

WHITEPAPER

# FUSE INSERTION AND ASSEMBLY OF FUSE BOXES

Production down to batch size 1

Quick changeover

High product quality

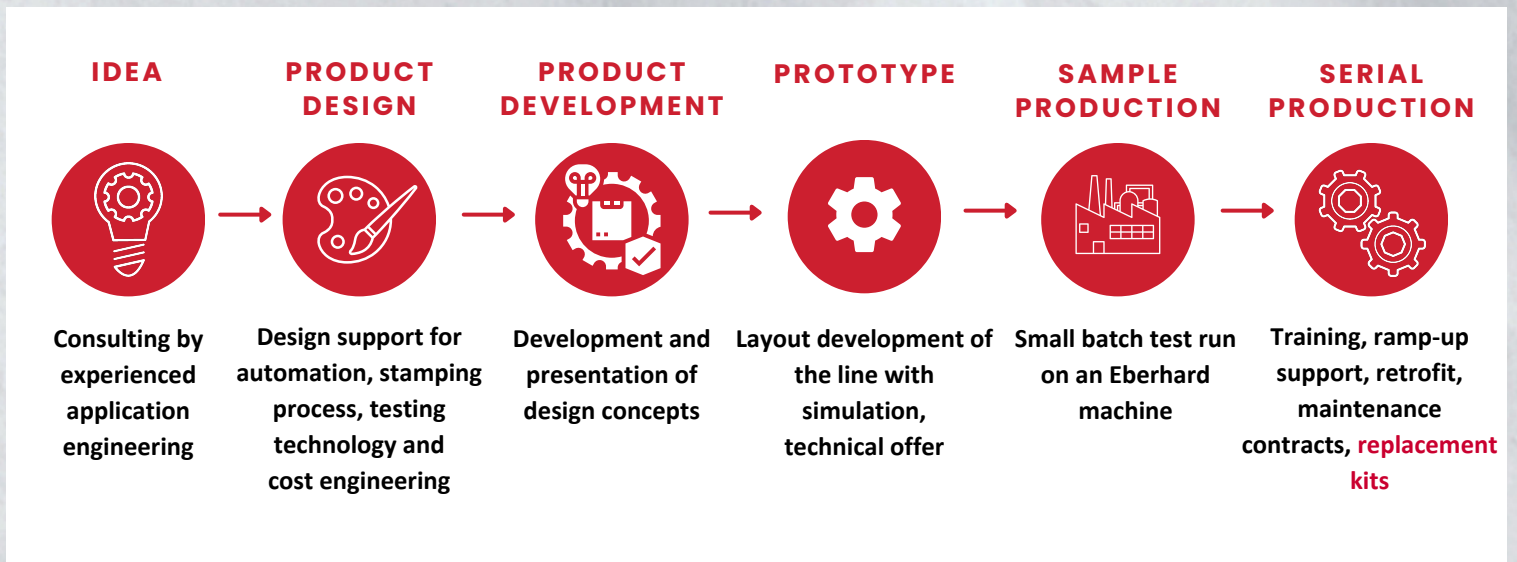
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CUSTOMIZE TO YOUR NEEDS:  
FROM FUSE INSERTION TO THE COMPLETE LINE



## Eberhard as Partner from the idea to implementation

We support our customers already in the design stage of their products.



**YOUR ADVANTAGES:** Shorter development times, cost reduction, low error rate, individual automation solutions especially for your product requirements

## ... over the entire life cycle of your production line



## Fuse insertion and assembly of fuse boxes

Flexible automation degree  
Customized to your needs

### INITIAL SITUATION

The range of electric equipment in today's vehicles is growing rapidly. Fuses are common devices for protecting these electrical components. Regardless of the vehicle type (car, truck, EV, HEV or combustion engine), many different fuses are used there. This requires more flexibility and versatility in the configuration of fuse boxes.

### YOUR CHALLENGE

Manufacturers of fuse boxes are faced with the problem of be able to flexibly and fully automatically process different fuse types in one machine for insertion into fuse boxes. Long changeover times impact productivity and manufacturing with several machines is not efficient. The fluctuating quality leads to complaints from end customers. This leads to customer dissatisfaction.

### OUR SOLUTION

Eberhard provides you with a fully automated solution for the economical and reliable assembly of your fuse boxes.

The wide range of fuse box configurations is guaranteed by free variant programming.

It is possible to change variants without stopping the machine.

Monitoring the press-in force of each individual fuse in the process rounds off our concept.

The modular design allows the extension of fuse insertion to a complete production line for fuse boxes, which includes all processes from pre-assembly of the box to labeling and packaging.

### YOUR ADVANTAGES



#### Modularity

Customize to your needs  
From fuse insertion to the complete line



#### Flexibility

Production down to batch size 1  
Insertion of various fuse types



#### Qualität

100% traceability  
100% inline control

# Fully automated insertion

## PROCESSES:

- Feeding of various fuses via bowl feeders
- Querying the insertion sequence by scanning a DMC code
- Force-monitored insertion according to insertion sequence

## TECHNICAL DATA:

- Up to 180 fuses / minute
- Up to 6 fuses / station (several stations possible in one machine)
- No changeover times when changing variants (free programming)
- Changeover time for product change: approx. 15 min
- Min. distance between fuses: 1.5 mm
- Max. movement path of the cross slide: X-axis 490 mm and Y-axis 320 mm
- Rotation of the workpiece holder from 0 to 360° possible
- The maximum dimension of a fuse box depends on the size, position and design of the insertion area



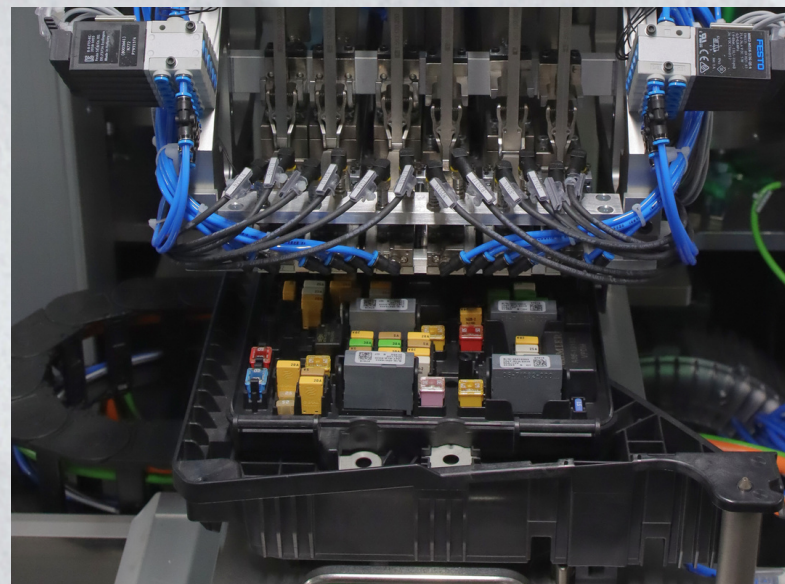
**INSERTION DOWN TO BATCH SIZE 1**



**QUICK CHANGEOVER**



**INTEGRATED CAMERA SYSTEM**



## Complete production line

### PRE-ASSEMBLY OF THE BOXES:

Pre-assembly can be done semi-automated or fully automated and includes the following steps:

- Pressing of steel bushings
- Pressing in bolts and bushings
- Assembling and hot stamping of housings

### FULLY AUTOMATED PROCESSES:

- Insertion of fuses
- Insertion of components (relais, screw studs)
- Tactile, optical and electrical inspection (100% inline)
- Laser printing of the fuse sequence on the cover of the box
- Label printing and application
- Label inspection



**FLEXIBLE  
DEGREE OF AUTOMATION**



**MODULAR UND  
CUSTOMIZED TO YOUR NEEDS**



**OPTICAL AND ELECTRICAL  
INSPECTION (100 % INLINE)**



**You have  
the challenge**

**We have  
the solution**

## ÜBER EBERHARD

60

With 60 years of experience, Eberhard is one of the world's leading manufacturers of high-quality and high-precision automation and assembly systems.



Our automation solutions are used in various industries: automotive and transportation, datacom and telecommunications, consumer electronics, industrial automation, renewable energies.

## WHY EBERHARD ?

Customers all over the world rely on the modularity, scalability and configurability of Eberhard machines. With 4 Eberhard subsidiaries and experienced service partners worldwide, we ensure fast response times and proximity to our customers.



### PCB PIN INSERTION

Eberhard offers standardized and customized solutions for inserting pins into PCBs. Placement speed up to 350 pins / min. PCB size up to max. 320 x 320 mm (12 x 12").



### CONNECTOR MANUFACTURING

The modular automation solutions for the production of connectors can be individually configured to meet customer and product requirements. The processes range from pin insertion and assembly up to quality control and packaging.



### SPECIAL ASSEMBLY

Eberhard assembly systems support all common process steps for assembling parts and components into complex assemblies: Joining, press-fitting, punching, screwing, testing, marking, cleaning, labeling, gluing, greasing...

## 40 Steps Checklist

### Your cooperation with us

During our collaboration, we work with you through 7 project phases. Starting with the inquiry through to the exclusive Eberhard Lifetime Excellence Service. The project includes 40 steps that must be completed to ensure the success of the project. **The following checklist illustrates all project phases and work steps to show you the collaboration with Eberhard.**

Project phases	Customer	Eberhard	Your contact person
<b>1</b> Request	<input type="checkbox"/> Lieferung eines Musters/ Zeichnung des Produkts <input type="checkbox"/> Beschreibung des Problems <input type="checkbox"/> Lieferung des Lastenhefts	<input type="checkbox"/> Understanding of the customer's problem <input type="checkbox"/> Understanding expectations regarding budget & schedule <input type="checkbox"/> Offer for sample production	<ul style="list-style-type: none"> <li>Sales</li> <li>Backoffice &amp; Customer Support</li> </ul>
<b>2</b> Conception	<input type="checkbox"/> Concept approval	<input type="checkbox"/> Feasibility study <input type="checkbox"/> Concept development <input type="checkbox"/> Risk analysis <input type="checkbox"/> Budgeting	<ul style="list-style-type: none"> <li>Sales</li> <li>Project Engineering</li> </ul>
<b>3</b> Offer	<input type="checkbox"/> Understanding & evaluation of the offer	Commercial part <input type="checkbox"/> Price <input type="checkbox"/> Delivery time <input type="checkbox"/> Payment terms           Technical part: <input type="checkbox"/> Specification <input type="checkbox"/> Acceptance criteria	<ul style="list-style-type: none"> <li>Sales</li> <li>Project Engineering</li> <li>Backoffice &amp; Customer Support</li> </ul>
<b>4</b> Negotiation & Order	<input type="checkbox"/> Purchase Order (PO) <b>or</b> <input type="checkbox"/> Purchasing Contract	<input type="checkbox"/> Order confirmation / purchase contract <input type="checkbox"/> Kick Off Meeting	<ul style="list-style-type: none"> <li>Sales</li> <li>Project Engineering</li> <li>Backoffice &amp; Customer Support</li> </ul>
<b>5</b> Realization	<input type="checkbox"/> Design Approval <input type="checkbox"/> Provision of material	<input type="checkbox"/> Project schedule <input type="checkbox"/> Milestones, regular exchange <input type="checkbox"/> Sample production <input type="checkbox"/> FAT	<ul style="list-style-type: none"> <li>Technical departments</li> <li>Project management</li> </ul>
<b>6</b> Delivery	<input type="checkbox"/> Providing infrastructure at site <input type="checkbox"/> Transportation if necessary	<input type="checkbox"/> Transportation <input type="checkbox"/> Commissioning <input type="checkbox"/> SAT           Training <input type="checkbox"/> Ramp-up support	<ul style="list-style-type: none"> <li>Project management</li> <li>Backoffice &amp; Customer Support</li> </ul>
<b>7</b> Eberhard Lifetime Excellence	<input type="checkbox"/> Maintenance contract	<input type="checkbox"/> Service <input type="checkbox"/> Maintenance <input type="checkbox"/> Spare parts           Optimizations <input type="checkbox"/> Retrofit <input type="checkbox"/> Digital Cockpit	<ul style="list-style-type: none"> <li>Service</li> <li>Retrofit</li> <li>Backoffice &amp; Customer Support</li> </ul>

Would you like to find out more about your individual options for automating the production of fuse boxes? We would be happy to advise you personally.

**Contact us now**

