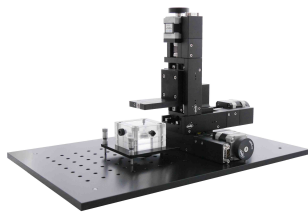

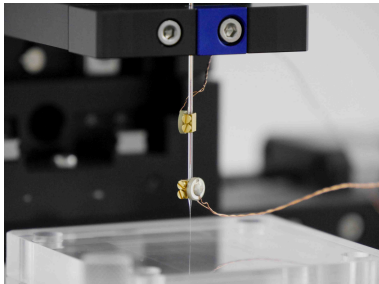

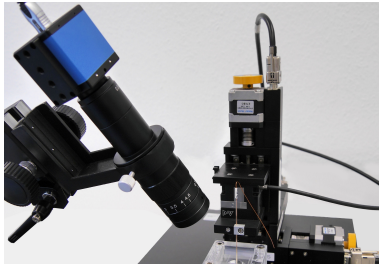

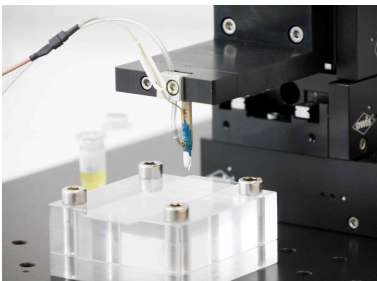
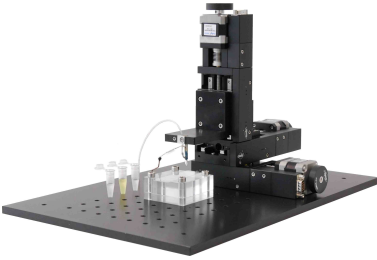
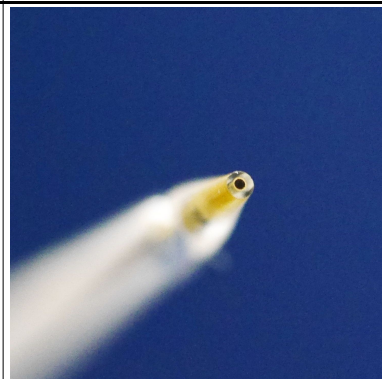


SECM Systems, Options and Upgrades		
Order No.	Name	
03-00001	<p><u>Sensolytics Base SECM</u></p> <p>A complete scanning electrochemical microscope as the starting point for all Sensolytics SECM systems, including:</p> <ul style="list-style-type: none"> • A high quality steppermotor-based positioning system with 25 mm travel range in all three spatial directions and 20 nm resolution (calc.). • Complete PMMA measuring cell with distance pieces to adapt to different sample heights and adjustable base plate for manual tilt compensation. • Beginners kit of electrodes consisting of two Pt-microelectrodes (25 und 10 μm), reference and counter electrode and a simple test sample for training purposes. • Industrial PC including TFT-screen, mouse, keyboard and Sensolytics SECM control software. <p>This setup is directed primarily at scanning rather flat surfaces with electrode diameters in the range of 10 to 100 μm and can be extended at any time with further options.</p>	
03-00002	<p><u>Option High-Res</u></p> <p>To increase the imaging quality of the Sensolytics Base SECM, this option provides an additional piezoelectric positioning system. It offers a 1 nm resolution (closed-loop) with a 100x100x100 μm scan range. Consists of a plug-in board for the controlling computer and the piezoelectric positioning system, which is mounted in the Sensolytics electrode holder. The option High-Res provides additionally a software-based tilt compensation.</p>	
03-00003	<p><u>Option Shearforce</u></p> <p>To precisely separate topographic and electrochemical information. The option Shearforce provides the ability to control the working distance between the SECM tip and the sample surface during high-resolution imaging experiments. Suitable for structure dimensions < 1 μm, depends on option High-Res.</p>	
03-00005	<p><u>Option Analog In</u></p> <p>Reading of up to eight analog signals from external datasources.</p>	
03-00006	<p><u>Option Video</u></p> <p>Videomacrosystem as helpful addition to our SECM systems. The option Video includes a monochrome USB CCD camera as well as a macro objective with manual zoom. The live-view image of the camera is integrated in the Sensolytics SECM software.</p> <p>Optional stand available: SECM Accessories, item no. 03-00024</p>	

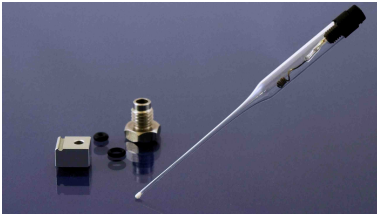

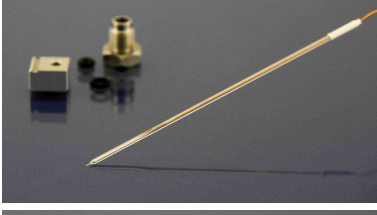
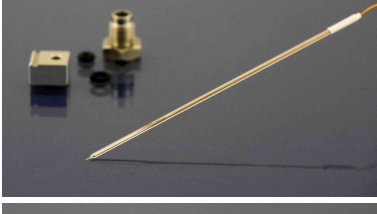
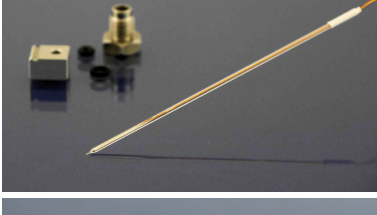
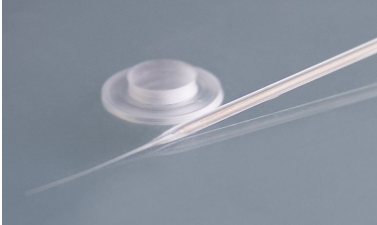
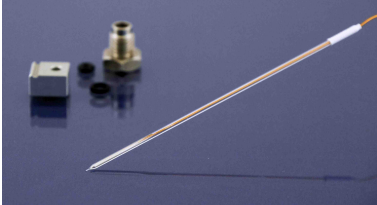
SECM Systems, Options and Upgrades		
Order No.	Name	
03-00010	<p><u>Option SDC</u> Option to upgrade a Base SECM with the Scanning Droplet Cell technique. Includes a special SDC tip holder, a force sensor for SDC tip positioning, a SDC body, two PTFE SDC tips (0,5 mm diameter opening) and a pump for electrolyte supply.</p>	
03-00012	<p><u>Option PicoPlot</u> Option to upgrade a Base SECM with a piezoelectric dispensing device for the preparation of material libraries.</p> <ul style="list-style-type: none"> • Droplet size: Two different dispensing heads are available with droplet sizes of 100-200 picoliters and 600-1100 picoliters, respectively. • Dispensable media: Dextrane solutions, Glycerol (< 50 % in H₂O), Polymers (P3OT 1 mg/ml in Trichloroethylene or Chlorobenzene, PEDOT:PSS 0.14/2.6 %), Proteins (< 5 mg/ml in PBS) and many others. Please contact us for the full list of dispensable media. 	
03-00014	<p><u>PicoPlot Dispenser</u> Complete piezoelectric dispensing device for the preparation of material libraries.</p> <ul style="list-style-type: none"> • Travelrange: 50x50x50 mm (X,Y,Z Steppermotor-controlled) • Resolution (min. Stepwidth): 0.02 µm • Maximum speed: 5 mm / sec • Droplet size: 100-200 picoliters • Dispensable media: Dextrane solutions, Glycerol (< 50 % in H₂O), Polymers (P3OT 1 mg/ml in Trichloroethylene or Chlorobenzene, PEDOT:PSS 0.14/2.6 %), Proteins (< 5 mg/ml in PBS) and many others. Please contact us for the full list of dispensable media. 	
03-00015	<p><u>Linear Stage Upgrade 50x50x50 mm for Base SECM</u> Exchange for the linear stages of the Base SECM:</p> <ul style="list-style-type: none"> • Travel length 50 mm (Base: 25 mm) • Bellows for Protection • Repeatability (unidirectional) <1 µm, repeatability (bidirectional) <2 µm (Base <15 µm) 	
03-00016	<p><u>Linear Stage Upgrade 105x105x50 mm for Base SECM</u> Exchange for the linear stages of the Base SECM:</p> <ul style="list-style-type: none"> • Travel length in X,Y 105 mm (Base: 25 mm) • Travel length in Z 50 mm (Base: 25 mm) • Bellows for protection, repeatability (unidirectional) <1 µm, repeatability (bidirectional) <2 µm (Base <15 µm) 	

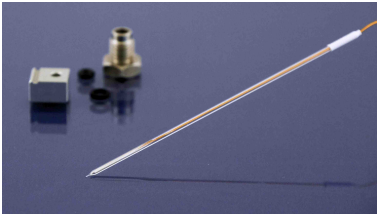
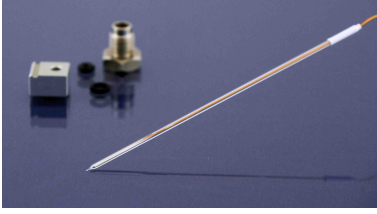
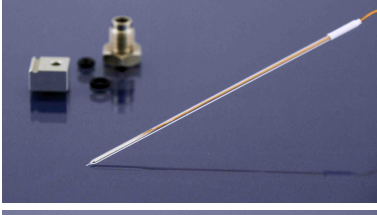

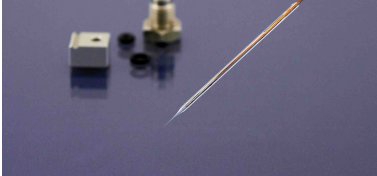
SECM Systems, Options and Upgrades	
Order No.	Name
04-05001	<p><u>Electrode for SPECM</u> Optical Fiber with Au Ring Electrode for Scanning PhotoElectroChemical Microscopy</p> <ul style="list-style-type: none"> • Core Diameter: 200 μm • Cladding Diameter: 220 μm • Coating Diameter: 255 μm • Wavelength range: 190nm - 1250nm (UV-Vis) <p>The coated fiber has a length of 1 m and is fixed in a glass capillary to be mounted in the standard SECM electrode holder. Its rear end is equipped with a SMA connector.</p>
05-03032	<p><u>Upgrade for mounting a SECM positioning system on top of an inverted microscope:</u></p> <ul style="list-style-type: none"> • Adapting plates to reversibly mount the SECM positioning system on a Zeiss Axio Vert A1 or the standard base plate of the SECM system. • Special electrode holder to adjust the horizontal distance between positioning system and optical pathway of the microscope • Microscope not included - a suitable Axio Vert configuration can be ordered from us upon request.

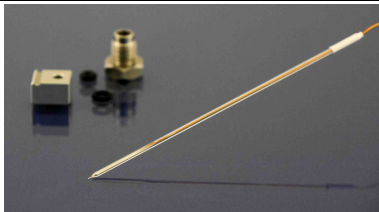
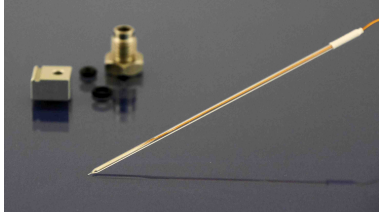
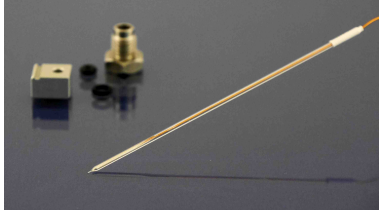
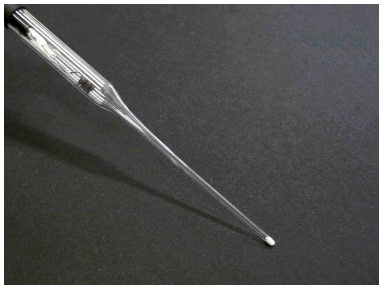


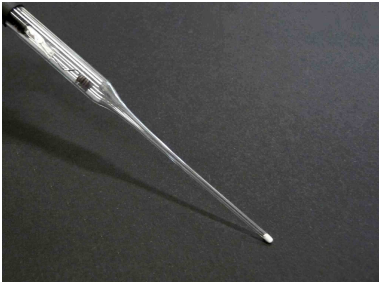
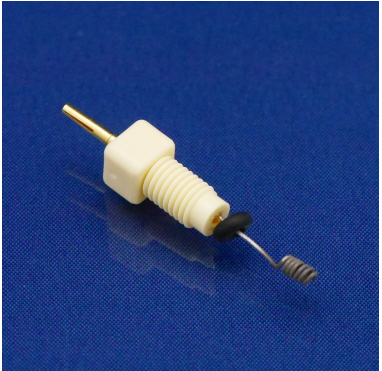
Scanning Droplet Cell	
Order No.	Name
20-00002	<p><u>Scanning Droplet Cell System</u></p> <ul style="list-style-type: none"> • Positioning system 145 x 145 x 25 mm, repeatability (bidirectional) <15 µm • Forcesensor-controlled droplet cell made from PMMA • Pump for electrolyte supply • Controlling PC incl. mouse, keyboard, monitor • Sample holder • Control software • 2 SDC-tips made from PTFE, diameter 0,5 mm
20-00004	<p><u>Option Photoelectrochemistry for SDC</u></p> <p>Optical Fiber for local illumination of sample surfaces</p> <ul style="list-style-type: none"> • Core Diameter: 1 mm • Length: 2 m • Material: PMMA • Wavelength range: UV-Vis • Rear end equipped with a SMA connector
20-00005	<p><u>Scanning Droplet Cell System</u></p> <ul style="list-style-type: none"> • Positioning system 75 x 75 x 50 mm, repeatability (bidirectional) <15 µm • Forcesensor-controlled droplet cell made from PMMA • Pump for electrolyte supply • Controlling PC incl. mouse, keyboard, monitor • Sample holder • Control software • 2 SDC-tips made from PTFE, diameter 0,5 mm



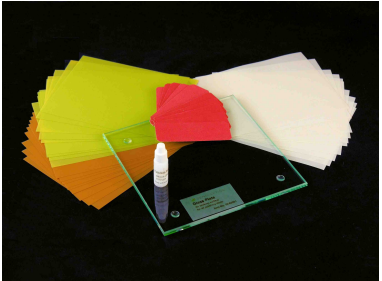

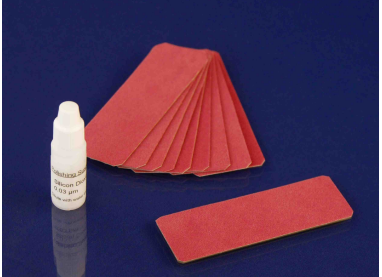


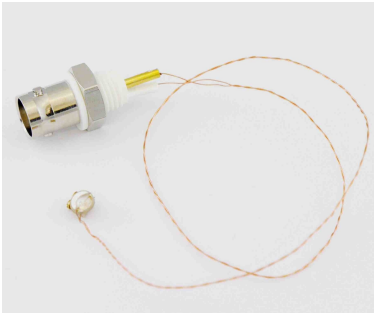

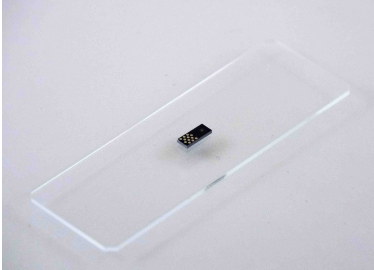
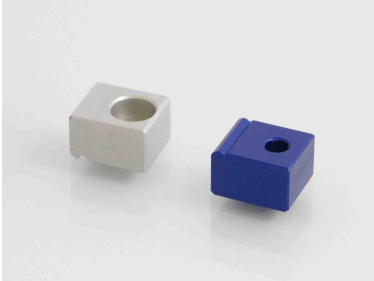
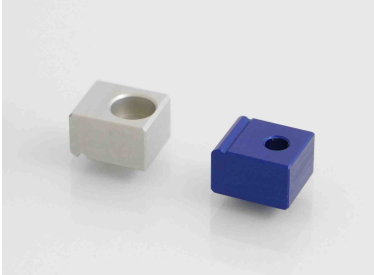
Electrodes		
Order No.	Name	
04-00001	<p><u>Miniaturized Ag/AgCl reference electrode</u> Consisting of a tapered glass body including a porous ceramic frit and a chloridized silver wire with a 2 mm socket for connection to the potentiostat. The overall length is approx. 110 mm. We recommend 3 M KCl as filling electrolyte. Fits in our SECM measuring cells without inlets for reference and counter electrode.</p>	
04-00002	<p><u>Counter Electrode, Platinum</u> Miniaturized counter electrode fitting in all variants of the Sensolytics SECM measuring cell. Made from a coiled 250 µm Pt wire and sealed in a stabilizing soda lime glass body of approx. 50 mm length.</p>	
04-00003	<p><u>Microelectrode, gold 10 µm</u> Disk-shaped Au-microelectrode to be used as probe in all types of Sensolytics SECM. The gold wire (diameter 10 µm) is sealed in soda lime glass, length ca. 95-105 mm, diameter 1.5 mm, RG-value >10.</p>	
04-00004	<p><u>Microelectrode, gold 25 µm</u> Disk-shaped Au-microelectrode to be used as probe in all types of Sensolytics SECM. The gold wire (diameter 25 µm) is sealed in soda lime glass, length ca. 95-105 mm, diameter 1.5 mm, RG-value >10.</p>	
04-00005	<p><u>Microelectrode, gold 50 µm</u> Disk-shaped Au-microelectrode to be used as probe in all types of Sensolytics SECM. The gold wire (diameter 50 µm) is sealed in soda lime glass, length ca. 95-105 mm, diameter 1.5 mm, RG-value >10.</p>	
04-00006	<p><u>Nanoelectrode, platinum 200-500 nm</u> Vibratory disk-shaped platinum nanoelectrodes imbedded in quartz glass. The outer diameter of the electrode body is 0.9 mm, length 7 to 8 cm. This type of electrode is required for imaging in the constant-distance mode of SECM (option Shearforce).</p>	
04-00007	<p><u>Microelectrode, platinum 10 µm</u> Disk-shaped Pt-microelectrode to be used as probe in all types of Sensolytics SECM. The platinum wire (diameter 10 µm) is sealed in soda lime glass, length ca. 95-105 mm, diameter 1.5 mm, RG-value >10.</p>	




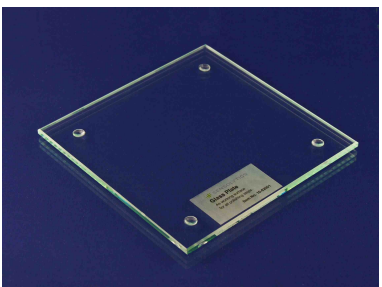
Electrodes		
Order No.	Name	
04-00008	<p><u>Microelectrode, platinum 25 µm</u> Disk-shaped Pt-microelectrode to be used as probe in all types of Sensolytics SECM. The platinum wire (diameter 25 µm) is sealed in soda lime glass, length ca. 95-105 mm, diameter 1.5 mm, RG-value > 10.</p>	
04-00009	<p><u>Microelectrode, platinum 50 µm</u> Disk-shaped Pt-microelectrode to be used as probe in all types of Sensolytics SECM. The platinum wire (diameter 50 µm) is sealed in soda lime glass, length ca. 95-105 mm, diameter 1.5 mm, RG-value > 10.</p>	
04-00010	<p><u>Microelectrode, platinum 100 µm</u> Disk-shaped Pt-microelectrode to be used as probe in all types of Sensolytics SECM. The platinum wire (diameter 100 µm) is sealed in soda lime glass, length ca. 95-105 mm, diameter 1.5 mm, RG-value > 10.</p>	
04-00011	<p><u>Microelectrode, platinum ~1 µm</u> Disk-shaped Pt-ultramicroelectrode (Ø ca. 1 µm) to be used as probe in all types of Sensolytics SECM. The platinum wire is sealed and pulled in a quartz glass body, electrode length ca. 95-105 mm, outer glass diameter 0.9 mm, RG-value > 10.</p>	
04-00012	<p><u>Microelectrode, platinum ~5 µm</u> Disk-shaped Pt-ultramicroelectrode (Ø ca. 5 µm) to be used as probe in all types of Sensolytics SECM. The platinum wire is sealed and pulled in a quartz glass body, electrode length ca. 95-105 mm, outer glass diameter 0.9 mm, RG-value > 10.</p>	
04-00013	<p><u>Reference Electrode 4 mm Ag/AgCl</u> Miniaturized Ag/AgCl gel reference electrode to be used in our SECM measuring cells. The outer glass diameter is 4 mm and 3 M KCl is recommended as storage electrolyte.</p>	
04-00014	<p><u>Microelectrode, carbon 7-9 µm</u> Disk-shaped carbon microelectrode to be used as probe in all types of Sensolytics SECM. The carbon fibre (diameter 7-9 µm) is sealed in soda lime glass, the lower end is isolated by electrodeposition paint.</p>	

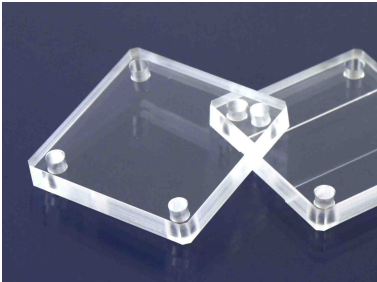
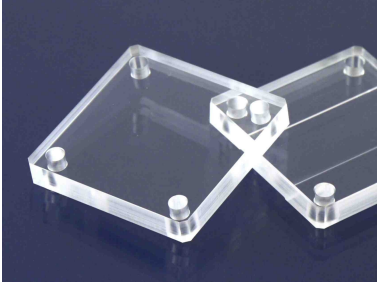
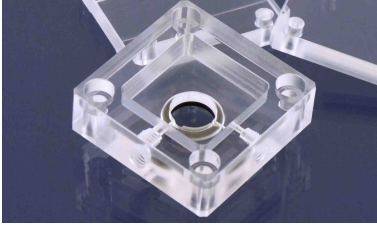

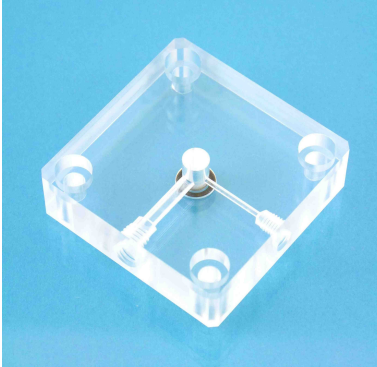
Electrodes		
Order No.	Name	
04-00017	<p><u>Microelectrode, gold 100 μm</u> Disk-shaped Au-microelectrode to be used as probe in all types of Sensolytics SECM. The gold wire (diameter 100 μm) is sealed in soda lime glass, length ca. 95-105 mm, diameter 1.5 mm, RG-value >10.</p>	
04-00018	<p><u>Nanoelectrode, platinum 500-1000 nm</u> Vibratory disk-shaped platinum nanoelectrodes imbedded in quartz glass. The outer diameter of the electrode body is 0.9 mm, length 7 to 8 cm. This type of electrode is required for imaging in the constant-distance mode of SECM (option Shearforce).</p>	
04-00019	<p><u>Microelectrode, nickel 10 μm</u> Disk-shaped Ni-microelectrode to be used as probe in all types of Sensolytics SECM. The nickel wire (diameter 10 μm) is sealed in soda lime glass, length ca. 95-105 mm, diameter 1.5 mm, RG-value >10.</p>	
04-00020	<p><u>Microelectrode, nickel 25 μm</u> Disk-shaped Ni-microelectrode to be used as probe in all types of Sensolytics SECM. The nickel wire (diameter 25 μm) is sealed in soda lime glass, length ca. 95-105 mm, diameter 1.5 mm, RG-value >10.</p>	
04-00021	<p><u>Counter Electrode, Platinum Net</u> Miniaturized Platinum net electrode fitting as counter electrode in the Sensolytics sample polarization cell (item no. 05-03026 and 05-03039).</p>	
04-02001	<p><u>Electrolyte Reservoir for Reference Electrode</u> Replacement electrolyte reservoir for miniaturized reference electrode item no. 04-00001.</p>	

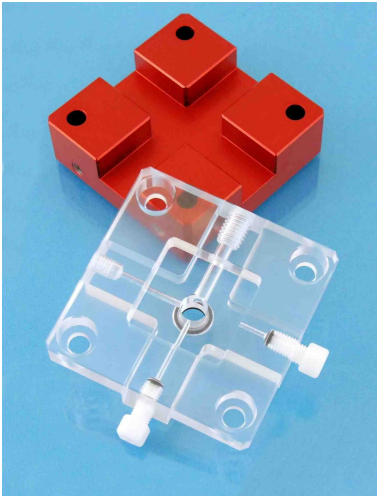
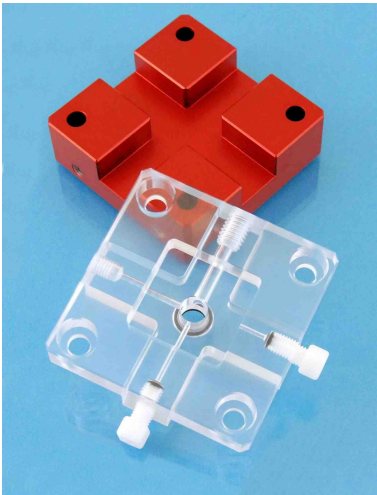
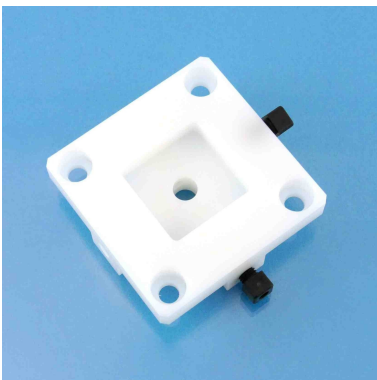
Electrodes		
Order No.	Name	
04-02002	<p><u>Internal System for Reference Electrode</u> Internal system for miniaturized reference electrode item no. 04-00001.</p>	
04-02006	<p><u>Adapter cable for Reference Electrode</u> Cable with 2 mm connector to 4 mm jack for connection of the miniaturized reference electrode Item No. 04-00001.</p>	
04-04000	<p><u>Chloridized Silverwire for SDC</u> Chloridized silver wire as reference electrode for option SDC including screwcap and O-ring.</p>	

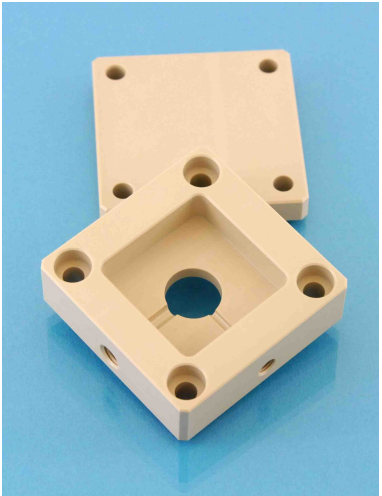
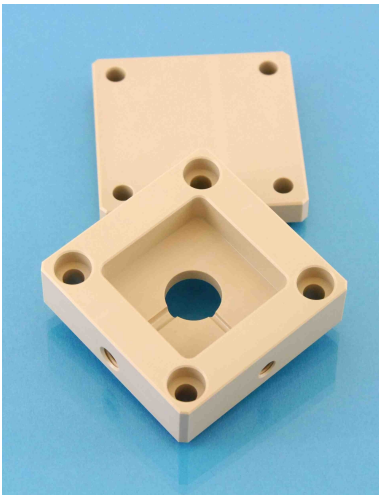

SECM Accessories		
Order No.	Name	
03-00020	<p><u>Faraday Cage for Sensolytics SECM-Systems</u> Faraday cage made from steel, varnished light grey, 50x45x70 cm. Sealed cable inlets, holes in the bottom to decouple vibrations of the cage from the positioning system.</p>	
03-00024	<p><u>Gooseneck Stand for Option Video</u> Gooseneck Stand for mounting the Videomacrosystem on the SECM baseplate. Includes a fine drive to adjust the focus.</p>	
04-01000	<p><u>Shearforce Actuator Set</u> Piezoelectric agitation system for the shearforce-based distance control (Option Shearforce). For electrodes with Ø 0.9 mm (standard).</p>	
04-01001	<p><u>Electrode Polishing Set</u> Complete micro polishing set for manual cleaning of microelectrodes (item no. 04-00003 to 04-00005, 04-00007 to 04-00010 and 04-00017) consisting of a glass plate (size of 15 cm x 15 cm, thickness of 5 mm) as a flat and stable ground for all polishing steps, aluminum oxide polishing paper with grain sizes of 5 µm, 1 µm and 0.3 µm (size ca. 10.5 x 13.5 cm, 10 sheets from each type), 7 mL of polishing suspension (colloidal silicon dioxide, grain size 0.03 µm, dilutable with water) and 10 sheets (size ca. 7.5 x 2.5 cm) of corresponding polishing cloth.</p>	
04-01002	<p><u>Set of polishing paper</u> Polishing paper with grain sizes of 5 µm, 1 µm and 0.3 µm (size ca. 10.5 x 13.5 cm, 10 sheets from each type).</p>	
04-01003	<p><u>Set of polishing suspension and cloth</u> 7 mL of polishing suspension (colloidal silicon dioxide, grain size 0.03 µm, dilutable with water) and 10 sheets (size ca. 7.5 x 2.5 cm) of corresponding polishing cloth fixed on microscope glass slides.</p>	

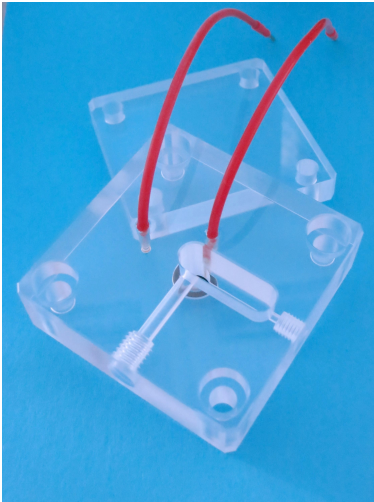

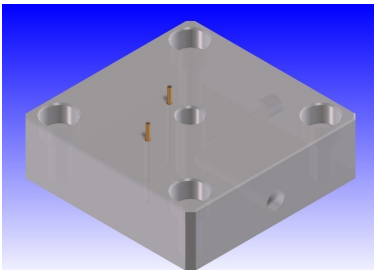
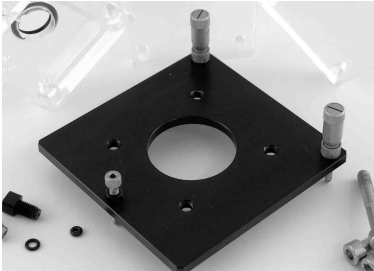
SECM Accessories		
Order No.	Name	
04-01004	<p><u>Shearforce Actuator Set</u> Piezoelectric agitation system for the shearforce-based distance control (Option Shearforce). For electrodes with \varnothing 1.0 mm.</p>	
04-02004	<p><u>Quarz Capillaries</u> OD 0.9 ± 0.05 mm, ID 0.3 ± 0.1 mm, L 90 mm</p>	
04-02005	<p><u>Capillaries of Soda-Lime Glass</u> OD 1.5 ± 0.1 mm, ID 0.75 ± 0.02 mm, L 100 mm</p>	
05-00052	<p><u>SECM Measuring Station</u> SECM measuring table (2 levels adjustable in height) with passive vibration isolation</p> <ul style="list-style-type: none"> • Size: 120 x 130 x ca. 76 cm • Isolated area: ca. 40 x 50 cm • Base frame white powder-coated • Scratch-resistant MDF-Plate as non-isolated desktop 	
05-00059	<p><u>Dust Cover</u> Dust cover for SECM positioning system</p>	
05-00064	<p><u>SECM Trainings Structure</u> SECM test specimen on glass slide.</p>	
05-00079	<p><u>3-axis Joystick</u> Joystick for a convenient movement of long travel rages during prepositioning.</p>	
05-03004	<p><u>Clamp for SECM Electrode Holder (blue)</u> Replacement clamp for electrodes with outer glass diameters of \varnothing 0.9-1.0 mm. Required for ultramicroelectrodes (item no. 04-00011/12) and nanoelectrodes (item no. 04-00006/18).</p>	
05-03005	<p><u>Clamp for SECM Electrode Holder (silver)</u> Replacement clamp for electrodes with outer glass diameters of \varnothing 1.5 mm. Required for all microelectrodes.</p>	

SECM Accessories		
Order No.	Name	
05-03029	<u>SDC Tip</u> Tip for Scanning Droplet Cell, 0.5 mm opening, PTFE	
05-03030	<u>SDC Tip</u> Tip for Scanning Droplet Cell, 0.2 mm opening, PTFE	
05-03042	<u>SDC Tip</u> Tip for Scanning Droplet Cell, 1 mm opening, PTFE	
10-02001	<u>Glass plate for polishing set</u> Glass plate with silicone rubber feeds as stable ground for all polishing steps.	

Measuring Cells		
Order No.	Name	
05-03011	<p><u>SECM Cell Distance Plate 1</u> PMMA distance plate for SECM measuring cell.</p>	
05-03012	<p><u>SECM Cell Distance Plate 2</u> PMMA distance plate for SECM measuring cell with groove for microscopic slides.</p>	
05-03013	<p><u>SECM Cell Standard</u> Standard SECM measuring cell with large electrolyte reservoir (approx. 20 mL) and orthogonal oriented inlets for reference and counter electrode.</p>	
05-03014	<p><u>Fitting for Reference Electrode</u> Replacement fitting for 4 mm reference electrode made from stainless steel.</p>	
05-03015	<p><u>SECM Cell Small Volume</u> SECM measuring cell specially adapted for small volumes. Made of PMMA and includes orthogonal oriented inlets for reference and counter electrode. Fitting item no. 05-03014 is required for this cell.</p>	

Measuring Cells		
Order No.	Name	
05-03019	<p><u>SECM T-Plate</u> Baseplate for SECM studies at controlled temperatures. Made from anodized aluminum with meander-type arranged water channels and tube connectors (inlet and outlet) for easy linkage with a thermostat/cryostat.</p>	
05-03020	<p><u>SECM T-Cell (PMMA)</u> Measuring cell made from PMMA that fits to item no. 05-03019 (T-plate). Beside the two standard inlets for fixation of reference and counter electrode, two additional tube fittings are incorporated into the measuring cell as gas inlets or as flow cell connectors.</p>	
05-03021	<p><u>SECM T-Cell (POM)</u> Measuring cell made from POM that fits to item no. 05-03019 (T-plate). Beside the two standard inlets for fixation of reference and counter electrode, two additional tube fittings are incorporated into the measuring cell as gas inlets or as flow cell connectors.</p>	

Measuring Cells		
Order No.	Name	
05-03023	<p><u>SECM Cell Standard (PEEK)</u> Standard SECM measuring cell made of PEEK with large electrolyte reservoir and orthogonal oriented inlets for reference and counter electrode.</p>	
05-03024	<p><u>SECM Cell Distance Plate 1 (PEEK)</u> PEEK distance plate for SECM measuring cell.</p>	
05-03025	<p><u>Set of Fittings for Auxiliary Electrodes</u> Replacement fitting and corresponding O-ring for auxiliary electrodes. Fits to all Sensolytics SECM cells with standard inlets for reference and counter electrode.</p>	

Measuring Cells		
Order No.	Name	
05-03026	<p><u>Sample Polarization Cell</u> SECM measuring cell for small electrolyte volumes made of PMMA with spring contacts for convenient sample contacting. Diameter of opening for sample: 8 mm. We recommend the Sensolytics Platinum net electrode (item no. 04-00021) for this measuring cell.</p>	
05-03027	<p><u>SECM Cell (old design)</u> Standard SECM measuring cell with large electrolyte reservoir, PMMA</p>	
05-03028	<p><u>Fitting for Reference Electrode</u> Replacement fitting for 4 mm reference electrode made from POM.</p>	
05-03036	<p><u>Set of Fittings for Microelectrodes or SDC Inlets</u> Replacement fitting and corresponding O-ring for microelectrodes. Fits to all Sensolytics SECM cells with standard inlets for counter electrode as well as SDC body inlets.</p>	
05-03038	<p><u>SECM Cell for Investigation of Upright Electrodes</u> Customized SECM measuring cell for investigation of stick-type electrodes as sample surface. Made of PMMA.</p>	
05-03039	<p><u>Sample Polarization Cell</u> SECM measuring cell for small electrolyte volumes made of PEEK with spring contacts for convenient sample contacting. Diameter of opening for sample: 8 mm. We recommend the Sensolytics Platinum net electrode (item no. 04-00021) for this measuring cell.</p>	
05-03050	<p><u>Baseplate for SECM Cell</u> Adjustable metallic baseplate for SECM measuring cells made from black anodized aluminium.</p>	

Services		
Order No.	Name	
03-09000	<u>SECM Installation and Training (EU)</u>	
03-09001	<u>SECM Installation and Training (World)</u>	
03-09101	<u>Warranty extension to 5 years</u> Applies on all mechanical and electronic parts. Consumable parts and parts subject to wear and tear are not covered by this extended warranty.	