

## ICI-DP sets

Double Pulse Magnetic Field Source sets

### available as:

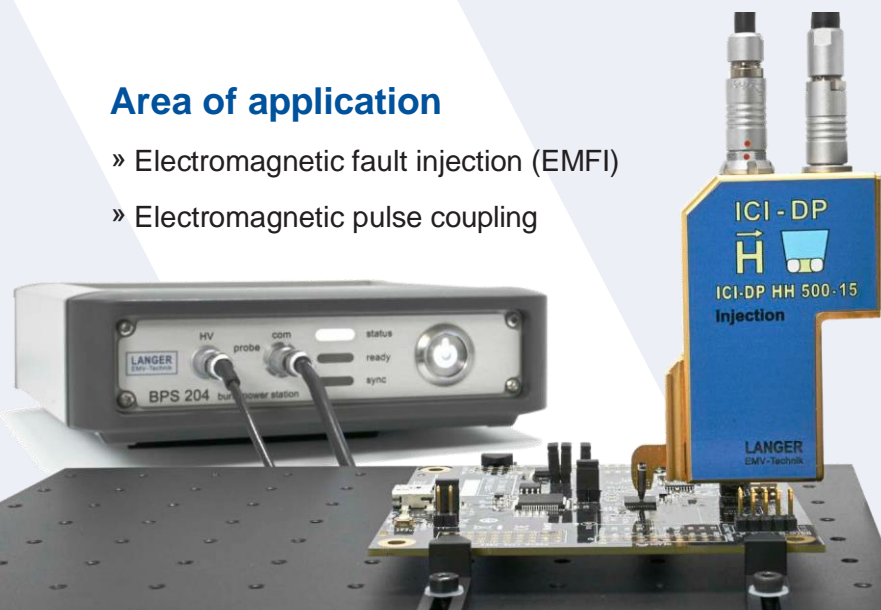
- ICI-DP HH250-15 set, size of probetip 150  $\mu\text{m}$
- ICI-DP HH250-15 set, size of probetip 250  $\mu\text{m}$
- ICI-DP HH500-15 Set, size of probetip 500  $\mu\text{m}$
- ICI-DP HH1000-15 set, size of probetip 1000  $\mu\text{m}$

### Unique Selling Point:

- high voltage up to 1000 V
- magnetic field probe tips down to 250  $\mu\text{m}$  coil diameter (250  $\mu\text{m}$ , 500  $\mu\text{m}$ , 1000  $\mu\text{m}$ )
- all probe tips spring loaded
- double pulse sequence with variable delay down to 25 ns
- high similarity of both pulses
- all parameters controllable via software/ API including pulse polarity
- pulse rise time about 2 ns
- low trigger to pulse delay (about 35 ns)

### Area of application

- » Electromagnetic fault injection (EMFI)
- » Electromagnetic pulse coupling



## ICI-DP sets

More variety of ICI-DP probe tips for electromagnetic fault injection (EMFI)

Langer EMV-Technik GmbH has been offering the ICI series for fault injection into cryptographic circuits and protocols for several years. This has now been extended with the ICI-DP series. In addition to a stronger disturbance effect, the new system now also offers the possibility to generate two disturbance pulses in quick succession.

In addition to the improved disturbance parameters, Langer EMV-Technik now also offers different probe tips. Tip diameters of 1000  $\mu\text{m}$ , 500  $\mu\text{m}$ , 250  $\mu\text{m}$ , and even 150  $\mu\text{m}$  are available.

While the two larger probe tips (500  $\mu\text{m}$  & 1000  $\mu\text{m}$ ) are mainly designed for attacks on encapsulated circuits, the two small probe tips (250  $\mu\text{m}$  & 150  $\mu\text{m}$ ) allow for very precise localized fault injection into decapped circuits. The following figure shows an example of a chip with an edge length of 4 mm and a possible positioning of the different ICI-DP probe tips. The significantly increased spatial resolution of the small probe tips is clearly visible.

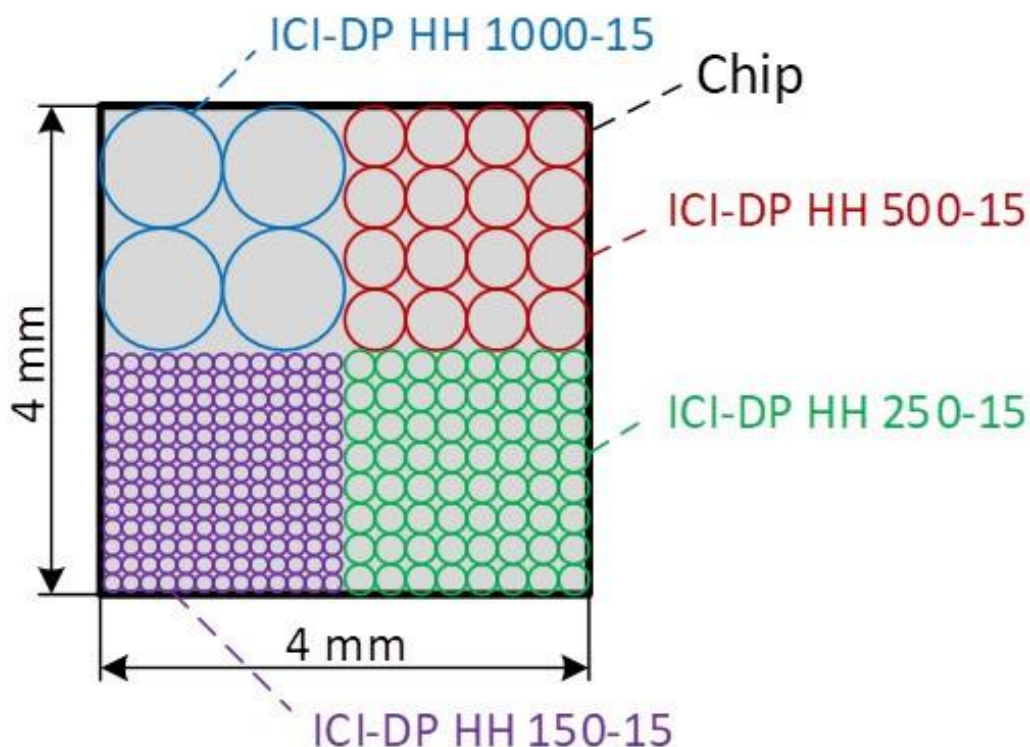
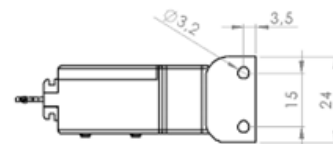
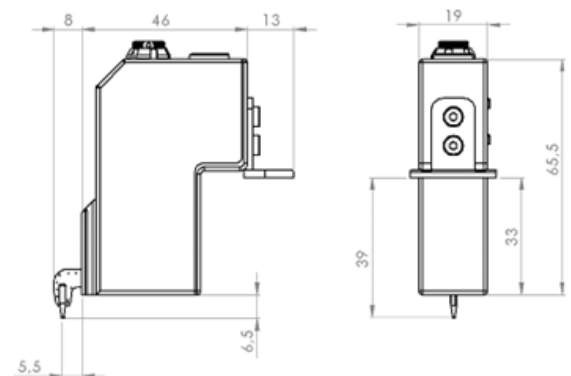


Figure 1: Comparison of the different ICI-DP probe tips



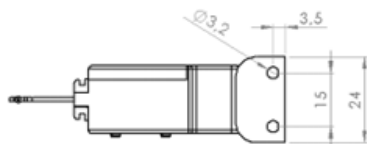
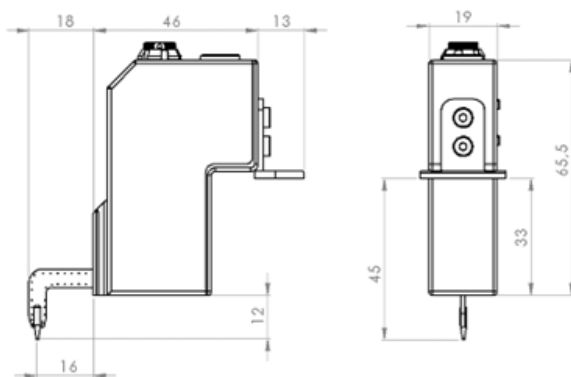
The product range of Langer EMV-Technik GmbH is completed by different tip types, i.e. the dimensions of the probe tip in relation to the housing. While the standard tip type 01 is close to the housing, tip type 02 offers more space both laterally and downwards. Tip type 03 is designed for users who require extra space at the bottom. Other customized tip types are available upon request. All tip types can also be ordered for the ICI series.



Tip Type 01

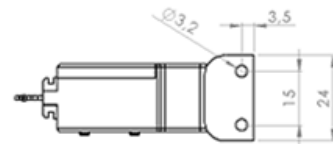
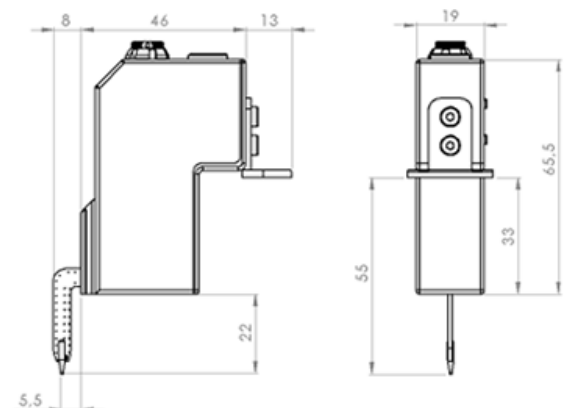
all dimensions in [mm]

Figure 2: Tip Type 01



Tip Type 02

all dimensions in [mm]



Tip Type 03

all dimensions in [mm]



Figure 3: Tip Type 02

Figure 4: Tip Type 3



The set ICI-DP HHxxx-15 set is designed to inject electromagnetic pulses with high temporal and spatial resolution into safety critical circuits (electromagnetic fault injection - EMFI). This set can be used to generate single pulses as well as a double pulse sequence with a pulse following time of minimum 25 ns. The set includes the high voltage source BPS 204 as well as the probe ICI-DP HHxxx-15.

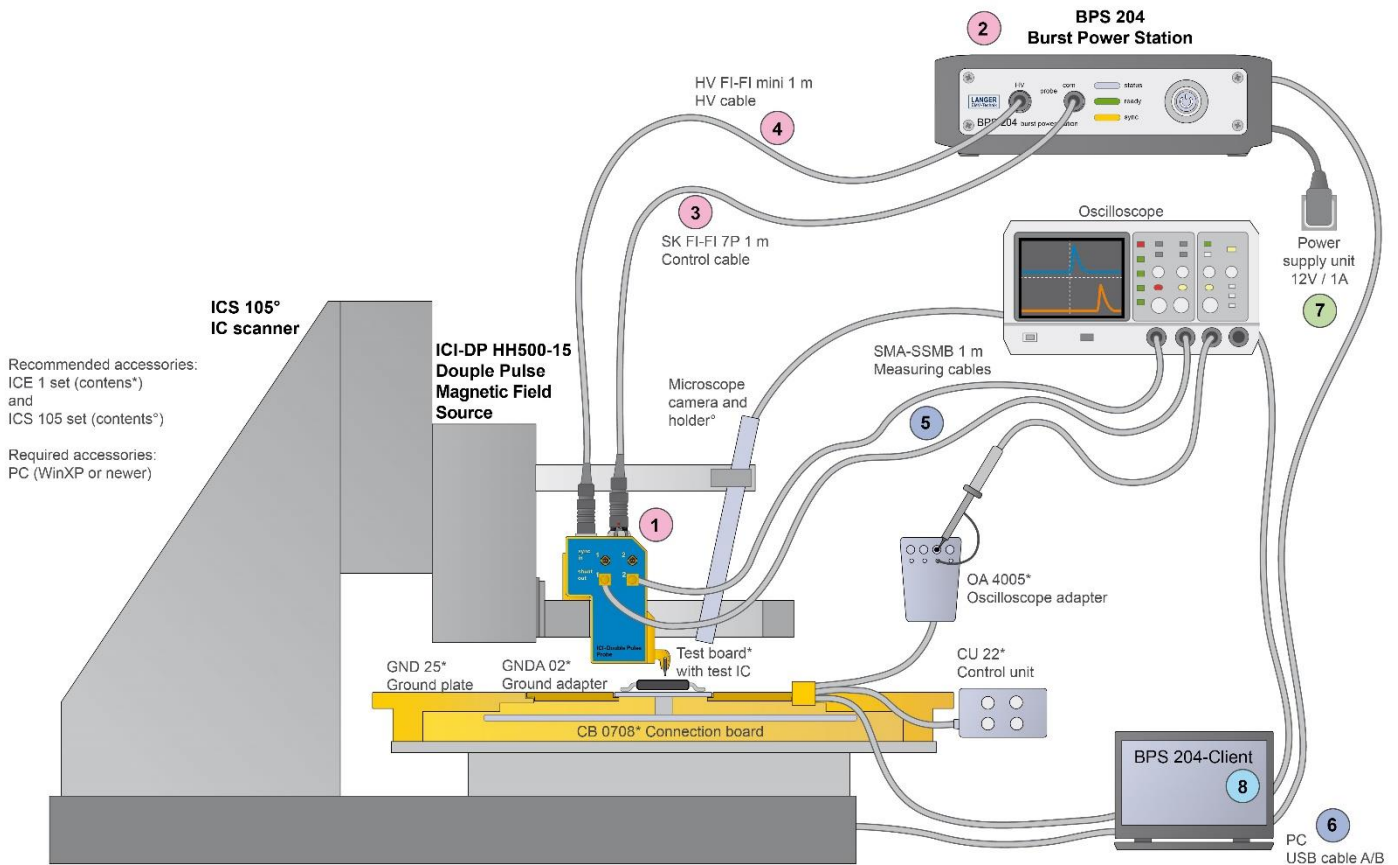


Figure 5: Schematic set-up with mover





The ICS 105 IC scanner allows for measurements of high-frequency near fields above ICs. Depending on the used ICR near-field microprobe magnetic or electric fields can be measured with a measuring resolution of 50 to 100  $\mu\text{m}$ . The probe can also be automatically rotated to determine the magnetic field's direction.

Optionally the ICS 105 scanner can be used for measurements above small assemblies in combination with UH-DUT universal holder and SH 01 probe holder.

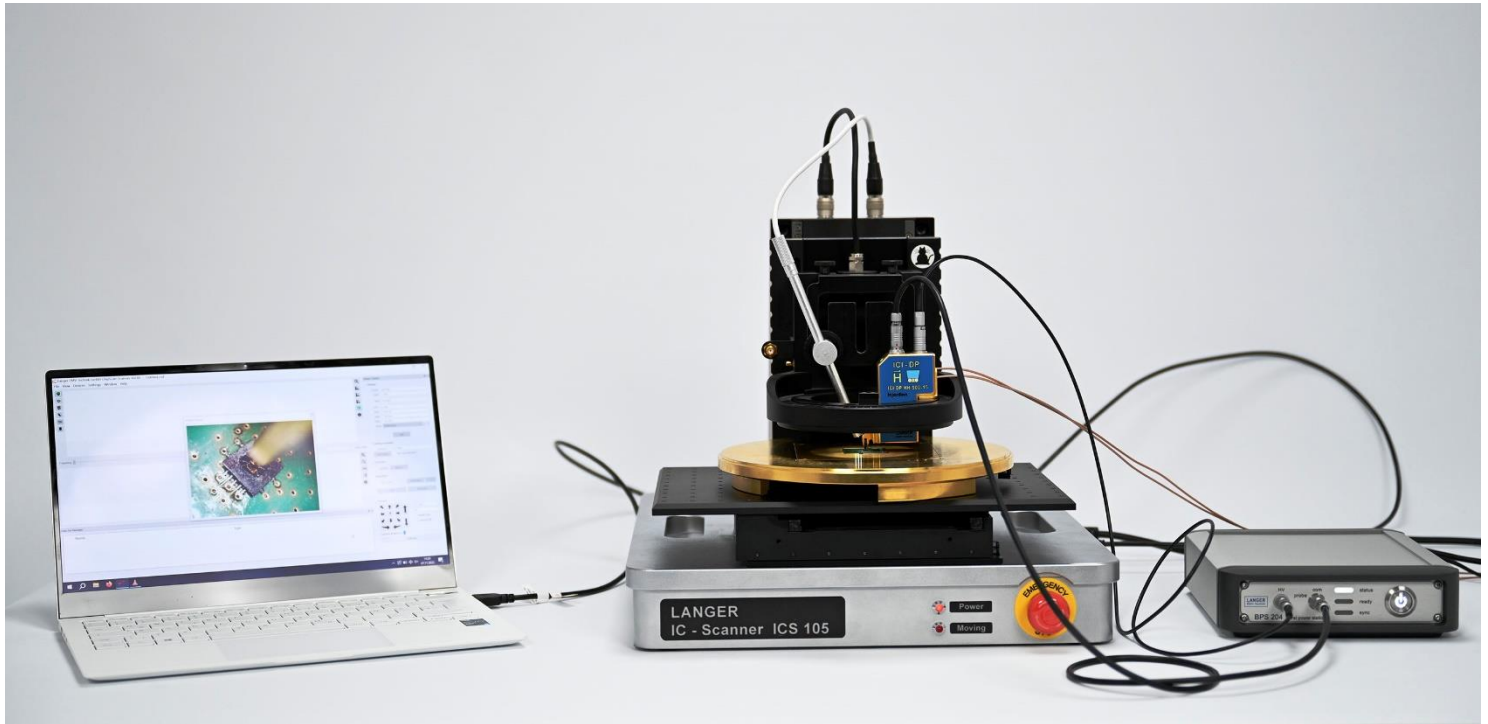


Figure 6: Fault injection measuring station with Langer IC scanner

