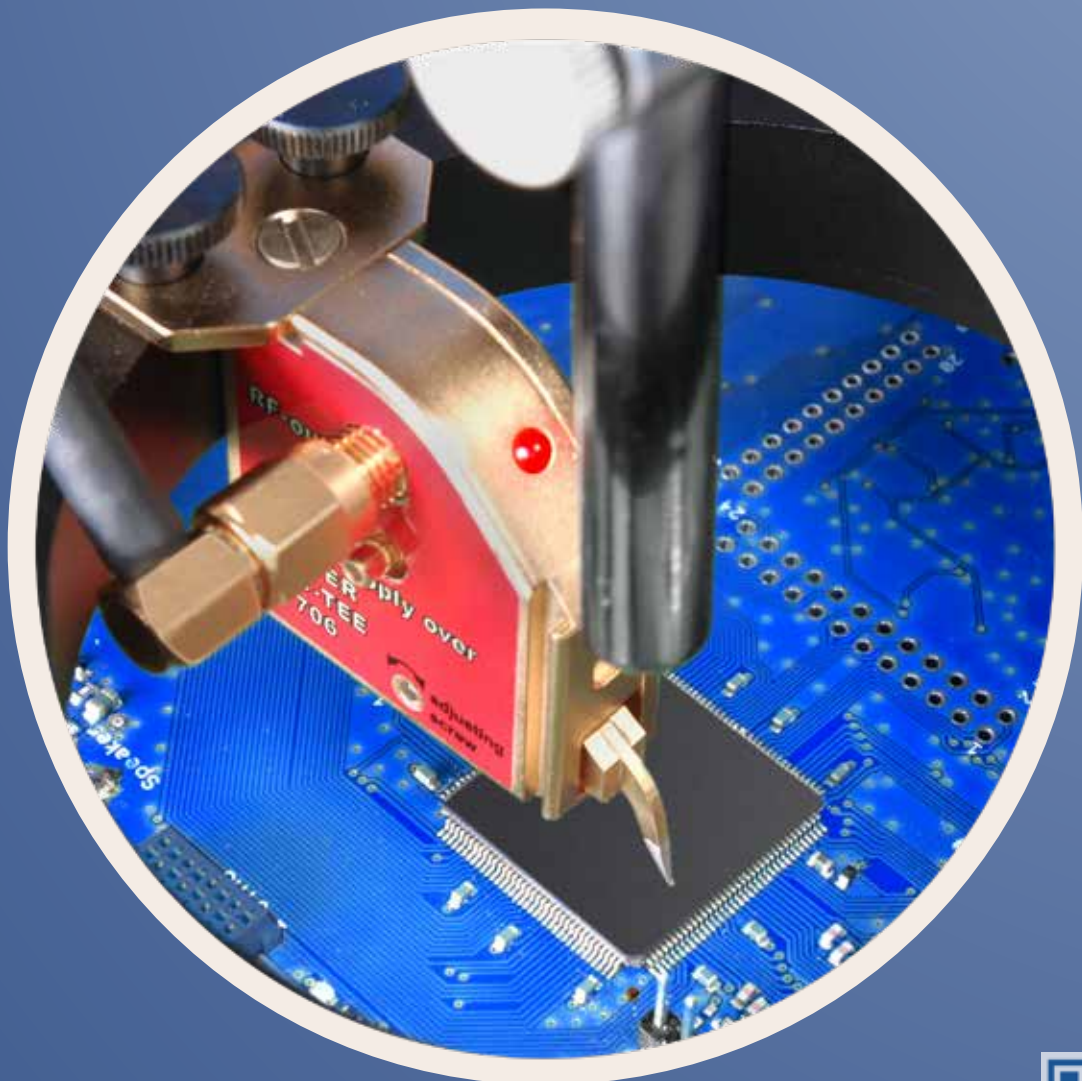




# IC Security Equipment



# Company Profile

## Company Profile:

Langer EMV-Technik GmbH stands for high-quality products and reliable support in the development of electronic products – with a clear focus on design-stage EMC optimization.

Our goal is to enable customers to create interference-free, efficient, and market-ready products. This is built on three pillars:

- ✂ EMC measurement and test equipment for PCB, IC-EMC, and IC Security
- EMC experimental seminars – knowledge transfer through hands-on training
- 🔧 EMC consulting – practical, solution-oriented, tailored

Early EMC evaluation and targeted optimization make development projects more efficient and cost-effective. In this way, we create measurable added value – from the idea to the finished product.







## ICR Probe series

### Near-Field Microprobes for Radiated Emission Surface Scan and Side-Channel Analysis

- Spatial resolution down to 60  $\mu\text{m}$
- 200 kHz - 6 GHz frequency range
- Vertically and horizontally aligned tips
- Integrated preamplifier

With an ICR microprobe, high-frequency magnetic or electric fields in the range between 200 kHz and 6 GHz can be measured above an integrated circuit or a small module with a very high spatial measuring resolution - down to 60  $\mu\text{m}$ . Mounted onto an IC scanner the near-field microprobes can be moved along all three axes over the chip surface and also rotated around the z-axis.

## Near-Field Microprobe types



**ICR E**  
horizontal  
7 MHz - 3 GHz



**ICR HH**  
horizontal  
200 kHz - 6 GHz



**ICR HV**  
vertical  
200 kHz - 6 GHz



**ICS 105**  
4-Axis Positioning System



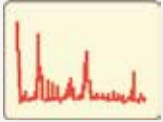
ICR HV 100-6  
microprobe

Test IC





# Side Channel Analysis

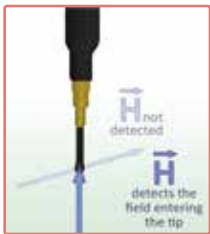


## Near Field Probes

### Near-Field Probes for Radiated Emission Surface Scan and Side-Channel Analysis

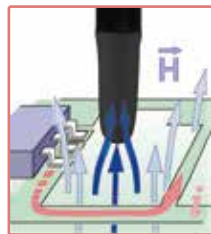
- Spatial resolution down to 1 mm
- 100 kHz - 40 GHz frequency range
- Wide variety of probe types available
- Optional external preamplifier available

## Selection of Near-Field Probes



**RF-B 0.3-3**

- 30 MHz - 3 GHz
- headsize  $\varnothing \approx 2$  mm
- horizontal



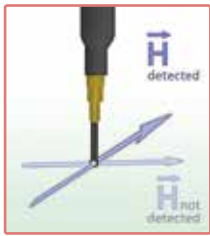
**RF-B 3-2**

- 30 MHz - 3 GHz
- headsize  $\varnothing \approx 4$  mm
- horizontal



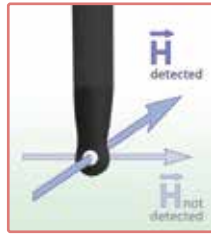
**XF-B 3-1**

- 30 MHz - 6 GHz
- headsize  $\varnothing \approx 4$  mm
- horizontal



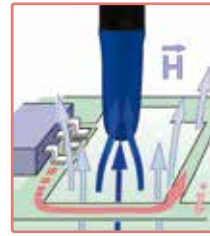
**RF-R 0.3-3**

- 30 MHz - 3 GHz
- headsize  $\varnothing \approx 2$  mm
- vertical



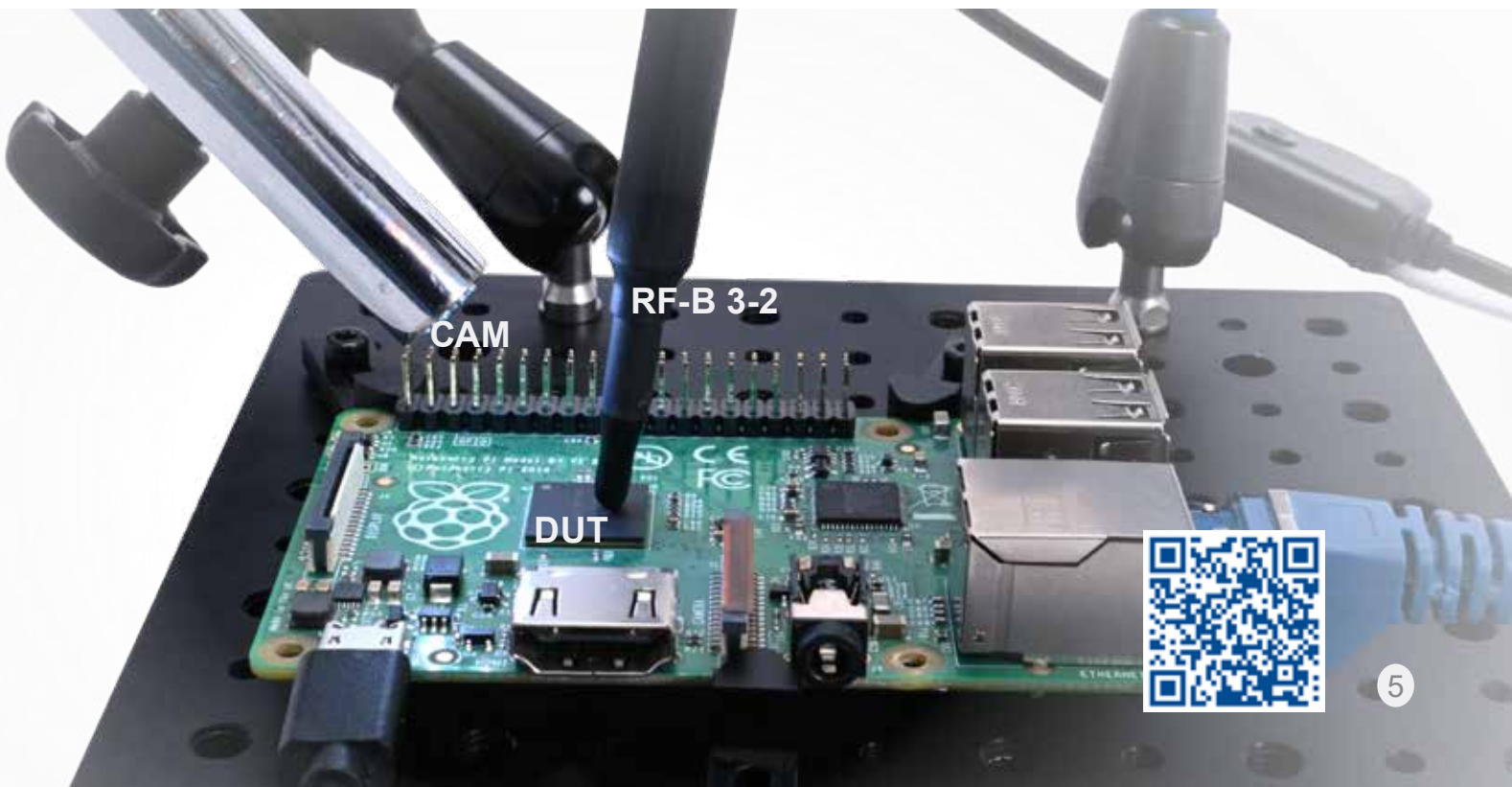
**RF-R 3-2**

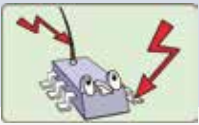
- 30 MHz - 3 GHz
- headsize  $\varnothing \approx 3$  mm
- vertical



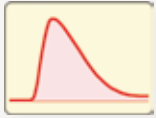
**LF-B 3**

- 100 kHz - 50 MHz
- headsize  $\varnothing \approx 4$  mm
- horizontal



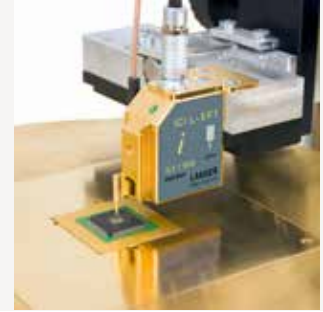


# EM Fault Injection



## ICI Probe series IC EM Pulse Injection Langer Pulse

- Pulse injection into IC  
→ for EMFI & pulse immunity analysis
- Pulse rise time: 2 ns
- Spatial resolution: 500  $\mu\text{m}$
- voltage up to 500 V



## ICI Probe types



**ICI HH500-15**  
Pulse Magnetic  
Field Source



**ICI E450**  
Pulse Electric  
Field Source

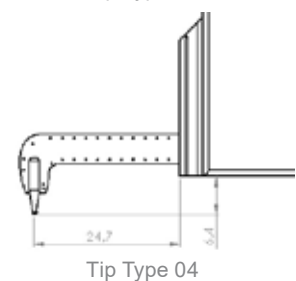
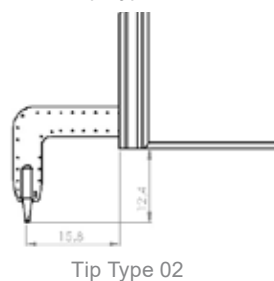
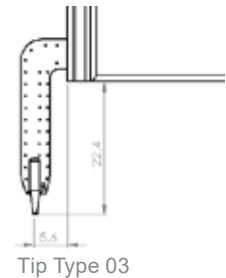
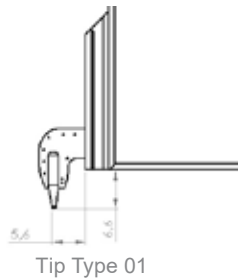
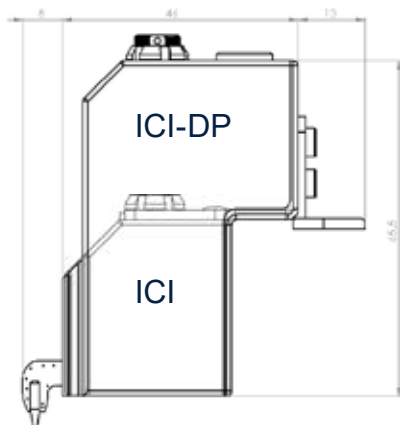


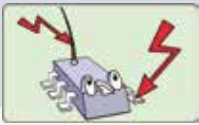
**ICI I900**  
Pulse Current  
Source (FBBI)



The ICI and ICI-DP probes enable the injection of fast transient magnetic or electric fields as well as current pulses into integrated circuits. They are intended to use for high-precision and high-resolution electromagnetic fault injection (EMFI) or body biasing injection (BBI). With the ICI-DP probes, single disturbance pulses as well as a double pulse sequence with a pulse following time down to 25 ns can be injected into ICs with precise timing and location.

## Tip Types





## ICI-DP Probe series IC EM Double Pulse Injection Langer Pulse

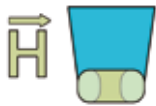
- Double pulse injection into IC
- Pulse rise time: 2 ns
- Spatial resolution: 150 - 1000  $\mu\text{m}$  due to different probe tips
- voltage up to 1000 V



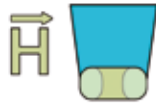
### ICI-DP Probe types



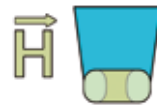
**ICI-DP HH150-15**  
Double Pulse Magnetic  
Field Source



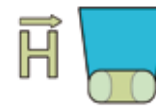
**ICI-DP HH250-15**  
Double Pulse Magnetic  
Field Source



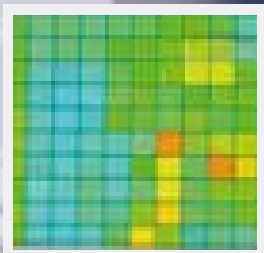
**ICI-DP HH500-15**  
Double Pulse Magnetic  
Field Source



**ICI-DP HH1000-15**  
Double Pulse Magnetic  
Field Source



### Sensitivity Heat Map



Test IC

ICI -DP  
HH 500-15  
probe



Langer EMV-Technik is in the forefront of research, development, and production in the field of EMC. Through EMC experimental seminars and EMC workshops we offer our comprehensive knowledge to our customers.

Our interference emission and interference immunity EMC measurement technology as well as the IC test system are used mainly in the development stage and are in worldwide demand.

Developers and designers gain new perspectives and

more efficient working strategies for module- and IC developments with the EMC know how and measurement technology of Langer EMV-Technik GmbH.

The individual pre-compliance consulting services provided by Langer EMV-Technik GmbH help developers and designers quickly find solutions to complex EMC problems in IC, device, and module development.

We make both our comprehensive EMC expertise and research results available to our customers via practical experimental EMC seminars and in-house events.



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