



THE RFID FACTORY

PRODUCT OVERVIEW



CONTENTS

MUEHLBAUER GROUP AT A GLANCE.....4

RFID COMPETENCE6

SMART FACTORY CONCEPT / THE RFID FACTORY8

MB PALAMAX®10

ANTENNA PRODUCTION12

APS 35014

INLAY ASSEMBLY16

DDA WF Family18

DDA 40000.....20

DDA 40000 - P.....22

RFID CONVERTING.....24

IL 3000026

CL 4000028

CL 6000030

RFID PERSONALIZATION.....32

PL FLEX.....34



MUEHLBAUER GROUP AT A GLANCE

MUEHLBAUER’S BUSINESS UNITS AND SITES

The **Muehlbauer Group** is a German high-tech company that is known worldwide for its innovative solutions in the field of automated production. With over 40 years of experience, Muehlbauer develops customized technologies for the future of industry and everyday life. The company is the secret driving force behind many developments that make our modern lives safe and efficient.

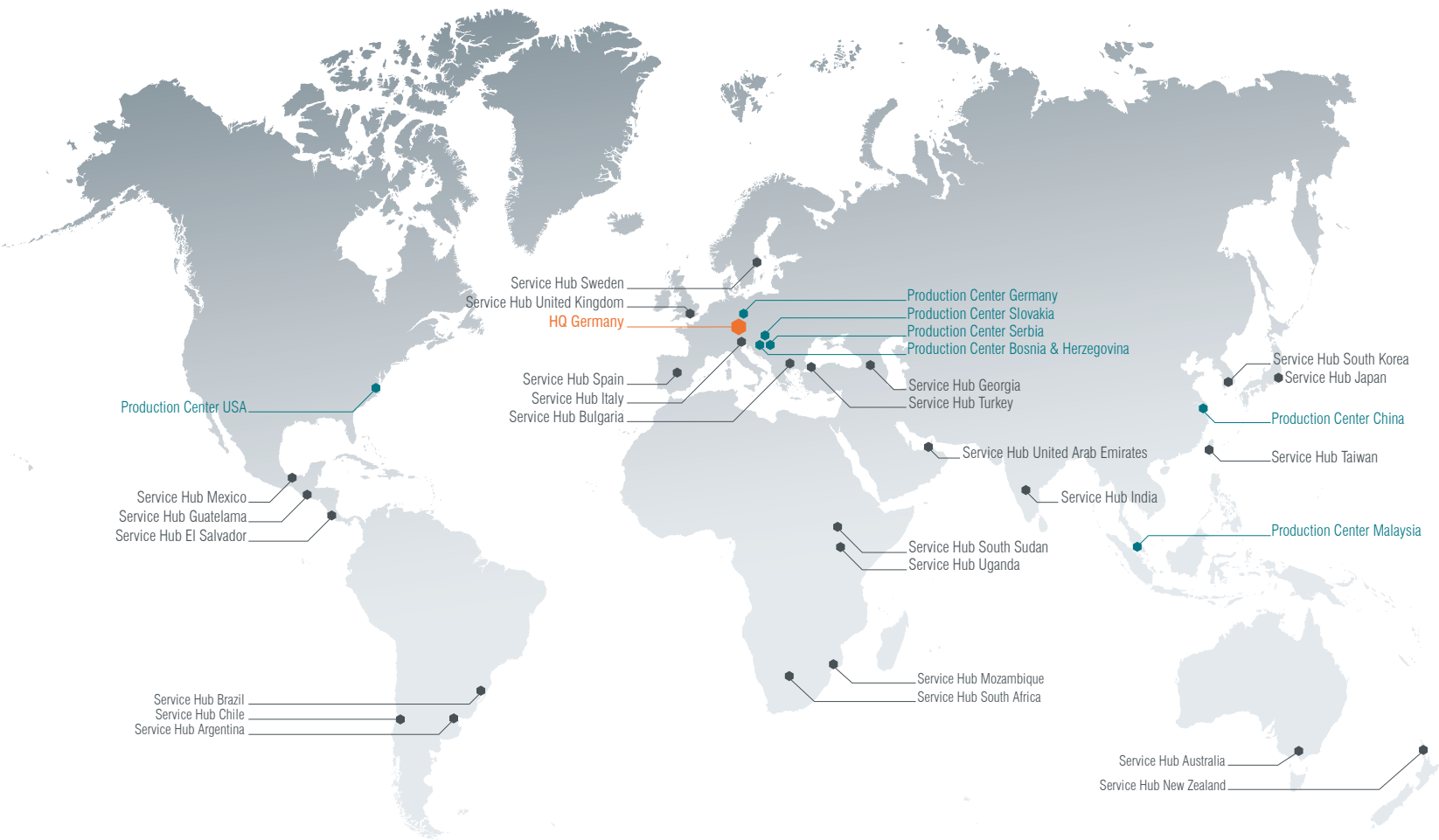
Since its foundation in 1981 in Roding, Bavaria, Muehlbauer has stood for maximum precision. The Muehlbauer **Parts & Systems** business unit consists of the company’s own precision parts production with a state-of-the-art electroplating facility. All components for machines and other products are manufactured here in-house – individually and, if necessary, overnight! Our MPS makes us extremely agile and independent.

Our **AUTOMATION** division goes far beyond the assembly of customized production systems! We provide intelligent software solutions for the automation of different production steps and drive Industry 4.0 forward. We are passionate about serving 90% of the global RFID market with our high-speed bonders, and have achieved market leadership in the semiconductor industry with our unique die sorting technology.

Our newest and currently most dynamic division **ATECH** – Advanced Energy Technologies – brings unique machine requirements to series production. In the field of e-mobility, we offer highly efficient production lines for the manufacture of pouch cells and prismatic cells for lithium-ion batteries, as well as MEAs & stacks for fuel cells. Our newly built ATECH Giga Center with dry room provides optimal conditions for gigascale manufacturing.

Our **TECURITY®** division is the leading specialist when it comes to implementing innovative security systems for identifying and verifying documents and people. For example, we manufacture systems for the production of chip cards, IDs and passports or supply eGates and self-registration kiosks and the associated software for airports and border crossings. With more than 30 years of experience and over 300 successfully implemented ID projects worldwide, we offer our customers absolute expertise and trust at the highest level.

More than 4,000 employees at over 30 locations worldwide ensure that Muehlbauer’s visions become reality around the globe. Sustainability, quality and unwavering trust in partnerships are the pillars on which our company has built its success story. Muehlbauer is not just a service provider, but a **creative problem solver** that shapes the future every day with innovative ideas and technological excellence.



Muehlbauer
Bosnia & Herzegovina



Muehlbauer
China



Muehlbauer
Germany



Muehlbauer
Malaysia



Muehlbauer
Serbia



Muehlbauer
Slovakia



Muehlbauer
USA



MPS
Precision Parts & Surface Engineering



AUTOMATION
Production Equipment & Systems



MB ATECH
Battery & Fuel Cell Technologies

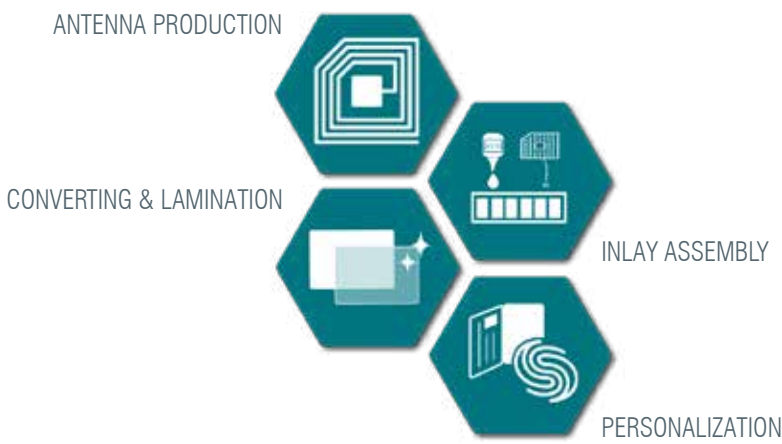


WORLD OF TECURITY®
Government & Technology Solutions



RFID COMPETENCE CENTERS

REALIZING RFIDeas WORLDWIDE



Newport News, VA
USA



Roding
GERMANY



Melaka
MALAYSIA



Wuxi
CHINA



Nitra
SLOWAKIA

COMPETENCE IN RFID

	ANTENNA PRODUCTION	CHIP HANDLING	CONVERTING	PERSONALIZATION	
1985		■			Development of our core competence Chip Handling: Specialization on small chips, high speed and high accuracy for Flip Chip technology
1988		■			First turnkey production solutions for Smart Cards
1995		■			Development of world first RFID Inlay Production System (TAL 1500). Since then, Muehlbauer has been a major driving force for the RFID production technology
2004		■	■		Muehlbauer draws up the strategy to become a turnkey solution provider for the complete RFID Factory. Our target is to provide our customers the most efficient and competitive RFID production and personalization solutions
2010			■		First Converting solution
2014	■				The latest innovations "Antenna Production Systems" was realized
		■			The revolutionary "Direct Die Attach System DDA 20000" Roadmap for 100.000 UPH entered the marked
				■	The latest "Personalization Technologies" are presented to the market
	■	■	■	■	The Muehlbauer Group releases its new roadmap "CONCEPT 2020" during the 1st "RFID Innovation Days" event
2018		■			The DDA 40000 is launched
2019	■	■	■	■	Muehlbauer release "Concept 2023" + MB PALAMAX®
2020		■			The world record machine DDA 80000 WF was launched as the "front runner" of our flexible DDA WF Family
2021	■				APS – newest market solution available
				■	Personalization solutions approach to medical applications
2023			■		Release of CL 40000 and IL 30000
2025	■	■	■	■	Celebration of 30 years RFID competence

RFID COMPETENCE

SMART FACTORY CONCEPT

MB PALAMAX®

ANTENNA PRODUCTION

INLAY ASSEMBLY

CONVERTING

PERSONALIZATION

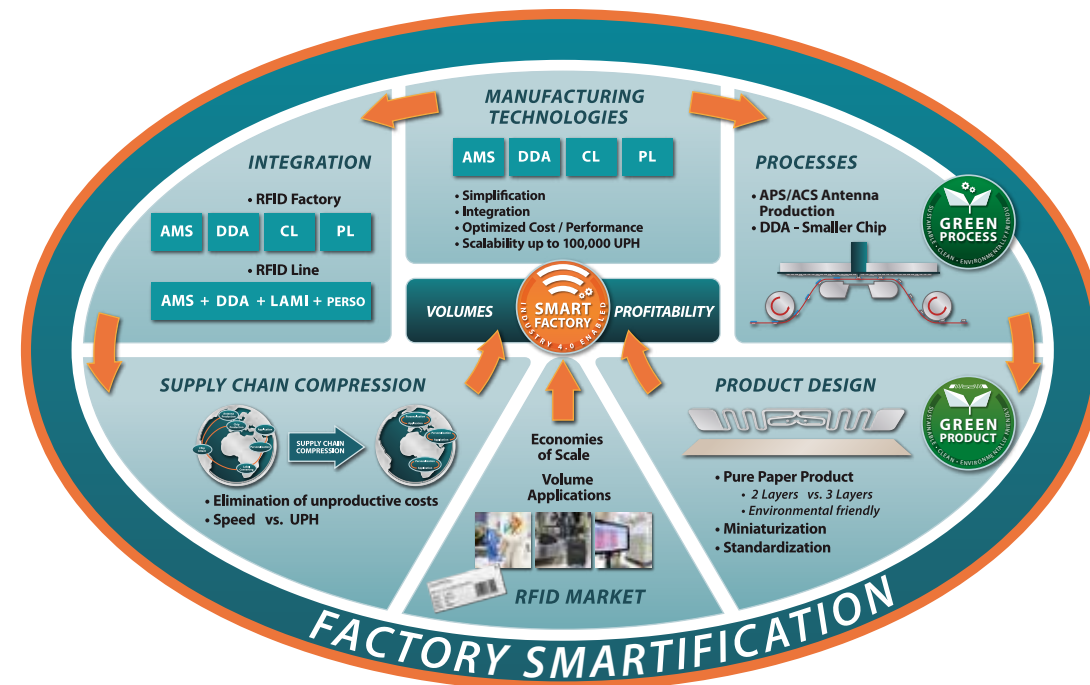


SMART FACTORY CONCEPT

THE FUTURE OF RFID MANUFACTURING

Based on the machine innovations from the Concept 2020, we respect the needs of high volume production linked with a sustainable green process and developed the Smart Factory Concept. The Smart Factory Concept is the roadmap for high automated,

sustainable production and material flow. Based on the intelligent production planning, the use of automated intelligent vehicles, preventive maintenance and full production transparency, there is only limited manpower required.



The integration of various manufacturing processes leads to stable and productive manufacturing lines, which guarantee high volume production with consistently high yield and uptimes. Furthermore there will be up to 30% less floor space required. With our Smart Factory Concept we combine the revolutionary

advancements with our unmatched expertise to a state-of-the-art technology controlled, monitored by our own-developed software solution. We will give our very best to develop the future technologies and always provide you the most competitive solutions.

THE RFID FACTORY

YOUR PARTNER FOR THE COMPLETE RFID SMART FACTORY

Nobody knows where the rapid growth of the RFID market will lead us to. Muehlbauer is able to provide you with the right technology to scope with the demands of tomorrow. Not only supply chain compression, high UPH and yield will be our challenge, in future we need to work on sustainable green manufacturing technologies and the decrease of process costs. Our Smart Factory Concept will offer the way to build a smart RFID factory

Industry 4.0, by having automated control of the manufacturing data; material and process flow. This new factory concept will be able to be more productive on less space and will even further reduce the cost. The total process can be handled by just a few people and will guarantee the highest utilization of the installed capacity. Even non Muehlbauer machines will be supported.



- Optimized material flow by automated vehicles for material transport
- Optimized machine utilization
- Preventive maintenance
- Support engineering in precise detection
- Fully automated data collection in real time
- Increased OEE and very fast ROI within months
- Significant reduction of manpower and floor space
- Full production transparency

RFID COMPETENCE

SMART FACTORY CONCEPT

MB PALAMAX®

ANTENNA PRODUCTION

INLAY ASSEMBLY

CONVERTING

PERSONALIZATION



MB PALAMAX®, Muehlbauer's Smart Factory solution, is developed for card, tag or booklet productions, personalization factories and semiconductor backend shop floors. Consisting of an NOSQL database, it is designed to set and collect process data to monitor and improve the efficiency of production and person-

alization. The collected process data is stored in big data sets for later processing, visualization and statistical analysis. MB PALAMAX® is the backbone of our Smart Factory solution, by collecting all relevant data and handling the process & material flow.



KEY FEATURES

- Monitor your production in real time and generate real production statistics with your preferred KPIs. For specific chip types only
- Improve your transparency
- Gain better data to investigate, understand and portray process flows and relationships.
- Run your production with improved security and optimally employed, well-trained staff.
- Intuitive and easy to use web interface
- Responsive user interface design allows optimal presentation on any chosen device
- Data collection from the shop floor of Muehlbauer equipment and also third party Muehlbauer's equipment
- State-of-the-art big data software architecture ensures future reliability



FEATURES & ADVANTAGES

- MB PALAMAX.MONITOR**
Monitors the real-time performance of the production
- MB PALAMAX.STATS**
Statistical tool which analyzes collected data & delivers customized statistics on OEE
- MB PALAMAX.REMOTE**
Enables the remote operation of machines on the shop floor from a control centre
- MB PALAMAX.TRACE**
Allows for the auditing of single manufacturing runs
- MB PALAMAX.MAINTAIN**
Enables the implementation of maintenance on demand
- MB PALAMAX.REPORT**
Provides extensive reporting capabilities and data dumps
- MB PALAMAX.RECIPE**
Enables production engineering to prepare & test a repeatable factory set-up. Factories can switch between products within minutes.

- The only software solution worldwide to combine personalization data management, complete production control and material management
- Covers the full production control requirements
- Highly automated workflows with little operator interaction
- Streamlined web-based user interfaces with easy localization

RFID COMPETENCE

SMART FACTORY CONCEPT

MB PALAMAX®

ANTENNA PRODUCTION

INLAY ASSEMBLY

CONVERTING

PERSONALIZATION



ANTENNA PRODUCTION

TECHNOLOGY OVERVIEW

Driven by the need of environmental friendly production processes, fast and flexible production cycles and high volume production capabilities, Muehlbauer brought the antenna manufacturing to the next level. The Antenna Printing System (APS) is designed to offer zero waste production without the need of harmful chemicals. The Muehlbauer antenna production technology marks a milestone in supply chain compression, antennae on demand production, full and full control over your design.

	APS 350
WEB WIDTH	350 mm
Annual capacity	approx. 240 million unit / year
ANTENNA TYPE	
UHF	Yes
HF	Yes
Troughput	3 m/min Roadmap 8 m/min
MATERIAL	Paper, Copper ink
YIELD	>99,7%

TECHNOLOGY

PRINTING TECHNOLOGY



ROTATION SCREEN PRINTING

- fully compostable thanks to natural materials

RFID COMPETENCE

SMART FACTORY CONCEPT

MB PALAMAX®

ANTENNA PRODUCTION

INLAY ASSEMBLY

CONVERTING

PERSONALIZATION



APS 350

ANTENNA PRINTING-SYSTEM

The completely new approach of the APS makes it possible for Smart Label suppliers to print their own antennas In-house on demand. The new process is cleaner and faster than all the conventional antenna technologies currently available on the market. With APS 350, copper ink antennas can be produced undergo-

ing an integrated quality assurance system. Especially for Smart Label producers that underlie fast reaction times, the APS is an interesting tool as they can produce antennas within hours instead of weeks.



ANTENNA ON DEMAND ON PAPER SUBSTATE

BENEFITS

- Fully decomposable copper antennas on paper
- Copper ink printing process without any waste chemicals (green process)
- Enables two layer products (green design)
- Cost reduction up to 70% compared to silver printing
- In house antenna supply – just in time
- UHF production



FEATURES & ADVANTAGES

ADVANTAGES

- Supply chain compression (no shipping from sub-supplier)
- Print-on-Demand flexibility (with existing design production within 8 hours)
- Know-how remains in your company
- Tag disposal < 30 days in standard composter

WORKSTATIONS

- | | |
|-----------------|------------------|
| Input spooler | Sintering system |
| Printing system | Visual tester |
| Drying system | Output spooler |
| Drive module | |

THROUGHPUT

- up to 3 m/min, roadmap for 8 m/min with rotative screen print
- up to 36,000 UPH (20 mm pitch, 4 row)
- up to 240 Mio. per year

DIMENSIONS

- Length 6000 mm
- Depth 2100 mm
- Height 2300 mm
- Weight 2000 kg



RFID COMPETENCE

SMART FACTORY CONCEPT

MB PALAMAX®

ANTENNA PRODUCTION

INLAY ASSEMBLY

CONVERTING

PERSONALIZATION



INLAY ASSEMBLY

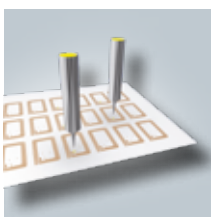
TECHNOLOGY OVERVIEW

Thanks to continuous development efforts, our chip attach machines are the most proven solution for inlay production. Besides the well-known Muehlbauer quality & technology standards, our DDA 80000 WF demonstrates leading edge performance with a world record and unique UPH up to 80.000. With our green DDA 40000-P your paper inlay will improve your operations to environmental friendly and flexible inlay production.

	DDA 20000 WF	DDA 40000 WF	DDA 80000 WF	DDA 40000	DDA 40000 - P
WEB WIDTH					
35 - 160 mm				Narrow Web	Narrow Web
100 - 350 mm					
100-385 mm	Wide Web	Wide Web	Wide Web		
TECHNOLOGY					
	Direct Die Attach (Single Head)	Direct Die Attach (Dual Head)	Direct Die Attach (Quadruple Head)	Direct Die Attach (Single Head)	Direct Die Attach (Single Head)
Max. UPH	20 000	40 000	80 000	40 000	40 000
Yield	>99.7%				
Highlight	Upgradeable	Upgradeable			
DIES					
Size	min.	0.2 x 0.2 mm			
	max.	1.5 x 1.5 mm			
ANTENNA					
Material	Copper, aluminum, silver on PET or paper	Copper, aluminum, silver on PET or paper	Copper, aluminum, silver on PET or paper	Copper, aluminum, silver on PET	Copper, aluminum, silver on paper or PET
OUTPUT					
Single Row				■	■
Multi Row	■	■	■		
ACCURACY					
Machine	± 15 μm				
Die Attach	± 30 μm				
Post Cure	± 50 μm				

DDA TECHNOLOGY

THE REVOLUTION IN FLIP CHIP DIE ATTACH - PROCESS FLOW



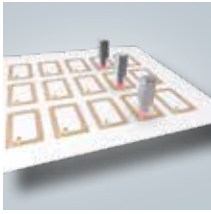
ADHESIVE APPLY

- Latest generation of adhesive jetting technology available
- Glue savings approx. 25 % compared to dispensing system
- Highest flexibility for all antenna formats



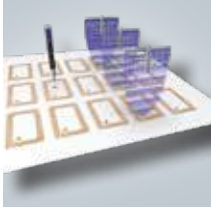
PRE-BONDING

- Machine accuracy ± 15 µm, die attach accuracy ± 30 µm
- Die handling from 0.2 x 0.2 mm up to 5.0 x 5.0 mm
- Full throughput with 100 % vision control for highest yield



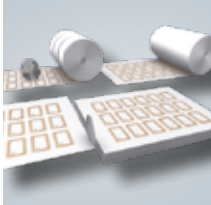
FINAL BONDING

- Smallest & most efficient thermode generation 0.5 N to 5 N ± 10 %
- Best thermode coplanarity ± 5 µm/mm
- Highest process accuracy ± 50 µm (after final bonding)



TESTING & BAD UNIT MARKING

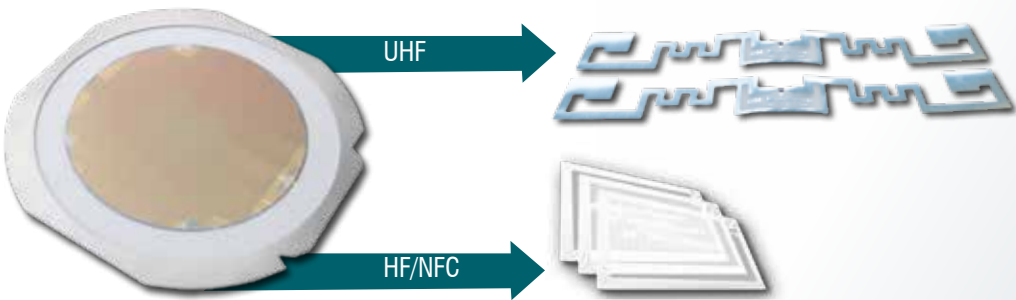
- 100% tested output quality
- In-house customized reader antenna design
- Muehlbauer standard tester
- Optional: CISC or Voyantic



UPWINDING OR SLITTING

- Single or multirow reels for label / ticket conversion

SUITABLE FOR EVERY APPLICATION



RFID COMPETENCE	●
SMART FACTORY CONCEPT	●
MB PALAMAX®	●
ANTENNA PRODUCTION	●
INLAY ASSEMBLY	◆
CONVERTING	●
PERSONALIZATION	●



DDA WF FAMILY

FLEXIBLE TECHNOLOGY FOR EACH & EVERY VOLUME

The DDA WF family represents the most proven and established Muehlbauer chip attach solutions for the latest market potentials. The flexible technology ready for each and every volume is based on our well-known direct die attach concept and beats up to 80 000 UPH with only one system and lowest footprint. With

our state-of-the-art technology, you can enter at any production volume and be flexible with upgrading your inlay production machine to the next stage. The production from 2 to 12 antenna rows is possible with tape width from 100mm – 385mm and 100% high-quality output control to reach highest yield.



MOST PROVEN CHIP ATTACH SOLUTION FOR THE LATEST MARKET POTENTIALS

BENEFITS

- Highest flexibility, in field upgrade possible at any time
- Inlay production from 2 to 12 rows possible
- Tape width from 100 - 385 mm



FEATURES & ADVANTAGES

ADVANTAGES

- Highest flexibility for wide web chip attach production
- Future proven technology
- Upgradeable concept growing with the market - also later on field

WORKSTATIONS

- | | | | |
|--|---------------|--|----------------------------|
| | Input spooler | | Finalbinder |
| | Prebinder | | Tester and bad unit marker |
| | Buffer | | Output spooler |

20000 WF DIMENSIONS E.G.

- Length 11605 mm
- Depth 2022 mm
- Height 2480 mm
- Weight 8150 kg



RFID COMPETENCE

SMART FACTORY CONCEPT

MB PALAMAX®

ANTENNA PRODUCTION

INLAY ASSEMBLY

CONVERTING

PERSONALIZATION



DDA 40000

ENTER A NEW DIMENSION FOR CHIP ATTACH

10 years ago, the Direct Die Attach concept was developed in Mühlbauer's development department and continuously optimized. The patented technology beats the 40 000 UPH with only one place system and a 30% smaller footprint. The significantly higher

throughput and the reduced complexity results in 80% less die attach costs, an outstanding quality and highest reliability. This system redefines the high-volume production and provides considerable potential for further cost and performance optimization.



SIMPLICITY IS THE ULTIMATE SOPHISTICATION

BENEFITS

- Production proven > 80 systems
- Cost reduction up to 80%
- Very high productivity, more than 10 billion products produced
- Fully compatible with standard curing process

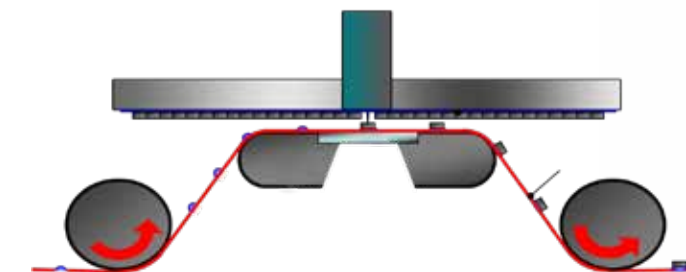


FEATURES & ADVANTAGES

ADVANTAGES

- Consistently high uptime
- Small footprint
- High accuracy & quality standards

WORKSTATIONS



DDA - SPECIAL PROCESS

- DDA - Strap - Info on request

DIMENSIONS

- Length 5760 mm
- Depth 1625 mm
- Height 2000 mm
- Weight 3130 kg



RFID COMPETENCE

SMART FACTORY CONCEPT

MB PALAMAX®

ANTENNA PRODUCTION

INLAY ASSEMBLY

CONVERTING

PERSONALIZATION

DDA 40000 - P

SUSTAINABLE PRODUCTION SOLUTION FOR PAPER ANTENNAS

Our sustainable Direct Chip Attach DDA 40000-P was developed as a production solution for paper antennas. The equipment is based on our well-known Direct Die Attach technology and further allows you a green inlay production with the same flexibility and speed at your inlay production. The handling of transparent and non-trans-

parent materials guarantees you unlimited flexibility and prepares you for future material requirements. With 100% high-quality output control, the machine can attach up to 280 Mio. chips per year onto antennas on paper substrate.



GREEN PRODUCTION MEETS HIGH SPEED CHIP ATTACH

BENEFITS

- Well-prepared for future material requirements
- Handling of transparent & non-transparent materials (e.g. paper)
- Fully compatible with standard curing process



FEATURES & ADVANTAGES

ADVANTAGES

- More pitch independend
- Cleaning paper from dust before processing in the machine (optional)
- High accuracy & quality standards
- Handling of green and enviromental friendly products

WORKSTATIONS



DIMENSIONS

- Length 6695 mm
- Depth 1757 mm
- Height 1990 mm
- Weight 3950 kg



RFID COMPETENCE

SMART FACTORY CONCEPT

MB PALAMAX®

ANTENNA PRODUCTION

INLAY ASSEMBLY

CONVERTING

PERSONALIZATION



CONVERTING

TECHNOLOGY OVERVIEW

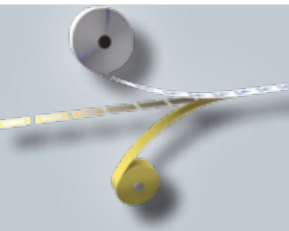
The wide range of Muehlbauer converting lines enables our customers to offer an incredible portfolio depth. From standard RFID labels, to baggage tags, on metal tags, animal ear tags, paper tickets and hangtags, nothing is impossible.

Muehlbauer converting lines can offer you the most efficient production solution for your products, no matter how demanding your product specification might be.

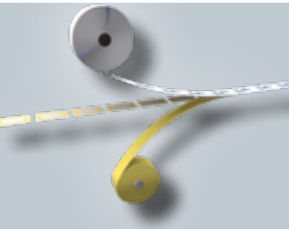
	IL 30000	CL 40000	CL 60000
Max. Speed	50 m/min	40 m/min	60 m/min
Max. Reel Diameter	500mm	500 mm	600 mm
Web Width	30 - 250mm	30 - 250 mm	30 - 250 mm
GLUE PROCESSING			
Transfer Glue		■	■
Hotmelt		■	■
INPUT MATERIALS			
Face Liner	■	■	■
Dry Inlay		■	■
Wet Inlay	■	■	■
Compensation Layer			■
Bottom Liner	■	■	■
DIE CUTTING			
Cutter		■	■
Accuracy		± 0.5 mm	± 0.5 mm
Technique		Rotative	Rotative
OUTPUT			
Single Ticket		■	■
On Reel	■	■	■

FOR LABELS, TICKETS & TAGS

PROCESS FLOW



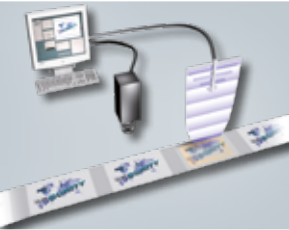
- ADHESIVE COMPONENTS
- Transfer adhesive hotmelt station



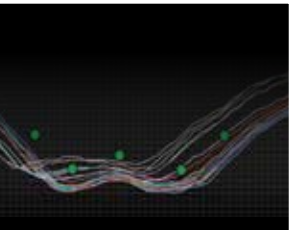
- LAMINATION
- Cold lamination
 - Register controlled



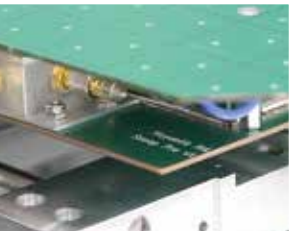
- DIE CUTTING
- Rotative or semi-rotative die cutting process
 - Fast and accurate
 - Pitch controlled



- TESTING & MARKING
- 100% tested output quality
 - In-house customized reader antenna design
 - Marking or rejection of bad units



- INLINE READ RANGE VERIFICATION/PERFORMANCE
- Inline performance test of UHF-inlays, -labels, -tickets etc. with Voyantic Tagsurance system
 - Frequency test range (e.g. 860... 960 MHz) instead of one fixed frequency in standard test procedures
 - Characteristical performance curve over the test range for judgement of quality & tolerances



RFID COMPETENCE

SMART FACTORY CONCEPT

MB PALAMAX®

ANTENNA PRODUCTION

INLAY ASSEMBLY

CONVERTING

PERSONALIZATION

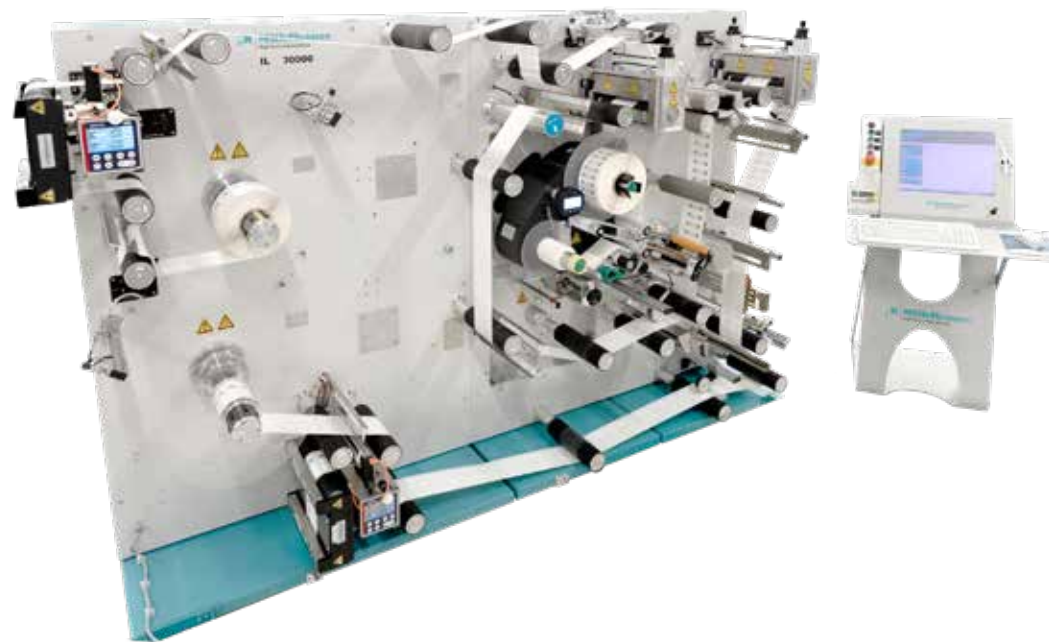


IL 30000

RFID INLAY INSERTION LINE

The IL 30000 inlay insertion line is designed for the fully automatic insertion of RFID inlays into conventional self-adhesive labels. Label converters are using their standard label printing presses to produce self-adhesive labels in a very efficient reel-to-reel process. By using the IL 30000, these labels can be

easily converted to Smart Labels by inserting “wet RFID inlays” between the adhesive labels and the liner in a stand-alone reel-to-reel-process (“de-lam/re-lam process”) with minimal invest and very fast production integration, it is your door opener into the RFID world.



FULLY AUTOMATED INSERTION OF RFID INLAYS

BENEFITS

- Low investment cost and fast return of investment
- Easy in operation
- Highest placement accuracy
- Dual row solution possible



FEATURES & ADVANTAGES

ADVANTAGES

- Easy process solution with very small footprint
- High production speed
- Known process de-lam/re-lam
- Effortless expansion of your portfolio

WORKSTATIONS

- Input spooler for self adhesive labels
- Feeding and despende system of wet inlay
- Lamination
- Tester and bad unit marker
- Output spooler

APPLICATION POSSIBILITIES

- Self-adhesive HF & UHF labels
- Multilayer labels (sandwich labels)
- Can also be used as an applicator

DIMENSIONS

- Length 2500 mm
- Depth 1170 mm
- Height 1720 mm
- Weight 1300 kg



RFID COMPETENCE

SMART FACTORY CONCEPT

MB PALAMAX®

ANTENNA PRODUCTION

INLAY ASSEMBLY

CONVERTING

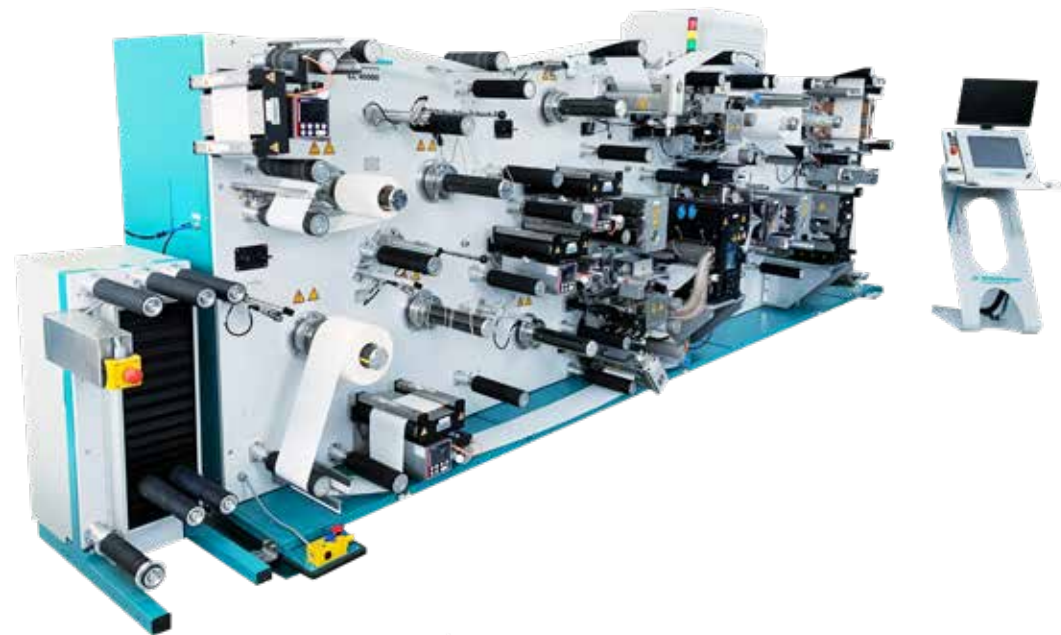
PERSONALIZATION

CL 40000

CONVERTING LINE FOR MID-VOLUME PRODUCTION

The CL 40000 is characterized by a successful combination of cost efficient design together with a high flexibility in output configurations. It is possible to convert wet inlays or finished labels directly from dry inlays in reel-to-reel mode with a wide variety of different adhesive options. All processes are in one modular system: antenna web handling, label lamination, die cutting as well as output testing. The system has a throughput of up to 40 m/min

for rotative cutting. With an optimized change-over time between different products paired with lowest tooling costs, this converting system is perfectly suited for a production with smaller lot sizes and at the same time fast changing applications. The friendly user interface, the intuitive handling of this converting machine and the low initial investment makes the CL 40000 especially interesting for entering the RFID market.



BEST PRICE/PERFORMANCE RATIO FOR SMALL & MID-RANGE VOLUME

BENEFITS

- Rotative die cut
- Fast return of investment
- Reduced production time and costs
- Dry inlay with hotmelt possible
- Wet inlay dispensing
- Dual row solution possible



FEATURES & ADVANTAGES

ADVANTAGES

- Fast, easy & cost-minimized product change over
- Easy in operation
- High precision inlay placement
- Small footprint

WORKSTATIONS

- | | |
|----------------------------------|-----------------------------------|
| Input spooler | Lamination |
| Input tester and bad unit marker | Cutting |
| Adhesive components | Output tester and bad unit marker |
| Material handling | Output spooler |

CONFIGURATION FLEXIBILITY

- Dry inlay off-pitch placement
- Dual hotmelt station
- One step production from inlay to Smart Label

APPLICATION POSSIBILITIES

- Wet inlay
- Self-adhesive label in one pass with dry inlay
- Ticket on reel
- Single row ticket production
- Two row label production
- Delam-relam process

DIMENSIONS

- Length 5978 mm
- Depth 1450 mm
- Height 2085 mm
- Weight 3133 kg



RFID COMPETENCE

SMART FACTORY CONCEPT

MB PALAMAX®

ANTENNA PRODUCTION

INLAY ASSEMBLY

CONVERTING

PERSONALIZATION

CL 60000

CONVERTING LINE FOR HIGH-VOLUME PRODUCTION

Muehlbauer's CL 60000 Converting Line represents a flexible, fast and modular concept for a high range of converting possibilities: Smart Labels and Smart Tickets from reel-to-reel or from reel-to-ticket/fanfold. Various input materials like dry inlay, wet inlay and even compensation layer (4-layer) can be processed. All processes are in one platform: reel-to-reel antenna web handling, label/ticket lamination, die cutting as well as output testing

— of course, with leading edge performance, state of the art quality and the best cost/performance ratio available on the market. Muehlbauer's converting machine CL 60000 is perfectly suited for high-volume RFID Label and Ticket production, where the issues of fast change over times and high quality are taken into account.



MOST FLEXIBLE MODULAR CONVERTING SOLUTION

BENEFITS

- Price / Performance leader
- Highest level of customization
- Lowest cost of ownership
- Flexible for labels, tickets and hangtags
- Dual-row solution





FEATURES & ADVANTAGES

ADVANTAGES

- High application flexibility
- Flexible for dry and wet inlays
- Upgrade possibilities also in field
- Hotmelt and/or transfer glue process

WORKSTATIONS

- | | |
|--|---|
|  Input spooler |  Lamination |
|  Input tester and bad unit marker |  Cutting |
|  Adhesive components |  Output tester and bad unit marker |
|  Material handling |  Output spooler |

CONFIGURATION FLEXIBILITY

- Transfer adhesive and hotmelt
- Second die cutter
- Single ticket output
- 4-Layer handling
- Performance testing inline
- Vision system
- Delam/Relam process

YOUR APPLICATIONS

- Self-adhesive label
- Ticket on reel
- Single Ticket / Hang tag

SPECIAL APPLICATIONS

- CL wide web


DIMENSIONS

- Length 8000 mm
- Depth 3600 mm
- Height 2500 mm
- Weight 5610 kg



RFID COMPETENCE 

SMART FACTORY CONCEPT 

MB PALAMAX® 

ANTENNA PRODUCTION 

INLAY ASSEMBLY 

CONVERTING 

PERSONALIZATION 

PERSONALIZATION

TECHNOLOGY OVERVIEW

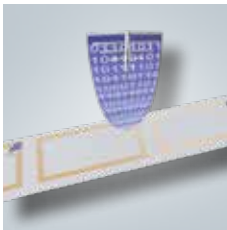
The personalization brings each label/ticket to life and with our wide range of solutions they represent the ideal machine for chip encoding, printing and verification. The efficient and fast set-up allows for a rapid change over. With transport speeds up to 60m/min

min the systems reaches peak-performance values with regard to UPH. To guarantee 100% flawless output quality, 100% of the labels/tickets are tested for functionality and print. The license free encoding gain you highest flexibility for all encoding formats.

	PL FLEX
SCOPE OF OPERATION	
Barcode reading	■
Chip encoding	■
Printing	■
Verification	■
machine speed	up to 60m/min
FREQUENCIES	
UHF	■
HF	■*
NFC	■*
MATERIALS FORMAT	
Labels on reel	30-250mm
Singulated Tickets/Tags	■
Width	19-150mm
Length	50-200mm
PRINTING	
max. dpi	600
Mono color	■
OUTPUT FORMAT	
On reel	■
On belt	■
Bad ticket removal	■

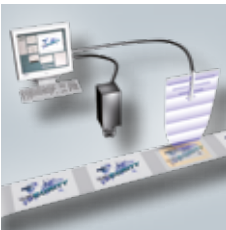
CHIP ENCODING & PRINTING

PROCESS FLOW



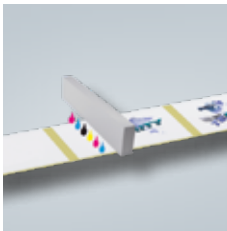
ENCODING

- Encode electronically data to each tag's RFID chip
- Data base containing all pertinent information
- For advanced encoding features such as password lock, perma lock and more



VERIFICATION & TESTING

- Every label will be tested for RF functionality and/or visual defects and/or data match
- Bad labels can either be visually marked or completely removed from the roll



PRINTING

- High-speed digital print system
- Mono chrome or full colour
- Variable Data-Printing (VDP) capability



MB MCES

PERSONALIZATION MANAGEMENT SYSTEM

MUEHLBAUER ENCODE FOR
MAXIMUM FLEXIBILITY AND
INDEPENDENCE



Customer Database



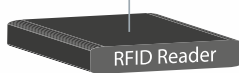
Database

MÜHLBAUER ENCODE



Coding DLL:
• RFID Chip Specifics
• Encoding Algorithm

using



RFID COMPETENCE

SMART FACTORY CONCEPT

MB PALAMAX®

ANTENNA PRODUCTION

INLAY ASSEMBLY

CONVERTING

PERSONALIZATION

The personalization software MUEHLBAUER ENCODE is based on Microsoft Dynamic Link Library (DLL) and therefore allows the adaption to any RFID Chip and encoding algorithm.

YOUR ADVANTAGES

- Suitable for all chip types with unique ID (TID or UID)
- For all frequencies (HF/NFC & UHF)
- Encoding algorithm is freely programmable

The DLL is based on Microsoft Visual C#. At the Muehlbauer Academy customers receive specialized developer trainings for the coding of the DLL. Our developer workstations are equipped with an offline RFID-Reader kit for HF and UHF frequencies and are available for testing and debugging.

*depending on chip type



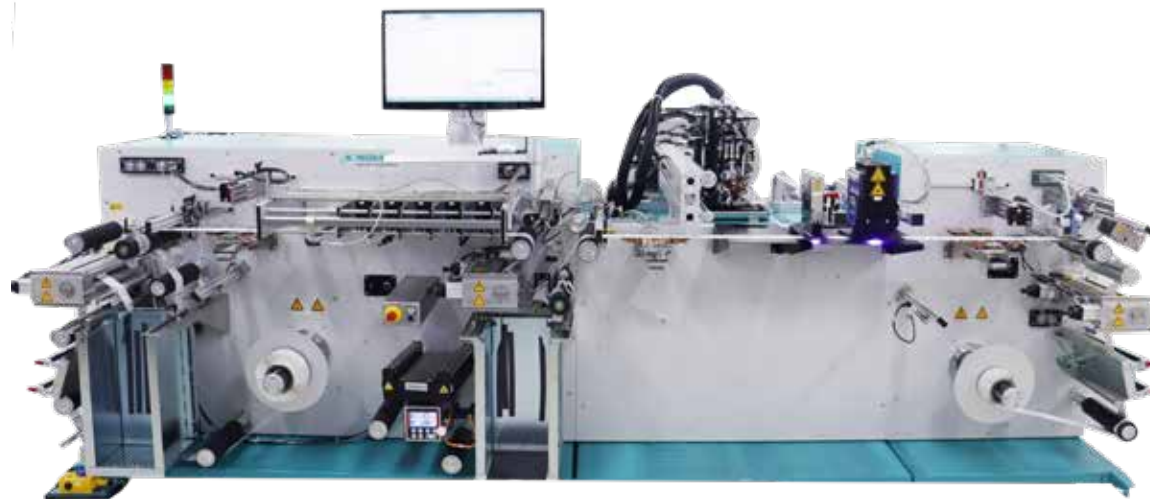
PL FLEX



SINGLE TICKET / REEL-TO-REEL PERSONALIZATION LINE

Muehlbauer's personalization line PL FLEX represents the ideal machine for the encoding, labeling and verification of tickets and tags for low and medium volumes. The efficient set-up and fast changeover allows for rapid changes of orders, either reel-to-reel or ticket-to-ticket. Also, a multiple handling of jobs is possible. Each ticket is tested and automatically reproduced when rejected

in order to guarantee flawless quality and lot integrity. PL FLEX' small-sized footprint allows it to be placed even in the smallest spaces, e.g. in an office environment. Furthermore, this economically-priced system is available with the license-free Muehlbauer ENCODE software solution for UHF and HF/NFC, which additionally saves costs during operation.



THE IDEAL SOLUTION FOR YOUR SERVICE BUREAU

BENEFITS

- Modular machine platform for highest flexibility
- Reel-to-reel and single ticket handling
- Multi-job handling in one batch
- UV inkjet printing up to 600dpi



FEATURES & ADVANTAGES

ADVANTAGES

- Wide range of encoding formats for UHF and HF/NFC
- License-free MB ENCODE: Suitable for almost all chip types
- Ready for Industry 4.0 and the MB Palamax Software solution

WORKSTATIONS

- | | |
|----------------|----------------|
| Input spooler | Printing |
| Trigger sensor | Verification |
| Barcode reader | Output spooler |
| Encoding | |

CONFIGURATION FLEXIBILITY

- PL FLEX Scan and Encode or with print module
- UHF and HF/NFC
- Reel-to-reel and single ticket

YOUR APPLICATIONS

- Individually personalized Single Tickets / Hangtags
- Individually personalized Labels / Tickets on reel

PL FLEX DIMENSIONS (MAX.)

- Length 7900 mm
- Depth 1240 mm
- Height 1700 mm
- Weight 1290 kg

RFID COMPETENCE

SMART FACTORY CONCEPT

MB PALAMAX®

ANTENNA PRODUCTION

INLAY ASSEMBLY

CONVERTING

PERSONALIZATION



MUEHLBAUER GERMANY

Muehlbauer Group Headquarters
Josef-Muehlbauer-Platz 1, 93426 Roding, Germany
Phone: +49 9461 952 0, Fax: +49 9461 952 1101
info@muehlbauer.de, www.muehlbauer.de

MUEHLBAUER USA

Muehlbauer Inc.
226 Pickett's Line
Newport News, VA 23603-1366, USA
Phone: +1 757 947 2820, Fax: +1 757 947 2930
info@muehlbauer.com, www.muehlbauer.com

MUEHLBAUER MALAYSIA

MB Automation (Malaysia) Sdn. Bhd.
No. 3 Jalan TU 62, Taman Tasik Utama,
75450 Melaka, Malaysia
Phone: +60 6 275 7100, Fax: +60 6 275 7101
info@muehlbauer.com.my, www.muehlbauer.com.my

MUEHLBAUER SERBIA

Muehlbauer Automation d.o.o.
Evropska 17, 22300 Stara Pazova, Serbia
Phone: +381 22 215 5100, Fax: +381 22 215 5130
serbia@muehlbauer.de, www.muehlbauer.com

MUEHLBAUER CHINA

Muehlbauer Technologies (Wuxi) Co., Ltd.
No 23. Huayi Road, Wuxi New District
214135 Wuxi, Jiangsu, China
Phone: +86 510 8190 0100, Fax: +86 510 8190 0101
info@muehlbauer.cn, www.muehlbauer.cn

MUEHLBAUER SLOVAKIA

Muehlbauer Automation s.r.o.
Novozámocká 233, 94905 Nitra, Slovakia
Phone: +421 37 6946 000, Fax: +421 37 6946 501
info@muehlbauer.sk, www.muehlbauer.com



MB Automation GmbH & Co. KG

Josef-Muehlbauer-Platz 1 | 93426 Roding | Germany
Tel.: +49 9461 952 0 | Fax: +49 9461 952 1101
Mail: info@muehlbauer.de | Web: www.muehlbauer.de