

# TargetSystem



**Automatic target preparation to both visible and hidden targets - without losing samples**

**Modular, upgradable system**

Target



*TargetMaster micropolisher with TargetDoser dosing system*

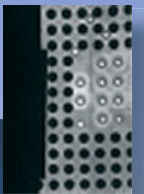
- Automatic preparation, cleaning and measuring
- Cross-sectioning and parallel polishing of mounted/unmounted samples
- Real-time alignment of visible (external) and hidden (internal) targets
- On-board laser measuring system\* provides  $\pm 5 \mu\text{m}$  system accuracy
- **IPS, Intelligent Preparation System**  
IPS database with removal rates for grinding and polishing surfaces  
Automatic re-calculation of removal rate and time
- Very simple operation

**Your benefits:**

- No samples lost
- Drastically reduced preparation time (< 30 minutes)
- No dependency on operator skills
- Full reproducibility

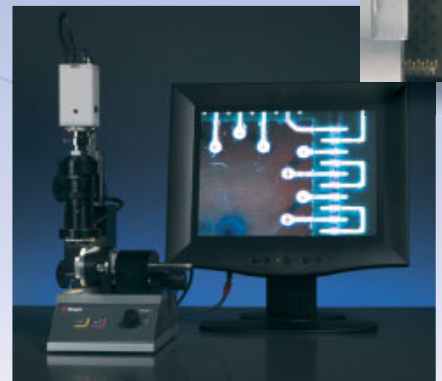
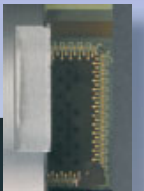
*\*) International patent application pending*

*BGA as seen using TargetX with x-ray*



*TargetX option for hidden targets e.g. BGA solder balls on mounted PCB*

*Microvias as seen using TargetZ*



*TargetZ option for visible targets e.g. microvias*

# System components

With a system accuracy of  $\pm 5 \mu\text{m}$ , TargetSystem is for target and other high accuracy preparation in R&D or failure analysis (FA) labs. Typical application areas are microelectronics, delayering and FA where fine cracks are to be inspected. The individual components of the system can be combined in several ways, according to requirements.

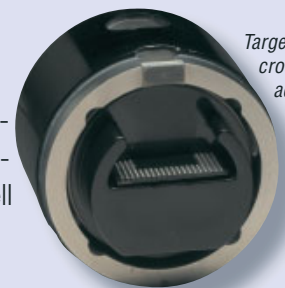


The heart of TargetSystem is the **TargetMaster**, a 200 mm micro-polisher with a closed polishing chamber to safeguard both preparation quality and operator. Removal at initial preparation step(s) is controlled by an electronic measuring system, for rapid approach to target. A second, in-line laser measuring system handles the demanding polishing steps. TargetMaster can be used either stand-alone or with one of the two set-up stations, TargetZ/-X.



**TargetDoser** is an automatic dosing station, providing preparation methods and process liquids to TargetMaster. TargetDoser comes with 7 pumps and 10 pre-programmed methods, and accommodates 200 user-defined methods.

**TargetGrip** is a tiltable specimen holder dedicated to TargetMaster. It accommodates mounted samples up to 40 mm diameter. Adapters are provided for larger specimens (TARIN), cross-sectioning (TARSC) and parallel polishing (TARPA), as well as a 40 mm to 25 mm adapter (TARAD), which serves as SEM mount, too.



TargetGrip with cross-section adapter (TA...)



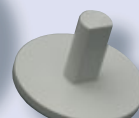
Parallel holder, (TARPA)



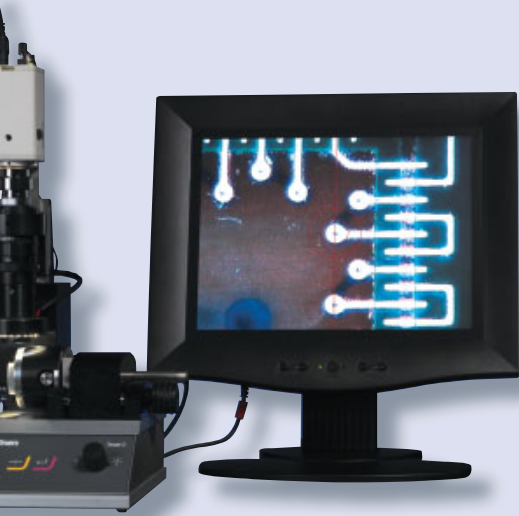
Adapter for  $\varnothing 40 - \varnothing 25$  mm, (TARAD)



Mount insert  $\varnothing 40$  mm, (TARIN)



# Preparation modes



**TargetZ** is used for aligning and measuring specimens with visible (external) targets. With a powerful vision system of up to 680x magnification and its 15" TFT monitor, TargetZ makes it a simple task to map and align even minute targets.



**TargetX** is for hidden (internal) targets, and comprises a set-up station and a console. The set-up station is placed in the users x-ray (not included) and is operated from the external console, permitting real-time alignment and measuring.

TargetMaster offers three preparation modes, which can be used separately or in combination.

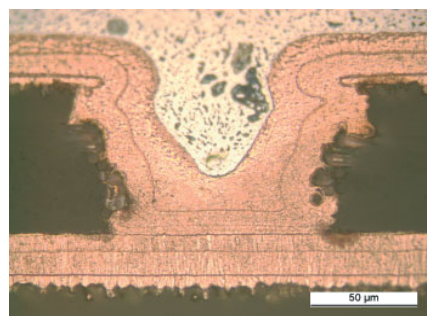


If e.g. consecutive layers of a specimen are inspected on a regular basis, **Removal mode** will take you to each of the layers with an accuracy of  $\pm 5$  microns – and automatically stop when it is there.

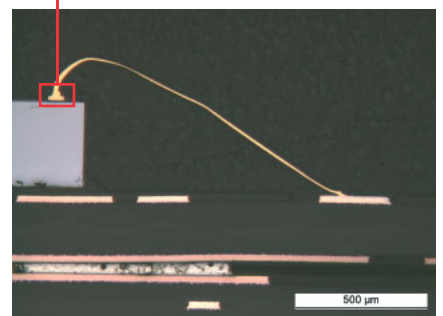
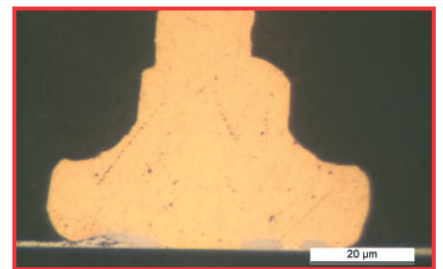
TargetSystem does away with manual target polishing, which is particularly wasteful when microscopic targets of e.g. microelectronic components are subjects of a preparation. Here TargetMaster and its **Target mode** is used in combination with a set-up station, TargetX or TargetZ. The type of set-up station is selected depending on whether hidden (internal) or visible (external) targets on a specimen are to be inspected.

Using TargetX with an x-ray device, the hidden (internal) target of your sample can be aligned in real-time and the target value (distance to target) measured. If, instead, visible (external) targets are the typical subject of inspection, TargetZ is the choice. With its powerful vision system even minute targets are precisely aligned and measured.

**Time mode** is for timed preparation, used e.g. at oxide polishing, and for manually controlled removal.



Microvia under BGA solder ball



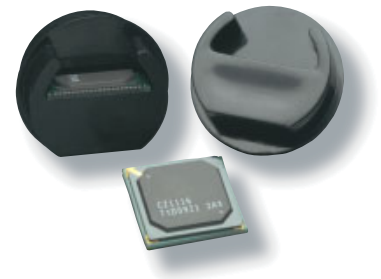
Overview and detail with 20 µm dia. Au-wirebond

# Two measuring systems

TargetMaster removal is controlled by two separate measuring systems. Grinding steps and removal until 175  $\mu\text{m}$  from target (re diagram) are controlled by an electronic measuring system, which continuously measures distance to target. In this fashion, the major part of the target distance is covered as quickly as possible.

Polishing steps and removal below 175  $\mu\text{m}$  (re diagram) are handled by a laser measuring system. The system uses a unique, relative measuring technique enabling a remarkable  $\pm 5 \mu\text{m}$  system accuracy.

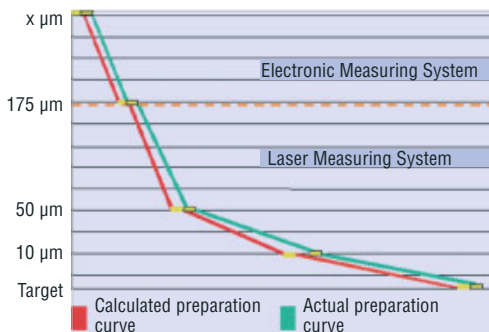
# IPS, Intelligent Preparation System



TargetMaster features a system, IPS, which automatically adapts removal time and rate according to actual properties of specimen and grinding/polishing surface. In effect, fewer measurements are necessary, meaning shorter preparation times.

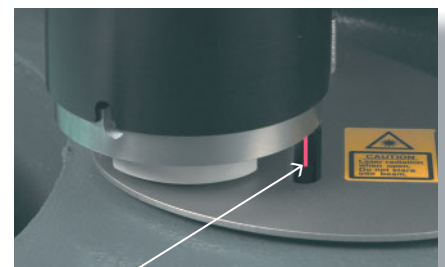
Before preparation starts, the sample height is measured and IPS calculates removal time for each of the steps (re below graph, in red). The removal times are based on the selected preparation method and base values. The base values are theoretical, conservative removal values for grinding and polishing surfaces, which are stored in the IPS database of TargetMaster.

Using the base values, preparation starts. After gaining experience with the properties of sample and surface, preparation stops and the actual amount of removed material is determined. On this basis, the actual removal rate for the first part of the step is calculated. The new, actual removal rate is then used for the remaining part of the step and so on (re graph, in green).



## IPS, How it Works

- Accuracy is secured by using relative laser measuring
- Removal rate at first part of any step originates from built-in database (base values)
- Process is interrupted, laser measurement made, and removal rate + time re-calculated
- Remaining step at new removal rate



On-board laser measuring system provides  $\pm 5 \mu\text{m}$  system accuracy

**TECHNICAL DATA****TargetSystem**

System accuracy ± 5 µm at 20°C / 68°F ± 2°C / 4°F.

**TargetMaster micropolisher**

Diameter 200 mm / 8"  
 Speed, turntable 40 - 300 rpm in steps of 10 rpm  
 Speed, specimen holder 20 - 150 rpm in steps of 10 rpm  
 Force 10 - 75 N in steps of 5 N  
 Rotational direction CW / CCW  
 Motor power 250 W / 0.33 HP

**Software and electronics**

Controls Touch pads  
 Memory FLASH-ROM / RAM / NV-RAM  
 LC display 240 x 128 dots with back light

**Safety standards**

EU-directives 98/37/EEC – Safety of Machinery  
 73/23/EEC – Low Voltage Directive  
 89/336EEC, 92/31/EEC – EMC Directive  
 Standards EN292-1, EN292-2, EN1050, EN60204-1 (IEC204-1),  
 EN61010-1 (+A2), NFPA 70, UL3101-1, CAN-CSA 22.2  
 No.1010.010-030, EN50081-1, EN50082-1, EN61326-1  
 (+A1), FCC 47 CFR Part 15 Class A, AS/NZS 2064.1/2

**Noise levels**

During preparation 54 dB (A)  
 During cleaning 72 dB (A)

**Working environment**

Temperature 5-40°C / 41-104°F.  
 Humidity 35-50% RH

**Supply**

Voltage / frequency 200-240 V / 50-60 Hz  
 Power inlet 1-phase (N+L1+PE) or 2-phase (L1+L2+PE)  
 The electrical installation must comply with "Installation  
 Category II".  
 Power, nominal load 700 W  
 Power, idle 16 W  
 Current, nom. 3.5 A  
 Current, max. 6.9 A  
 Pressure for tap water 1-10 bar / 14.5-145 psi  
 Water inlet 1/2" or 3/4"  
 Water outlet Ø 32 mm / 1 1/4"  
 Compressed air supply Ø 6 mm / 1/4"  
 Compressed air pressure 6-10 bar / 87-145 psi  
 Compressed air quality In compliance with ISO 8573-1, 5.6.4  
 Air extraction Ø 32 mm / 1 1/4"  
 Air extraction, min. airflow 30 m³ / 1059 ft³ per hour

**Dimensions and weight**

Width 820 mm / 32.3"  
 Depth 860 mm / 33.9"  
 Height 595 mm / 23.4"  
 Weight 115 kg / 253.5 lbs

**TargetGrip tiltable specimen holder**

Specimen sizes Ø 40 mm or Ø 25 mm with adapter (TARAD)  
 Cross-sectioning Sample Chair, adapter for cross-sectioning (TARSC),  
 max sample size 27x13 mm  
 Parallel polishing Parallel Holder, adapter for parallel polishing (TARPA),  
 max sample size 23x23 mm  
 Tilt range ± 5 degrees  
 Specimen holder dia. 58 mm  
 Weight 0.58 kg / 1.27 lb

**TargetDoser automatic dosing station**Capacity 4 pumps for suspension/lubricant,  
1 pump for OP-suspension, 1 pump for soap,  
1 pump for alcohol**Dosing Levels**

Suspensions 0.2-4.0 ml in 20 steps  
 All-in-one suspensions 0.2-12.0 ml in 20 steps  
 Lubricants 0.2-12.0 ml in 20 steps  
 OP-Suspensions 20.0-90.0 ml in 20 steps

**Software and electronics**

Controls Touch pads  
 Memory FLASH-ROM / RAM / NV-RAM  
 LC display 240x128 dots with back light

**Network connection**

Struers LAN Module Option

**Safety standards**

EU-directives 98/37/EEC – Safety of Machinery  
 73/23/EEC – Low Voltage Directive  
 89/336EEC, 92/31/EEC – EMC Directive  
 Standards EN292-1, EN292-2, EN1050, EN60204-1 (IEC204-1),  
 EN61010-1, EN50081-1, EN50082-1, UL3101-1,  
 CAN-CSA 22.2 No.1010.010-30, FCC Part 15 Class A

**Working environment**

Temperature 5-40°C / 41-104°F.  
 Humidity 35-50% RH

**Supply**

Voltage 24 V DC, 1 A supplied from TargetMaster

**Dimensions and weight**

Width 200 mm / 8"  
 Depth excl. bottle tray 210 mm / 8.3"  
 Depth incl. bottle tray 550 mm / 21.7"  
 Height 380 mm / 15"  
 Weight excl. bottle tray 8.5 kg / 18.7 lbs  
 Weight incl. bottle tray 10.0 kg / 22.0 lbs

**TargetX set-up station for hidden (internal) targets****Software and electronics**

Controls Touch pads  
 Memory FLASH-ROM / RAM / NV-RAM

**Safety standards**

EU-directives 98/37/EEC – Safety of Machinery  
 73/23/EEC – Low Voltage Directive  
 89/336EEC, 92/31/EEC – EMC Directive  
 Standards EN292-1, EN292-2, EN1050, EN60204-1 (IEC204-1),  
 EN61010-1, EN50081-1, EN50082-1, UL3101-1,  
 CAN-CSA 22.2 No.1010.010-30, FCC Part 15 Class A

**Working environment**

Temperature 5-40°C / 41-104°F.  
 Humidity 35-50% RH

**Supply**

Voltage / frequency 200-240V / 50-60 Hz  
 Power inlet 1-phase (N+L1+PE) or 2-phase (L1+L2+PE)  
 The electrical installation must comply with  
 "Installation Category II".  
 Power, nominal load 50 W  
 Power, idle 10 W  
 Current, nom. 0.25 A  
 Current, max. 1.0 A

**Dimensions and weight**

Width 705 mm / 27.7"  
 Depth 385 mm / 15.1"  
 Height 285 mm / 11.2"  
 Weight 13 kg / 28.6 lbs



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## TargetZ set-up station for visible (external) targets

### Software and electronics

Controls Touch pads  
 Video display 15" TFT monitor

### Safety standards

EU-directives 98/37/EEC – Safety of Machinery  
 73/23/EEC – Low Voltage Directive  
 89/336EEC, 92/31/EEC – EMC Directive  
 Standards EN292-1, EN292-2, EN1050, EN60204-1 (IEC204-1),  
 EN61010-1, EN50081-1, EN50082-1, UL3101-1,  
 CAN-CSA 22.2 No.1010.010-30, FCC Part 15 Class A

### Working environment

Temperature 5-40°C / 41-104°F.  
 Humidity 35-50% RH

### Supply

Voltage 24 V DC, 1 A supplied from TargetMaster  
 Video monitor 200-240V / 50-60 Hz

### Dimensions and weight

Width 235 mm / 9.3"  
 Depth 315 mm / 12.4"  
 Height 205 mm / 8.1"  
 Weight 15 kg / 33 lbs

SPECIFICATIONS	Cat. no.	Code
<b>TargetMaster</b> 200 mm micropolisher for automatic target preparation. Specimen holder (TARGR) and adapter (TARAD) included. Dosing system (TARDO) are ordered separately.	05756127	TARMA
<b>TargetGrip</b> Tilttable specimen holder for 40 mm dia. specimens.	05756901	TARGR
<b>TargetDoser</b> Automatic dosing system for supply and storage of process liquids and preparation methods. With 6 pumps for suspension/lubricant, 1 pump for OP-suspension.	05756904	TARDO
<b>TargetX</b> Set-up station for internal (hidden) targets. For use with x-ray not included with TargetX.	05756903	TARXX
<b>TargetZ</b> Set-up station for external (visible) targets. With 15" TFT video monitor.	05756902	TARZZ
<b>Struers LAN Module</b> Network adapter and software for LAN connection.	05626101	TEGLA
<b>Adapter</b> Adapter for TargetGrip, ø40 mm to ø 25 mm dia. Also used as removable SEM mount.	05756905	TARAD
<b>Sample chair</b> Adapter for cross-sectioning (disposable). Max specimen size 27 x 20,5 mm. 50 pcs.	05756908	TARSC
<b>Parallel holder</b> Adapter for parallel polishing (re-usable). Max specimen size 23 x 23 mm.	05756910	TARPA
<b>Resin barrier</b> Metal label for use with Sample chair (TARSC). 50 pcs.	05756907	TARLA
<b>Mould Insert ø40</b> Mould insert for use with ø40 mm mount cups, 50 pcs	05756912	TARIN

*Struers' products are subject to constant product development.  
 Therefore, we reserve the right to introduce changes in our products without notice.*