

WELCOME TO OUR WORLD

montrac[®] - the smart transport and process solution





INDUSTRY 4.0 NEEDS INTRALOGISTICS 4.0

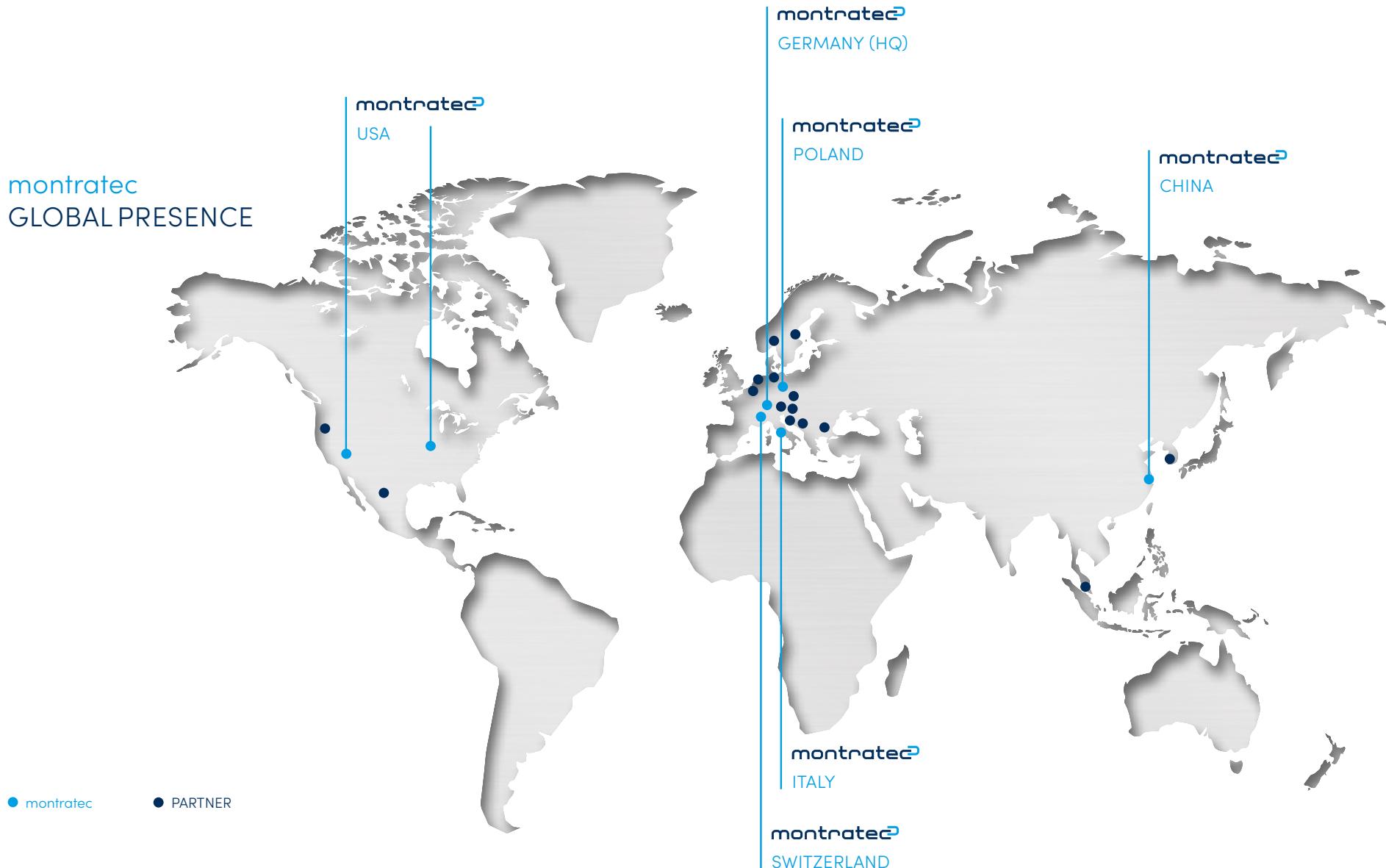
Individualised products with endless variants, ever-decreasing production cycles and the fully linked Industry 4.0 are posing challenges to your intralogistics. Conventional conveyor technology quickly reaches its limits. Only integrated transport and process solutions with intelligent controls, maximum flexibility and the utmost availability can allow your company to confidently look toward the future.

Our montrac[®] monorail transport system allows you to link production processes between robots and workspaces more flexibly than ever before. And you can boost the automation of complete production lines. It's how we contribute to helping you take advantage of the tremendous opportunities offered by Industry 4.0. With smart solutions for Intralogistics 4.0.

monratec PIONEERING INTRALOGISTICS SOLUTIONS WORLDWIDE

monratec GmbH, which is based in Niedereschach in the German state of Baden-Württemberg, was founded in 2017 after a demerger from the SCHMID Group. Our customers include well-known companies from the automotive, plastics, consumer goods, optics, food, medical and pharmaceutical industries.

montratec GLOBAL PRESENCE



montrac® – the Smart Intralogistic System

montrac® is an intelligent automation and transport system for interlinking industrial production and logistical processes and provides total flexibility, reliability and efficiency when it comes to conveyor technology.



Intralogistics with montrac®

IN-PLANT TRANSPORT

Intralogistics and manufacturing processes are usually optimized up to the last second. Our award-winning montrac® system achieves a maximum material throughput with a minimum of cycle time and a very high system stability, and guarantees a flexible expandability of the whole system.



ASSEMBLY AUTOMATION

montrac® is compact, modular and consists of system components. In confined spaces or across several floors montrac reliably and economically performs transport tasks in the assembly automation and supports production tasks and processes from batch size one in any desired diversity of variants to high-volume production.



PROCESS INTERLINKING

Reliable and trouble-free just-in-time operation of processing stations around the clock are tasks that are masterfully fulfilled by montrac®. The versatile properties of montrac® allow a flexible connection of individual production steps up to a systematic process interlinking and complete automation of entire production lines.



RELIABILITY

montrac® is the most reliable system to transport your products. If nevertheless a defect should occur on a Shuttle, it can be removed fast and replaced in a single move without stopping the line. The Shuttles and switches are the only active components in the system. Thanks to their design they require only little maintenance.



SIMPLICITY

montrac® was designed to be extraordinarily simple. The monorails and Trac connections enable a very easy and quick installation. Thanks to its very small curve radii the system is extremely compact. Based on the Smart Logistics Technology you do not even need to control your montrac track. The Shuttles know by themselves where the products are to be transported to.



FLEXIBILITY

Do your products have to keep pace with constantly changing designs and technological developments? Your intelligent conveyor system can any time be quickly adapted to new conditions. All components have the same basis and are compatible with each other. montrac® can be perfectly adapted to your spatial conditions and, thanks to its monorails, can also run in curves with a very small radius. Parts of different sizes can be transported on the same track at the same time. There are practically no limits to the layout flexibility. With our configuration tool you can easily expand, modify or adapt your system at will.



PROFITABILITY / EFFICIENCY

The ratio between possibilities and price is unique. montrac® offers direct advantages – such as an improved utilization of your production capacities, optimum use of spatial conditions, increased efficiency of your production by utilization of the transport time, a lower current consumption as well as shorter delivery times. montrac® has proved not only as an economic solution for very complex and expandable production and logistics facilities; also for smaller and simpler production processes montrac® is very attractive.



Advantages of montrac®

LOW-MAINTENANCE

montrac® sets revolutionary standards in the field of maintenance. montrac® is the world's only transport system requiring almost no maintenance. The very low percentage of mechanical components was developed, inter alia, with longevity in mind. The Shuttle is self-propelled by a brushless DC motor. All ball bearings are sealed and lubricated for life. The components are pre-set and meet the most exacting quality standards of our customers. Since all components comply with industrial EMC as well as ESD requirements, they are not a potential source of faults. A decision for montrac® is a decision for the most carefree system of all.



SMART LOGISTIC TECHNOLOGY

„Smart Logistic Technology“ is a method of allowing the Shuttles to operate the rail system of a montrac® transport system independently of a master control. The Smart Logistic Technology originated from the possibility to link identity characteristics with control commands to allow track components to operate auto-nomously. The master control is relieved from the duties related to the temporally and functionally correct activation of rail system control elements. Thus, on master control level more attention can be given to the machining processes in the processing stations.



TRAVEL TIME BECOMES PRODUCTION TIME

In your production process everything is optimized up to the last second. No product shall have to wait at any point in the sequence. The processing steps are highly standardized processes with the aim to optimize the cycle time and to lower the cost. Nevertheless you are still wasting production time. montrac® offers you the opportunity to have your workpieces tested or further processed during transport. The opportunities resulting from a power supply on the Shuttle - permanently available with a maximum output of 3A at 24 VDC - are practically unlimited. For your profit we do not allow your workpieces to take a break - not even during transport!



CLEANROOM

Thanks to its design and the use of purely electrically driven components montrac® has the perfect conditions for use under cleanroom conditions. The Shuttle MSH4 CR is mainly used in the cleanroom, for manufacturing sensitive products such as hard disks, wafers or medical products.



FASTER

The montrac® Shuttle MSH4 reaches a speed of up to 55m/min. Thus the Shuttle is even faster and can handle heavier loads than Shuttle 3 (30 m/min). Shuttle MSH4 is equipped with a particularly efficient control system.



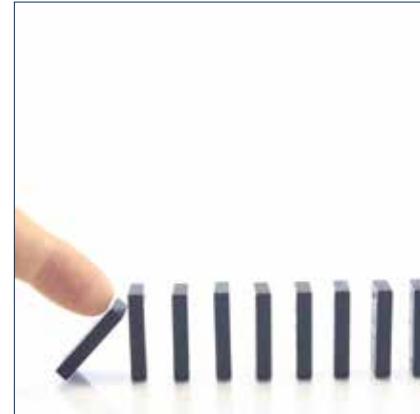
QUIET

With less than 57dB the montrac® noise level equals the level in a forest. This is achieved because the motor only runs when the Shuttle is in motion, because no pneumatic components are included and no belt drive is required (no friction of belts, platforms, pallets, no shocks).



INDEXING

Several products on one platform: With montrac® parts in pallet arrangement can be cycled through a processing station (multiple positioning device) step by step. Thus a processing axis can be saved. This improves the cycle time and reduces the number of Shuttles in a system.



IMPACT-FREE TRANSPORT

The montrac® system performs shock and vibration-free transport of highly sensitive products. During transport the Shuttle recognizes the cams which are attached to the Trac and thus enabling a selective stop.



Advantages of montrac®

VARIABLE WORKPIECES

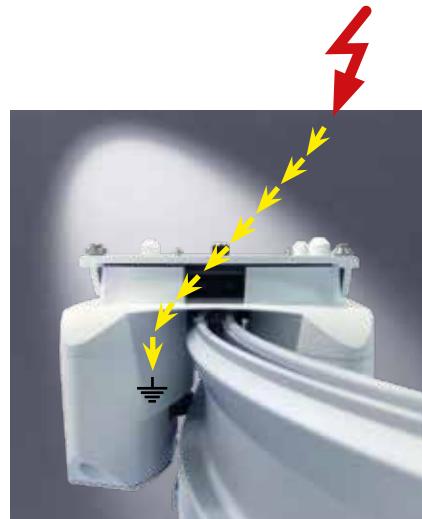
The montrac® system enables the transport of workpieces (up to 500mm x 750mm and 50kg*) and processing materials in the same line on different platform sizes.

* depending on product position and production environment.



ANTI-STATICS

The montrac® system meets the highest antistatic requirements. The electrostatic discharge capability is guaranteed at all times. This opens a wide range of possible applications in electronics and computer industries. montrac® meets the guidelines according to EN61000-6-2:2005 and EN61000-6-4:2011.



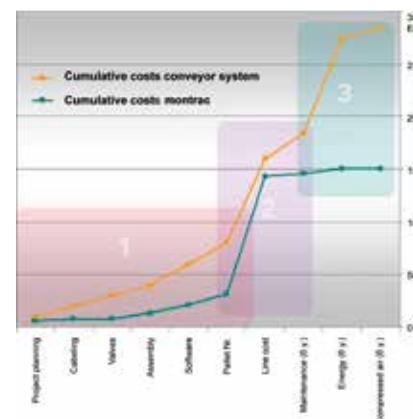
COST ADVANTAGE

A customer analysis showed as result the following cost comparison between a traditional conveyor system (34 motors, 11 stations and 48 pallets) and a montrac® system with 24 shuttles and 11 stations.

The diagram clearly shows the following parameters:

- 1) implementation of costs
- 2) investments
- 3) maintenance costs

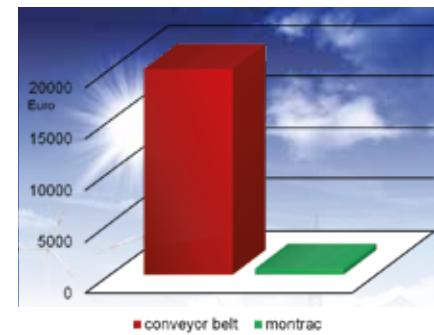
Over a period of 6 years, the montrac® system turns out to be 46% less expensive than the conveyor belt system.



AN ECOLOGICAL CONTRIBUTION

montrac® is not only cost-effective but also ecological. A conveyor belt system with 34 motors consumes 20,000€ of electricity per year. A comparable system incorporating montrac® only consumes 600€.

The environmental impact is reduced accordingly. If the comparison is transferred to the world of automobiles, a montrac® shuttle would be able to travel more than once around the world (projected reach of 26,600km) using only two tanks of diesel fuel.



Solutions for Your Production

INTRALOGISTICS

montrac® masters the smart warehouse management, with a high reliability of its equipment and in confined spaces. As an alternative to the classic roller conveyor belt with a maximum load of up to 50kg* montrac® offers the possibility to transport carrier plates and workpieces of different sizes on the same transport system. montrac® is worldwide one of the most popular and most efficient logistics employee.

* depending on product position and production environment



CLUSTER

montrac® can permanently supply the products to be transported with electricity during the travel. There is a multitude of possibilities for the materials handling technology - such as testing of workpieces already during their travel. Paired with antistatics these features that enable montrac® to convince the decision makers in this sector.



CAR LIGHTING

The world's most reputable manufacturers of headlamps rely on montrac® in their logistics and production processes. The Smart Logistic Technology and the antistatic properties of montrac® guarantee a speedy transport of intermediate products, without having any dust deposition on them. Therefore various innovators have been able to recapture their initial investment within a very short time.



CLEANROOM

montrac® is mainly equipped with electronically driven components. Thereby montrac® is perfectly suited for use in cleanrooms.



montrac® for the User

"MANY ADVANTAGES AT ONE BLOW"

„With the montrac® system we were able to realize several objectives at one time: we saved time, optimized control of production processes and direct employment of labor and improved our space utilization.“

Maurizio Romagnoli, Inhaber
Tech-Pol s.r.l.

MOST ADVANCED KNOW-HOW - ALSO FROM CUSTOMER PERSPECTIVE

„Based on a positive result gained in a previous project, we know we can find a suitable solution to satisfy the requirements in terms of compact dimensions, small footprint, compatibility with aseptic environments, reliability and high availability.“

Thomas Otto, Geschäftsführer
Vetter Pharma-Fertigung GmbH & Co. KG

EXTRACT montrac® REFERENCES



montrac® – Pure Flexibility

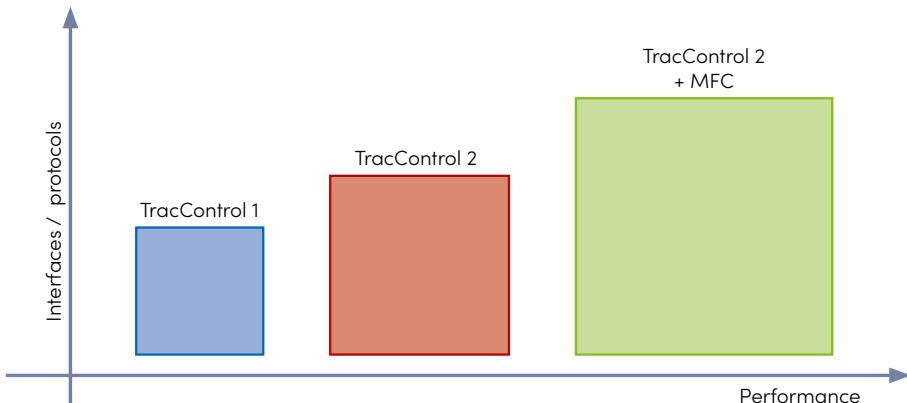
montrac® is completely modular, can be freely and flexibly configured and thus can be easily extended at any time. montrac® consists of three main categories, in which the intelligent Shuttles (material handling vehicles) are the heart of every montrac® system. In addition a configurator software is available.

- montrac® components
- TracSet profile system
- TracControl control elements
- montrac® configurator-software



TracControl – The Versatile montrac® Control

TRACCONTROL CONTROL SYSTEM



For controlling the montrac® system TracControl components are used, which are also of modular design and which can be dimensioned depending on the requirement profile:

- Customer requirements
- Complexity of the application field (intralogistics, assembly automation, process interlinking)
- Required interfaces to customer-supplied systems
- Flexibility and extensibility
- Material flow control and material management
- Data logging

From a simple, fully autonomous transport track to complex, networked transport and manufacturing systems for automated manufacturing, the TracControl of montrac® offers the tailor-made and flexible control solution:

TRACCONTROL 1

TracControl 1 is a drive control based on Smart Logistic Technology where the rail system is decoupled from the process and no higher-level control is needed. Costs and complexity are reduced to a minimum, a flexible extension is possible at any time.

TRACCONTROL 2

TracControl 2 allows different operating modes such as Smart Logistic Technology, Control Technology or a mixed operation. Modules consisting of standardized montrac® single components are controlled by the central control unit TracControl 2 Unit (TC2U). Configuration and control of the modules can be performed centrally by the TC2U.

TRACCONTROL 2 + MFC

In addition to the scope of TracControl 2 the material flow can be controlled and visualized and the process data can be recorded by means of a Material Flow Controller (MFC). The MFC provides interfaces which use the SECS/GEM protocol, the MDAC protocol and the OPC protocol. This allows to communicate with Host Manufacturing Execution Systems (MES) or third-party devices (such as robots).

Control Variants of the montrac® System

BASIC PRINCIPLE OF COMMUNICATION



Simple montrac® system with TracControl 1 control

Programmable control elements (TC1-IRM / TC2-IRM) are arranged along the montrac® monorail system, communicating with the Shuttles (material handling vehicles) via infrared interface. The control elements along the rail system can be controlled in a preconfigured setup (autonomous operati-

OVERVIEW OF TRACCONTROL CONTROL VARIANTS

Variant	Control philosophy	Central control unit	Control elements	Interfaces	
				Hardware	Protocol
TracControl 1	Autonomous		TC1-IRM		
	Partially autonomous	Customer-supplied control		I/O RS232	RS232
TracControl 2	Autonomous	TracControl 2 Unit (TC2U)	TC2-IRM		
	Partially autonomous	TracControl 2 Unit (TC2U)		I/O Ethernet	UDP (MDAC*)
TracControl 2 + MFC	System	TracControl 2 Unit (TC2U)	TC2-IRM	I/O Ethernet	OPC SECS/GEM MDAC*

* MDAC: montrac® spezifisches Kommunikationsprotokoll auf Basis von UDP.

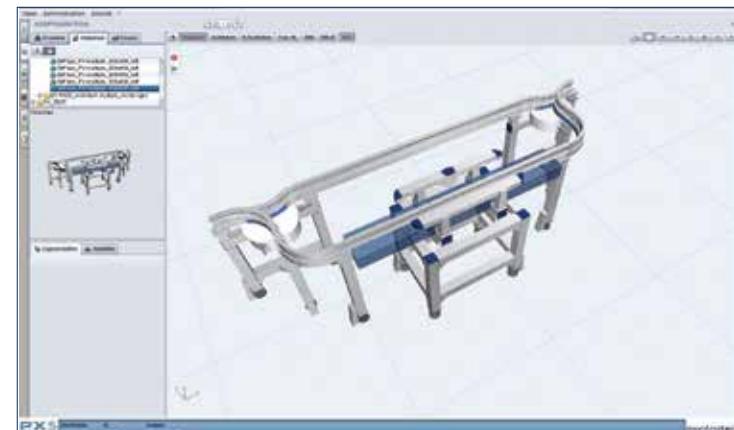
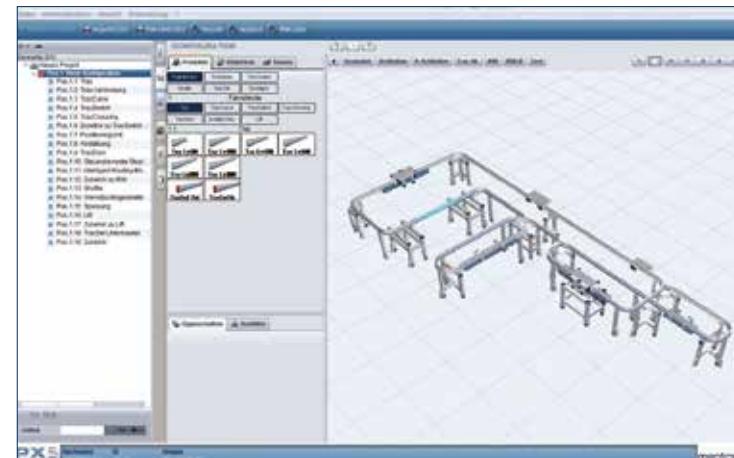
on) by the TracControl 2 Unit or they can be controlled by customer-specific systems (semi-autonomous operation). Within a montrac® system autonomous and semi-autonomously driven control elements can be mixed.

montrac® Configurator – Planning made easy

montrac® CONFIGURATOR – THE CONFIGURATION SOFTWARE WITH UNLIMITED POSSIBILITIES

The montrac® configurator is a very easy-to-use and free software within which you can create individual transport system layouts with a few mouse clicks. In the configurator, all standard components of the montrac® system are stored in a product library. With drag and drop the desired components are positioned in the configuration window. The software automatically detects the connection points.

The montrac® configurator can be downloaded for free from the website
www.montratec.com



Many Components – One System

SHUTTLE

The shuttles are intelligent transport vehicles. A Shuttle is available with one drive axis or as a Twin-Axle shuttle. Each Shuttle has a sensor which excludes potential collisions with obstacles or other Shuttles.



WORKPIECE PLATFORM

The workpiece platforms are the link between your products and the Shuttle. The platforms are available in various sizes. The number and location of the positioning prisms is a customer-specific choice.



TRAC

The monorail consists of a colorless anodized aluminium rod extruded profile. The conductor rails run on the inside and the grooves on the outside along the entire Trac, thus allowing for a flexible placing of the control modules. The Trac is compatible with the profile system.



TRACLINK

The TracLink is the connection element between two Trac sections. The TracLink also connects the conductor rails and serves as feeding point for the TracSupply.



Please refer to the montrac® Design Guide and the corresponding mounting manuals for further technical details.

TRACCURVE

In the montrac® transport system changes of Trac direction by 45° or 90° are realized by curved Tracs. With a connecting radius of only 220mm, montrac® offers unparalleled flexibility.



TRACSWITCH

The track switch is used to distribute Shuttles from one lane to two, and vice versa. Thanks to the small radii, bypasses and branches can be implemented in narrow spaces. The TracSwitches are operated electrically and are powered directly from the conductor rails.



TRACSWITCH ARENA

The TracSwitch Arena serves to convey the Shuttles either from one lane to a bypass (45°-output) or to the main lane. Thus it is possible to perform a complete bypass with a single component.



TRACCROSSING

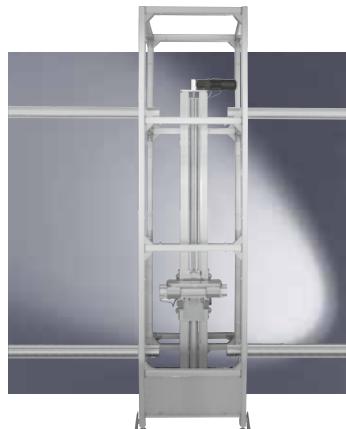
The crossing makes it possible for two lanes to intersect each other at a right angle. The electrical power is supplied directly from the conductor rails.



Many Components – One System

LIFT

The lift is used for the vertical transport of Shuttles to solve the following tasks: connecting two or more systems with different working heights; transport of Shuttles from a station to a ceiling system or vice versa.



SUPOTRAC

The SupoTrac serves as a support for manual workstations. The shuttle platform is slightly lifted up from the Shuttle; thus processing tasks are possible without straining the Shuttle and Trac with force impact.



POSITIONINGUNIT

A Positioning Unit is used where a shuttle platform needs to be positioned exactly and/or requires additional support of up to 4000N while being processed. Another standard version is the Multi Positioning Unit (MPU).



TRACCONTROL

The control cams and the TracControl components are used to control the route and the Shuttles of a montrac® system. The latter are defined depending on the requirement profile.



Please refer to the montrac® Design Guide and the corresponding mounting manuals for further technical details.

TRACDOOR

The TracDoor (gate) allows passage through a montrac® line or access to manual work stations within the line. The principle of a TracDoor is very simple: The gate is attached to a pivot point and can be opened manually.



BASE FRAME

There are appropriate standard base frames from our TracSet profile system available for all our montrac® components. Entire base frames for bypasses complete the extremely flexible system.



PROFILE-SYSTEM

The profile system „Tracset“ convinces through cross-product compatibility and flexibility. The proven dovetail system allows a quick and easy assembly of all montrac® products without machining.



ERGOTRAC

With the ErgoTrac a manual workstation can be set up more ergonomically. The workpiece platform is tilted 25° towards the operator. This makes the platform ergonomically more easily accessible and improves the visibility.



Special Components

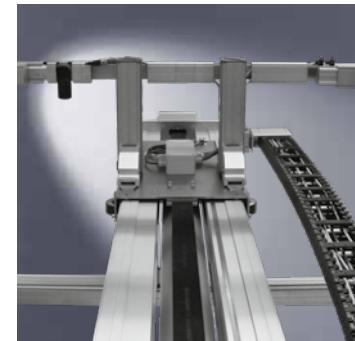
SHUTTLE CLEANROOM MSH4 CR

The Shuttle MSH4 CR is mainly used in the cleanroom, for manufacturing sensitive products such as hard disks, wafers or medical products.



CLEANROOM LIFT

The belt lift has been optimized for cleanroom applications and serves the vertical transport of Shuttles. This special lift is particularly reliable as well as maintenance-free and highly dynamic and precise.



PNEUMATIC LIFT

The pneumatic lift serves the vertical transport of the Shuttles. This compact and space-saving lift is easy to operate and has been especially designed for small height differences.



Please refer to the montrac® Design Guide and the corresponding mounting manuals for further technical details.

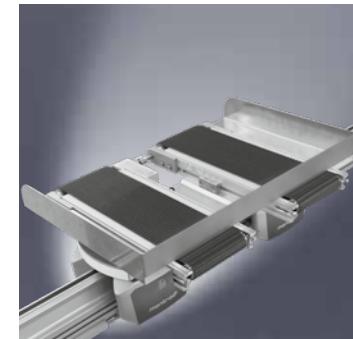
ADDITIONAL CURRENT COLLECTOR

24V / 3A can be supplied on the Shuttle. The Twin-Axle Shuttle with empty back axle serves as the basis. The power supplied for an additional component located on the Shuttle can be collected via an additional current collector built-in in the back axle.



SHUTTLE WITH TRANSPORT BELT

Transport belts adapted to special requirements are firmly attached to these Shuttles. Thus every Shuttle carries along the loading and unloading unit whereby complex handling stations become unnecessary. The power is supplied directly via the Shuttles.

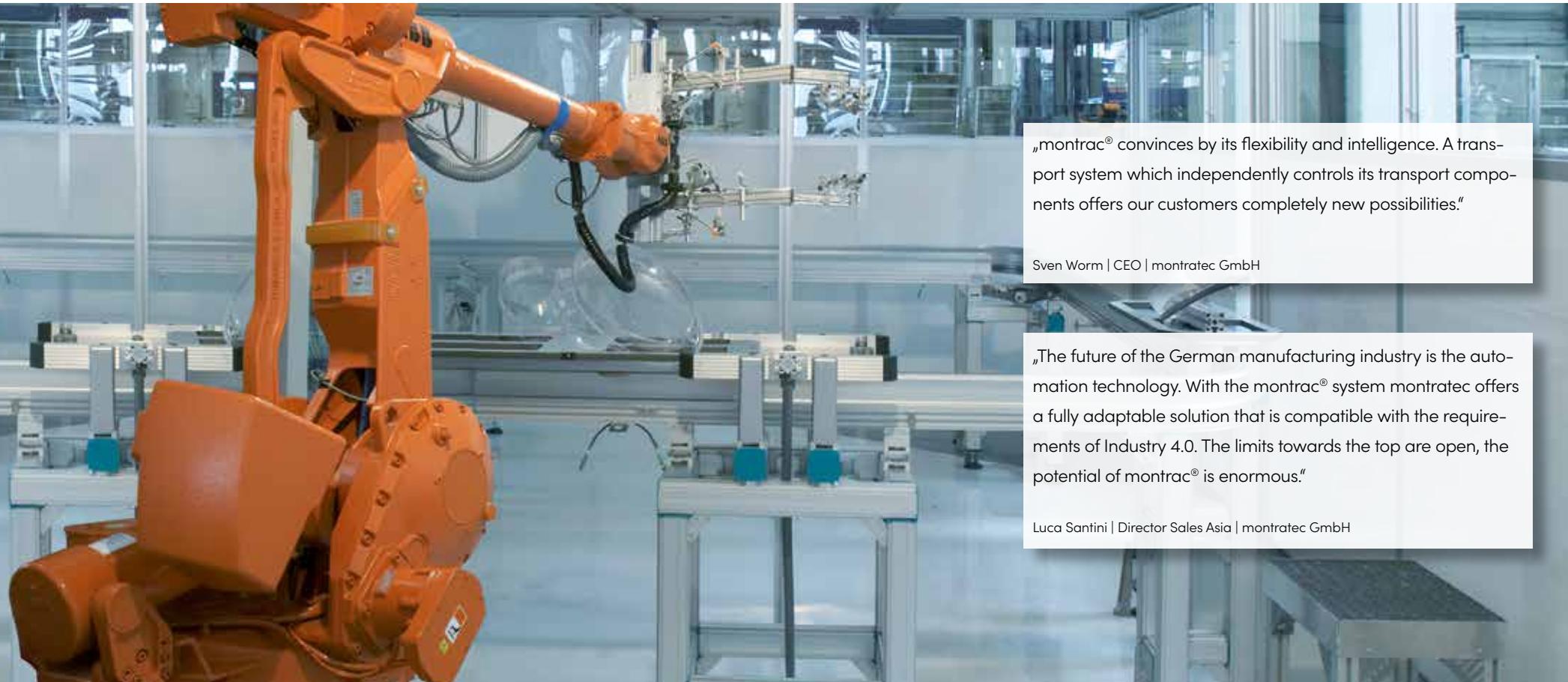


FLEXTRAC

Height differences can be overcome by FlexTrac, e.g. between machines and processing stations, without using a lift. Depending on the application different ascent angles up to 12° are possible.



Industry 4.0 – montrac® as Key Technology



„montrac® convinces by its flexibility and intelligence. A transport system which independently controls its transport components offers our customers completely new possibilities.“

Sven Worm | CEO | montratec GmbH

„The future of the German manufacturing industry is the automation technology. With the montrac® system montratec offers a fully adaptable solution that is compatible with the requirements of Industry 4.0. The limits towards the top are open, the potential of montrac® is enormous.“

Luca Santini | Director Sales Asia | montratec GmbH

The Future is Now!

montrac® - YOUR SOLUTION FOR INDUSTRY 4.0 APPLICATIONS

Smartly interlinking the information flow within a production or logistics sector and thus completely automating value-added processes: „Industry 4.0“ designates the revolutionary transformation of the production technology towards a self-controlled, dynamic and cross-company production network that optimizes and configures itself.

With the intelligent transport and logistics system montrac® montratec holds a highly promising solution for the requirements of Industry 4.0 ready. The application ranges from single systems up to complete factory automation and thanks to the modular design and the innovative TC2 control software it enables

maximum flexibility and efficiency. Interaction between shuttle (transport vehicles) and control is natively organized by means of the TC2.

In conjunction with the Material Flow Controller (MFC), the transport movements are constantly monitored and the montrac® system is optimally utilized. The shuttles communicate with each other via infrared signals and adjust their routing appropriately via integrated Smart Technology even during ongoing operation. Via standard interfaces montrac® can interact independently with additional systems or third-party components.

YOUR BENEFITS:

- Maximum flexibility through modular design
- Increased productivity through Smart Technology
- Cost savings due to low-maintenance system technology
- Increased efficiency through intelligent control software
- One-piece flow in favor of the Return On Investment (ROI)

montratec – Your Competent Service Partner

CUSTOMER TRAINING	ON-SITE MANAGEMENT	TECHNICAL SUPPORT	INSTALLATION & START-UP	MAINTENANCE & REPAIRS	SPARE PARTS & LOGISTICS
<ul style="list-style-type: none">■ Operation, maintenance and process training■ Certified technical Trainer team■ Tailor-made trainings■ Training of the integrator■ Service engineer	<ul style="list-style-type: none">■ On-site manager■ On-site training■ Project management	<ul style="list-style-type: none">■ Technical helpline■ Remote control service■ 24/7 Support	<ul style="list-style-type: none">■ Installation■ Start-up■ Parameterization■ Instruction■ Start-up support■ Hand-over	<ul style="list-style-type: none">■ On-site service■ Preventive maintenance■ General overhaul■ Relocation■ Inspection	<ul style="list-style-type: none">■ Global service network■ montratec spare parts quality■ Parts repair service

WE UNDERSTAND YOUR CHALLENGE!

montratec recommends an individual service contract to achieve highest productivity at predictable cost. We offer individual service agreements tailored to your specific requirements.

Holistic Project Management

The projects and project requirements of our customers are often highly complex. Influenced by increasingly sophisticated technology target values, entangled dependencies between different project areas and external stakeholders as well as the continuously increasing time and cost pressure, the project complexity is increasing rapidly. Our customers are therefore looking for a reliable service partner who manages projects holistically and in a targeted manner. monratec bundles the necessary project management skills and provides all process and automation components along the value chain from our internal production. As central contact we thus meet the role of an efficient project manager and coordinate suppliers, subcontractors and stakeholders as needed – always for the benefit of our customers.

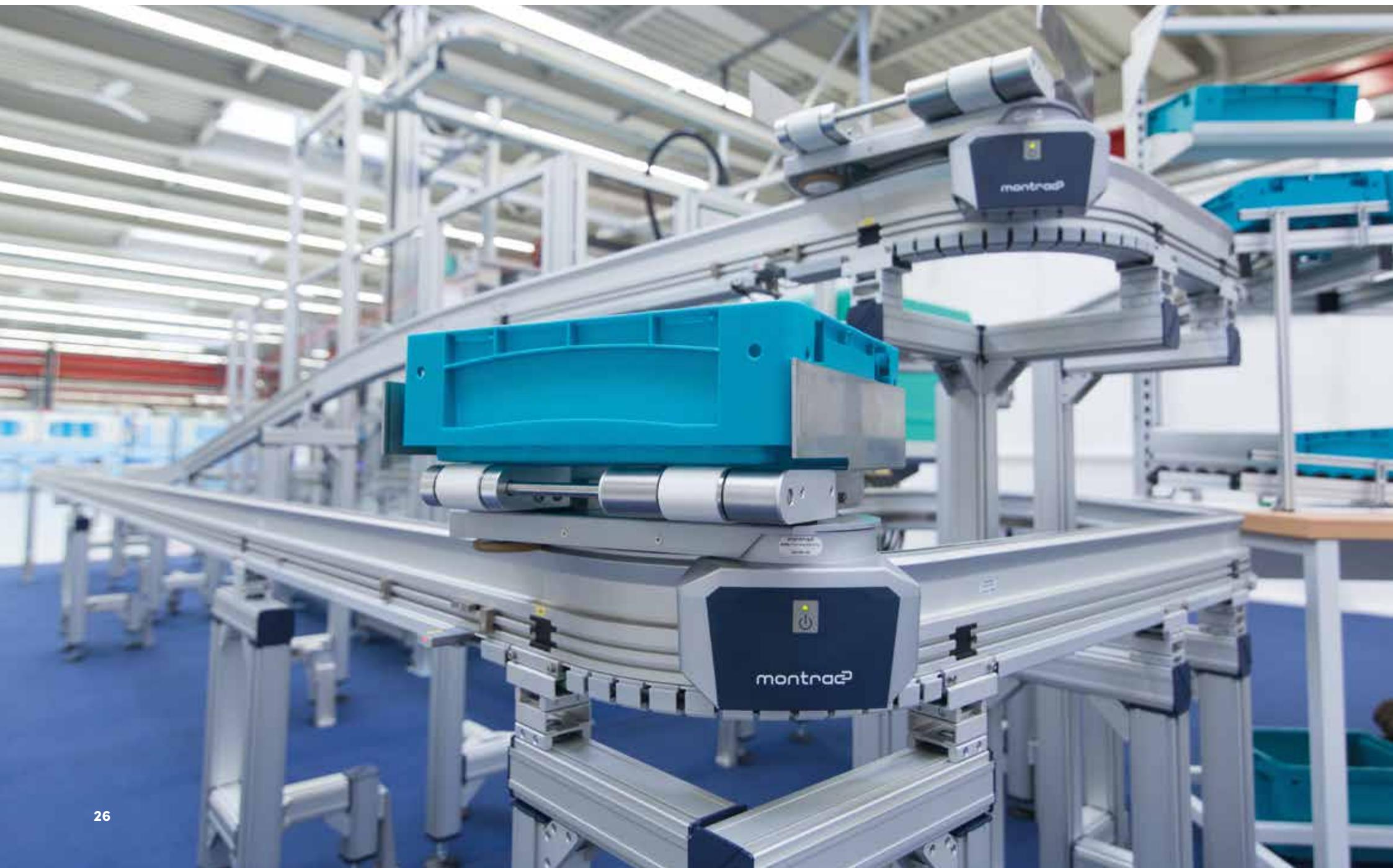
YOUR BENEFITS:

- Highly efficient project control through centralized project management
- Reduced investment risk by shifting the project responsibility
- Optimized time and budget management through accurate project communication
- Improved project evaluation by project reporting
- Reduced reaction times by defined responsibilities
- Maximum increase of your flexibility through reasonable task sharing.



SHIFT YOUR FOCUS AND SAVE TIME AND MONEY BY TRANSFERRING THE TOTAL PROJECT RESPONSIBILITY INTO THE COMPETENT HANDS OF monratec.

montrac® in Motion



WELCOME
TO OUR WORLD



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** Representation for Singapore and Malaysia

*** Representation for Sweden and Norway

**** Representation for USA, Canada, Mexico