VOSS Group

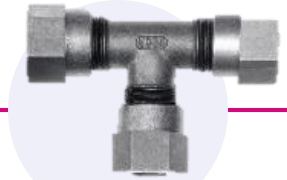
We are the system partner for fluid management

VOSS develops and produces innovative line and connection systems for mobile and stationary applications.

Milestones of the history

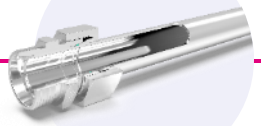
From plumbing fittings to ready-to-install modules for vehicle and machine construction.

1931
Foundation of the Armaturenfabrik Hermann Voss



1954
Tube couplings for mechanical engineering

1975
Quick connect systems for air brakes



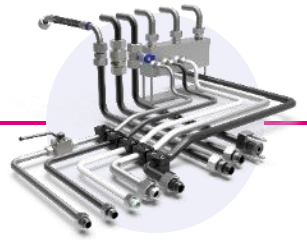
2003
Introduction tube forming system

2004
Modules for SCR systems

2007
Market launch of the zinc-nickel surface VOSScoat

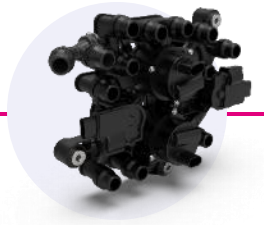
2013
Polymer Technology Center

2014
Line systems for battery temperature control

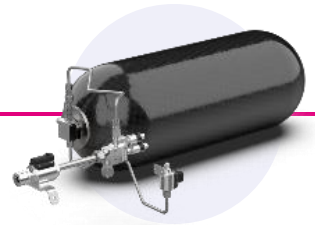


2016
Ready-to-install hydraulic lines

2018
Valves for thermal management



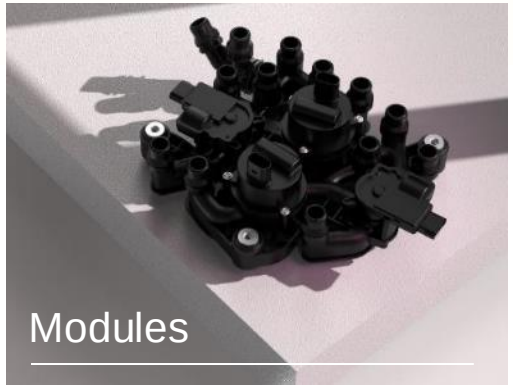
2020
Modules with valve control and mechatronics

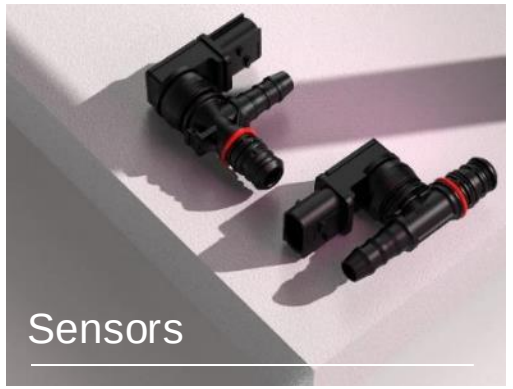


2022
Valve components for H_2- and fluid gas technology

Components for system solutions

From custom-made individual components to ready-to-install lines and assemblies: Our products impress with their performance, long service life, and ease of installation.





Industry solutions

With over nine decades of experience, we offer customized systems for a wide range of requirements in mobile and stationary applications.

Trucks and buses

Passenger cars and light vehicles

Off-Highway and mechanical engineering


CLICKID
BY VOSS

Technical overview

„Glove“: Fixes sensor units and cables

Sensor unit clipped to index finger: recording movements

Sensor unit clipped to thumb: recording movements and audio

„Heart“ of the device: wrist unit records movements, processes data and hosts the AI model

Sensors **recognize the assembly attempt** and use AI to **classify the connection** as successful or not

ClickID benefits all stakeholders of the assembly process

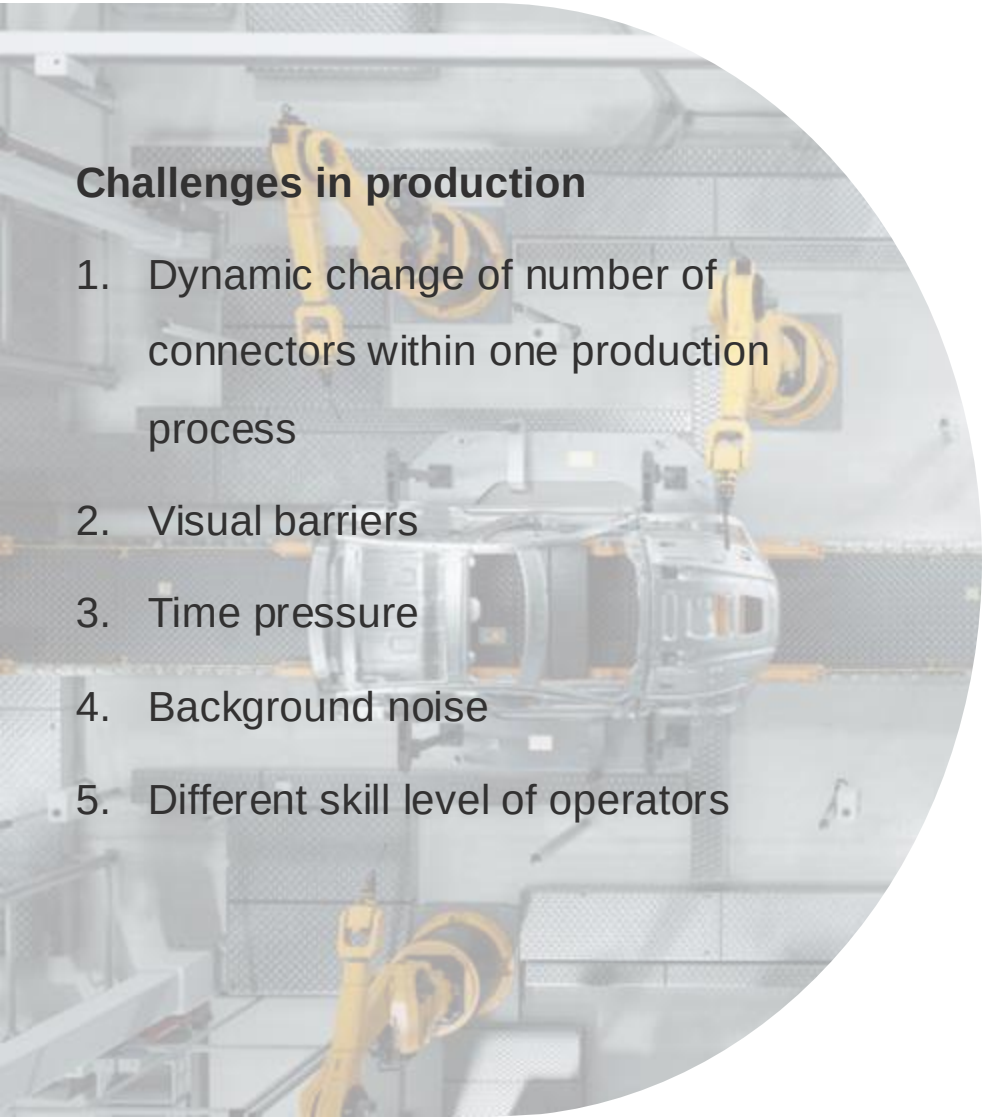
Quotes taken from customer projects

“I can prove that I correctly executed the assembly”
Line worker

“We can lower costs for rework”
Corporation

“I gain control and insight over my assembly process”
Responsible officer

ClickID – a quality assistant for manual assembly processes

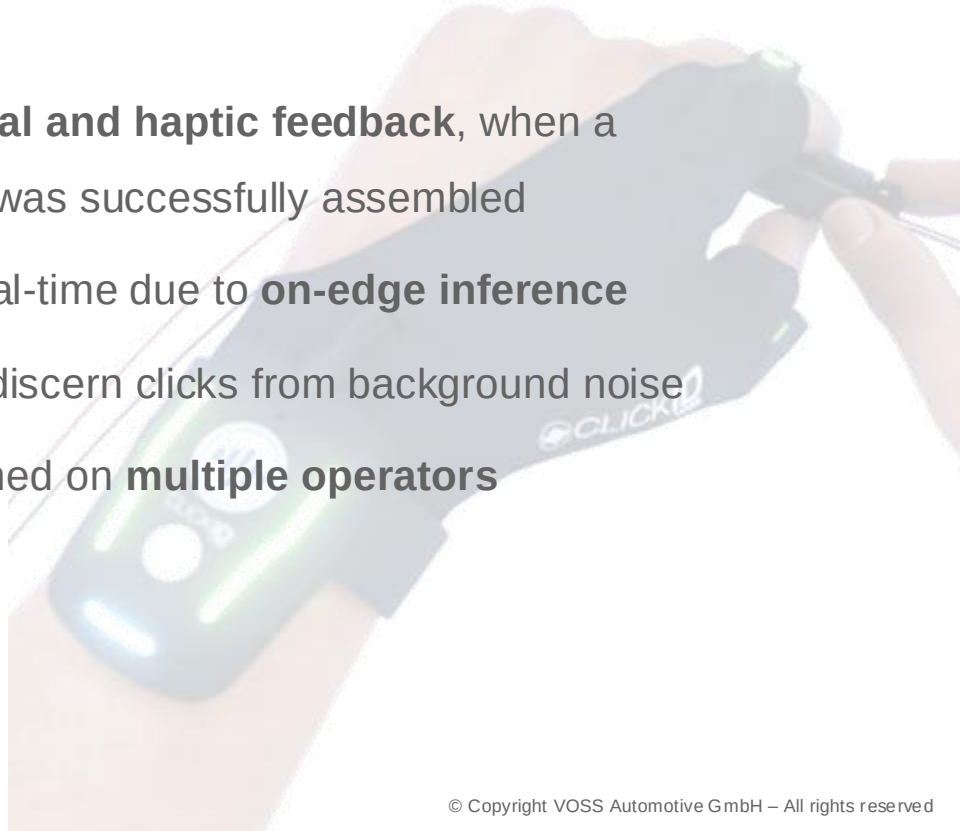


Challenges in production

1. Dynamic change of number of connectors within one production process
2. Visual barriers
3. Time pressure
4. Background noise
5. Different skill level of operators

How ClickID addresses these pain points

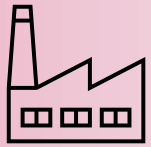
1. Confirms the **correct number** of connected plugs
2. Gives **optical and haptic feedback**, when a connection was successfully assembled
3. Works in real-time due to **on-edge inference**
4. Uses **AI** to discern clicks from background noise
5. Can be trained on **multiple operators**



ClickID benefits all stakeholders of the assembly process

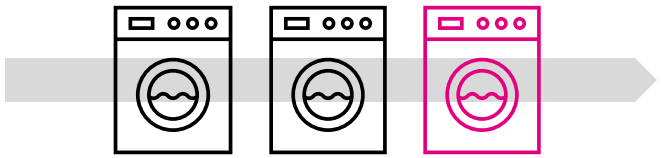
Example benefit analysis

…by how much?

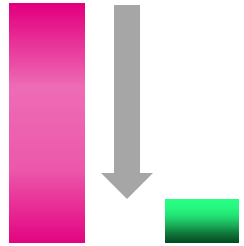


"We can lower costs for rework"
Corporation

We tailor our AI model to your needs, aiming for **99% accuracy**, meaning…

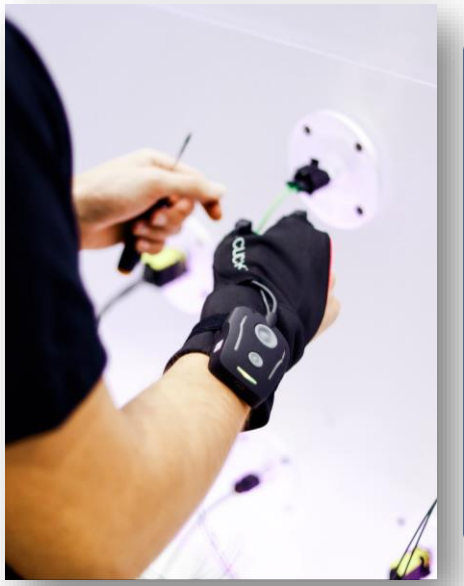


...if you have an assembly process
- with 10 connectors, 100 units a day
- with a 1% reject rate
- costing you 100 € per reject



…you can reduce rejects by over **80%** and save **~16.000 €** per month in reject / repair cost alone

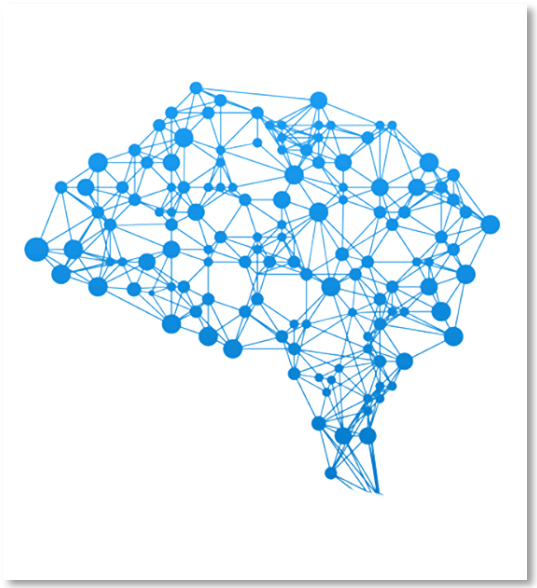
ClickID at one glance



Operators wear device while assembly tasks Production system and device synch the product ID and, if variable, the expected number of clicks per product

Device recognizes, if the assembly is OK or NOK and gives feedback via light and vibration.
Verification of successful connection is done by preprocessing movement and audio and feed that data to an AI model

The verification process is documented by sending the data to a local PC, a local cloud or the VOSS cloud



The architecture ensures that the data can be used to improve the AI further, to analyze the use case performance and facilitates the integration of ClickID with the production IT

We install ClickID within 5 steps at your production

Acquisition	Specification	Training	Installation	Support
				
Get in touch, Use Case predefinition	Specification of technical requirements, initial data recording, POC	Long term data recording and training of the AI	Configuration/ Customizing of the software and AI, implementing the devices into IT	Support in case of technical challenges, AI updates, Q&A

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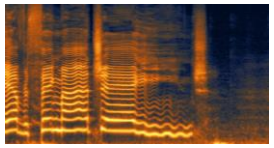
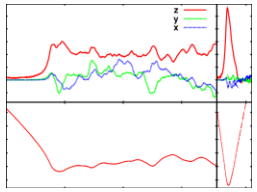
From sensor data to the green light – feature extraction

Data recording

With microphones and sensors



Audio signal



Multidimensional acceleration signals

Feature extraction

e.g., maximum acceleration, intensity of the audio signal at 6000 Hz, characteristic frequencies etc...

Motion Feature 1	Motion Feature 2	Audio-Feature 1	Label
70,57928	321014	305395,97	0
23,876867	12592,866	10797,12	0
187,68767	5227336	5130421	0
210,54323	8025900,5	8080293	0
144,93954	1960970,8	1949484,1	0
52,71595	184129,34	176633,42	0
33,405098	22023,3	21814,15	0
64,561295	195894,97	185608,97	0
31,921719	21135,121	18097,668	0
32,405083	305101,88	240672,08	0
29,468683	156893,55	98124,4	1
26,162106	13105,126	12492,677	0
73,72981	844169,8	760499,94	0
85,36894	853389,4	853744,3	0
42,136105	202784,97	175893,28	1
34,13236	34158,15	30369,527	0
15,812829	9233,708	7317,903	0
37,312492	f68262,63	62502,566	1

From sensor data to the green light – a look at the data

Data points described by these extracted features...

Motion Feature 1	Motion Feature 2	Audio-Feature 1	Label
70,57928	321014	305395,97	0
23,876867	12592,866	10797,12	0
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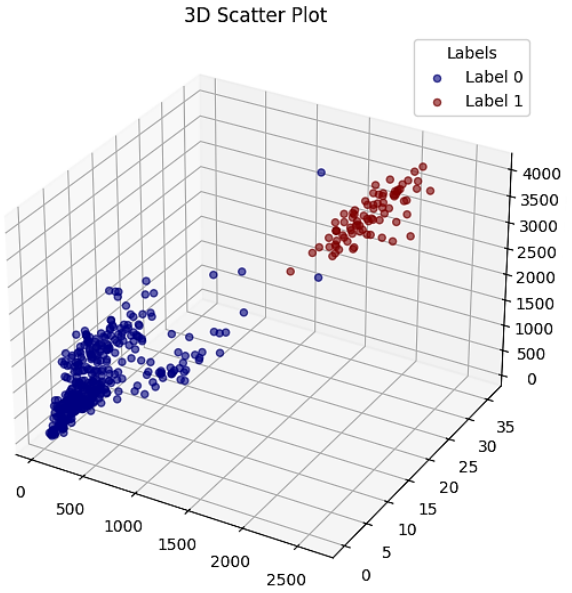
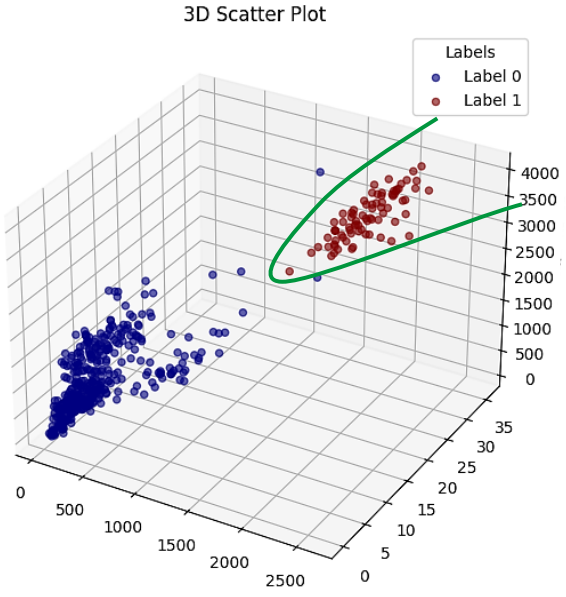
15,812829	9233,708	7317,903	0
37,312492	f68262,63	62502,566	1

...can be displayed graphically (for better understanding)

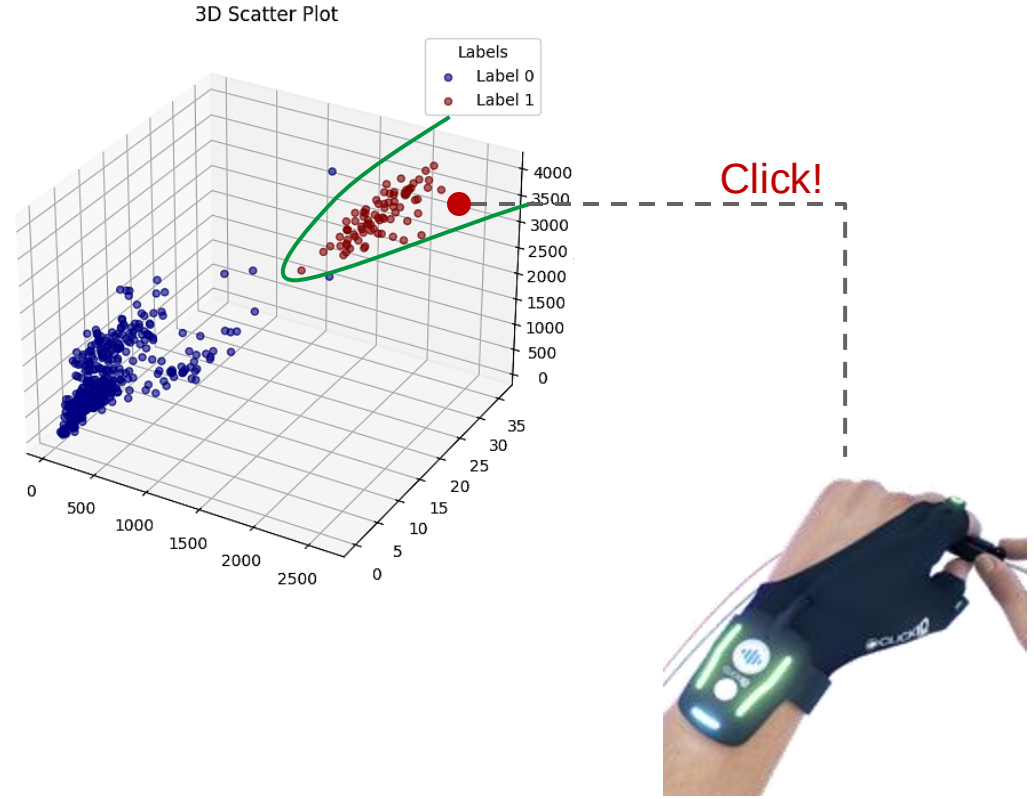


From sensor data to the green light – model training

The AI model in the glove learns the difference (the boundary) between clicks and non-clicks



...so that when a new sound happens, it can be decided whether it is a click!



Thank you!

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