

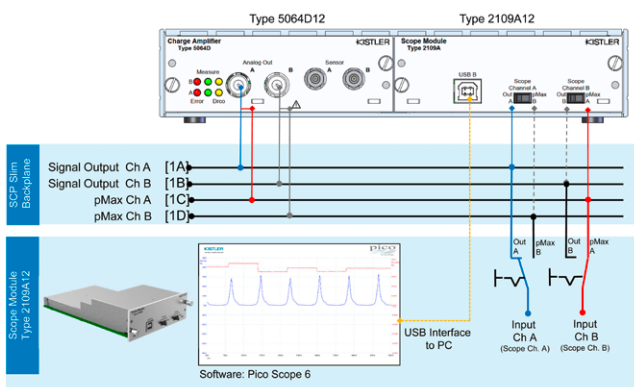
Scope Module for SCP/SCP Slim

The universal 2- and 4-channel scope module is a complementary module for monitoring and acquisition of cylinder pressure signals, pMax or any other signal generated from the SCP/SCP Slim amplifiers.

- Suitable for any SCP/SCP Slim rack
- SCP internal signal transfer (no external wiring)
- Display and recording of raw signal incl. pMax value from Type 5064D
- Powerful scope software included
- Easy to integrate with PC via USB on front panel

Description

The scope module enables display and monitoring of cylinder pressure and pMax signal output provided by the charge amplifier Type 5064D. The module is also an ideal expansion for the universal signal monitoring and measurements for SCP and SCP Slim. The 2-channel module Type 2109A12 has a selectable signal input of channel A (cylinder pressure A) or channel B (cylinder pressure B). In addition, the pMax signal can be selected between pMax cyl. A and pMax cyl. B.



System Configuration of SCP Slim Type 2852B with Type 5064D12 and 2-channel scope module Type 2109A12

The 4-channel module Type 2109A14 has the signal input of channel A (cylinder pressure A) and channel B (cylinder pres-

Type 2109A...



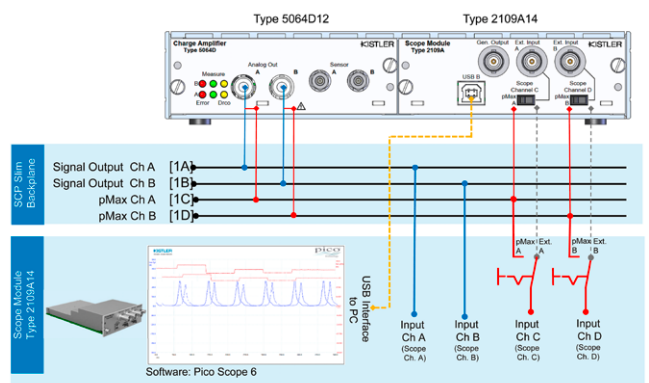
Type 2109A12



Type 2109A14

sure B). It is characterized by two selectable connections/BNC interfaces to allow the device to be used for general purpose "scope" applications – checking signal integrity, fault diagnosis etc.

In addition, the module offers an arbitrary waveform and signal generator whose signals can be accessed via a BNC interface. A signal database provided by Kistler allows simulations of some typical real engine application signals.



System Configuration of SCP Slim Type 2852B with Type 5064D12 and 4-channel scope module Type 2109A14

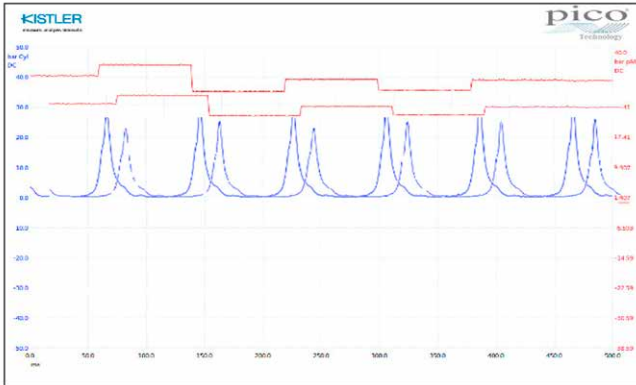
Included is a powerful software tool which takes advantage of the display size, resolution and processing power of the PC. Unlike a conventional benchtop oscilloscope, the size of the display is limited only by the size of the computer monitor. The software is also easy to use on touch-screen devices.

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This information corresponds to the current state of knowledge. Kistler reserves the right to make technical changes. Liability for consequential damage resulting from the use of Kistler products is excluded.

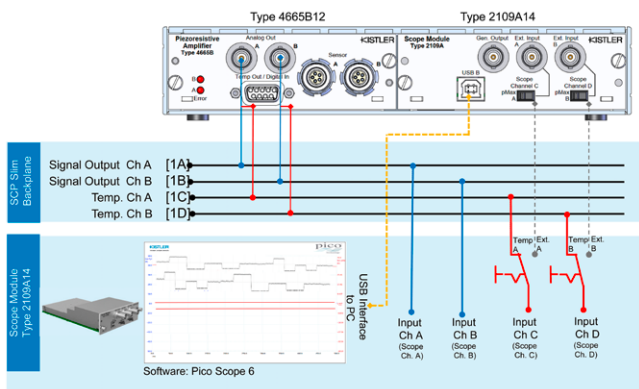
Application

Wherever onsite signal display and signal monitoring like cylinder pressure, is needed, Type 2109A12 or Type 2109A14 is an excellent choice.



Signal display of 4-channel Type 2109A14, showing cylinder pressure channel A & B and pMax from channel A & B of charge amplifier Type 5064D.

The possibility for channel selection and 2 additional analog input BNC ports offers universal use. Especially when using the scope module in combination with SCP Slim, the system can be perfectly used for onboard-, testbed- as well as for laboratory applications.



Signal display of 4-channel Type 2109A14, showing inlet pressure channel A & B and temperature of sensors connected to channel A & B

Technical data

Vertical

Type	2109A12	2109A14	
Numbers of channels	2	4	
Maximum sampling rate	MS/s	100	500
Buffer memory	kS	8	48
AWG bandwidth	kHz	100	1,000
Bandwidth (-3 dB)	MHz	10	25
Rise time (calculated)	ns	35	14
Vertical resolution	bits	8	
Enhanced vertical resolution up to	bits	up to 12	
Input ranges	mV		±20
	mV	±50, ±100, ±200, ±500	
	V	±1, ±2, ±5, ±10, ±20	
Input sensitivity	mV/div V/div	10 ... 4	10 ... 4
Input coupling	Hz	AC/DC	
Signal input			2 x BNC neg.
		via backplane of SCP/SCP Slim	
DC accuracy	%FS	±3	
Oversoltage protection	V	V ±100 (DC+AC peak)	

Horizontal (timebase)

Type	2109A12	2109A14		
Maximum sampling rate (real-time)	1 ch.	MS/s	100	500
	2 ch.	MS/s	50	250
	3 or 4 ch.	MS/s		125
Maximum sampling rate USB (USB streaming)	MS/s	1	8.9	
Shortest timebase	ns/div	10	2	
Longest timebase	s/div	5,000		
Buffer memory (shared between active channels)	kS	8	48	
Buffer memory (USB streaming mode)	MS	100	(shared between active channels)	
Buffer memory (USB streaming mode)		up to available PC memory		
Max buffers (normal triggering)		10,000		
Timebase accuracy	ppm	±100	±50	
Sample jitter	ps	30	20	
	RMS			
ADC sampling		simultaneous sampling on all enabled channels		

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Technical data (Continuation)

Dynamic Performance (typical)

Type		2109A12	2109A14
Crosstalk (full bandwidth, equal ranges)		better than 200:1	better than 300:1
Harmonic distortion	dB	< -50 @100 kHz, fullscale	
Noise	μ V RMS	<150 (\pm 50 mV range)	

Triggering

Type	2109A12/2109A14		
Trigger modes		none, auto, repeat, single	
Advanced triggers		edge, window, pulse width, window pulse width, dropout, window dropout, interval, logic	
Trigger types		rising or falling edge	

Automatic measurement

Type	2109A12/2109A14		
Scope mode		AC RMS, true RMS, cycle time, DC average, duty cycle, falling rate, fall time, frequency, high pulse width, low pulse width, max., min., peak to peak, rise time, rising rate	
Statistics		min., max. average and standard deviation	

Function generator for Type 2109A14

Standard output signals		Sine, square, triangle, DC voltage, ramp, sinc, Gaussian, half-sine
Standard signal frequency		DC to 1 MHz
Output voltage range	V	\pm 2

General

Type	2109A12/2109A14	
PC connectivity		USB 2.0 (USB 3.0 compatible). USB cable included
Power requirements		Powered from USB port
Weight	kg	\approx 0,4
Operating temperature range*)	$^{\circ}$ C	0 ... 50
Min./max. temperature range*)	$^{\circ}$ C	-20 ... 60

*) non condensing

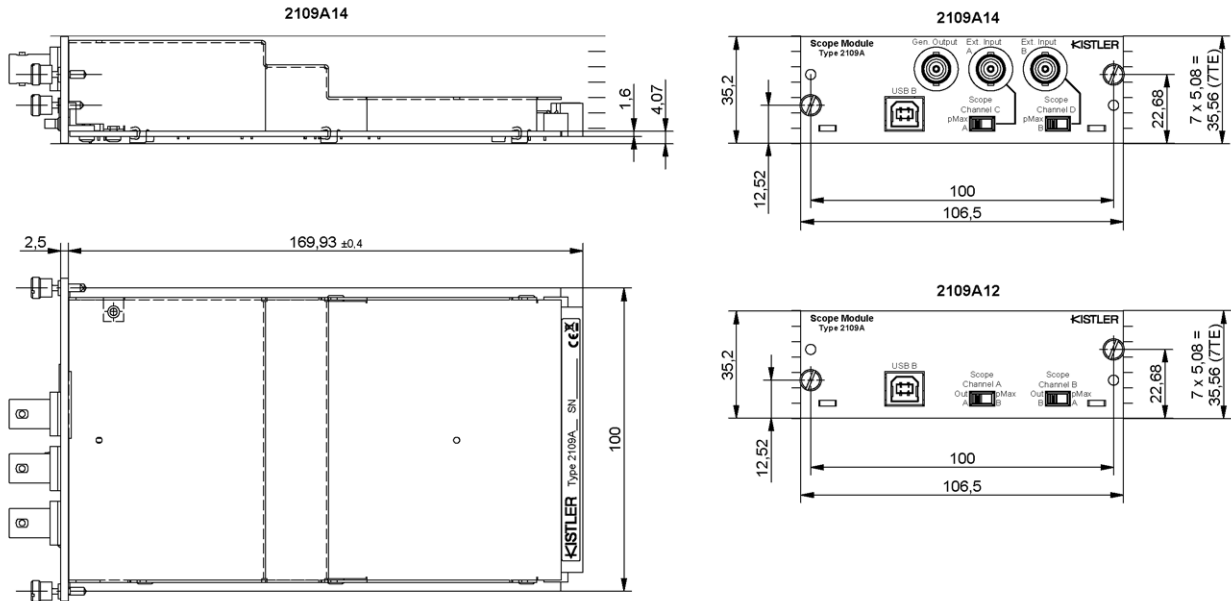
Connections for Type 2109A12

Signal inputs (cylinders ch.A/ch.B) (selectable between ch.A or ch.B)	Type	64 pin DIN 41612 (via backplane of SCP/SCP Slim)
Signal inputs (pMax ch.A/pMax ch.A) (selectable between pMax ch.A or pMax chB)	Type	64 pin DIN 41612 (via backplane of SCP/SCP Slim)

Connections for Type 2109A14

Signal inputs (cylinders ch.A/ch.B) (selectable between ch.A or ch.B)	Type	64 pin DIN 41612 (via backplane of SCP/SCP Slim)
Signal inputs (pMax ch.A /pMax ch.A) (selectable between pMax ch.A or pMax chB)	Type	64 pin DIN 41612 (via backplane of SCP/SCP Slim)
General signal inputs	Type	2 x BNC (neg.)
Arbitrary waveform and function generator	Type	1 x BNC

Dimensions



Included accessories

- USB cable (A – B) l = 1 m

Type/Mat. No.

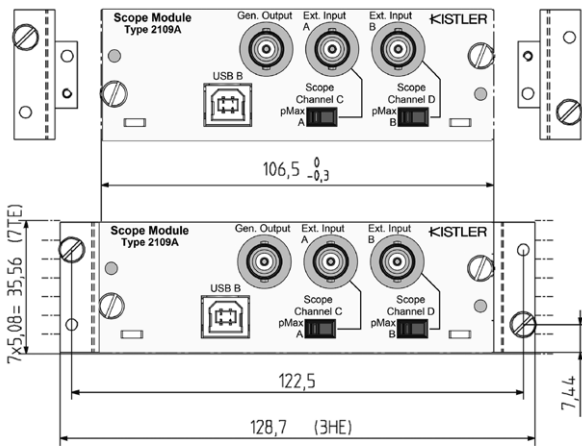
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Optional accessories

- Adaption kit to fit scope module Type 2109A12 or Type 2109A14 into SCP Type 2853...

Type/Mat. No.

5746A5



Ordering key

Type 2109A

PiezoSmart

2-channel scope module	12
4-channel scope module	14

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