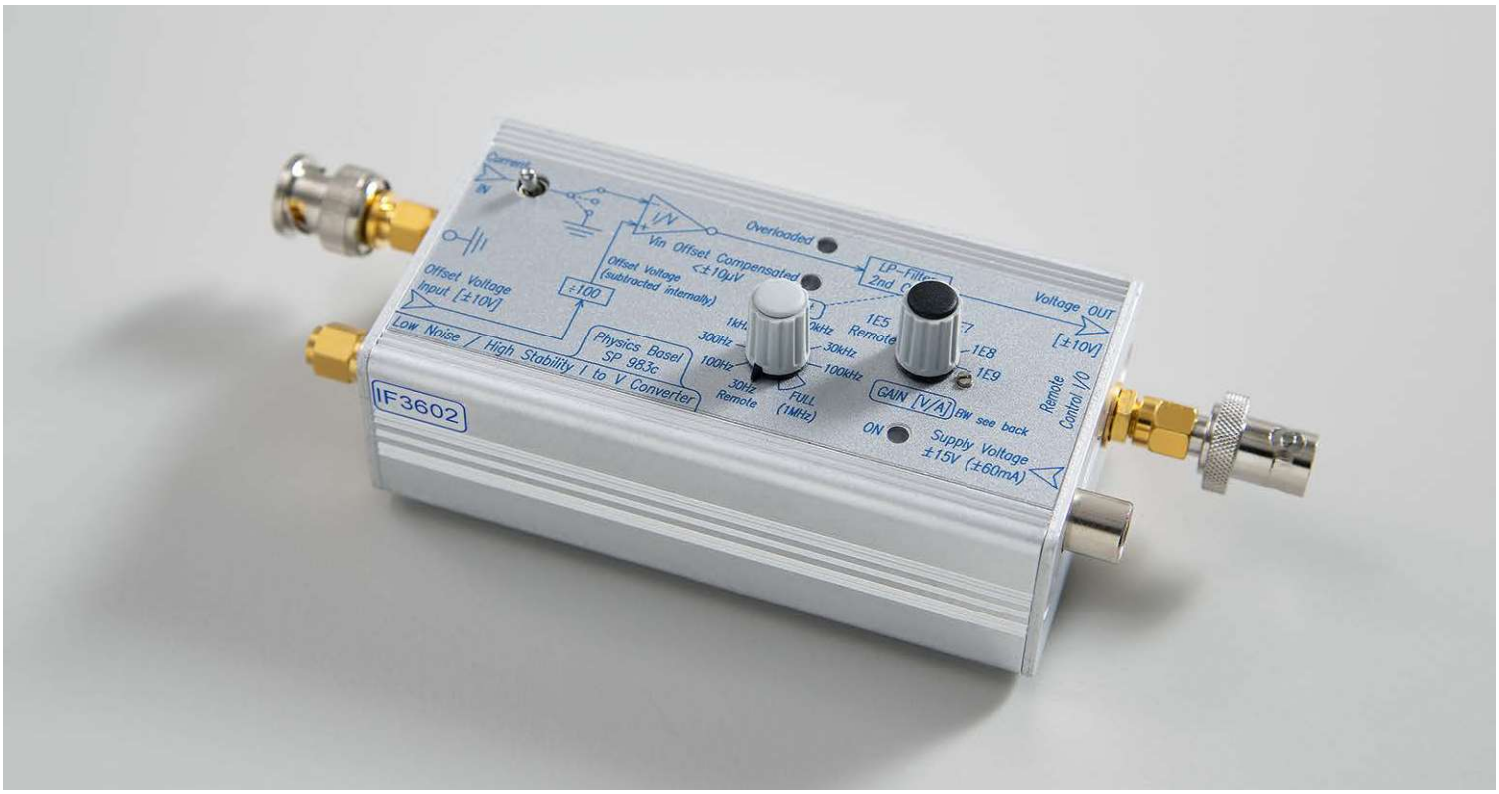
Basel Precision Instruments



Low-Noise High-Stability I to V Converter

ultra-low-noise, floating, input bias voltage, stabilized feedback

- Ultra-low voltage noise: **1.2 nV/√Hz @ 1 kHz**
- Ultra-low current noise: **5-6 fA/√Hz @10 Hz**
- The only available IV converter with actively stabilized input voltage: **drift < 0.2 µV/˚C**
- A floating instrument: **avoids ground loops**
- External bias voltage up to **±2 V**,
  enables host of new measurements, such as exploring symmetric source-drain biasing, biasing multi-terminal devices, biasing SPM tips, reducing noise by measuring current twice, and many more
- Small and light for **mounting directly on the breakout box**
- Adjustable low-pass filter from 30 Hz to full bandwidth
- Variable gain: 10^5 to 10^9 V/A

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Model: SP983c	-IF	01-IF	-LSK	02-LSK
Input J-FET	IF3602, best for R < 1 MΩ or C > 1 nF		LSK389A, best for R > 1 MΩ and C < 1 nF	
Stable, low-noise and overload protected input current				
Current noise @10 Hz & 10^9 V/A (fA/√Hz) Current noise @1 kHz & 10^9 V/A (fA/√Hz)	6 9		5 8	
leakage current magnitude (pA)	40	50 *	3	3 *
Stable, low-drift and low-noise input voltage (low voltage noise relevant for R < 1 MΩ)				
Input voltage noise @ 10 Hz (nV//√Hz) Input voltage noise @ 1 kHz (nV//√Hz)	2.0 1.2	2.6 * 2.0 *	4.5 1.9	5.0 * 2.7 *
Input voltage drift	0.15 µV/K @25°C - feedback stabilized			
Input bias voltage (internally subtracted at output)	±100 mV	±1 V NEW	±100 mV	±2 V NEW
Gain	five decades 10^5 to 10^9 V/A - remote controllable			
Integrated low-pass filter	30 Hz to 100 kHz - remote controllable			
DC input impedance	33 Ω – 46 Ω			
GBWP	600 MHz		68 MHz	
Dimensions and weight	small size, low weight 122 x 55 x 35 mm, 165 gr			

Table shows typical specs
* Noise and leakage current values are measured at zero bias and may change with bias voltage. The noise of the externally applied voltage (divided by 2, 5 or 10 depending on the model) adds to the input voltage noise. Therefore, it's important to use a very low-noise voltage source, such as BASPI's LNHR DACII

Bandwidth

Gain (V/A)	10^9	10^8	10^7	10^6	10^5
Typical Bandwidth (-3dB) @ 1V	1.7 kHz	24 kHz	94 kHz	315 kHz	580 kHz

Applications

Low-noise and low-drift current measurements

- low-temperature experiments, e.g., quantum transport in dilution refrigerators
  optimized for filtered lines with high capacitance (IF model)
  optimized for high impedance loads, e.g., spin-blockade readout of a qubit (LSK models)
- scanning tunneling microscopes preamplifier
  can apply a bias voltage and simultaneously measure the current on the same lead
- sensitive current measurements with high bias voltage stability
  input voltage is actively stabilized to ensure negligible drift
- low-level light detection with photodiodes or photomultipliers