal that, upon completing a process, that process station communicates to the self-propelled shuttle what the next process station will be. At each place that a routing decision needs to be made, the Trac asks the shuttle where it is headed and directs it accordingly. In addition to providing chaotic routing capability, Chaos Technology reduces the need for I/O hardware, programming, and cabling; and localized controls make the system easy to reconfigure. While it offers customers a wealth of options and simplifies handling, Chaos Technology does not increase the price of a system.



“...of all advantages the Montrac offers, I consider the ability to power the parts from the shuttle while in transit, to be the greatest...”

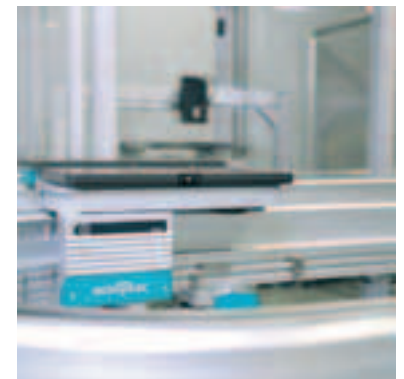
Roman Wieser, Siemens VDO Firstline Manager

**TRAVEL TIME BECOMES PRODUCTION TIME** Montrac has developed an additional current collector on the shuttle that can continuously supply 3 A at 24 VDC to the product. This opens up the possibility of processing the product while it is in transit. This technology has already been used to boot up electronic devices prior to entering test operations, resulting in 65% less process time. Of course, the concept could be used in many other applications. Montrac does not give your product a moment's rest, not even in transit.

“...Certain products our business manufactures require exacting cleanroom standards. Montrac provided the best part conveyance solution for our class 100 cleanspace environments while also providing an unparalleled combination of flexibility, cost, and features...”

Ryan Johnson, Engineer, Hewlett-Packard

**CLEANROOM** Montrac is perfectly suited for cleanrooms. The shuttles are self-propelled and therefore have no dirty belts. There is no sliding friction to create particulate. Even its form reduces air turbulence. The standard components were designed for a class 1000 cleanroom. With minor adjustments we have reached class 100 according to US Federal standard 209E.



**HANDLING FROM BELOW** With Montrac it is possible to work on the product from below by ejecting the pallet from the shuttle and moving it to the side. This can be done while the shuttle is moving so production is not interrupted. Pulling the pallet aside allows full access to work on the product from below, whereas traditional systems have a specific area that can be accessed.

**QUIET** At only <57dB, Montrac is quieter than a typical office. This is because the motors only run when the shuttles are in motion, and there are no pneumatic components or belts involved.

**INDEXING (SEVERAL PRODUCTS ON ONE PALLET)** With Montrac, the pallet can index through multiple positions presenting several parts to a production process. By having more stops closer together, the cycle time can be reduced. This also makes the system more economic by reducing the number of shuttles.

**IMPACT-FREE TRANSPORT** There are no hard stops on a Montrac system. The shuttle reads flags or “cams” placed along the Trac that tell it where to stop. There is also an optical sensor integrated in the shuttle that recognizes obstacles. In each case, the shuttle slows to a stop to protect impact-sensitive products.

**RAPID ADVANCE** With the rapid advance module, a cycle time of less than 1 second can be reached. It is possible to step forward and reverse. The shuttles are pulled from an external drive, which carries the pallet

**ELEVATOR** Montrac can go over paths and connect different areas of subassembly overhead using the Elevator. The Elevator can move to multiple positions to transport your products on several levels.

**ANTISTATIC AND ELECTROMAGNETIC PROPERTIES** The Montrac-System exceeds the highest antistatic requirements and meets European electromagnetic interference guidelines, EMV, EN 50081-2 and EN 50082-3. Thanks to these features, a wide range of possible applications in electronics and computer industries are opened.

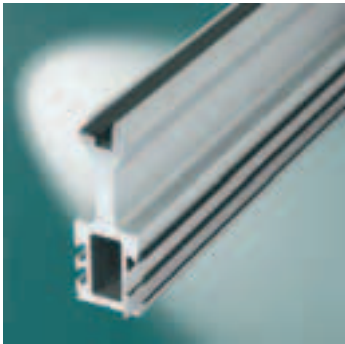
**ENERGY CONSUMPTION/ECOLOGICAL IMPACT** Montrac’s economic use of energy is remarkable. When compared to normal conveyor systems, consumption of electricity is 20 times lower and compressed air is almost nonexistent. Montrac shuttles only consume energy when they are in motion. Ironically, traditional conveyors consume the most energy when the products are at rest because the belts are always running and pallets in queue create more drag on the belts than pallets in motion.

**PRODUCT SIZE UP TO 500 x 750 mm<sup>2</sup> AND 24 kg** Montrac is the only system that allows you to transport different sized pallets simultaneously. Depending on your requirements, the pallets can be 300 x 550 mm<sup>2</sup> and can carry products up to 500 x 750 mm<sup>2</sup> weighing up to 24kg.



## COMPONENTS AND TECHNICAL DATA

**TRAC** The monorail is made of clear anodized aluminum extrusion. The bus bars are on one side, and the T-slots accept flexible control elements on the other. The Trac easily mounts to our Quick-Set® framing system.



Surface moments of inertia:  
 $J_x = 230 \text{ cm}^4$ ,  $J_y = 21.6 \text{ cm}^4$   
 Resistive torques:  
 $W_x = 37.7 \text{ cm}^3$ ,  $W_y = 10.8 \text{ cm}^3$   
 Mass per meter: 5.4 kg/m  
 Twisting: max. 1 mm/m

**TRACLINK** The TracLink is the connection between two Trac sections. It allows the Trac to be cut with a simple straight cut while accommodating the electrical connections.



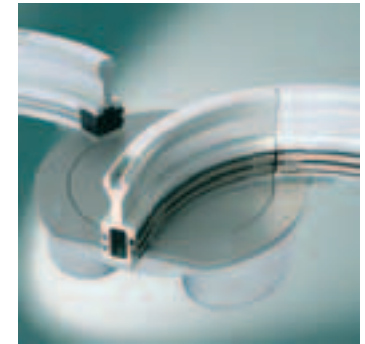
Mass: 0.38 kg  
 Impedance of resistor in ground circuit: 100 kΩ

**TRACCURVE** Montrac transport system includes 90° and 45° curves. With a connecting radius of only 280 mm, Montrac offers unparalleled flexibility.



Mass: 2.5 kg (90°), 1.6 kg (45°)  
 Connecting radius of Curve: 280 mm

**TRACSWITCH** The switch serves to divide and merge traffic into/away from multiple paths. Parallel lines can be as close as 560 mm together thanks to the small radii. The TracSwitch operates electrically and is powered directly from the Trac.



Mass: 11.9 kg  
 Current consumption: 0.6 A  
 Time for Shuttle to traverse (from start switch to sign-off sensor): ~1.9 s

**TRACCROSSING** The crossing makes it possible for two lanes to intersect each other in a right angle. The TracCrossing operates electrically and is powered directly from the Trac.



Mass: 12.2 kg  
Current consumption: 0.6 A  
Time for Shuttle to traverse (from start switch to sign-off sensor): ~2.0 s

**PALLET** The pallet is the custom-tooled platform that is the linking element between your products and the shuttle. They can vary in size and range from 200 x 300 mm<sup>2</sup> to 300 x 550 mm<sup>2</sup>. You can determine the location and number of positioning prisms.



Standard dimensions and mass:  
200 x 300 mm<sup>2</sup>; 2.5 kg  
200 x 400 mm<sup>2</sup>; 3.3 kg  
300 x 400 mm<sup>2</sup>; 5.0 kg  
200 x 550 mm<sup>2</sup>; 4.6 kg  
300 x 550 mm<sup>2</sup>; 6.9 kg

**SHUTTLE** The shuttles are intelligent self-propelled vehicles. Their maximum speed is 30 m/min. They are available with a single drive axle or two drive axles. A single axle shuttle can carry up to 12 kg, while a dual axle shuttle can carry 24 kg. Each drive axle has a maintenance-free, 24 V brushless DC motor and sensors to avoid collisions with other shuttles or obstacles.



Maximum speed: 30 m/min  
Current consumption: ~0.8 Amps at  
Max constant speed per driven axle

**Single-axle Shuttle**

Maximum payload: 12 kg

**Double-axle Shuttle**

Maximum payload: 24 kg

**Double-axle Shuttle with Dummy rear axle**

Maximum payload: 12 kg  
Power take-off to customers part:  
3A at 24 VDC

**SUPOTRAC** With this device a manual work-station can be ergonomically organized.



**POSITIONING UNIT** A Positioning Unit is used where a shuttle needs to be positioned exactly and/or if the plate requires additional support while being processed. A standard variation of the Positioning Unit is the Multiple Positioning Unit which allows the shuttle to index to multiple stops. Specially designed positioning units have been tested to support up to 20 metric tons.



**CONVEYORS** We offer configurable conveyors in three different versions and an asynchronous palletized transfer system, which can be used as a complementary transport system. All components are compatible with our dovetail system (Quick-Set®). You can configure your conveyor on our Conveyor Configurator online.



**AUTOMATION** Components are a modular system for automated assembly. All components are equipped with our proven dovetail system and are therefore compatible with all Montech products, as well as being easy to assemble. All components are available at advantageous prices in our online shop.



**QUICK-SET®** This is a profile system that is compatible with all products. It is specifically designed for dynamic loads, but it is equally suitable as static framework. It is based on our proven dovetail system. Quick-Set® permits rapid, simple assembly of all Montech products without designing or machining adapter plates. All components are available at advantageous prices in our online shop.



EPV Mass (pallet length 300, 400, 550 mm): 11.6, 12.8, 14.6 kg  
MPV (pallet length 300, 400, 550 mm): 12.6, 14.7, 16.8 kg  
Repeatability of Pallet positioning EPV:  
In X and Y  $\pm 0.02$  mm, in Z  $\pm 0.2$  mm  
Repeatability of Pallet positioning MPV:  
In X and Y  $\pm 0.03$  mm, in Z  $\pm 0.2$  mm  
Maximum additional force: 3 kN,  
with reinforcement from below 25 kN  
Time to change a pallet: 2.85 s



**REFERENCES**

## REFERENCES

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BMW Motoren

Boehringer Ingelheim

Bose

BTicino

Chiron Behring

Ferrero

Geomag

Hella KGaA Hueck & Co.

IBM

IfK Automation

Leoni Bordnetzsysteme

Pharmaton

Radine

Reemtsma

Saia-Burgess

Salvatore Ferragamo

Siemens VDO

Tampoprint

Tchibo

Universal Avionics

Vimar

Volvo

FLEXIBILITY FOR INNOVATORS ONLY



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