Purchase Contract

(hereafter the "**Contract**")

1. CONTRACTUAL PARTIES

1.1 **Fyzikální ústav AV ČR, v. v. i.**,

with seat: Na Slovance 1999/2, 182 21 Praha 8,
represented by: RNDr. Michael Prouza, Ph.D., Director,
Registered in the Register of public research institutions of the Ministry of Education, Youth and Sports of the Czech Republic.

Bank: [redacted]
Account No. IBAN: [redacted]; SWIFT (BIC): [redacted]
ID No.: 68378271
Tax ID No.: CZ68378271

(hereinafter the "**Buyer**")

and

1.2 **H TEST a.s.,**

with seat: Na Hřebenkách 1206/25, 150 00 Praha 5,
represented by: Ing. Václav Haasz, předseda představenstva,
registered in Obchodní rejstřík vedený Městským soudem v Praze, B 6041.

Bank: [redacted]
Account No.: [redacted]
ID No.: 25784480
Tax ID No.: CZ25784480

(hereinafter the "**Seller**"),

(the Buyer and the Seller are hereinafter jointly referred to as the "**Parties**" and each of them individually as a "**Party**").

2. FUNDAMENTAL PROVISIONS

2.1 The Buyer is a public research institution whose primary activity is scientific research in the area of physics, especially elementary particles physics, condensed systems, plasma and optics.

2.2 The Buyer wishes to acquire the subject of performance hereof (the Probe Station) in order to ensure that he will be able to measure the electrical properties of the required number of strip silicon sensors during the production phase of ATLAS ITk project.

2.3 The Seller was selected as the winner of a public procurement procedure announced by the Buyer in accordance with Act No. 134/2016 Coll., on Public Procurement, as amended (hereinafter the "**Act**"), for the public contract called **"Probe Station – repeated procurement procedure"** (hereinafter the "**Procurement Procedure**").

2.4 The documentation necessary for the execution of the subject of performance hereof consist of

2.4.1 Technical specifications of the subject of performance hereof attached as **Annex No. 1** hereto**.**

2.4.2 The Seller´s bid submitted within the Procurement Procedure in its parts which describe the subject of performance in technical detail (hereinafter the "**Sellers's Bid**"); the Sellers´s Bid forms **Annex No. 2** to this Contract and is an integral part hereof.

In the event of a conflict between the Contract's Annexes the technical specification / requirement of the higher level / quality shall prevail.

2.5 The Seller declares that he has all the professional prerequisites required for the supply of the subject of performance under this Contract, is authorised to supply the subject of performance and there exist no obstacles on the part of the Seller that would prevent him from supplying the subject of this Contract to the Buyer.

2.6 The Seller acknowledges that the Buyer considers the Seller's participation in the Procurement Procedure, provided that the Seller complies with all qualification requirements, as the confirmation of the fact that the Seller is capable of providing performance under the Contract with such knowledge, diligence and care that is associated and expected of the Seller's profession, and that the Seller's potential performance lacking such professional care would give rise to corresponding liability on the Seller's part. The Seller is prohibited from misusing his qualities as the expert or his economic position in order to create or exploit dependency of the weaker Party or to establish an unjustified imbalance in the mutual rights and obligation of the Parties.

2.7 The Seller acknowledges that the Buyer is not in connection to the subject of this Contract an entrepreneur and also that the subject of this Contract is not related to any business activities of the Buyer.

2.8 The Seller acknowledges that the production and delivery of the subject of performance within the specified time and of the specified quality, as shown in Annexes No. 1 and 2 of this Contract (including the invoicing), is essential for the Buyer. If the Seller fails to meet contractual requirements, it may incur damage of the Buyer.

2.9 The Parties declare that they shall maintain confidentiality with respect to all facts and information, which they learn in connection herewith and / or during performance hereunder, and whose disclosure could cause damage to either Party. Confidentiality provisions do not prejudice obligations

on the part of the Buyer arising from valid legislation.

3. SUBJECT-MATTER OF THE CONTRACT

3.1 The subject of this Contract is the obligation on the part of the Seller to deliver and transfer into the Buyer's ownership:

the Probe Station (hereafter the "**Equipment**")

and the Buyer undertakes to take delivery of the Equipment and to pay to the Seller the agreed upon price.

3.2 The following activities form an integral part of the performance to be provided by the Seller:

3.2.1 Formulation of conditions which must be met at the place of Buyer in order to install the Equipment;

3.2.2 Transport of the Equipment incl. all accessories specified in Annexes 1 and 2 of the Contract to the site, un-packaging and control thereof;

3.2.3 Installation of the Equipment including connection to installation infrastructure at the site;

3.2.4 Execution of the acceptance tests;

3.2.5 Delivery of instructions and operating and repair manuals to the Equipment in Czech or English language to the Buyer, in electronic and hardcopy (printed) versions;

3.2.6 Training of operators at the site (at least two-day training of 2 operators);

3.2.7 Free-of-charge warranty service including service inspections;

3.2.8 Provision of technical support in the form of consultations.

3.3 The subject of performance (Equipment) is specified in detail in Annexes No. 1 and No. 2 hereto.

3.4 The Seller shall be liable for the Equipment and related services to be in full compliance with this Contract, its Annexes, the submitted bid and all valid legal regulation, technical and quality standards and that the Buyer will be able to use the Equipment for the defined purpose. In case of any conflict between applicable standards it is understood that the stricter standard or its part shall always apply.

3.5 The delivered Equipment and all its parts and accessories must be brand new and unused.

4. PERFORMANCE PERIOD

4.1 The Seller undertakes to manufacture, deliver, install and handover the Equipment to the Buyer within 20 weeks of the conclusion of this Contract.

4.2 The performance period shall be extended for a period during which the Seller could not perform due to obstacles on the part of the Buyer.

5. PURCHASE PRICE, INVOICING, PAYMENTS

5.1 The purchase price is based on the Seller's submitted bid and amounts to **9.782.629,82 CZK** (in words: ninemillions sevenhundredeightytwothousand sixhundredtwentynine Czech crowns eightytwo haléřs) excluding VAT (hereinafter the **"Price"**). VAT shall be paid by the Buyer and settled in accordance with the valid Czech regulation.

5.2 The Price represents the maximum binding offer by the Seller and includes any and all performance provided by the Seller in connection with meeting the Buyer's requirements for the proper and complete delivery of the Equipment hereunder, as well as all costs that the Seller may incur in connection with the delivery, installation and handover, and including all other costs of expenses that may arise in connection with creation of an intellectual property and its protection.

5.3 The Parties agreed that the Price shall be invoiced after the handover protocol in accordance with Section 10.4 will have been signed. In case the Equipment will be delivered with minor defects and / or unfinished work, the Price shall be invoiced after removal of these minor defects and / or unfinished work.

5.4 The invoice issued by the Seller as a tax document must contain all information required by the applicable laws of the Czech Republic. Invoices issued by the Seller in accordance with this Contract shall contain in particular following information:

5.4.1 name and registered office of the Buyer,

5.4.2 tax identification number of the Buyer,

5.4.3 name and registered office of the Seller,

5.4.4 tax identification number of the Seller,

5.4.5 registration number of the tax document,

5.4.6 scope of the performance (including the reference to this Contract),

5.4.7 the date of the issue of the tax document,

5.4.8 the date of the fulfilment of the Contract,

5.4.9 purchase Price,

5.4.10 registration number of this Contract, which the Buyer shall communicate to the Seller based on Seller's request before the issuance of the invoice,

and must comply with the double taxation agreements, if applicable.

5.5 The Buyer prefers electronic invoicing, with the invoices being delivered to efaktury@fzu.cz. All issued invoices shall comply with any international double taxation agreements, if applicable.

5.6 Invoices shall be payable within thirty (30) days of the date of their delivery to the Buyer. Payment of the invoiced amount means the date of its remittance to the Seller's account.

5.7 If an invoice is not issued in conformity with the payment terms stipulated by the Contract or if it does not comply with the requirements stipulated by law, the Buyer shall be entitled to return the

invoice to the Seller as incomplete, or incorrectly issued, for correction or issue of a new invoice, as appropriate, within five (5) business days of the date of its delivery to the Buyer. In such a case, the Buyer shall not be in delay with the payment of the Price or part thereof and the Seller shall issue a corrected invoice with a new and identical maturity period commencing on the date of delivery of the corrected or newly issued invoice to the Buyer.

5.8 The Buyer shall be entitled to unilaterally set off any of his payments against any receivables claimed by the Seller due to:

5.8.1 damages caused by the Seller,

5.8.2 contractual penalties.

5.9 The Seller shall not be entitled to set off any of his receivables against any part of the Buyer's receivable hereunder.

6. OWNERSHIP TITLE

6.1 The ownership right to the Equipment shall pass to the Buyer by handover. Handover shall be understood as delivery and acceptance of the Equipment duly confirmed by Parties on the Handover Protocol.

7. PLACE OF DELIVERY OF THE EQUIPMENT

7.1 The place of delivery and handover of the Equipment shall be the room No. 036 in the main building of the Ústav teorie informace a automatizace AV ČR, v. v. i. (Institute of Information Theory and Automation AS CR), at Pod Vodárenskou věží 4, 182 08 Praha 8, Czech Republic.

8. PREPAREDNESS OF THE PLACE OF DELIVERY

8.1 The Seller shall notify the Buyer in writing of the exact date of installation of the Equipment at least 28 days prior to such date, ensuring that the deadline for the performance hereunder is maintained.

8.2 The Buyer shall be obliged to allow the Seller, once the deadline set forth in Section 8.1 hereof expires, to install the Equipment at the place of performance.

9. COOPERATION OF THE PARTIES

9.1 The Seller undertakes to notify the Buyer of any obstacles on his part, which may negatively influence proper and timely delivery of the Equipment.

9.2 The Buyer shall be entitled to receive information on the progress with the Equipment manufacture.

10. DELIVERY, INSTALLATION, HANDOVER AND ACCEPTANCE

10.1 The Seller shall transport the Equipment at his own cost to the place of handover. If the shipment is intact, the Buyer shall issue delivery note for the Seller.

10.2 The Seller shall perform and document the installation of the Equipment and launch experimental tests in order to verify whether the Equipment is functional and meets the technical requirements of Annexes No. 1 and 2 hereof.

10.3 Handover procedure includes handover of any and all technical documentation pertaining to the Equipment, user manuals and certificate of compliance of the Equipment and all its parts and accessories with approved standards.

10.4 The handover procedure shall be completed by handover of the Equipment confirmed by the Handover Protocol containing specifications of all performed tests. The Handover Protocol shall contain the following mandatory information:

10.4.1 Information about the Seller, the Buyer and any subcontractors,

10.4.2 Description of the Equipment including description of all components and serial numbers,

10.4.3 Description of executed acceptance tests: type of test, duration, achieved parameters,

10.4.4 List of technical documentation including the manuals,

10.4.5 Confirmation on training, its participants and extent,

10.4.6 Eventually reservation of the Buyer regarding minor defects and unfinished work including the manner and deadline for their removal,

10.4.7 Date of signature of the Equipment Handover Protocol.

10.5 Handover of the Equipment does not release the Seller from liability for damage caused by product defects.

10.6 The Buyer shall not be obliged to accept Equipment, which would show defects or unfinished work and which would otherwise not form a barrier, on their own or in connection with other defects, to using the Equipment. In this case, the Buyer shall issue a record containing the reason for his refusal to accept the Equipment.

10.7 Should the Buyer not exercise his right not to accept the Equipment with defects or unfinished work, the Seller and the Buyer shall list these defects or unfinished work in the Handover Protocol, including the manner and deadline for their removal. Should the Parties not be able to agree in the Handover Protocol on the deadline for removal of the defects, it shall be understood that any defects shall be removed / rectified within 14 days from the handover of the Equipment.

11. TECHNICAL ASSISTANCE – CONSULTATIONS

11.1 The Seller shall be obliged to provide to the Buyer free-of-charge technical assistance by phone or e-mail relating to the subject-matter hereof during the entire term of the warranty period. The Seller undertakes to provide to the Buyer paid consultations and technical assistance relating to the subject-

matter hereof also after the warranty period expires.

12. REPRESENTATIVES, NOTICES:

12.1 The Seller authorized the following representatives to communicate with the Buyer in all matters relating to the Equipment delivery:

[redacted]

12.2 The Buyer authorized the following representatives to communicate with the Seller:

[redacted]

12.3 All notifications to be made between the Parties hereunder must be made out in writing and delivered to the other Party by hand (with confirmed receipt) or by registered post (to the Buyer's or Seller's address), or in some other form of registered post or electronic delivery incorporating electronic signature (qualified certificate) to epodatelna@fzu.cz in case of the Buyer and to info@htest.cz in case of the Seller.

12.4 In all technical and expert matters (discussions on the Equipment testing and demonstration, notification of the need to provide warranty or post-warranty service, technical assistance etc.) electronic communication between technical representatives of the Parties will be acceptable using e-mail addresses defined in Sections 12.1 and 12.2.

13. TERMINATION

13.1 The Buyer is entitled to withdraw from the Contract without any penalty from the Seller in any of the following events:

13.1.1 The Seller is in delay with the handover longer than 4 weeks after the date pursuant to Section 4.1 hereof.

13.1.2 Technical parameters or other conditions required in the technical specification defined in Annex No. 1 and 2 hereto and in the relevant valid technical standards will not be achieved by the Equipment at acceptance.

13.1.3 Facts emerge bearing evidence that the Seller will not be able to deliver the Equipment.

13.1.4 The Seller will not meet the qualification criteria within the Procurement Procedure

13.2 The Seller is entitled to withdraw from the Contract in the event of the Buyer being in default with the payment for more than 2 months with the exception of the cases when the Buyer refused invoice due to defect on the delivered Equipment or due to breach of the Contract by the Seller.

13.3 Withdrawal from the Contract becomes effective on the day the written notification to that effect is

delivered to the other Party. The Party which had received performance from the other Party prior to such withdrawal shall duly return such performance.

14. INSURANCE

14.1 The Seller undertakes to insure the Equipment against all risks, in the amount of the Price of the Equipment for the entire period commencing when transport of the Equipment starts until duly handed over to the Buyer. In case of breach of this obligation, the Seller shall be liable to the Buyer for any damage that may arise.

14.2 The Seller is liable for the damage that he has caused. The Seller is also liable for damage caused by third parties undertaken to carry out performance or his part under this Contract.

15. WARRANTY TERMS

15.1 The Seller shall provide warranty for the quality of the Equipment for a period of 12 months. The warranty term shall commence on the day following the date of signing of the Handover Protocol pursuant to Section 10.4 hereof. In case the Buyer accepted the Equipment with defects or unfinished work the warranty term shall commence on the day following the date of removal of the defects or unfinished work. The warranty does not cover consumable things.

15.2 Should the Buyer discover a defect, he shall notify the Seller to rectify such defect using the email address info@htest.cz. The Seller is obliged to notify the Buyer without delay about any change of this email address. The Seller shall be obliged to review any warranty claim within 7 business days from receipt and to propose solution, unless agreed otherwise by the Parties.

15.3 During the warranty period the Seller shall be obliged to rectify any claimed defects within 14 business days from receipt of the Buyer's notification. In cases of unusual defects, the Seller shall be obliged to rectify the defect in the period corresponding to the nature of the defect and to define the deadline for the handover of the rectified Equipment.

15.4 During the warranty period any and all costs associated with defect rectification / repair including transport and travel expenses shall be always borne by the Seller.

15.5 The repaired Equipment shall be handed over by the Seller to the Buyer on the basis of a protocol confirming removal of the defect (hereinafter the "**Repair Protocol**") containing confirmations of both Parties that the Equipment was duly repaired and is defect-free.

15.6 The repaired portion of the Equipment shall be subject to a new warranty term in accordance with Section 15.1, which commences to run on the day following the date when the Repair Protocol was executed.

15.7 The Seller declares that he shall ensure post-warranty [out-of-warranty] service for the period of 10 years after the warranty term expires; the service terms shall be identical with provisions of Sections 15.2 and 15.3.

15.8 The Seller undertakes to provide the Buyer with updates of the software controlling the Equipment for the entire term of warranty service.

16. CONTRACTUAL PENALTIES

16.1 The Buyer shall be entitled to claim a contractual penalty against the Seller in the amount of 0,05 % of the Price for each commenced day of delay with the delivery pursuant to Section 4.1 hereof with a possible grace period of 10 days.

16.2 The Buyer shall have the right to a penalty in the amount of 0.05 % of the Price for each commenced day of delay with rectifying of claimed defects.

16.3 The Buyer shall be entitled to claim a contractual penalty against the Seller in the amount of 30 % of the Price, in case it will subsequently take advantage of the opportunity to withdraw from the Contract pursuant to Section 13.1.1 and 13.1.2.

16.4 In case of default in payment of any due receivables (monetary debt) under the Contract, the defaulting Buyer or Seller (the debtor) shall be obliged to pay a contractual penalty in the amount of 0.05 % of the owed amount for each commenced day of delay with the payment.

16.5 All contractual penalties shall be payable within 30 days from the date claimed.

16.6 Payment of the contractual penalty does not prejudice the rights of the Parties to claim damages.

17. DISPUTES

17.1 Any and all disputes arising out of this Contract or the legal relationships connected with the Contract shall be resolved by the Parties by mutual negotiations. In the event that any dispute cannot be resolved by negotiations within sixty (60) days, the dispute shall be resolved by the competent court in the Czech Republic based on application of any of the Parties; the court having jurisdiction will be the court where the seat of the Buyer is located. Disputes shall be resolved exclusively by the law of the Czech Republic.

18. FINAL PROVISIONS

18.1 This Contract represents the entire agreement between the Buyer and the Seller. The relationships between the Parties not regulated in this Contract shall be governed by the Act No. 89/2012 Coll., the Civil Code, as amended.

18.2 In the event that any of the provisions of this Contract shall later be shown or determined to be invalid, ineffective or unenforceable, then such invalidity, ineffectiveness or unenforceability shall not cause invalidity, ineffectiveness or unenforceability of the Contract as a whole. In such event the Parties undertake without undue delay to subsequently clarify any such provision or replace after mutual agreement such invalid, ineffective or unenforceable provision of the Contract by a new provision, that in the extent permitted by the laws and regulations of the Czech Republic, relates as closely as possible to the intentions of the Parties to the Contract at the time of creation hereof.

18.3 This Contract may be changed or supplemented solely by means of numbered amendments in writing, furnished with the details of time and place and signed by duly authorised representatives of the Parties. The Parties expressly reject modifications to the Contract in any other manner.

18.4 This Contract is drawn up in three (3) counterparts, each of which is deemed to be the original. The

Buyer shall receive two (2) counterparts, the Seller shall receive one (1) counterpart.

18.5 The Parties expressly agree that the Contract as a whole, including all attachments and data on the Parties, subject-matter of the Contract, numerical designation of this Contract, the Price and the date of the Contract conclusion, will be published in accordance with Act No. 340/2015 Coll. on special conditions for the effectiveness of some contracts, publication of these contracts and Contract Register, as amended (hereinafter the "**CRA**"). The Parties hereby declare that all information contained in the Contract and its Annexes are not considered trade secrets under § 504 of the Civil Code and grant permission for their use and disclosure without setting any additional conditions.

18.6 The Parties agree that the Buyer shall ensure the publication of the Contract in the Contract Register in accordance with CRA.

18.7 This Contract becomes effective as of the day of its publication in the Contract Register.

18.8 The following Annexes form an integral part of the Contract:

Annex No. 1: Technical specification on the subject of performance

Annex No. 2: Technical description of the device as presented in Seller's bid

18.9 The Parties, manifesting their consent with the entire contents of this Contract, attach their signature hereunder.

In Prague on 13. 7. 2018	In Prague on 10. 7. 2018
For the Buyer:	For the Seller:
_____	_____
RNDr. Michael Prouza, Ph.D.	Ing. Václav Haasz
Director	Předseda představenstva H TEST a.s.

Annex No. 1

Technical specification on the subject of performance as defined by the Buyer

Item ref.	Minimum required Probe Station equipment	Complies YES/NO	Equipment surpassing the minimum requirements	Expected range of parameter N	N	Formula for weighted partial score
Vibration isolation table						
1.1	Vibration isolation table as a support for the probe station	YES	Vibration isolation table for 200mm probe station is included.			
Fully programmable moving chuck stage						
2.1	XY travel > 200 mm x 200 mm	YES	XY travel > 203 mm x 203 mm			
2.2	XY movement accuracy <= 3.0 um	YES	≤ 2.5 µm			
2.3	XY movement repeatability <= 2 um	YES	≤ 2 µm			
2.4	Z travel >= 5.0 mm	YES	5 mm			
2.5	Z movement accuracy <= 2.0 um	YES	≤ 2 µm			
2.6	Z movement repeatability <= 2.0 um	YES	≤ 1 µm			
2.7	Theta travel +- 5.0°	YES	± 5.5°			
2.8	Highly accurate theta movement to allow precise alignment	YES	± 2 µm (measured at edge of 200 mm chuck			
Round chuck						
3.1	200 mm Au plated low leakage/noise triaxial round chuck	YES	FemtoGuard Triaxial Tesla Chuck, Au, Thermal			
3.2			300 mm Au plated low leakage/noise triaxial round chuck	N = 0/1	0	N*2000
3.3	Chuck noise <= 50 fA at 10 V and 25°C	YES	40 fA			
3.4	Chuck noise <= 5 pA at 3 kV and 25°C	YES	4 pA			
3.5	Minimum voltage range between 0 V and 3kV	YES	0 – 3 kV			
3.6	System planarity <= 40 um at 25°C	YES	≤ 35 µm			
3.7	Presence of vacuum lines in the chuck for fixing of tested samples	YES	Vacuum system with 5 zones for fixing samples			
3.8	Possibility of ultra-low noise and frost-free cold and warm measurements (-50°C ... +200°C)	YES	-55°C … +300°C			

3.9			Possibility of ultra-low noise and frost-free cold and warm measurements (Tmin °C ... Tmax °C)	N = N1 + N2 = (Tmin + 50)/(-10) + (Tmax – 200)/50 where N1 > 0 and N2 > 0	2.5 (0.5+2)	N*100
Environmental chamber						
4.1	Complete light enclosure	YES	Integrated MicroChamber (Dark,Dry & EMI-Shielding)			
4.2	EMI shielding	YES	Integrated MicroChamber (Dark,Dry & EMI-Shielding)			
4.3	System for easy wafer/sample loading	YES	Roll-out wafer stage (For safe/easy wafer loading)			
4.4	Top hat of the environmental chamber allowing access of at least 8 probes	YES	Top hat with 8 access for probes is integral part of MicroChamber.			
4.5	System for distribution of gaseous nitrogen or dry air to the environmental chamber	YES	Distribution of gaseous nitrogen or dry air is integral part of MicroChamber.			
4.6	Frost free probing for temperatures between (-50 °C … +200 °C)	YES	-55°C … +300°C			
4.7			Frost free probing for temperatures between (Tmin °C … Tmax °C)	N = N1 + N2 = (Tmin + 50)/(-10) + (Tmax – 200)/50 where N1 > 0 and N2 > 0	2.5 (0.5+2)	N*100
Thermal system						
5.1	Air-cooling technology	YES	Thermal system with air cooling Technology is included.			
5.2	Thermal system providing temperature range on the chuck between (-50 °C … +200 °C)	YES	-55°C … +300°C			
5.3			Thermal system providing temperature range on the chuck between (Tmin °C … Tmax °C)	N = N1 + N2 = (Tmin + 50)/(-10) + (Tmax – 200)/50 where N1 > 0 and N2 > 0	2.5 (0.5+2)	N*100
5.4	Temperature uniformity on the chuck <= 0.5 °C at 25 °C	YES	≤ 0.5°C at 25°C			
5.5	Temperature stability on the chuck <= 0.5 °C at 25 °C	YES	≤ 0.5°C at 25°C			
Digital microscope system						
6.1	Optical bridge with manual XYZ movement	YES	Bridge mount, 2x2" XY, 4" air-assisted Z lift			
6.2			Optical bridge with motorized XYZ movement	N=0/1	0	N*50
6.3	Microscope system compatible with Probe Station control system	YES	eVue-III Digital Imaging System			

6.4	Automatic focusing system	YES	Optical Z-Contact System, AutoFocus			
6.5	Sample navigation system using pattern recognition methods	YES	Included in Velox control SW			
6.6	Objective, 10x	YES	Mitutoyo 10X			
Probe positioners						
7.1	7 manual probe positioners with magnetic or vacuum base	YES	4 left and 3 right DPP220 positioners included			
7.2			7 motorized probe positioners with magnetic or vacuum base	0 <= N <= 7	0	N*100
7.3	Travel range in XYZ axes > 10 mm	YES	12.5 mm			
7.4	Resolution <= 1 um	YES	1 µm			
Probes compatible with selected probe positioners						
8.1	Minimal electrical current to be measured: 10 pA	YES	System can achieve this level, depends also on measurement equipment.			
8.2	Maximal resistivity to be measured: several hundreds of GOhms	YES	System can achieve this level, depends also on measurement equipment.			
8.3	Typical capacitance to be measured: 0.1 pF	YES	System can achieve this level, depends also on measurement equipment.			
8.4	1 probe and needle need to be able to work with the voltage of 1.1 kV	YES	HVP-13 probe with 1.1 kV guarded and 3 kV unV maximum voltage is included.			
8.5	6 probes and needles need to be able to work with the voltage up to 200 V	YES	6 triaxial probes included			
Probe needles						
9.1	Needles with tip size of 7 um – 50 pieces	YES	2x set of 25 pcs.			
9.2	Needles with tip size of 12 um – 50 pieces	YES	2x set of 25 pcs.			
9.3	Needles with tip size of 25 um – 50 pieces	YES	2x set of 25 pcs.			
9.4	Needle material required is tungsten	YES	Tungsten			
Probe card holder						
10.1			Probe card holder with manual adjustment system with maximal voltage applied to one card pin of 200 V	N = 0/1	0	N*1000
10.2			Probe card holder with motorized adjustment system maximal voltage applied to one card pin of 200 V	N = 0/1	0	N*2000
PCs, screens						

11.1	Control PC + 2 LED screens (1 screen for control software + 1 screen for microscope digital output)	YES	Control PC with SW and 2 monitors is included.			
Communication ports						
12.1	GPIB (for communication between Probe Station and external device)	YES	GPIB, RS232 and TCPIP interfaces are included			
Control software, LabVIEW drivers						
13.1	Software for complete control of the Probe Station including programmable and automatic movement of chuck stages, compatible with microscope system (pattern recognition, alignment, etc.)	YES	Velox Probe Station Control Software is included.			
13.2	LabVIEW drivers for the Probe Station control system (for the possibility to include the Probe Station control into more complex custom made LabVIEW codes)	YES	LabVIEW integration toolkit & driver is included			
Special probe which is able to move together with the chuck						
14.1	1 probe that is moving together with the chuck and permanently contacting one particular contact pad located on the top surface of the tested sample to the ground, this contact needs to be kept especially during the long “strip-by-strip” measurements when the HV of 1 kV is applied through the chuck to the back plane of the tested sample and chuck with the sample is moving	YES	Flying probe for 1.5kV single contact for T200 systém is included.			
14.2	This special probe needs to fit into the environmental chamber to enable cold or warm measurements	YES	The flying probe should be used at complete temperature range -55°C … +300°C			

Annex No. 2

The Seller's bid in the extent it describes technical parameters of the Equipment

Attached Specifications:

1. Tesla - data sheet (15 pages)
2. Positioners - product overview (5 pages)
3. eVue – data sheet (7 pages)
4. Velox – product brochure (8 pages)

Quotation (Nabídka) (6 pages)

Tesla

200 mm On-Wafer Power Device Characterization System

DATA SHEET

Designed specifically for accurate power device measurements at the wafer level, the Tesla on-wafer power device characterization system is engineered to provide probing levels of up to 3,000 V (triaxial), 10,000 V (coaxial) and 200 A standard or 600 A high current. It supports a measurement temperature range of -55°C to 300°C. In combination with Cascade Microtech's patented MicroChamber®, the Tesla features a high-power, gold-plated chuck to ensure low-contact resistance, thin-wafer handling and power dissipation; all while providing a low-noise, fully guarded and shielded test environment. To ensure the utmost safety during a high-voltage measurement, the Tesla 200 mm power device characterization system (T200) employs a certified safety interlock system integrated with an ergonomic clear enclosure or infrared laser light curtain.

The powerful Velox™ probe station control software features easy on-screen navigation, wafer mapping, seamless integration with analyzers and measurement software, and enables simple operation of motorized positioners and thermal systems. For a wide range of high-power applications, the Tesla system powered by Velox software achieves high accuracy and high test efficiency.

FEATURES / BENEFITS

High-voltage/ current probes	On-wafer power device characterization up to 10,000 V, 600 A Reduced probe and device destruction at high currents up to 20 A DC and 300 A pulse (600 A when two probes are used in parallel) Increased isolation resistance and dielectric strength to provide full triaxial capability at high voltage (3,000 V) for low-leakage measurement
Gold-plated high-power chuck technology	Prevent thin wafers from curling and breaking Advanced MicroVac™ chuck surface for minimum contact resistance between wafer and chuck Accurate Rds(on) measurement at high current
Safety for operator and device	Safety interlock system with clear enclosure or light curtain for operator safety during measurements Roll-out stage for full wafer access and easy wafer loading/unloading
Seamless integration	Convenient connection kits for easy and safe system integration with Keysight and Keithley power device analyzers Seamless integration between Velox and analyzers/measurement software

CascadeMicrotech®

Note: For physical dimensions and facility requirements, refer to the Tesla Facility Planning Guide.

POWER HANDLING

Tesla Chucks	Coax	Standard	High Current
Max voltage	10 kV (coaxial)*	3,000 V (triaxial), 10 kV (coaxial)*	3,000 V (triaxial), 10 kV (coaxial)*
Max current	200 A (pulsed), 10 A (DC)	200 A (pulsed), 10 A (DC)	600 A (pulsed), 20 A (DC)
Power dissipation			100 W generated in 1 cm^2 area at -40°C

*Maximum 6,000 V (coaxial) with T200-STA-AP model

MEASUREMENT PERFORMANCE

Typical Chuck Noise (Triaxial)*

		PN T200-STA-AP		PN T200-STA-M		Settling Time**
		Standard	High Current	Standard	High Current	
10 V	-55°C/-50°C	20 fA	180 fA	40 fA	180 fA	< 200 fA @ 1.0 sec
	25°C	20 fA	40 fA	40 fA	40 fA	< 200 fA @ 0.5 sec
	200°C	20 fA	120 fA	40 fA	120 fA	< 200 fA @ 1.0 sec
	300°C	30 fA	240 fA	60 fA	240 fA	< 200 fA @ 2.0 sec
3 kV	-55°C/-50°C	2 pA	4 pA	4 pA	4 pA	< 15 pA @ 1.5 sec
	25°C	2 pA	4 pA	4 pA	4 pA	< 15 pA @ 1.5 sec
	200°C	3 pA	4 pA	6 pA	4 pA	< 15 pA @ 1.5 sec
	300°C	6 pA	12 pA	10 pA	12 pA	< 15 pA @ 4.5 sec

Typical Chuck Leakage (Coaxial)

		PN T200-STA-AP		PN T200-STA-M	
		Coax / Standard	High Current	Coax / Standard	High Current
3 kV	-55°C/-50°C	2 nA	4 nA	2 nA	4 nA
	25°C	2 nA	4 nA	2 nA	4 nA
	200°C	2 nA	4 nA	2 nA	4 nA
	300°C	4 nA	10 nA	4 nA	10 nA
6 kV	-55°C/-50°C	4 nA	6 nA	4 nA	6 nA
	25°C	4 nA	6 nA	4 nA	6 nA
	200°C	4 nA	8 nA	4 nA	8 nA
	300°C	8 nA	20 nA	8 nA	20 nA
10 kV	-55°C/-50°C	-	-	7 nA	10 nA
	25°C	-	-	7 nA	10 nA
	200°C	-	-	7 nA	12 nA
	300°C	-	-	14 nA	34 nA

* Overall leakage current is comprised of two separate components: 1) offset, and 2) noise. Offset is the DC value of current due to instrument voltage offset driving through isolation resistance and instrument offset current itself. Noise is low-frequency ripple superimposed on top of offset and is due to disturbances in the probe station environment. Noise and leakage are measured with a B1505A- B1510A (HPSMU) and or B1513A/B/C with Cascade Microtech setups or equivalent; 1s sample interval, auto or 1 nA range, 1 µA compliance, 40 PLC integration. Typical noise values are defined using the standard deviation. The maximum peak noise value may be 2-3 times higher than typical noise values depending on environmental factors such as humidity, vibration, temperature fluctuation, condition of the cable and connectors etc.

** Settling time is measured with a B1505A/HPSMU Cascade Microtech setup or equivalent; 2 ms sampling interval, Fixed range: 1 nA, 1 µA compliance, 1 NPLC integration.

MEASUREMENT PERFORMANCE (CONTINUED)

System Residual Capacitance

	PN T200-STA-AP	PN T200-STA-M	
Capacitance	4.0 pF	40 pF	

HIGH POWER PROBES FOR T200

	Ultra High Power Probe	High-Current Probe	High-Voltage Probe
			
Probe	UHP	HCP-XX	HVP-XX
Current	Up to 300 A	Up to 100 A	Up to 5 A
Voltage	Up to 10,000 V	Up to 500 V	Up to 3,000 V

*See High-Power Probe data sheet for more information.

MECHANICAL PERFORMANCE

X-Y Stage	Semi-automated	Manual
Travel	203 mm x 203 mm (8 in. x 8 in.)	203 mm x 203 mm (8 in. x 8 in.)
Motion control	5 phase stepper motors and manual controls	Manual controls (X-Y direct rotary knobs)
Resolution	1 µm (0.04 mils)	5 mm / turn
Repeatability	≤ 2 µm (0.08 mils)	
Accuracy	≤ 2.5 µm (0.1 mils)	
Speed	> 50 mm/sec (2 in./sec)	
Feedback system	1 µm resolution closed loop optical linear encoder	

Z Stage	Semi-automated	Manual
Travel	5 mm (0.19 in.)	Fixed Z mount
Resolution	1 µm (0.04 mils)	
Repeatability	≤ 1 µm (0.04 mils)	
Accuracy	≤ 2 µm (0.08 mils)	

MECHANICAL PERFORMANCE (CONTINUED)

Theta Stage	Semi-automated	Manual
Travel	± 5.5°	± 5.7°
Resolution	0.65 µm (0.03 mils)*	0.8° / turn
Repeatability	± 2 µm (0.08 mils)*	
Accuracy	± 2 µm (0.08 mils)* standard moves ± 3 µm (0.12 mils)* large moves	

* Measured at edge of 200 mm chuck

System	
Move time (semi-automated)	≤ 750 ms (200 µm Z down – 1000 µm XY – 200 µm Z up)
Probe-force capability	20 kg (44 lb.) maximum
Probe-force deflection	≤ 0.0015 µm/µm slope per 10 kg load
System planarity	≤ 35 µm (1.3 mils) @ 25°C
	≤ 35 µm (1.3 mils) @ -60°C (typical)
	≤ 35 µm (1.3 mils) @ 200°C (typical)
	≤ 50 µm (2.0 mils) @ 300°C (typical)

MICROCHAMBER

Electrical	PN T200-STA-AP	PN T200-STA-M
EMI shielding	≥ 20 dB 1 kHz - 100 MHz (typical)	≥ 20 dB 1 kHz - 100 MHz (typical)

Light Shielding	
Type	Complete dark enclosure around chuck
Wafer access	Front access door with rollout stage for easy wafer loading
Probe compatibility	Standard MicroChamber TopHat™ allows access for up to eight probes
Light attenuation	≥ 120 dB

Purge and Condensation Control	
Test environment	Low volume for fast purge, external positioning and cable access to maintain sealed environment
Dew point capability	> -70°C for frost-free measurements and high-voltage measurements*
Purge gas	Clean dry air or oil-free nitrogen (See facilities planning guide for detailed purge gas requirements.)
Purge flow rate	Standard purge - manual controls, variable 0 to 110 l/min (4 CFM) at SATP**
	Quick purge - manual controls, standard purge rate or maximum > 110 l/min (4 CFM) at SATP**
Purge time	15 min for measurements @ -55°C (typical)
External condensation control	Integrated laminar-flow air distribution on external MicroChamber surfaces to eliminate condensation Controls for ON/OFF and flow rate for both top and bottom surfaces

* Please see the facilities guide for air requirements to enable optimum dew point for low-temperature measurements using a thermal chuck inside the MicroChamber.
** Standard Ambient Temperature And Pressure (SATP).

PLATEN SYSTEM

Platen	
Material	Steel for magnetic positioners
Dimensions	74.5 cm (W) x 59.5 cm (D) x 20 mm (T) (29.3 in. x 23.4 in. x 0.78 in.)
Platen to chuck height	14 ± 0.5 mm (0.55 ± 0.02 in.)
Accessory compatibility	Minimum of 8 DC or 4 RF positioners allowed, compatible simultaneous probe card holder use
Thermal management	Integrated laminar-flow air-cooling for thermal expansion control

Platen Ring Insert	
Material	Steel for magnetic positioners
Weight	4.5 kg (9.9 lb.)
Standard interface	For MicroChamber, TopHat, probe card holders and custom adapters

Platen Lift	
Type	Precision 4-point linear lift
Range	5.0 mm (0.20 in.)
Repeatability	≤ 3 µm (0.12 mils)
Lift control	Ergonomic handle with 90° stroke. Optional micrometer control for fine adjustment of probe card contact.

WAFER AND AUX CHUCK DESIGN

Wafer Chuck	Coax	Standard	High Current
Type	HV Coaxial	HV FemtoGuard Triaxial	HV FemtoGuard Triaxial
Diameter			
200 mm (8in.) - Thermal	●	●	●
200 mm (8in.) - Non Thermal	●	●	
Material	Gold (Au) plated aluminum		
Electrical connection	Dual HV triax cables with integrated chuck port		
Supported measurement modes			
Coaxial	●	●	●
Triaxial		●	●
AUX chucks (integrated)	Optional	2	2
Vacuum uniformity	Patented MicroVac technology using 495 micro-hole pattern for uniform vacuum hold down of thin, warped and partial wafers, and uniform temperature conductivity.		
Vacuum zones	5 selectable zones, with hole patterns arranged in approximately 9, 70, 93, 143 and 178 mm diameters (0.4, 2.8, 3.8, 5.6 and 7 in.)		
Vacuum actuation	Easy access multi-zone manual vacuum controls, and software control (semi-automated)		
Thin wafer support	Thin wafers down to 50 µm and optional support for Taiko wafers		

WAFER AND AUX CHUCK DESIGN (CONTINUED)

Auxiliary Chuck

Quantity	0, 1, or 2, integrated with chuck assembly (see Wafer Chuck table above)
Substrate size (maximum)	15.2 mm x 22.1 mm (0.59 in. x 0.87 in.) ISS substrate
	19 mm x 19 mm (0.75 in. x 0.75 in.) substrate
Material	Standard current: Two RF absorbing Eccosorb (magnetically loaded) aux chucks
	High Current: One RF absorbing Eccosorb (magnetically loaded) and one steel aux chuck
Thermal isolation	For probe tip-cleaning substrates
Flatness	≤ 8 µm (0.3 mils)
Vacuum actuation	Independently controlled apart from wafer vacuum zones

GENERAL SYSTEM SPECIFICATIONS

Note: For physical dimensions and facility requirements, refer to the Tesla Facility Planning Guide.

Velox Probe Station Control Software

The Tesla 200 mm power device characterization system is equipped with Velox probe station control software. The Velox software provides all features and benefits required for semi-automated operation of the probe system, such as:

- WaferMap with Z-profiling, sub-die stepping, binning and other useful features
- Integrated thermal control
- CellView using stitched image of the full device to enable on-screen navigation within the die layout when using eVue
- Configurable user interface and programmable buttons

Communication Ports

Type	Qty	Location	Note
USB 2.0	6	Station Controller - Rear	For security keys and USB instrument control
USB 2.0	2	Station Controller - Front	
USB 3.0	4	Station Controller - Rear	
LAN GbE	2	Station Controller - Rear	
RS-232	1	Station Controller - Rear	For instrument control (thermal, LASER, microscope, etc). Additional RS-232 ports supplied with USB adapter for test instrument control.
GPIB IEEE 488.2	As Needed	Station Controller - Rear	Supplied with USB adapter for test instrument control

Accessory Interface Ports

Type	Qty	Location	Note
Edge-sense	1	Station interconnect panel	Probe card contact sense
VNA-CAL	1	Station interconnect panel	Control for switched GPIB (remote/local software control)
INKER	1	Station interconnect panel	Control for die inker
Switched AC Power			
Type	**Qty**	**Location**	**Note**
IEC (f) microscope	1	Station interconnect panel	Software ON/OFF control for microscope light
IEC (f) aux	1	Station interconnect panel	Software ON/OFF control for auxiliary power

THERMAL SYSTEM PERFORMANCE

Thermal System Overview			Coax	Standard	High Current
Temperature ranges	-50°C to 200°C, ATT, liquid cool (200 mm)		●	●	
	-55°C to 300°C, ATT, air cool (200 mm)		●	●	
	+20°C to 300°C, ATT, air cool (200 mm)		●	●	
	+30°C to 300°C, ATT, air cool (200 mm)		●	●	
	-55°C to 300°C, ERS AirCool3 (200 mm)				●
	+20°C to 300°C, ERS AirCool3 (200 mm)				●
	+30°C to 300°C, ERS AirCool3 (200 mm)				●
Wafer temperature accuracy	Standard [1,2]	± 2.5°C at 100°C			
	High Accuracy [3]	± 0.05°C (0 to 250°C)			
Thermal uniformity	Coax, Standard, High Current[4]	≤ ± 0.5C° @ 25°C, ≤ ± 1.5°C @ -60°C, ≤ ± 0.85°C @ 200°C, ≤ ± 1.5°C @ 300°C			

1. As measured with an Anritsu WE-11K-TSI-ANP or WE-12K-GW1-ANP type K thermocouple surface temperature measurement probe with offset calibration procedure. Conditions: closed chamber with minimum recommended purge air, probe centered on a blank silicon wafer, chuck at center of travel and standard probe height. Typical type K thermocouple probe tolerances are ±2.2°C or ±0.75% of the measured temperature in °C (whichever is greater).

2. The test setup can change the wafer temperature accuracy from the calibration by ±5°C (typical). Test setup attributes include open or closed chamber, probe or probe card construction and number of contacts, purge air flow rate, and lab environmental conditions.

3. Special high accuracy calibration using KLA Sense array wafer (Consult factory for pricing and availability)

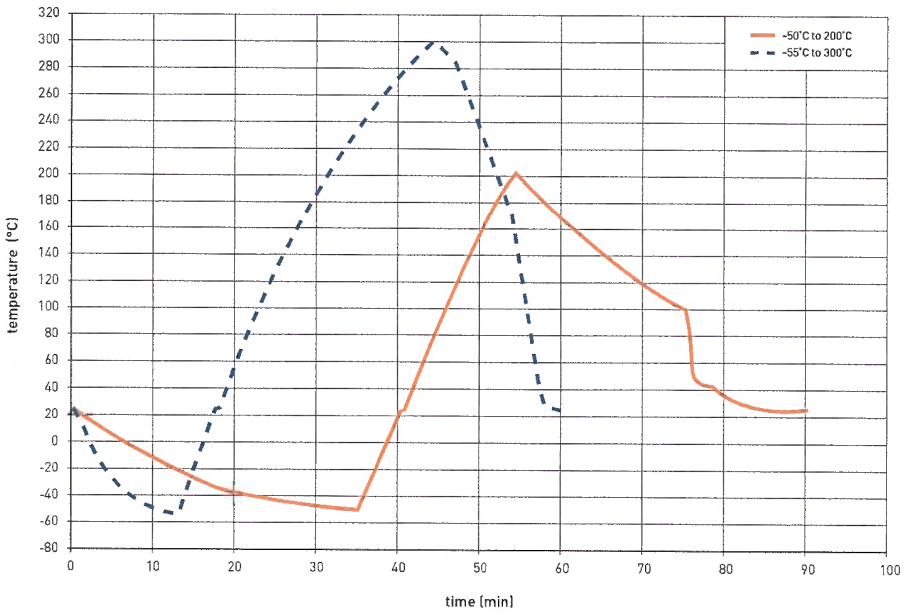
4. As measured at DUT (device under test) probing location.

ATT Thermal System Specifications, 200 mm

	Air Chilled	Liquid Chilled
Temperature range	-55°C to 300°C	-50°C to 200°C
Transition time – Heating	-55°C to 25°C: 5 min (typical)	-50°C to 25°C: 6 min (typical)
	25°C to 300°C: 27 min (typical)	25°C to 200°C: 14 min (typical)
Transition time – Cooling	300°C to 25°C: 15 min (typical)	200°C to 25°C: 34 min (typical)
	25°C to -55°C: 15 min (typical)	25°C to -50°C: 34 min (typical)
Temperature resolution	0.1°C	0.1°C
Audible noise	< 60 dB(A)	< 60 dB(A)

ATT Thermal Transition Time

Typical times using T200-STA-AP with FemtoGuard® Chuck.



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THERMAL OPTIONS AND PERFORMANCE

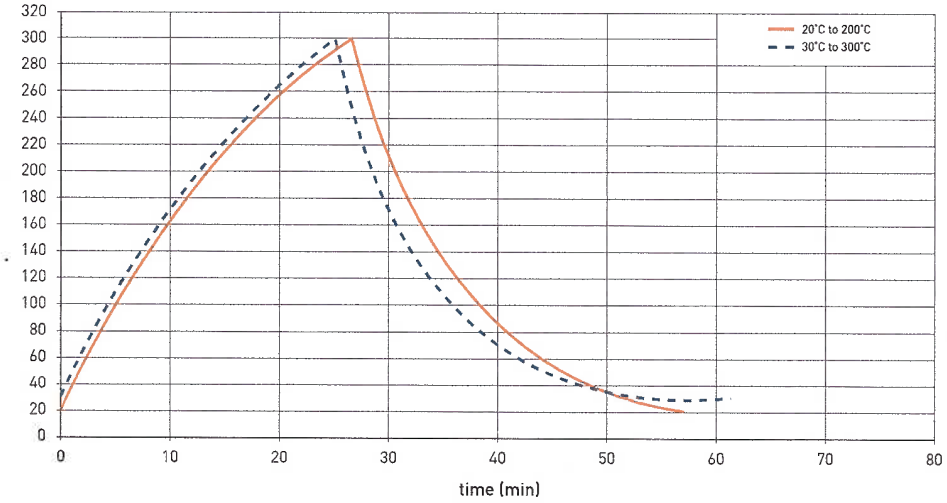
ATT Ambient Option Specifications, 200 mm

	Forced Ambient	Ambient
Temperature range	+ 20°C to 300°C	+ 30°C to 300°C
Transition time - Heating	27 min (typical)	25 min (typical)
Transition time - Cooling	31 min (typical)	36 min (typical)
Temperature resolution	0.1°C	0.1°C
Audible noise	< 60 dB(A)*	< 60 dB(A)

* Forced Ambient system uses a Booster chiller. Noise measured while cooling (0.4 m from MicroChamber load door).

ATT Thermal Transition Time

Typical times using T200-STA-AP with FemtoGuard Chuck.



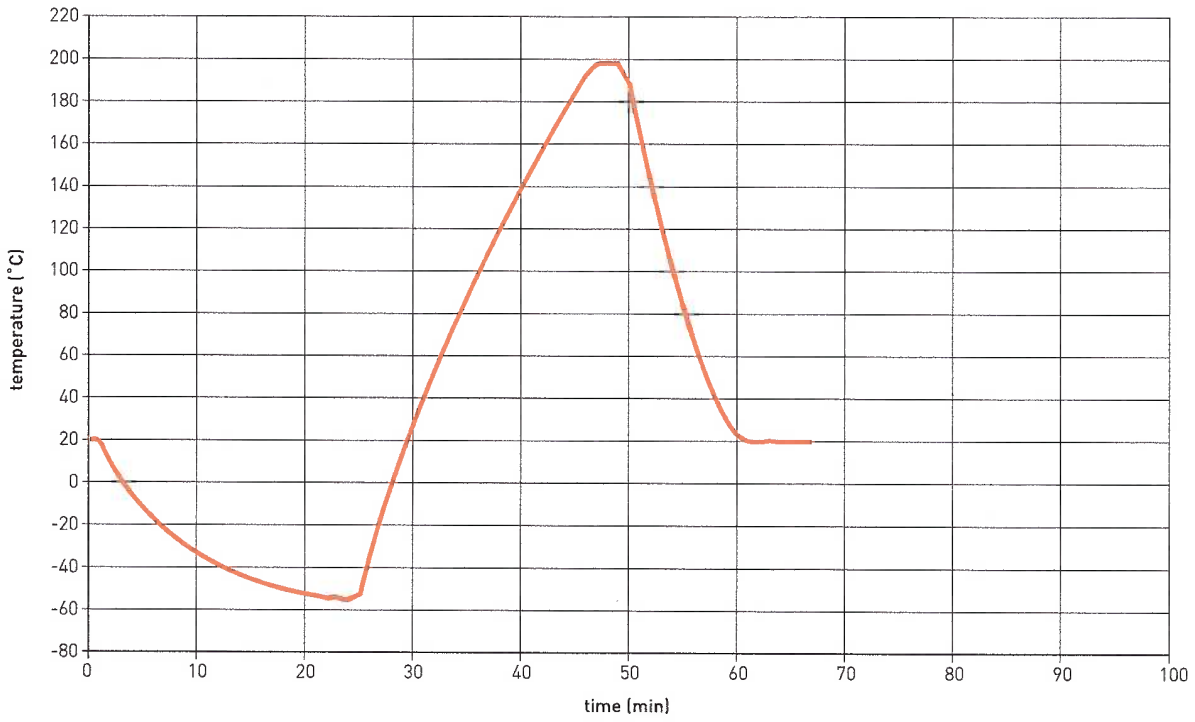
THERMAL OPTIONS AND PERFORMANCE

ERS AirCool3 Thermal System Specifications, 200 mm

Temperature range	-55°C to 300°C
Transition time – Heating	-55°C to 25°C: 6 min (typical), 25°C to 300°C: 30 min (typical)
Transition time – Cooling	300°C to 25°C: 15 min (typical), 25°C to -55°C: 23 min
Temperature uniformity	≤ 0.5°C @ 25°C, ≤ 2.0°C @ -55°C, ≤ 2.0°C @ 200°C
Temperature resolution	0.1° C
Audible noise	< 58 dB(A)

ERS Thermal Transition Time (-55°C to 300°C)

Typical times using T200-STA-AP with FemtoGuard Chuck.



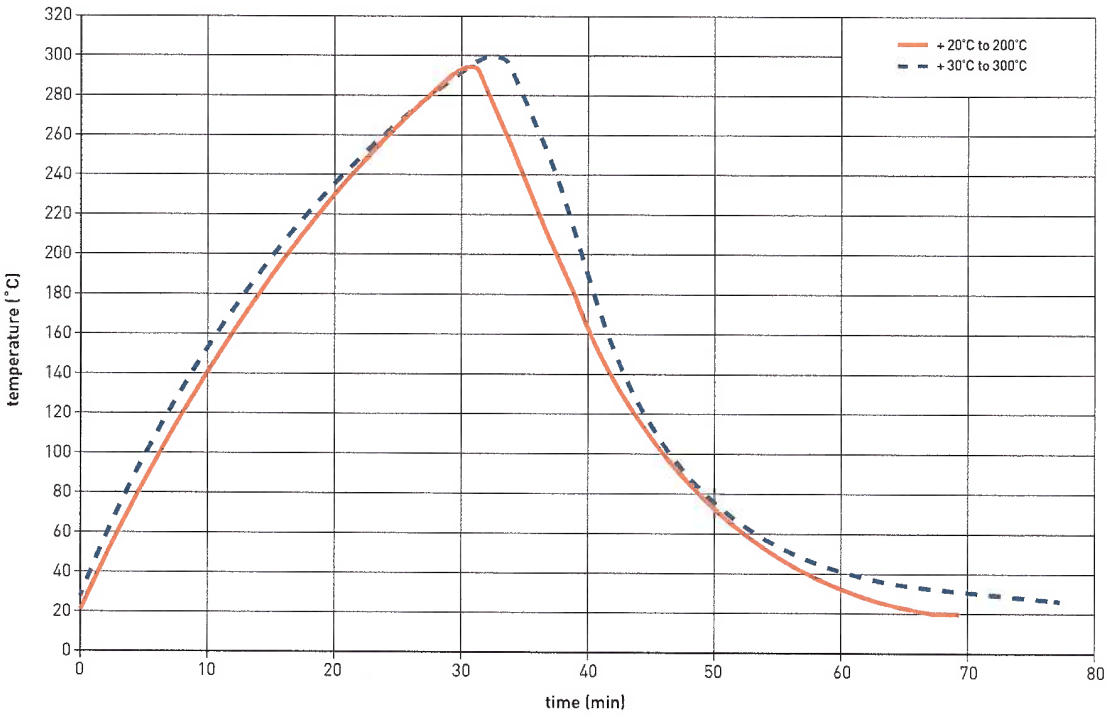
THERMAL OPTIONS AND PERFORMANCE

ERS AirCool3 Ambient Option Specifications, 200 mm

	Forced Ambient	Ambient
Temperature range	+ 20°C to 300°C	+ 30 to 300°C
Transition time - Heating	30 min (typical)	30 min (typical)
Transition time - Cooling	35 min (typical)	40 min (typical)
Temperature resolution	0.1°C	0.1°C
Temperature uniformity	≤ 0.5°C @ 30°C, ≤ 3.0°C @ 300°C	≤ 0.5°C @ 30°C, ≤ 3.0°C @ 300°C
Audible noise	< 58 dB(A)	< 58 dB(A)

ERS Thermal Transition Time

Typical times using T200-STA-AP with FemtoGuard Chuck.



AVAILABLE STATION MODELS

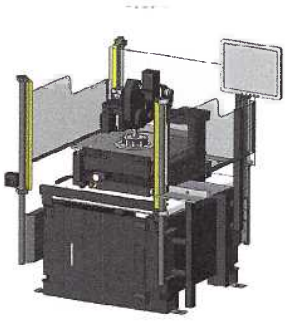
Tesla Semi-automated 200 mm Probe Station	P/N T200-STA-AP	P/N T200-STA-M
MicroChamber for dark, dry and enhanced EMI-shielding enclosure	●	●
PureLine™ technology for premium signal path fidelity	●	N/A
AttoGuard® for enhanced I-V and C-V testing	●	N/A
Roll-out wafer stage for safe and easy wafer loading	●	●
High-stability platen with linear lift	●	●
Four-axis precision motorized stage	●	●
User guides, tools and accessories	●	●
Universal power cord kit	●	●
Velox probe station control software	●	●
Complete automation tools – AutoAlign, AutoDie, AutoXYZT correction	●	●
Thermal control, video window, wafer map, remote access	●	●

Tesla Manual 200 mm Probe Station	P/N T200M-STA-AP	P/N T200M-STA-M
MicroChamber for dark, dry and enhanced EMI-shielding enclosure	●	●
PureLine technology for premium signal path fidelity	●	N/A
AttoGuard for enhanced I-V and C-V testing	●	N/A
Roll-out wafer stage for safe and easy wafer loading	●	●
High-stability platen with linear lift	●	●
Precision manual X-Y stage	●	●
User guides, tools and accessories	●	●

TESLA SAFETY SYSTEMS

Select one of the **Required** safety systems for the station configuration:

Part Number	Description
170-750	Clear safety enclosure package for Tesla 200 mm on-wafer power device characterization system
151-461	Laser infrared safety light curtain package for Tesla 200 mm on-wafer power device characterization system



T200 with a laser infrared safety light curtain option

T200 with a clear safety enclosure option

AVAILABLE CHUCK MODELS

To complete the station configuration:

1. Select a modular chuck from the following non-thermal or thermal list.
2. Select a matching thermal system if a thermal chuck is desired.

Tesla Non-Thermal Chucks

		Chuck Compatibility	
Part Number	**General Description**	**AP**	**M**
TC-002-202	FCoaxial Tesla chuck, non-thermal, 200 mm (8"), Au		●
TC-002-402	FemtoGuard triaxial Tesla chuck, non-thermal, 200 mm (8"), Au	●	●

Tesla Thermal Chucks

			Chuck Compatibility	
Part Number	**General Description**	**Cooling**	**AP**	**M**
TC-402-202	Coaxial Tesla chuck, thermal, -50°C to 200°C, 200 mm (8"), Au	Liquid		●
TC-412-202	Coaxial Tesla chuck, thermal, -55°C to 300°C, 200 mm (8"), Au	Air		●
TC-402-402	FemtoGuard triaxial Tesla chuck, standard, -50°C to 200°C, 200 mm (8"), Au	Liquid	●	●
TC-412-402	FemtoGuard triaxial Tesla chuck, standard, -55°C to 300°C, 200 mm (8"), Au	Air	●	●
TC-232-502	FemtoGuard triaxial Tesla chuck, high current (600 A), -55°C to 300°C, 200 mm (8"), Au	Air	●	●

Tesla Thermal Systems

Part Number	**General Description**	**Cooling**
TS-412-05T	Thermal system for Summit™ / Tesla, 20°C to 300°C (100-230 VAC 50/60 Hz)	Air
TS-412-02T	Thermal system for Summit / Tesla, 30°C to 300°C (100-230 VAC 50/60 Hz)	Air
TS-412-14P	Thermal system for Summit / Tesla, -60°C to 300°C (100-230 VAC 50/60 Hz)	Air
TS-402-07R	Thermal system for Summit / Tesla, -55°C to 200°C (208 VAC 60Hz)	Liquid
TS-402-07E	Thermal system for Summit / Tesla, -55°C to 200°C (230 VAC 50Hz)	Liquid
TS-232-05T	Thermal system for Tesla with high current chuck, 20°C to 300°C (100-230 VAC 50/60 Hz)	Air
TS-232-02T	Thermal system for Tesla with high current chuck, 30°C to 300°C (100-230 VAC 50/60 Hz)	Air
TS-232-14P	Thermal system for Tesla with high current chuck, -60°C to 300°C (100-230 VAC 50/60 Hz)	Air

MICROSCOPE MOUNT OPTIONS

Tesla 200 mm Station Platform

	P/N 162-165	P/N 162-160
High-stability bridge/transport	Programmable	Manual
Travel X-Y	50 mm x 50 mm (2 inch x 2 inch)	50 mm x 50 mm (2 inch x 2 inch)
Travel X-Y in TopHat™	13 mm x 13 mm (0.5 inch x 0.5 inch)	13 mm x 13 mm (0.5 inch x 0.5 inch)
Type	Stepper motor with closed-loop encoder system	N/A
Resolution X-Y	0.4 µm (0.016 mils)	5 mm (0.2 inch)/turn, coaxial XY control
Repeatability X-Y	≤ 2 µm (0.08 mils)	N/A
Accuracy X-Y	≤ 5 µm (0.2 mils)	N/A
Speed X-Y	5 mm (0.2 inch)/second	N/A
Planarity	10 µm (0.4 mils) over full travel with 5 kg (11 lb.) load	10 µm (0.4 mils) over full travel with 5 kg (11 lb.) load
Z gross lift	4" vertical lift, pneumatic with up/down, for easy probe access	4" vertical lift, pneumatic with up/down, for easy probe access
Z gross repeatability	1 µm (0.04 mils)	1 µm (0.04 mils)
Z focus	Coarse/fine focus uses microscope system, programmable focus available	Coarse/fine focus uses microscope system
LASER compatible	Yes	Yes

STATION CONTROLLER

P/N 125-014	System controller with Nucleus™ / Windows XP
P/N 158-270	System controller with Velox / Windows 7

TESLA STATION ACCESSORIES

Microscope/video system
Vibration isolation table
LCD monitor and stand kit
Key board and mouse tray
Side shelf
Scope mount
Microscope objective lens
High-voltage probes / positioners
High-current probes / positioners
Chuck connectors
Interconnect accessories kit (package) for various power device analyzers
High-voltage /high-current cables and adapters

PROBING KIT

Probing kit includes necessary accessories, such as high-current/voltage probes, probe holders, positioners and interconnect cables for typical vertical and lateral device measurement setup.

Probing Kit for Keysight B1505A

Item	Description
High-current probe package	HCP high-current parametric probe holder with BNC connector (quantity of two)
	Replaceable probe tips (box of five)
	Probe micropositioner (quantity of two)
High-voltage probe package with Kelvin sense capability	HVP high-voltage parametric probe holders with SHV connectors (quantity of three), or with Keysight triaxial connectors (quantity of two)
	Replaceable probe tips (box of 25)
	Probe micropositioner (quantity of five)
System interface panels	Keysight B1505A accessory mounting kit
Cables	Basic cable kit for Keysight B1505A accessory connection, including probe-to-panel, panel-to-chuck and chuck-to-instruments cables

Probing Kit for Keithley Equipment 236/237

Item	Description
High-current probe package	HCP high-current parametric probe holder with banana jack (quantity of two)
	Replaceable probe tips (box of five)
	Probe micropositioner (quantity of two)
High-voltage probe package with Kelvin sense capability	HVP high-voltage parametric probe holders with Amphenol triaxial connectors (quantity of three)
	Replaceable probe tips (box of 25)
	Probe micropositioner (quantity of three)
System interface panels	High-voltage interface panel (triaxial)
	High-current interface panel
Cables	High-voltage triaxial cable package, including probe-to-panel, panel-to-instrument and chuck-to-instruments cables

REGULATORY COMPLIANCE

Certification	TÜV certified for US and Canada, CE, SEMI S2 and S8

WARRANTY

Warranty*	Fifteen months from date of delivery or twelve months from date of installation
Service contracts	Single and multi-year programs available to suit your needs

*See Cascade Microtech's Terms and Conditions of Sale for more details.

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Data subject to change without notice

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Positioners

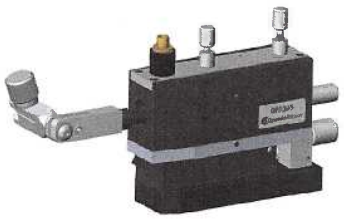
Product Overview

Cascade Microtech offers a wide variety of manual and motorized probe positioners for any application from DC to 500 GHz and beyond, as well as positioners specifically designed for RF/microwave, sub-micron and MEMS applications.

MANUAL POSITIONERS

DPP105-PTH

Feature resolution	5 µm
Travel range (X / Y / Z)	8 mm / 6 mm / 25 mm
Screw resolution* (X / Y / Z)	350 µm / 500 µm / 1000 µm
Mounting	Vacuum, magnetic
Footprint (W x D)	60 mm x 20 mm
Station compatibility	Summit™
Application	Basic IV probing Ideal for applications that require more than eight positioners



DPP105-AI-S

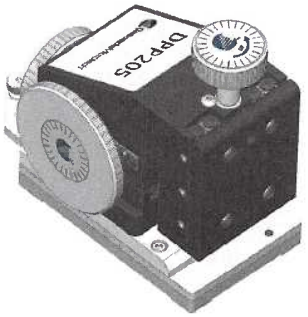
Feature resolution	5 µm
Travel range (X / Y / Z)	8 mm / 6 mm / 25 mm
Screw resolution* (X / Y / Z)	350 µm / 500 µm / 1000 µm
Mounting	Vacuum, magnetic
Footprint (W x D)	60 mm x 20 mm
Station compatibility	PM5, PM8, PM300, PA200, PA300
Application	Basic IV probing Ideal for applications that require more than eight positioners

* Axis movement per 360° lead screw rotation.

CascadeMicrotech®

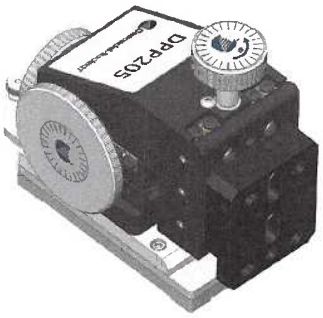
DPP205 / DPP210 / DPP220

Feature resolution	3 µm (DPP205) / 2 µm (DPP210) / 1 µm (DPP220)
Travel range (X / Y / Z)	12.5 mm / 12.5 mm / 12.5 mm
Screw resolution* (X / Y / Z)	500 µm / 500 µm / 500 µm (DPP205) 250 µm / 250 µm / 250 µm (DPP210) 125 µm / 125 µm / 125 µm (DPP220)
Mounting	Vacuum, magnetic
Footprint (W x D)	90 mm x 60 mm
Station compatibility	Tesla, Elite™ 300, PA300 MicroAlign™, Summit
Application	IV/CV probing Failure analysis



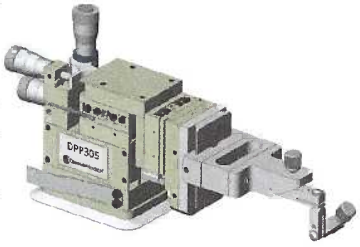
DPP205-S / DPP210-S / DPP220-S

Feature resolution	3 µm (DPP205-S) / 2 µm (DPP210-S) / 1 µm (DPP220-S)
Travel range (X / Y / Z)	12.5 mm / 12.5 mm / 12.5 mm
Screw resolution* (X / Y / Z)	500 µm / 500 µm / 500 µm (DPP205-S) 250 µm / 250 µm / 250 µm (DPP210-S) 125 µm / 125 µm / 125 µm (DPP220-S)
Mounting	Vacuum, magnetic
Footprint (W x D)	90 mm x 60 mm
Station compatibility	PM5, PM8, PM300, PA200, PA300, BlueRay™
Application	IV/CV probing Failure analysis



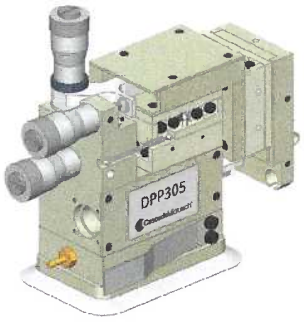
DPP305-PTH / DPP310-PTH

Feature resolution	0.5 µm
Travel range (X / Y / Z)	10 mm / 10 mm / 8 mm
Screw resolution* (X / Y / Z)	500 µm / 500 µm / 500 µm (DPP305-PTH) 250 µm / 250 µm / 250 µm (DPP310-PTH)
Mounting	Vacuum, magnetic
Footprint (W x D)	75 mm x 50 mm
Station compatibility	Elite, Summit
Application	High-precision and high-resolution probing High-performance IV/CV probing and failure analysis Internal node probing



DPP305-S / DPP310-S

Feature resolution	0.5 µm
Travel range (X / Y / Z)	10 mm / 10 mm / 8 mm
Screw resolution* (X / Y / Z)	500 µm / 500 µm / 500 µm (DPP305-S) 250 µm / 250 µm / 250 µm (DPP310-S)
Mounting	Vacuum, magnetic
Footprint (W x D)	75 mm x 50 mm
Station compatibility	PM5, PM8, PM300, PA200, PA300, PA300 MicroAlign
Application	High-precision and high-resolution probing High-performance IV/CV probing and failure analysis Internal node probing



* Axis movement per 360° lead screw rotation.

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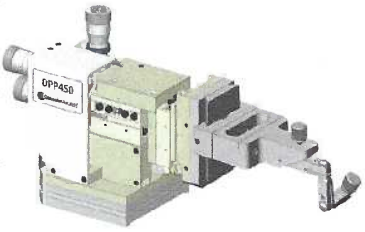
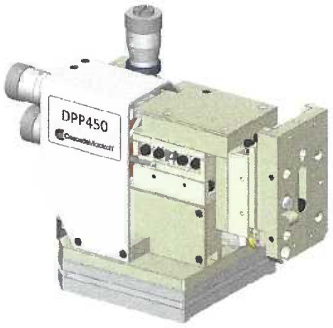
DPP450-PTH

Feature resolution	0.2 µm
Travel range (X / Y / Z)	10 mm / 10 mm / 8 mm
Screw resolution* (X / Y / Z)	500 µm / 500 µm / 500 µm, 5 µm / 5 µm / 5 µm (Fine adjustment screws)
Mounting	Vacuum, magnetic
Footprint (W x D)	75 mm x 50 mm
Station compatibility	Elite, Summit
Application	High-resolution probing High-performance IV/CV probing and failure analysis High-performance internal node probing



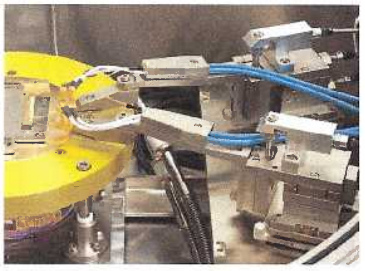
DPP450-S

Feature resolution	0.2 µm
Travel range (X / Y / Z)	10 mm / 10 mm / 8 mm
Screw resolution* (X / Y / Z)	500 µm / 500 µm / 500µm, 5 µm / 5 µm / 5 µm (Fine adjustment screws)
Mounting	Vacuum, magnetic
Footprint (W x D)	75 mm x 50 mm
Station compatibility	PM5, PM8, PM300, PA200, PA300, PA300 MicroAlign
Application	High-resolution probing High-performance IV/CV probing and failure analysis High-performance internal node probing



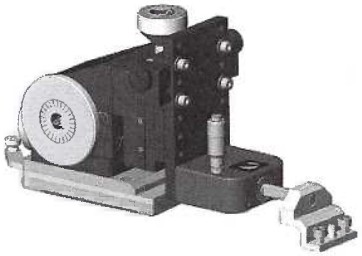
VCP110

Feature resolution	3 µm
Travel range (X / Y / Z)	12 mm / 12 mm / 12 mm
Screw resolution* (X / Y / Z)	250 µm / 250 µm / 250 µm
Mounting	Magnetic
Footprint (W x D)	65 mm x 65 mm
Station compatibility	PLV50, PLC50, PMV200, PAV200, PMC200, PAC200
Application environment	IV/CV/RF probing and failure analysis in vacuum/cryogenic



RPP210-AI

Feature resolution	3 µm
Travel range (X / Y / Z)	12.5 mm / 12.5 mm / 12.5 mm
Screw resolution* (X / Y / Z)	250 µm / 250 µm / 250 µm
Mounting	Vacuum, magnetic
Footprint (W x D)	90 mm x 60 mm
Station compatibility	Summit
Application	RF and multi-contact/mixed-signal probing Versatile wafer level reliability probing



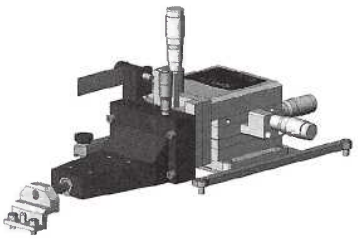
RPP210-S

Feature resolution	3 µm
Travel range (X / Y / Z)	12.5 mm / 12.5 mm / 12.5 mm
Screw resolution* (X / Y / Z)	250 µm / 250 µm / 250 µm
Mounting	Vacuum, magnetic
Footprint (W x D)	90 mm x 60 mm
Station compatibility	PM5, PM8, PM300, PA200, PA300, BlueRay, PA300 MicroAlign
Application	RF and multi-contact/mixed-signal probing Versatile wafer level reliability probing

* Axis movement per 360° lead screw rotation.

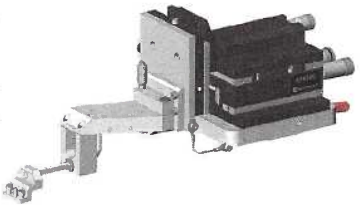
RPP304-SU-AI

Feature resolution	3 µm
Travel range (X / Y / Z)	12 mm / 12 mm / 12 mm
Screw resolution* (X / Y / Z)	1000 µm / 1000 µm / 1000 µm
Mounting	Bolt down
Footprint (W x D)	133 mm x 147 mm
Station compatibility	Summit, Tesla 200
Application	High-performance RF, multi-contact/mixed signal probing High-performance versatile wafer-level reliability probing Single-ended broadband/mmWave, THz, source/load pull, RF noise probing



RPP305-EL-AI

Feature resolution	3 µm
Travel range (X / Y / Z)	25 mm / 25 mm / 10 mm
Screw resolution* (X / Y / Z)	500 µm / 500 µm / 500 µm
Mounting	Bolt down
Footprint (W x D)	124 mm x 124 mm
Station compatibility	Elite, Tesla 300
Application	High-performance RF, multi-contact/mixed signal probing High-performance versatile wafer-level reliability probing Single-ended broadband/mmWave, THz, source/load pull, RF noise probing



RPP305-S

Feature resolution	3 µm
Travel range (X / Y / Z)	25 mm / 25 mm / 10 mm
Screw resolution* (X / Y / Z)	500 µm / 500 µm / 500 µm
Mounting	Magnetic, bolt down
Footprint (W x D)	100 mm x 124 mm
Station compatibility	PM5, PM8, PM300, PA200, PA300, BlueRay, PA300 MicroAlign
Application	High-performance RF, multi-contact/mixed signal probing High-performance versatile wafer-level reliability probing Single-ended broadband/mmWave, THz, source/load pull, RF noise probing

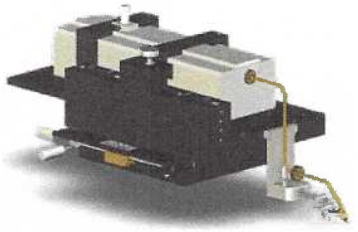
PH350HF

Feature resolution	3 µm
Travel range (X / Y / Z)	25 mm / 25 mm / 10 mm 75 mm fast X-coarse movement for coaxial measurements
Screw resolution* (X / Y / Z)	500 µm / 500 µm / 500 µm
Mounting	Bolt down
Footprint	430 mm x 334 mm
Station compatibility	PM8, PA200, PA300: Please consult factory
Application	High-performance single-ended/differential broadband/mmWave, sub-THz S-parameters, source/load pull, RF noise

* Axis movement per 360° lead screw rotation.

mmW Large Area Positioner

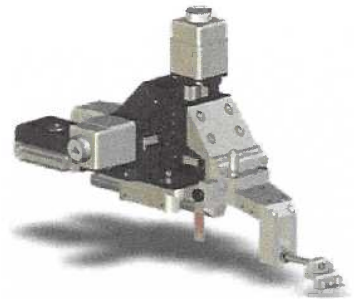
Feature resolution	3 µm
Travel range (X / Y / Z)	150 mm / 150 mm / 12.5 mm
Screw resolution* (X / Y / Z)	400 µm / 400 µm / 400 µm
Mounting	Bolt down
Footprint (W x D)	204 mm x 204 mm
Station compatibility	Elite, Summit
Application	High-performance single-ended/differential broadband/mmWave, sub-THz S-parameters, source/load pull, RF noise



MOTORIZED POSITIONERS

MS1

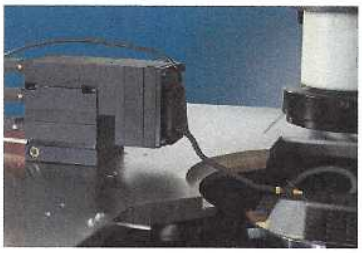
Feature resolution	3 µm
Travel range (X / Y / Z)	25 mm / 25 mm / 15 mm
Screw resolution* (X / Y / Z)	400 µm / 400 µm / 400 µm
Mounting	Bolt down
Footprint	160 mm x 148 mm
Station compatibility	Elite, Summit
Application	IV/CV, RF motorized probing Multi-contact/mixed-signal probing Versatile wafer-level reliability probing



* Axis movement per 360° lead screw rotation.

PH510

Feature resolution	3 µm
Travel range (X / Y / Z)	25 mm / 25 mm / 25 mm
Encoder resolution (X / Y / Z)	0.02 µm / 0.02 µm / 0.02 µm
Mounting	Vacuum, magnetic, bolt down
Footprint	64 mm x 122 mm
Station compatibility	PM5, PM8, PM300, PA200, PA300, BlueRay, PA300 MicroAlign
Application	IV/CV, RF motorized probing Multi-contact/mixed-signal probing Versatile wafer-level reliability probing



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CascadeMicrotech

eVue

Digital Imaging System

DATA SHEET

The eVue™ digital imaging system is optimized for on-wafer test with Cascade Microtech's probe stations. The revolutionary multi-optical path, multi-camera design of eVue offers the perfect balance of optical resolution, digital zoom and live-motion video. The eVue utilizes 3MP cameras to enhance optical visualization and uses an increased color frame rate to ensure efficient wafer and in-die navigation. With the VueTrack™ on-site probe-to-pad alignment technology, eVue continues the tradition of innovation to increase productivity with fast navigation, set-up and unattended thermal test functionality.

With the Velox™ probe station control software, the eVue automates pattern recognition, pixel-to-micron calibration and enables a CellView feature for fast sub-die navigation. The eVue powered by Velox software enables fast and precise small-pad probing with easy point and shoot navigation, digital zoom and image capturing.

FEATURES / BENEFITS

Easy, accurate navigation	Quick, easy probe tip navigation with large field of view and high magnification Fast and precise wafer, die, sub-die and small-pad probing with multi-cam, quad-view and picture-in-picture capabilities
Productivity	Unattended testing over multiple temperatures with VueTrack technology Fast setup, navigation and data collection with Velox software
Real-time Z-profiling and XY correction	Automate small pad probing by optimizing Z-height, eliminating the potential for non-uniform probe overdrive Collect repeatable and accurate data by minimizing probe-to-probe alignment errors
Software tools for fast, accurate probe-to-pad alignment	Fast and accurate probe card alignment and planarization using multi-view function (up to 28 sub-views) Reduce measurement time using automatic RF probe tip alignment and ISS navigation
Easy image capture and export	Easy capture of high-resolution images (3 Megapixel) and ability to record live-motion views Easy export and email of image/video files

CascadeMicrotech®

OPTICAL PATH

Objective: Mitutoyo M Plan APO	Optical* path+camera	Optical path magnification	FOV X (mm)	FOV Y (mm)	Maximum image density**
2X	1	0.5	13.10	9.84	2.440
	2	2.0	3.28	2.46	
	3	5.0	1.31	0.98	
5X	1	0.5	5.24	3.94	15.252
	2	2.0	1.31	0.98	
	3	5.0	0.52	0.39	
10X	1	0.5	2.62	1.97	61.009
	2	2.0	0.66	0.49	
	3	5.0	0.26	0.20	
20X	1	0.5	1.31	0.98	244.036
	2	2.0	0.33	0.25	
	3	5.0	0.13	0.10	
50X	1	0.5	0.52	0.39	1525.228
	2	2.0	0.13	0.10	
	3	5.0	0.05	0.04	

* Maximum zoom ratio path 1 = 3.8, path 2 = 9.8, path 3 = 40

** Maximum image density is the ratio of camera array size to FOV @ 2048x1536 using optical path 3

OPTICAL APPLICATIONS

	N.A	**Resolving power***	**Working distance**	**Depth of focus**	**FOV Max eVue 40X and 10X**	**FOV Min eVue**	**Application 40X only ****		
Mitutoyo M Plan APO		µm	mm	µm	X,Y mm @ 0.5X mag	X,Y mm @ 20.0X mag	DC/CV, FA, DD	RF	Z Z Profiling
2X	0.055	5.0	34	91.00	13.10 x 9.84	0.33 x 0.25		◐	⊗
5X	0.14	2.0	34	14.00	5.24 x 3.94	0.13 x 0.09	◐	●	⊗
10X	0.28	1.0	33.5	3.50	2.62 x 1.97	0.07 x 0.05	◐	●	●
20X	0.42	0.7	20	1.60	1.31 x 0.98	0.03 x 0.02	●	◐	●
50X	0.55	0.5	13	0.90	0.52 x 0.39	0.01 x 0.01	◐		◐

● = Best, ◐ = Good, ⊗ = Not supported

* Resolving power and focal depth based on reference wavelength of 550 nm

** Minimum FOV listed is for eVue 40X models. For eVue 10X models, the minimum FOV is approximately 1/10 of the maximum FOV shown.

SOFTWARE

BASE PACKAGE	**eVue 10X and 10X PRO**	**eVue 40X and 40X PRO**
Standard Software Features	●	●
Single view (1024 x 768)	●	●
Color mode	●	●
Monochrome mode	●	●

SOFTWARE (CONTINUED)

	eVue 10X	eVue 10X	eVue 10X PRO	eVue 40X PRO
Measuring tape tool	●	●	●	●
Cross-hair tool	●	●	●	●
Image annotations, text overlays, scale indicators*	●	●	●	●
Image capture (BMP, JPG, TIFF)	●	●	●	●
Automatic pixel-to-micron video calibration (semi-auto stations)	●	●	●	●
Quick zoom toolbar, user defined presets	●	●	●	●
Manual Z-profile (with stage)	●	●	●	●
Single Z-profile map	●	●	●	●
Fast auto-gain control*	●	●	●	●
Remote focus with range indicator*	●	●	●	●
Auto focus				
Automatic Z-profile (with eVue-III)			●	●
Multiple Z-profiles (load / save)			●	●
Z-profile setup / guide			●	●
Profile using die locations			●	●
Real-time auto Z-height			●	●
Fast auto contact/separate focus tracking			●	●
Multi-view mode				
Probe card alignment tool			●	●
High-resolution video (1280 x 1024)			●	●
Camera select (1, 2)			●	●
Camera select (1, 2, 3)			●	●
Single view			●	●
Multi-window views			●	●
Primary + 3, 5, 6, 7, 16, 28 sub views*			●	●
Multi-cam mode				
Single view			●	●
Single view with magnifier			●	●
Picture-in-Picture view (PIP)			●	●
Dual view			●	●
Quad view (3 camera visualizer with pan and zoom)			●	●
Vertical / horizontal setup			●	●

*Requires Nucleus™ 4.1 or Velox 2.0 or later

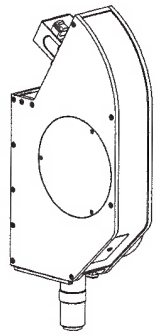
HARDWARE

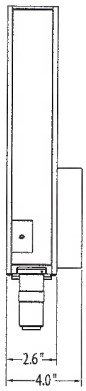
	eVue 10X	eVue 40X	eVue 10X PRO	eVue 40X PRO
Zoom range	0.5 - 5.0	0.5 - 20.0	0.5 - 5.0	0.5 - 20.0
Zoom resolution	0.1X through zoom range			
Zoom features	Par focal, Par centric, and Par theta throughout zoom range			
Remote focus resolution	0.2 µm	0.2 µm	0.2 µm	0.2 µm
Remote focus range	2 mm	2 mm	2 mm	2 mm
Auto focus			Yes	Yes
Optical path+camera	Two cameras	Three cameras	Two cameras	Three cameras
Imaging technology	Color imaging			
Illumination system	LED (solid state, long life) illumination system			
Standard video frame rates (1024 x 768)				
Color / Monochrome	45.5 fps	45.5 fps	45.5 fps	45.5 fps
High-resolution video frame rates (2048 x 1536)				
Color / Monochrome			13.1 fps	13.1 fps
Auto objective identification	Yes, when using intelligent objective mount			

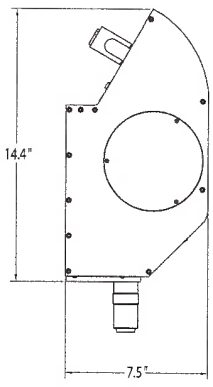
*Frame rates are typical values in frames per second (fps) and are effected by the scene being viewed, zoom ratio and camera exposure settings in the eVue system software.

HARDWARE / REQUIREMENTS

Weight	3.72 kg (8.2 lbs) without focus block
LED lamp life	5000 hours average (3-4 years typical usage @ 25°C)
Operating conditions	
Voltage	Input: 47-63 Hz, 100-240 VAC, 0.55 A (CE,UL,ETL), Output: 12 VDC, 2.08 A maximum
Temperature	+20°C to +50°C (+68°F to 122°F)
Humidity	20 to 85 %, non condensing
MTBF (mean time before failure of non-consumable parts)	30,000 (10 year useful life)
Recommended objective lenses	Mitutoyo 2X, 5X, 10X, 20X, 50X (M Plan APO, SL)
Computer requirements	Compatible with Cascade Microtech's eVue "certified" computer only







COMPONENTS INCLUDED IN ALL MODELS

Multi-CCD microscope/imager	Intelligent objective lens mount
Sub-micron programmable remote focus stage	Digital video PC interface card
Integrated LED illumination system	Video processing software
USB remote control box	Velox software integration module

AVAILABLE MODELS

	PRE-CONFIGURED PACKAGES BY PROBE STATION TYPE		
	Elite™ 300	**Summit™**	**As a station accessory**
eVue 10X	**P/N 151-521**	**P/N 151-522**	**P/N 151-523**
10X standard zoom range (two cameras)	Included	Included	Included
2" heavy duty focus block	Not required	Included	Included
High-performance computer with 20" LCD monitor	Not required	Not required	Included
eVue 40X	**P/N 151-541**	**P/N 151-542**	**P/N 141-543**
40X extended zoom range (three cameras)	Included	Included	Included
2" heavy duty focus block	Not required	Included	Included
High-performance computer with 20" LCD monitor	Not required	Not required	Included
eVue 10X PRO	**P/N 151-531**	**P/N 151-532**	**P/N 151-533**
PRO package containing three software toolkits Multi-Z (optical Z-contact system, autofocus) Multi-cam (wafer-probe navigation, picture-in-picture) Multi-view (hi-res video, probe card alignment, probe zoom views)	Included	Included	Included
10X standard zoom range (two cameras)	Included	Included	Included
2" heavy duty focus block	Not required	Included	Included
High-performance computer with 20" LCD monitor	Not required	Not required	Included
eVue 40X PRO	**P/N 151-551**	**P/N 151-552**	**P/N 151-553**
PRO package containing three software toolkits Multi-Z (optical Z-contact system, autofocus) Multi-cam (wafer-probe navigation, Picture-in-Picture) Multi-view (hi-res video, probe card alignment, probe zoom views)	Included	Included	Included
40X extended zoom range (three cameras)	Included	Included	Included
2" heavy-duty focus block	Not required	Included	Included
High-performance computer with 20" LCD monitor	Not required	Not required	Included

ACCESSORIES AND UPGRADES

P/N 131-954 INTELLIGENT OBJECTIVE LENS MOUNT

The intelligent objective lens mount is used with eVue digital imaging systems, and includes a programmable memory device for storing microscope objective lens information (magnification, N.A. (Numerical Aperture), brand, serial number, pixel-to-µm ratio). This information is read from the Intelligent Mount when inserted into the eVue digital imaging system, and is used to automatically configure and optimize performance.

P/N 131-964 UPGRADE, PRO PKG

High-performance "PRO package" upgrade for eVue digital imaging systems

This will upgrade a basic eVue system to include all the features of the PRO package eVue versions.

The eVue PRO package upgrade includes the following:

Software toolkits

- Multi-Z (optical Z-contact system, autofocus)
- Multi-cam (wafer-probe navigation, Picture-in-Picture)
- Multi-view (high-resolution video, probe card alignment, multi-needle views)

On-site installation

OBJECTIVES

P/N 102-516 Mitutoyo M Plan APO 2X Objective	●
P/N 106-762 Mitutoyo M Plan APO 5X Objective	●
P/N 102-517 Mitutoyo M Plan APO 10X Objective	●
P/N 102-518 Mitutoyo M Plan APO 20X Objective*	●
P/N 102-293 Mitutoyo M Plan APO 50X Objective*	●

● = Recommended, ◐ = Available *Not compatible with Celadon VersaTile probe cards due to the high profile of the probe card.

ACCESSORIES AND UPGRADES (CONTINUED)

VUETRACK TECHNOLOGY

The VueTrack technology provides a novel method to track probe tips and correct for drift, allowing a customer to run a probe station unattended at multiple temperatures with no operator intervention. The VueTrack technology significantly increases test productivity and test cell efficiency by eliminating the idle time between temperature transitions and automatically generating parametric and reliability data. The VueTrack technology is compatible with Cascade Microtech's Elite, Summit 12000B and S300 series of probe stations.

HTS ENHANCEMENTS

High Thermal Stability (HTS) enhancements minimize the thermal drift of the probe supporting components. They are made of high temperature stable materials such as Invar. Using HTS enhancements, transition and die soak time can be minimized to optimize the probe station's productivity.

AVAILABLE ITEMS*

VueTrack technology**

VueTrack 30-day demo license***

HTS platen

HTS probe card holder

HTS probe arms for probes (DCP or DCP-HTR or PTT needles)

HTS probe tips for DCP-HTR

VueTrack / HTS upgrade package

* Contact Cascade Microtech for details.
** Nucleus 4.1 or Velox 2.0 or later and eVue PRO model required. Contact Cascade Microtech for software upgrade and/or eVue PRO upgrade.
*** Nucleus 4.1.2 or Velox 2.0 and Cascade Microtech's on-site application training required. Contact Cascade Microtech for software upgrade and/or eVue PRO upgrade.

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Data subject to change without notice

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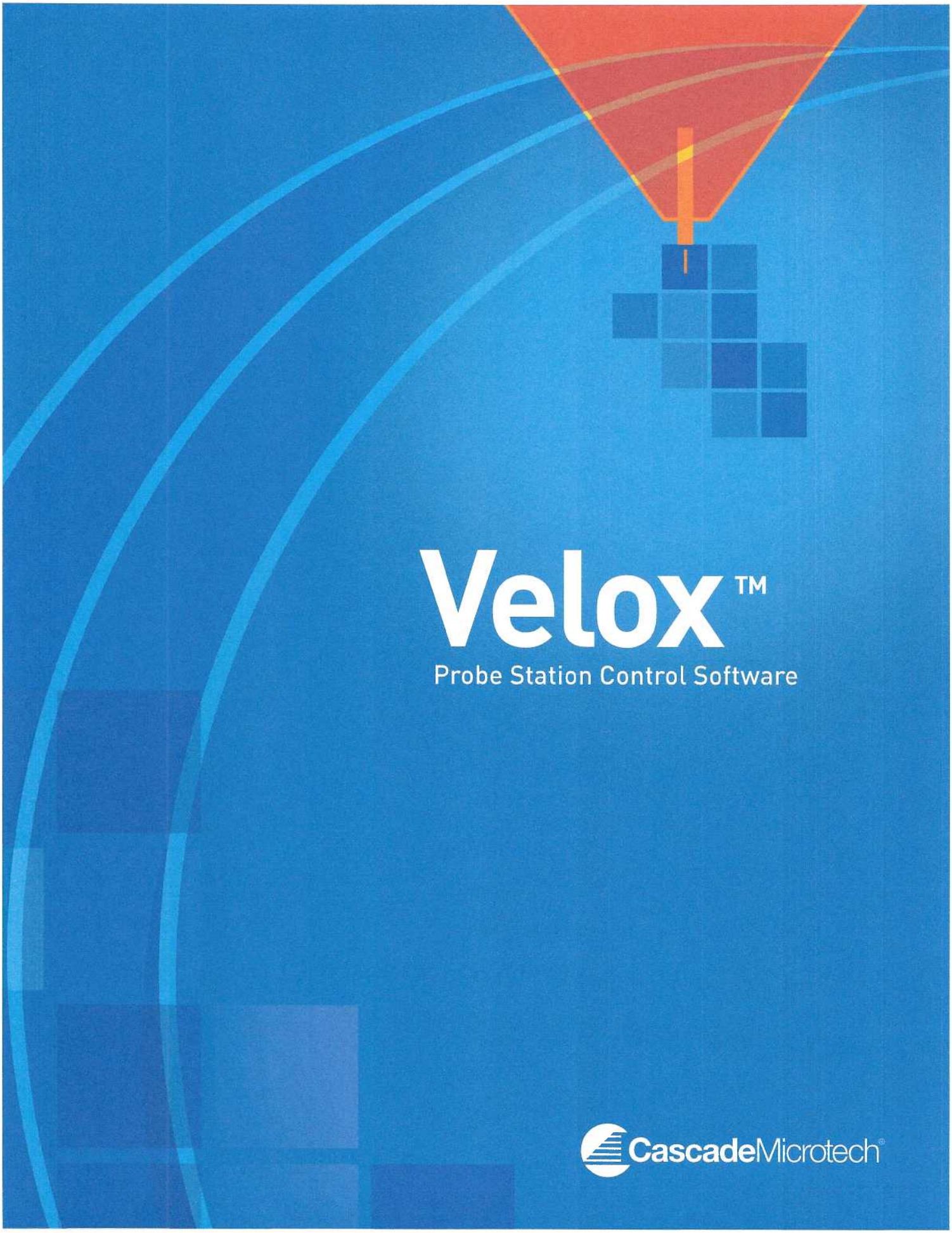

Velox™
Probe Station Control Software
CascadeMicrotech®

Introducing Velox:
It's Time to Rethink Time to Data

Emerging IC markets put mounting pressure on test facilities

New markets and new applications have created a nearly insatiable demand for devices. Just look at the numbers. The average smartphone contains 14 key IC components—and over a billion of these mobile devices will soon be sold every year. In all, nearly 60 billion ICs now ship worldwide every quarter. To meet this instiable demand, worldwide fab capacity is set to soar to over 220 million units when measured in 200 mm wafers. At the same time, fab costs will skyrocket to support processes shrinking down to 10 nm, 7 nm and 5 nm.

It's no wonder that labs everywhere are under mounting pressure. Often, an entire fab line stays idle while waiting to tweak its process based on your lab's test results. You need to deliver the right data, and you need to deliver it right now.

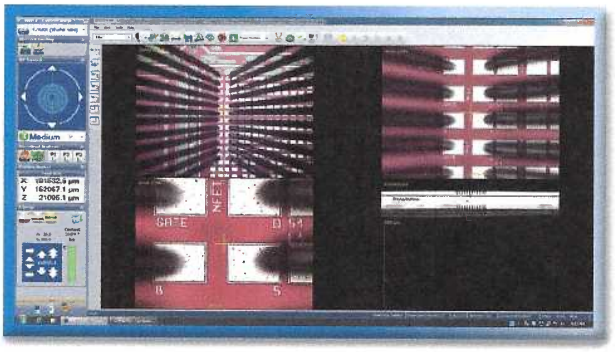
At the same time, you're expected to extract the utmost efficiency from your equipment. You need to keep costs at a minimum, yet produce maximum performance in terms of speed and accuracy during testing. All of your hardware needs to continually earn a solid return on investment. Each operator needs the means to contribute their individual best, regardless of their particular skill level.

And if all this isn't enough, you need to keep your eye on the future and plot a reliable course for anticipated growth, both in people and technology.

Velox integrates and focuses your lab's performance like never before

Velox delivers a universal software solution that applies to all probe stations from Cascade Microtech. It incorporates the best of the previous generation of probe station control software—Nucleus™ and ProberBench™—and then goes a big step further by compressing your time-to-data to an absolute minimum. Velox focuses the lab's operations and engineering expertise, and promotes closer collaboration.

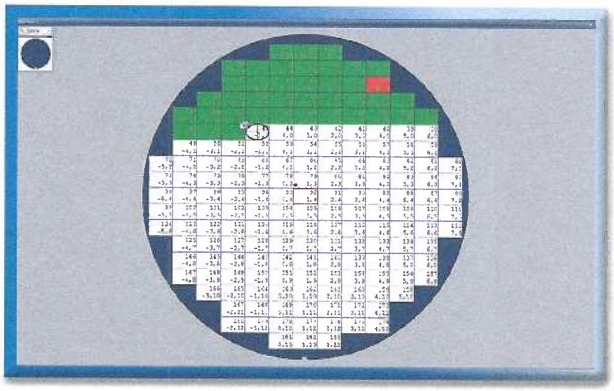
It permits broad flexibility in terms of operation. It accommodates scalable levels of automation, from programmable stage movements, to automated wafer handling. It gets the most out of your probe station hardware. And Velox provides a solid and secure operating platform, giving you long-term continuity. Velox accommodates future requirements that preserve your knowledge base going forward.



One lab, one software solution

Numerous studies have shown that when groups of professionals interface with applications through a single operating platform, it enhances their efficiency. Windows and the Mac OS are the classic examples, but wafer-level test applications are no exception. By merging the outstanding features of Nucleus and ProberBench, Velox creates a single control system for your entire lab. Engineers exchange their expertise on common ground. New users come up to speed faster. Experienced users mine the depth of the Velox feature set quickly. And all users find their individual style of operation easily accommodated.

The Velox probe station control software runs on Microsoft's Windows 7, an established standard in both industry and business. This way, you gain long-term continuity when it comes to future versions of Velox. Accordingly, we have committed to upgrades that both refine and expand the software's capabilities. With Velox, you can anticipate future requirements with confidence. And since Velox is backwards compatible with your Cascade Microtech probe stations, you can preserve and protect your current hardware investment.



Faster time to data through advanced automation

Velox puts a wide range of automation capabilities right at your fingertips. You can easily automate tasks such as wafer alignment, probe navigation, temperature control and pattern recognition of multiple instances. Plus, the VeloxPro™ option enhances full automation of wafer processing through customizable sequencing of loading, aligning and wafer stepping. In effect, the entire test sequence and data extraction process can be automated from end-to-end.

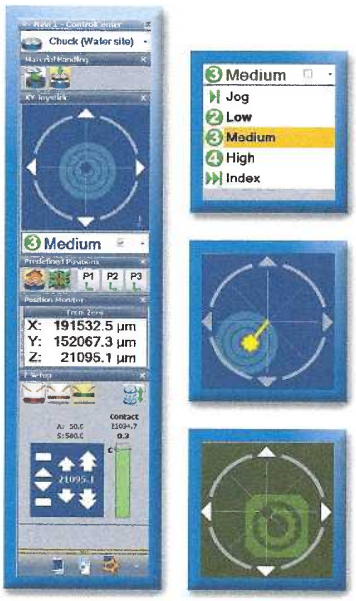
With Velox, you can accelerate your test cycles to their peak—and still have the utmost confidence in your data.

Know Where You're Going Before You Get There

The most efficient path from one operation to the next

When designing Velox, we envisioned a central hub and applied it to the operation of probe stations. The idea is simple enough: You work better if you have a single location that you always arrive and depart from as you progress through probe setup and execution.

The Velox ControlCenter gives you a conceptual anchor as you work. No matter what you're doing, you have the entire spectrum of probe station controls just a single click away. No detours, no delays.

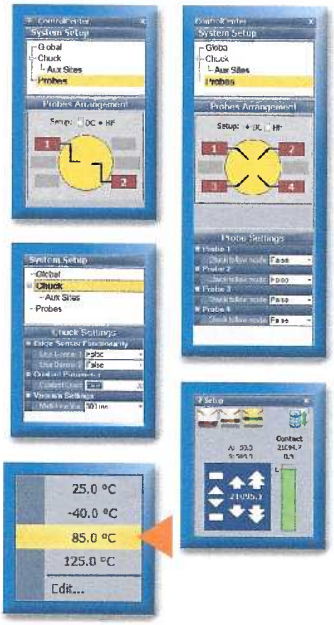


Continuous Visual Monitoring of Probe Locations

Fast, simple visual reference points

The toolbar is the central point of all project management, while the ControlCenter aides with wafer loading and device-specific settings. It's graphical and intuitive as well as customizable. You have a single visual representation in the form of an iconic joystick to initiate probe movements in the X and Y axes. It includes sliders that ensure you move with precision and accuracy in the anticipated direction. All the while, you're presented with continuous numerical feedback on your present location in the X, Y and Z axes. And at the outset, wizards provide assistance to automate alignment and index calculations.

At the same time, ControlCenter graphically represents Z-axis moves with three buttons for contact, separation and alignment. There are three additional buttons for continuous Z-up/ Z-down movements. Probe placement speed, jog size, separation and alignment can all be individually adjusted.



The ControlCenter interface also gives you access up to six motorized probe positioners, so you can even automate multi-product or multi-device testing.

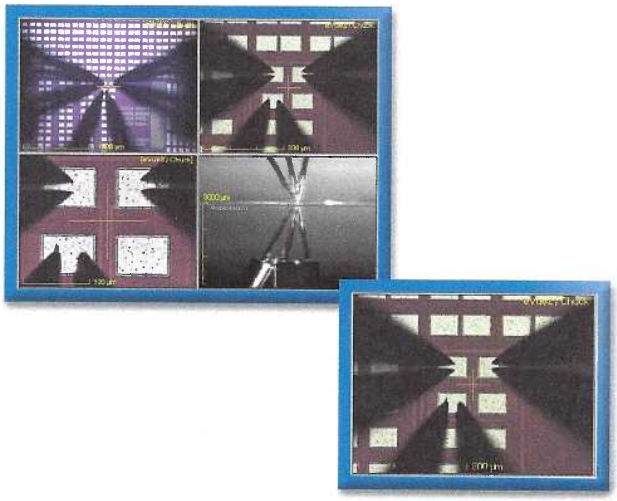
Automated temperature control

Many probe scenarios call for testing over a range of temperatures, and ControlCenter responds with a feature set that enables automation of the process. You can preset four different temperatures, define the soak time between each setting, and compensate for thermal expansion.

Maintain a large field-of-view during probe placement

The Velox Vision System acts as a powerful aid in wafer navigation, probe placement, wafer alignment, and sub-die navigation. It gets you where you want to go faster, and delivers more information once you arrive. Velox seamlessly works with the eVue™ multi-camera architecture to provides the perfect balance of optical resolution, digital zoom and live-motion video. You realize a new level of optical clarity all the way from the whole die down to the smallest structures.

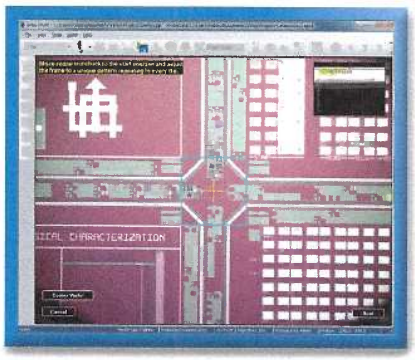
The Vision System's multiple views give you an instant context for the probe needle's position on the wafer. eVue's multi-camera mode presents you with simultaneous low-, medium- and high-magnification video of the probe needle in its current position. Seamless zoom through the camera's full optical and digital range gives you added speed and precision during probe-to-pad alignment. And the eVue PRO option adds a 2048 x 1536 megapixel mode, plus auto-focus and auto-exposure.



***ControlCenter:** Puts you in complete control. A central dashboard for project management, wafer loading and device-specific settings.*

Powerful wafer alignment tools

The Velox Vision System brings a new level of automation to wafer alignment and pre-contact probe placement. The key to this advance is innovative pattern recognition software, which provides a built-in point of reference on the wafer surface. With this geometrical anchor established, it goes on to perform the required calculations for die size and corrective maneuvers.



Wafer alignment becomes automatic, and corrected XY placement is performed on-the-fly before contact occurs. Our eVue Digital Imaging System extends this capability to the Z-axis, resulting in faster, safer probe placement than previously possible.

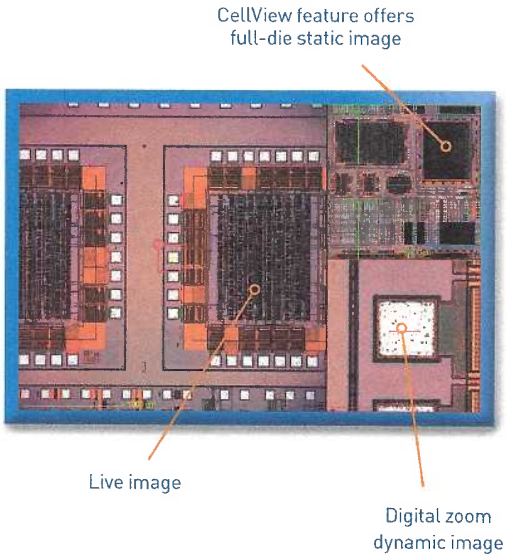
For all probe placement and wafer alignment tasks, the Velox Vision System features point-and-shoot navigation, which streamlines and simplifies maneuvering on the wafer surface.

With CellView, you maintain a constant point of reference

A common problem has been the loss of visual reference points during sub-die navigation. You have to leave the area of interest and zoom out to re-orient yourself. Once you have obtained your next touchdown location, then zoom in.

CellView solves this problem by automatically tracking your present location at multiple scales of reference. You always have a static image of the full die, along with a live image of the area of interest, and a dynamically zoomed view of the pad or feature in question. Click on any feature in the die overview, and the chuck automatically travels there on the live video and memorizes the location. It makes sub-die alignment nearly instantaneous.

CellView builds a stitched image of the overall device and allows quick on-screen navigation across the entire die layout. You realize ultra-fast sub-die alignment through point-and-shoot image capture.

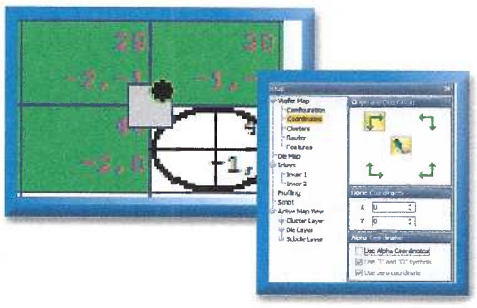


***Velox Vision System:** Complete and continuous visual access to probes and wafer surfaces. Realize quicker navigation and improved accuracy.*

Chart Your Journey Across the Wafer with Unparalleled Accuracy

Wafer Map gives you a global point of view

To create an optimized probing pattern, you need to have the big picture in plain view. Wafer Map does this through a graphic representation of the entire wafer surface. Easily identify your current location, and from this global perspective you can rapidly define the probe's path of travel during testing. A concise setup window lets you identify starting locations, probing patterns and stepping sequences, all optimized for maximum efficiency. Plus Wafer Map lets you test die all the way to the wafer's edge.



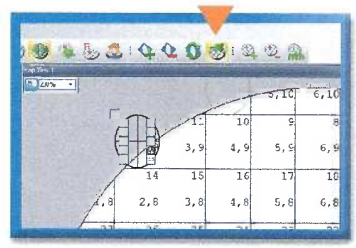
Also, you can stay on top of complex probing operations with automatic binning, automated statistical accumulation, and the storage of unlimited die and sub-die definitions. No wafer is too complicated - no probe strategy too dense.

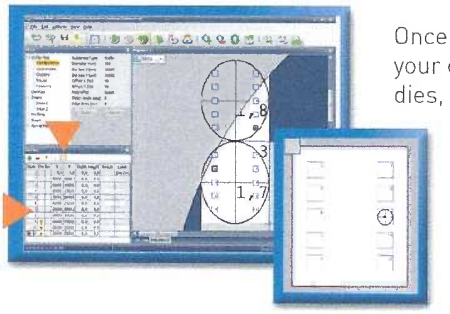
Sub-die mapping clarifies a wafer's outer edge

Once you reach the edge of a wafer, you have to deal with different subsets of the probe points assigned to each die. Further, each of these sub-die variants will differ in how critical they are to gathering relevant test data.

***Wafer Map:** Quickly develop an optimized probing strategy for die, sub-die and Z-axis.*

Velox's sub-die mapping feature streamlines both the definition and ranking of all sub-dies on the wafer. Sub-dies can easily be configured and adjusted to each individual die and gather data from the critical edge dies. You have a choice of both automatic and manual operation. In the manual mode, you can travel along the wafer's edge and graphically define contact points through simple point-and-shoot navigation. The automatic mode offers a time-saving alternative when applicable.



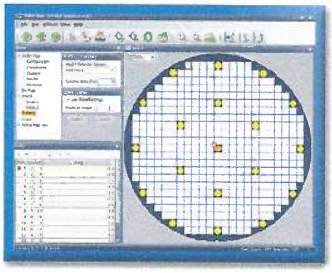


Once you've completed your census of sub-dies, you can quickly organize them in order of priority during probing, and disable those that don't contribute to test results.

Keep your Z-axis within normal limits

The closer you get to a wafer's surface, the more variable its topography becomes. And microscopic differences can quickly create macroscopic problems if you don't properly account for variations in the contact height. Velox resolves this issue with Z-Profiling, which substantially improves the probe's contact consistency, preserving data integrity.

Z-Profiling employs auto-focus and edge sensing to automatically define Z-axis offsets for different points on the wafer. It then goes a step further by interpolating the Z-axis delta as you move between these profile points. For repeatable chuck positions, you now have a complete picture of probe height, including compensation for thermal changes and wafer flatness.

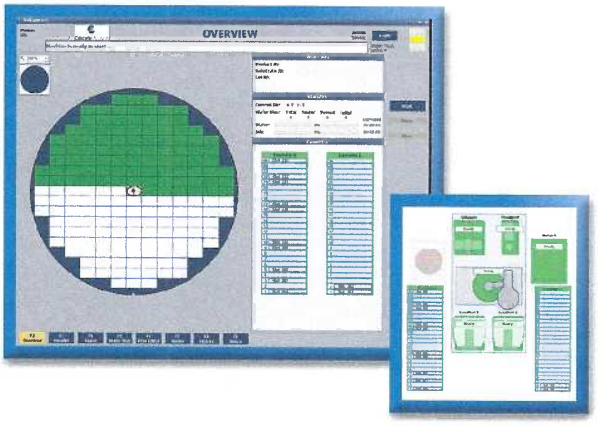


We've Automated the Process of Automation

VeloxPro enables true test cycle automation

It's one thing to have the capability to automate an entire test cycle, and quite another to actually make it happen. In response, we offer VeloxPro, a unique software option that simplifies and automates many of the steps required to define a fully-automated probe sequence. VeloxPro is a SEMI E95-compliant user interface.

From wafer handling through stepping and probe contact, VeloxPro provides a guided user workflow to achieve full automation. Alignment, temperature control and Z-Profiling are also defined along the way. A set of graphical windows display the wafer and cassette maps, and updates to reflect pass/fail progress when the test cycle executes. VeloxPro even supports multiple wafer types within a cassette to enable the automation of measurements on multiple devices. The wafer hot swap feature allows removal of the cassette and replacement of the wafer during the test cycle without interrupting the test process. With VeloxPro, you get the fastest possible time-to-job-completion, even in mixed-signal environments.



Two-way traffic with test instrumentation

No probe station control software lives in a vacuum, and neither does VeloxPro. WaferSync™ provides the final step to integrate Velox probe station control software and test executive programs. VeloxPro lets you build a bridge to Keysight Technologies' WaferPro Express for automated over temperature test. You achieve a two-way channel of communication that synchronizes data acquisition with probing processes such as locating the wafer's home die, stepping to each die, conducting sub-die operations and automatic calibration with WinCal XE™. No need for additional programming. All described and executed while you are connected to WaferPro Express.

With WaferSync, connected to WaferPro Express, your time to first automated measurement is reduced to an absolute minimum.

***VeloxPro:** The fastest, simplest path to automation of the entire test cycle, from wafer loading to data acquisition*

Velox keeps you at the forefront in wafer-level test

Today's relentless advances in IC technology require an extraordinary effort from engineering labs worldwide. Velox delivers a comprehensive and systematic means of achieving the highest possible levels of performance and accuracy in virtually any engineering test environment.

It focuses all your staff's knowledge and skill via a single system of control and operation that extends across the entire spectrum of wafer-level test scenarios, from manual probe placement to fully-automated test sequences. In every instance, you realize a maximum return on your hardware while minimizing time-to-data.

For more information on Velox, contact Cascade Microtech at 1-800-550-3279.

CascadeMicrotech®

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Data subject to change without notice.

VeloxBrochure_December2015

For more information, call 1-800-550-3279
Toll-Free in USA or 503-601-1122.
www.cascademicrotech.com

HTEST

FORMFACTOR™

NABÍDKA

NKD180165

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Česká republika

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Datum vystavení: 05.06.2018 Doba platnosti do: 31.08.2018

Název	Množství	MJ	Cena/MJ	Sleva	Cena bez DPH
CM_T200-STA-AP	1	ks	[redacted]	[redacted]	[redacted]

STN,TESLA,200mm,SEM-AUTO,M-CHAMBER,ATTO,PURELINE
Cascade Microtech Tesla 200mm Series Semi-Automatic Station Platform, with MicroChamber, AttoGuard, and PureLine Technology.
INCLUDES:
- Integrated MicroChamber (Dark,Dry & EMI-Shielding)
- PureLine Technology (Premium Signal Integrity)
- AttoGuard (For enhanced IV & CV)
- Roll-out wafer stage (For safe/easy wafer loading)
- High stability platen with linear lift
- 4-axis precision motorized stage
- User Guides, Tools, and accessories
- Universal Power cord Kit

Záruka v měsících: **12**

Dodací lhůta v týdnech: **20**

CM_142-033	1	ks	[redacted]	[redacted]	[redacted]

TABLE,DELUX,VIBRATIONISO,W/LCD-ACC MOUNTS,V2
Vibration isolation table for 200mm probe stations V2 (DELUX package)
FEATURES:
- Heavy duty frame and steel tabletop (40"W x 40"D X 32"H)
- Integrated leveling feet and rolling casters
- Seismic restraint kit
- Storage shelf below tabletop
- Ergonomic front support bar
- Computer accessory mounting kit for keyboard, mouse, joystick
- Multi-directional LCD monitor support arm (VESA)
- Enclosed system (side walls and front access door)

Záruka v měsících: **12**

Dodací lhůta v týdnech: **20**

CM_131-940	1	ks	[redacted]	[redacted]	[redacted]

KIT,LCD-VESA MOUNT,DUALMONITOR
Dual (2nd) LCD monitor mounting kit for Probe Stations. The kit allows mounting of a 2nd LCD monitor (not included) to an existing single monitor configuration. The kit can be used to mount the 2nd LCD monitor on the opposite side to the single LCD monitor, or attached to the single monitor arm for both on one side. Can be used with S300 or Vibration Isolation table for 200mm probe stations (DELUX).
.
INCLUDES:
- Mounting kit & Ergonomic articulated arm for free floating placement
- Supports LCD monitor with VESA mount (weight range 12-29lbs)
- 16" height range, and tilt/swivel adjustment.
- VESA mounting plates (70/100mm)

Záruka v měsících: **12**

Dodací lhůta v týdnech: **20**

Pokračování tisku nabídky č. NKD180165

Název	Množství	MJ	Cena/MJ	Sleva	Cena bez DPH
CM_151-461	1	ks	[redacted]	[redacted]	[redacted]

KIT,LIGHT CURTAIN,TESLA200mm
Probe station Light Curtain and Safety system for Cascade Microtech Tesla 200 High Power Probe Station
INCLUDES:
- Light Curtain system surrounding the probe station
- Integrated safety interlock for high power testing
- Clear acrylic side and rear panels (removable for equipment setup)

Záruka v měsících: **12**

Dodací lhůta v týdnech: **20**

CM_TS-412-14P	1	ks	[redacted]	[redacted]	[redacted]

Thermal system for Summit Platform, -60°C to 300°C, air-cool ATT, (200-240 VAC 50/60 Hz)

COMPLETE THERMAL SYSTEM FOR SUMMIT PLATFORM WITH 200mm MODULAR THERMAL CHUCK (Air Cooling Technology)
.
ATT "Enhanced" C-SERIES, -60C TO 300C, 200-230VAC, 50/60HZ
.
INCLUDES:
- Enhanced "Low Noise" Precision Thermal Controller
- Fast Transition 2 stage Air Chiller
- Integrated LCD touch screen
- Local control & remote access tools
- Controller/Chiller Interconnect cables
- Probe station specific coolant hoses & facility connections

Záruka v měsících: **12**

Dodací lhůta v týdnech: **20**

CM_TC-412-402	1	ks	[redacted]	[redacted]	[redacted]

FemtoGuard Triaxial Tesla Chuck, Au, Thermal, -55°C to 300°C, ATT air-cool, 200mm (8")

Cascade Microtech modular thermal chuck with Advanced FemtoGuard / Hi-Power Technologies, optimized for use with TESLA high power probe stations.
.
INCLUDES:
- Patented MicroVac chuck surface (200mm, Gold) for:
- Ultra-low chuck to wafer contact resistance
- Thin wafer mounting
- Patented FemtoGuard Technology for:
- Ultra-low noise measurements and controlled leakage
- Advanced measurement accuracy and speed
- High voltage/current chuck layers and triaxal cables
- Aux chucks(2), and integrated service loop for accurate XY stepping
- Air cooled thermal chuck (ATT) with -55 to +300oC range
.
NOTES: Compatible with TS-412-xx thermal systems

Záruka v měsících: **12**

Dodací lhůta v týdnech: **20**

CM_162-160	1	ks	[redacted]	[redacted]	[redacted]

High stability optics bridge mount, 2x2" XY, 4" pneu Z lift for S11/12K (with scope mounting plate)

High Stability Microscope Bridge Mount for Tesla, Summit 11000/12000 series Probe Stations.
.
INCLUDES:
- High stability bridge with air-assisted optics lift
- Precision 2x2" X-Y microscope transport
- Ideal for probing fine structures
- Includes scope mounting plate
- Also compatible with laser setups

Záruka v měsících:

12

Dodací lhůta v týdnech: 20

CM_151-532 1 ks [redacted]

eVue-III Digital Imaging System, 10X, Remote Focus, Pro Package

EVUE III 10X PRO,SUMMIT
eVue-III Digital Imaging System w/High Performance "PRO Package", use with Cascade Microtech Wafer Probe Stations and Package/Board Test Systems.
The system includes:
- PRO Package containing 3 Software Toolkits
: Multi-Z (Optical Z-Contact System, AutoFocus)
: Multi-Cam (Wafer-Probe Navigation, Picture-in Picture)
: Multi-View (Hi-Res Video, Probe Card Alignment, probe zoom views)
- Multi-CCD microscope/imager, 10X Standard Zoom range (2 CCD)
- Sub-micron Programmable Remote Focus Stage
- USB remote control & Integrated LED Illumination
- 2" Heavy duty focus block, intelligent objective lens mount (1)
- PCIe interface card

Záruka v měsících: 12

Dodací lhůta v týdnech: 20

CM_102-517 1 ks [redacted]

Mitutoyo objective, 10X, 33.5 mm working distance (0.28 N.A.)

Záruka v měsících: 12

Dodací lhůta v týdnech: 20

CM_158-270 1 ks [redacted]

High Performance Probe Station Controller for Cascade Microtech Summit 12000B, S300 and REL-6100 Semi-Automatic Probe Stations.
INCLUDES:
- Velox Probe Station Control Software including Toolbar, Control Center, SPECTRUM Vision System, Wafer Map and GPIB, RS232, TCPIP Interfaces
- Industrial grade cabinet (19" rack mountable)
- Intel Core i7 (Quad Core), 8GB RAM, 1TB HDD, DVD-RW, 2xDVI, 2xLAN, 2xRS232, 8xUSB 2.0, 4xUSB 3.0, 2xPCI, 1xPCIx16, 1xPCIx1
- Single and Dual monitor output
- NI488.2 USB GPIB adapter
- Windows 7 64bit Operating System and Acronis True Image

Záruka v měsících: 12

Dodací lhůta v týdnech: 20

CM_149-786 1 ks [redacted]

LabVIEW integration toolkit & driver for Velox and Nucleus Prober control software (Ver. 2.0)

Záruka v měsících: 12

Dodací lhůta v týdnech: 20

CM_153-144 2 ks [redacted]

Computer LCD monitor, 24", 1920x1080, VESA mount

- TFT Active Matrix, 23.6" Diagonal viewing area
- Integrated Stereo Speakers
- Thin Bezel design with Anti-glare screen
- Max Resolution: 1920x1080
- Fast response time: 5ms
- VESA mount and stand
- Analog and digital video input (HDMI)
- 100-240VAC 50/60Hz, UL/TUV/CE/RoHS

Záruka v měsících: 12

Dodací lhůta v týdnech: 20

Pokračování tisku nabídky č. NKD180165

Název	Množství	MJ	Cena/MJ	Sleva	Cena bez DPH
CM_DPP220-M-L-S	4	ks	[redacted]	[redacted]	[redacted]
STANDARD DC PROBE POSITIONER 200TPI MAG BASE LEFT OPEN PLATFORM					
Záruka v měsících:	**12**				
Dodací lhůta v týdnech:	**20**				
CM_DPP220-M-R-S	3	ks	[redacted]	[redacted]	[redacted]
STANDARD DC PROBE POSITIONER 200TPI MAG BASE RIGHT OPEN PLATFORM					
Záruka v měsících:	**12**				
Dodací lhůta v týdnech:	**20**				
CM_HVP-13	1	ks	[redacted]	[redacted]	[redacted]
High voltage, triaxial probe with CMI HV Triax connection.					
The high voltage probe specifications include: - Maximum voltage guarded: 1100V DC - Maximum voltage unguarded: 3000V DC - Maximum current: 100mA - Cable characteristics: Approximately 50 ohms (48 ohms) - Connector type: Amphenol triax threaded 11/16-24 - Replaceable tip type: Straight PTT style needles - Recommended range of overtravel: 50um to 100um - Scrub: 20um to 40um - Positioner compatibility: DCM family					
Záruka v měsících:	**12**				
Dodací lhůta v týdnech:	**20**				
CM_144-390	6	ks	[redacted]	[redacted]	[redacted]
Triaxial Probe, straight, for Universal Probe Holder, with 30" integrated cable, Triax (m)					
Záruka v měsících:	**12**				
Dodací lhůta v týdnech:	**20**				
CM_DPP105-M-AI-S	2	ks	[redacted]	[redacted]	[redacted]
BASIC DC PROBE POSITIONER 50TPI MAG BASE WITH ARM					
Záruka v měsících:	**12**				
Dodací lhůta v týdnech:	**20**				
CM_PTT-070-25	2	ks	[redacted]	[redacted]	[redacted]
Probe tip, tungsten, straight, 7 micron, 1 set of 25					
Záruka v měsících:	**12**				
Dodací lhůta v týdnech:	**20**				
CM_PTT-120-25	2	ks	[redacted]	[redacted]	[redacted]
Probe tip, tungsten, straight, 12 micron, 1 set of 25					
Záruka v měsících:	**12**				
Dodací lhůta v týdnech:	**20**				

Název	Množství	MJ	Cena/MJ	Sleva	Cena bez DPH
CM_PTT-250-25	2	ks	[redacted]	[redacted]	[redacted]
Probe tip, tungsten, straight, 25 micron, 1 set of 25					
Záruka v měsících: **12**					
Dodací lhůta v týdnech: **20**					
CM_144-388	6	ks	[redacted]	[redacted]	[redacted]
Universal Probe Holder with dovetail adapter kit (DPP2xx/3xx/450 series compatible)					
Záruka v měsících: **12**					
Dodací lhůta v týdnech: **20**					
CM_100751	2	ks	[redacted]	[redacted]	[redacted]
BNC ADAPTER CABLE DPP105 / 50 Ohm COAX / FEMALE-MALE / 1500mm					
Záruka v měsících: **12**					
Dodací lhůta v týdnech: **20**					
CM_SQ-FLY-PROBE	1	ks	[redacted]	[redacted]	[redacted]
Flying probe for 1.5kV single contact for T200 system Adjustment XYZ direction, probe tip replaceable Price includes R&D, material, assembling, integration and test					
Záruka v měsících: **12**					
Dodací lhůta v týdnech: **20**					
CM_SRV-INSTALL-SYS	1	ks	[redacted]	[redacted]	[redacted]
Installation of system by Cascade Certified FSE					
Záruka v měsících: **12**					
Dodací lhůta v týdnech: **20**					
CM_SRV-APPS-TRAIN	1	ks	[redacted]	[redacted]	[redacted]
TRAINING, APPLICATION,ON-SITE Pricing is based on 2 day's onsite, not a daily rate. Pricing includes labor, travel, lodging, and/or per diem expenses.					
Záruka v měsících: **12**					
Dodací lhůta v týdnech: **20**					
DOPRAVNE	1	ks	[redacted]	[redacted]	[redacted]
Dopravné					
Dodací lhůta v týdnech: **20**					

NABÍDKA NKD180165

Pokračování tisku nabídky č. NKD180165

Platební podmínky: **14** dnů
Dodací podmínky: **DDP**

Součet	9 782 629,82 Kč
DPH	2 054 352,26 Kč
Celkem s DPH	11 836 982,08 **Kč**

Nabídkové ceny:

Ceny uvedené v nabídce jsou platné, pokud společnost H TEST a.s. během doby platnosti nabídky obdrží závaznou objednávku. Dodávka zboží, u kterého je vyžadována exportní nebo importní licence, je vázána na udělení této licence.

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Společnost H TEST a.s. je zapsána do OR vedeného Městským soudem v Praze, oddíl B, vložka 6041.