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Polo Regionale di Como  
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Date: 19.09.2017  
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## Quotation 11001146

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Dear Dr. Sordan,

thank you for your inquiry. Please find the requested offer. Further details can be seen in the detailed description below. Raith standard terms for delivery will apply if not quoted differently.

Art.Nr	Article	Quantity	Price	Total/ EUR
20665		1 pcs	380.000,00	380.000,00

### **eLINE refurbished system**

**Components which are new or which have been refurbished before delivery are marked in bold characters**

The e\_LiNE is the most versatile e-beam system for uncompromised Nanostructuring, Pattern Inspection, Dimensional Metrology and Nanoengineering. Thermal Field Emission (TFE) filament technology offers ultra high resolution capabilities in all operation modes.

Advanced application like e-beam CVD, nanomanipulation, electrical probing and x-ray analytics are available by selecting Nanoengineering accessories.

The e\_LiNE electron column comprises the ultimate in electron optical development. A unique cross-over-free beam path gives extremely high beam current density and exceedingly low aberrations. This results in top quality lithography performance. The e\_LiNE electron optics offers unsurpassed low voltage inspection and metrology even below 1 KeV.

Software integration is the key asset of e\_LiNE: No other system can match the Raith software suite in terms of flexibility, ease of use and safety in a multi user environment.

The e\_LiNE is completely built-up and fully tested at the Raith factory. The system undergoes two complete acceptance procedures; one before it leaves factory, and the other one after the instrument has been installed. The system is designed and intended for turnkey operation once it

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is delivered and installed. A smooth installation, training and setup is guaranteed since all mechanical, electronic, and software components are under control of a single vendor.

The e\_LINE key hardware features:

- **thermal field emission (TFE) Schottky source**
- cross-over-free beam path with highest beam current density
- compound electromagnetic-electrostatic immersion lens for lowest beam aberrations
- fully digital electron optics column, beam energy selectable between 100 eV - 30 keV
- fast electrostatic beamblanking
- 100 x 100 mm travel range laser interferometer controlled stage
- stage controlled in closed with dc-motors for main drives shift piezos fine positioning
- 2nm XY position resolution at any working distance, writefield size and SEM magnification
- user defined write fields from 0,5 µm to 2 mm with automated calibration and selection
- 30 mm variation in working distance at full interferometric control
- kinematic - stress free - mount of a large variety of sample holders (see options list) through front door and pull out stage
- **20 MHz DSP controlled high speed pattern processor unit with dynamic scan corrections**

**Key Raith Nanosuite software features:**

- **Raith Nanosuite system control software with true multi-user management system**
- **integrated GDSII editor with Gbyte file handling capabilities**
- **eLINE Plus FLEXposure patterning modes, GDSII patterning on image and attributing**
- **eLINE Plus SEM inspection and image archiving**
- **eLINE Plus dimensional metrology software**
- **proximity effect correction, postprocessor, Monte Carlo and 3D resist exposure simulation**
- **high speed PC with Windows 7 software environment**
- **second software license for offline PC data preparation (offline PC not included but available on request)**

Standard delivery include:

- universal sample holder for small and large samples up 2 inch square
- picoamperemeter with IEEE-Interface
- CCD Camera
- electron beam lithography starter kit
- system water chiller (closed circuit)

Documentation:

- operation and reference manuals
- Windows-based help menus incorporated into software suite

Site survey, system installation and 5 days initial training included

10019	<b>Manual loadlock for eLINE Plus</b> for up to 100 x 100 mm samples	1 pcs	24.000,00	24.000,00
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The eLINE Plus can be equipped with a manual load lock to transfer samples up to 100 x 100 mm square. The unit is compatible with all available sample holders except the 3D module.

- short loading cycles
- load lock with high vacuum gate valve
- control electronics
- oil free pumping

Art.Nr	Article	Quantity	Price	Total/ EUR
	- safety interlocks			
10187	<b>Shipment package ROW</b> for Raith EBL & FIB systems	1 pcs	15.000,00	15.000,00
	includes - Packing material - Shipment cost - Transport-Insurance from Raith factory => loading bay customer - according to INCOTERMS 2010 DAP (delivered at place, duty unpaid)			
10012	<b>3D module</b> inspection module compatible with eLINE Plus and ionLINE Plus	1 pcs	18.500,00	18.500,00
	- motorised arrangement for rotating and tilting samples 10 x 10 mm square - tilt angle 0 - 90 degree - rotation 360 degree - full software control with Raith software suite (digital motion, position recall, homing and initialization for tilt) - manual control using joystick controller  <u>- note: the 3D module is not compaible with eLINE load lock and must be loaded through the front door.</u>			
10043	<b>traxx</b> Stitching error free continuous writing mode for elongated paths	1 pcs	126.000,00	126.000,00
	Zero pattern displacement using FBMS technology  The traxx lithography module comprises design, control and patterning of structures in a continuous, stitching error free writing mode - using the unique Raith fixed-beam-moving-stage (FBMS) technology. This allows excellent precision and flexibility in patterning thin but extended lines or paths as well known from i.e. integrated optics structures or X-Ray optics pattern which do not allow for stitch field boundaries.  traxx is therefore the superior solution and ideally suited for following applications (e.g.):  - Waveguides of all kinds (bended, coupled, arrayed, tapered, xray, plasmonic) - Ring resonators, microring filters - Xray lenses, zoneplates - Atom chips (Bose-Einstein condensate templates) - SQUID coils, heating coils  Patterning jobs can be realized with a true stationary beam or with a programmable high speed beam shape continuously formed by the pattern generator during controlled stage movement. This operation allows fabrication of well defined line widths without having the need to rely on a defocused beam. The patterns are fully integrated into an extended GDSII database and editor. Standard beam scanning and path control patterning sequences can be mixed and executed directly from a single GDSII file. The traxx editing functionality allows to define lines of flexible geometry and to prepare them for direct patterning in FBMS control mode.			

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	<p>In FBMS patterning mode the stage motion is controlled via an intelligent stage electronics based on a high performance DSP architecture.</p> <p>Features:</p> <ul style="list-style-type: none"> <li>- Writes smooth, continuous patterns over large distances with no stitching errors</li> <li>- Curved path and standard scanning beam pattern definition</li> <li>- Dedicated curved paths editor and conversion function</li> <li>- Stage follows curved paths at constant speed under laser control with beam feedback loop</li> <li>- Spot mode and programmable beam shape patterning for flexible linewidth control</li> <li>- Combined FBMS and vector scan patterning in one run</li> <li>- Positioning resolution of &lt; 1 nm</li> <li>- Standard free, intrinsic calibration mode for multiple scan field sizes</li> <li>- FBMS patterning control fully integrated in GDSII editor and Raith multi user software interface</li> </ul> <p>Note: In case of a traxx field upgrade, the motor controller will be replaced and the interacting electronic units' wiring will be slightly modified. A most recent current version of Raith pattern generator technology and Raith nanolithography software release is mandatorily required, which is not included in the costs.</p>			
Net value				563.500,00 EUR
Enduser Discount				213.500,00- EUR
Total Net Value				350.000,00 EUR
VAT	0,00%			0,00 EUR
Total				350.000,00 EUR
Waiver of performance bond (Ref. your letter "dichiarazione" dated 18th September 2017)				50,00-EUR
<b>New final price</b>				<b>349.950,00 EUR</b>

**Terms of delivery:** eLINE (refurbished system)

**Delivery time:** Within 4 - 6 months after confirmed receipt of order and prepayment.

In case the customer requests to join a factory acceptance (FAT), delivery time will be subject to a "ready for FAT" note submitted by Raith to the customer. FAT times must be added to delivery times.

If customer requests to inspect tool and FAT protocol prior to shipment, delivery time will be 4 - 8 weeks longer.

**Date of installation:** to be agreed

For Raith Turnkey solutions:  
 Raith offer includes costs for visits for site survey, installation and acceptance of the system on site (SAT). Training of about five (5) days is included. In case another visit(s) will become necessary for reasons which Raith cannot be held responsible for, the customer may have to cover any additional costs for travelling, accommodation and engineer time arising out of this.

If not included in the quotation, Raith will charge engineer time and expenses to the Raith service rates. Travelling and accommodation will be charged on cost basis.

**Prices:** DAP Loading Bay Interuniversity Center Como

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Raith cannot be held responsible to cover import duties or local VAT.

**Payment:**

50% on order  
40% on delivery  
10% on acceptance

Payment on acceptance will automatically become due if acceptance tests are delayed for more than 30 days for reasons which are within Buyers responsibility.

Each down payment will have to be made by remittance to one of our accounts within 30 days after invoice.

**Reservation of proprietary rights:**

The goods will remain in Raith property until full payment is completed.

**Technical changes / description**

Due to our policy of continuous development we reserve the right to change specification without notice. Raith should inform the customer in case of major changes in specification if they arise.

Errors excepted.

This quotation refers to the current version of the corresponding technical description of the quoted product, which is available on request.

**Warranty:**

6 months warranty after acceptance, but at maximum 8 months from date of delivery, if Raith is not responsible for the delay of installation or finalizing the acceptance.

For Raith software the Raith standard terms of delivery apply.

For any sub supplied parts sub suppliers warranty conditions will apply.

**Validity of quote:**

30.09.2017

**General terms and conditions:**

Our general terms and conditions ([www.raith.com](http://www.raith.com)) apply, unless otherwise agreed.

**Raith VAT ID No.:**

DE 124 727 617

**Important note:**

**Availability of the system cannot be guaranteed.  
Refurbished systems are sold on first-come-first-served basis.**

Yours sincerely  
**Raith GmbH**

**Dr. Andreas Remscheid**  
**Sales Director Europe**

This offer has been generated automatically and is valid without signature.

Art.Nr	Article	Pieces	Price	Total/ EUR
10041	<p><b>Automated Height Sensing</b>            for Raith systems 4" up to 8"            laser based measurement and            correction of working distance</p> <p>Sample surface height variation is detected and focal plane automatically corrected. This allows for patterning over larger areas with e.g. wafer bow, small tilt or extended topographic features exceeding the depth of focus.</p> <ul style="list-style-type: none"> <li>- integrated laserdiode and CCD sensor for height sensing</li> <li>- automated feedback to piezo height controller, Z-motor or focus lens</li> <li>- includes software module for autolevelling and focus adjustment</li> </ul> <p><b>Note: Special price offered is only valid at factory integration.</b></p>	1 pcs	19.500,00	19.500,00
10190	<p><b>UPS</b>            Uninterrupted Power Supply            for Raith systems</p> <p>Autonomy time: about 30 min,</p> <p>Integrated and controlled system shut down when critical time for main power off is reached.</p> <p>Note: if purchased after system installation, additional items required -            please consult with Raith Service Team</p> <p>Note: the batteries must be replaced on a regular base to avoid the risk of health hazard. This is included in our service contracts.</p>	1 pcs	4.900,00	4.900,00