

# Self-Sensing Cantilever Starter Kit (Plus)



SCL's pre-amplifier (printed circuit board [PCB], connectors and protection case)

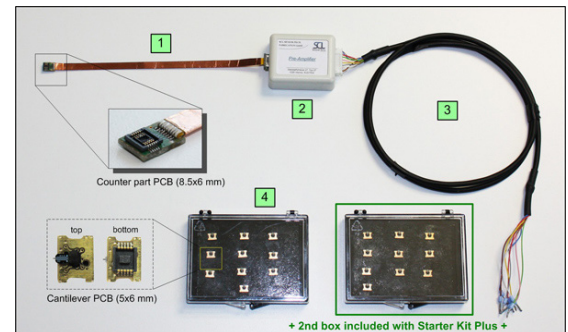
## Description

The core element of SCL's self-sensing starter kit (plus) is the pre-amplifier. It supplies a Wheatstone bridge based sensor with a stable and low-noise reference voltage and amplifies the bridge output signal. It can be generally used to amplify small sensor voltages. This signal is wired to a data readout device (Lock-in amplifier, atomic force microscope controller, etc.). The internal fixed reference voltage amounts to 2.048 V but can be switched via a jumper to an external bridge supply. The total gain is set to  $G=100$  with a high bandwidth of 2.5 MHz. An offset voltage in the output signal can be corrected by adding an external DC bias or manually with an onboard potentiometer. The image on the right side shows the content of the self-sensing starter kit.

## Specifications

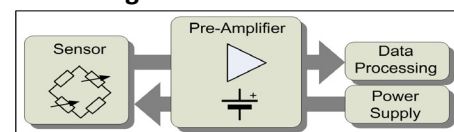
Dimensions (l x w x h)	
pre-amp PCB	48 x 28 x 1.6 mm
Pre-amp PCB incl. connectors	52 x 28 x 7 mm
Enclosure	46 x 36 x 18 mm
Electrical Specifications	
Operation voltage $V_s$	+/-5... +/-15 V
Gain, voltage amplification	100x
Bandwidth	$f_{3dB} = 2,5 \text{ MHz @ } 2mV_{pp}$ sine input signal
Power consumption	340 mW @ $V_s = +/-10V$ ( $I_{Bias} = +/-17 \text{ mA}$ ) 160 mW @ $V_s = +/-5V$ ( $I_{Bias} = +/-16 \text{ mA}$ )
Total offset adjustment range	$(V_s-) +1.4 \text{ V to } (V_s+) -1.0 \text{ V}$
manual onboard offset range	+/-5V
Output impedance	50 Ohm
Input impedance	3 GΩ    6 pF
Wheatstone bridge supply voltage (external input possible)	2,048 V (voltage reference)
Slewrate output stage	27 V/μs
Connectors and cables	
Input connector (cantilever side)	FFC 8 Pin
Output connector	Header Connector 8 Pin
Input FFC cable	FFC, 8 pol, length=152mm
Output cable	shielded flexible cable, l=1m, open ends

## Pre-amplifier kit content

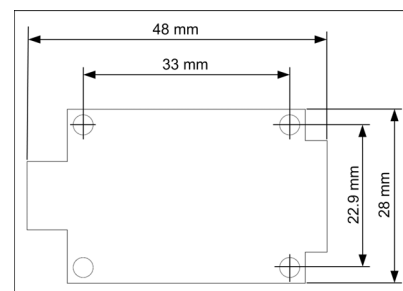
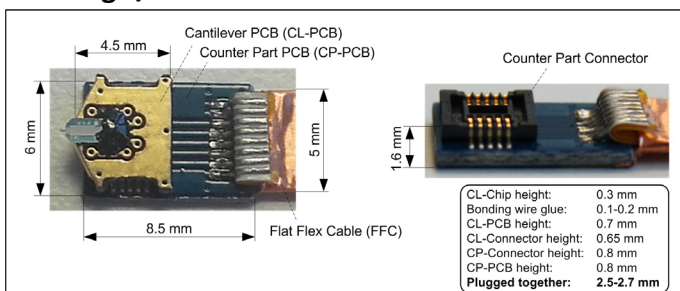


A self-sensing starter kit consists of 1) a counter part PCB connected to a flat flex cable, 2) a pre-amplifier, 3) an output cable and a cantilever box with 10 cantilevers. Starter kit plus includes a second cantilever box with an attractive discount.

## Block diagram



## Drawings / mechanical dimensions



Dimensions of the counter-part PCB, cantilever PCB and the pre-amplifier PCB