



Scientech Compact MSO is a unique test instrument combining a powerful Mixed Signal Oscilloscope, Protocol Analyzer, Waveform and clock Generator, Spectrum Analyzer and Data Recorder in one tiny USB powered device.

It offers 10 capture channels (2 analog and 8 digital) with 100 MHz analog bandwidth, 40MSps logic speed and up to 12 bits analog resolution as well several output channels for its signal generators, triggers and external control signals.

Compact MSO is fast with a frame rate up to 100 Hz driving a digital Phosphor display. It works just like a quality stand-alone scope. View waveforms, plots, spectra and more on its smooth flowing real-time screen. Even live capture logic data can be viewed this way.

Alternatively large buffers support high speed one-shot capture with post-capture zoom, scrolling and measurement, or it can stream direct to disk for off-line replay and analysis.

Software is included for Windows, Mac OS X or Linux. Features include mixed signal, storage and sampling Oscilloscopes, logic timing, SPI, CAN, I2C and UART packet decoders, a spectrum analyzer, X-Y phase plotter and data recorder

Technical Specifications & Features

Inputs	Scientech 710S	Scientech 710P	Scientech 710U	Scientech 7120U	Scientech 7325N	Scientech 7445N
Analog Bandwidth (1)	10MHz	20 MHz	100 MHz	100 MHz	100 MHz	100 MHz
Capture Channels (2)	2 Analog or 1+8 logic	2 Analog + 8 logic	2 Analog + 8 logic +4 DAQ	2 Analog or 1 + 8 logic +2 DAQ	2 Analog + 8 logic +2 DAQ	4 Analog + 8 logic +4 DAQ
Input Ranges (3)	±1.1 V~ ± 5.2V	±550 mV~ ±5.2V	±220 mV~ ±5.2V	±48.8 mV~ ±11.8V	±48.8 mV~ ±11.8V	±48.8 mV~ ±11.8V
Vertical Scaling	10 mV/Div ~ 2V/Div	5 mV/Div ~ 2V/Div	1 mV/Div ~ 2V/Div	500uV/Div ~ 5V/Div.	500uV/Div ~ 5V/Div	500uV/Div ~ 5V/Div
Vertical Accuracy	± 3%	± 3%	± 2%	± 2%	± 2%	± 2%
Analog Sensitivity	50mV	20mV	10mV	2mV	1mV	1mV
Maximum Sensitivity (4)	5mV	2mV	1mV	200uV	50uV	100uV

Technical Specifications & Features

Input Filters (5)	✗	✓	✓	✗	✗	✓
Probe Attenuation (6)	✗	✓	✓	✓	✓	✓
Data Acquisition Inputs	✗	✗	✓	✓	✓	✓
Protocol Inputs	-	UART, SPI, I2C & CAN Bus				
Analog Coupling (7)	DC (Manual offset)	DC (input sensing, auto offset)		AC (Software switchable and auto offset)		
Input Impedance	1MΩ ± 1%, 10pF (analog), 100kΩ ±1%, 20pF (logic)			1MΩ ± 1%, 20pF (analog), 100kΩ ±1%, 5pF (logic)		
	✗	✗	✗	✗	✗	✓
Logic Input Levels	3.3/5V CMOS (TTL compatible)					

Acquisition	Scientech 710S	Scientech 710P	Scientech 710U	Scientech 7120U	Scientech 7325N	Scientech 7445N
Real-Time Mixed Signal	✓	✓	✓	✓	✓	✓
Sub-Sampled Analog	✗	✓	✓	✓	✓	✓
Mixed Signal Streaming	✗	✓	✓	✓	✓	✓
Spectrum Analyzer	✗	✓	✓	✓	✓	✓
RF Spectrum Analyzer	✗	✗	✓	✓	✓	✓
Macro High Resolution	✗	✗	✓	✓ (via enhanced data mode)		
Data Acquisition capture	✗	✗	✓	✓	✓	✓
Digital Sample Rate (max)	10 MSps	20 MSps	40 MSps	40 MSps	40 MSps	40 MSps
Analog Sample Rate (max)	5 MSps	10 MSps	20 MSps	40 MSps	40 MSps	40 MSps
Sub-Sample Rate (max)	—	100 MSps	500 MSps	500 MSps	2 GSps	1 GSps

Streaming Rate (max)	—	100 kSps	500 kSps	50 kSps	70 kSps	70 kSps
Native Resolution [8]	8 Bits		12 Bits	8 Bits		
Effective Resolution [9]	10 ENOB		14 ENOB	11 ENOB	15 ENOB	12 ENOB
Display Frame Rate (max)	20 Hz (50ms)	50 Hz (20ms)	100 Hz (10ms)	40 Hz (25ms)		
Capture Buffer Sizes	12 kS, 6 kS x 2 or 6 kS x 9	12 kS, 6 kS x 2, 6 kS x 9 or 3 kS x 2+6kS x 8		64 kS x 2 64 kS x 9	512 kS x 2 or 256 kS x 2 + 512kS x 8	128 kS x 12
Timebase Range [10]	10 us/Div. ~ 2 s/Div.	10 us/Div. ~ 50 s/Div.		1ns/Div ~ 50 s/Div.		
Timebase Accuracy	0.01%(100 ppm)					

Triggers [11]	Sciencetech 710S	Sciencetech 710P	Sciencetech 710U	Sciencetech 7120U	Sciencetech 7325N	Sciencetech 7445N
Comparator [COMP]	✓	✓	✓	✓	✓	✓
Logic State (MASK)	✓	✓	✓	✓	✓	✓
Sampled Analog (SALT)	✗	✓	✓	✓	✓	✓
Logic Sequence (FUSE)	✗	✗	✓	✗	✗	✗
Trigger Modes	Edge (Rise/Fall) & Logic	Edge (Rise/Fall), Level/State & Logic		Edge (Rise/Fall), Level/State & Logic		
Hysteresis/Sensitivity	± 2%	± 2% (COMP) or variable (SALT)		± 2% (COMP) or fixed (BAND)		
Trigger Filter	Fast & Normal	Fast, Normal & Slow (10us ~ 100ms)		Fast, Normal & Slow (10us ~ 10ms)		
Cross-Trigger Operation	Logic triggers analog	Logic triggers analog & vice versa		Logic triggers analog & vice versa		
Trigger Delay Timebase	✗	100 us to 10s (programmable)		10 us to 60s (programmable)		
Trigger Hold-off		1 ms ~ 100ms		1 ms ~ 1s		
Generators [12]	Sciencetech 710S	Sciencetech 710P	Sciencetech 710U	Sciencetech 7120U	Sciencetech 7325N	Sciencetech 7445N
Clock Generator (CLK)	✗	✓	✓	✓	✓	✓
Voltage Generator (DCV)	✗	✓	✓	✓	✓	✗
Waveform Generator (VSR)	✓	✓	✓	✓	✓	✗
Logic Pattern Generator (LPG)	✗	✗	✓	✓	✓	✗
Triggered One-Shot Mode	-	-	-	✓	✓	-
Chirp/Sweep Mode	-	-	-	✓	✓	-
Write/Pink Noise Mode	-	-	-	✓	Via Replay Mode	-
Waveform Replay Mode	-	-	-	1024 sample (max)	✓	-
Trigger/Sync Clocks	-	-	-	✓	✗	-
Output Level Controls	-	-	-	✓	✓	-
Clock frequencies (CLK)	-	1 kHz ~ 20 MHz		1 kHz ~ 5 MHz	1 kHz	
Waveform Functions (13)	Sine, Ramp, Step	Sine, Ramp, Step, Exponent & loadable		Sine, Ramp, Step, Exponent & loadable		-
Frequency Range	2 Hz ~ 100kHz	2 Hz ~ 250kHz		1 Hz ~ 500kHz	1 Hz ~ 5 MHz	-
Frequency Resolution	3 Digits	3 Digits below 100kHz		6 decimal digits	6 decimal digits (one shot)	-
Frequency Accuracy (14)		±50ppm, 20° to 30° (typical)				-
Bipolar Output	✗	✗	✗	✓	✓	-
Output Level		3 Vpp		40 mVpp ~ 10 Vpp		-
Output Impedance		100Ω		50Ω		-
Voltage Tolerance		+9V (max)		+12V (max)		-
Waveform Resolution		8 Bits		8 Bits (Multiplying)		-

Interfaces	Scientech 710S	Scientech 710P	Scientech 710U	Scientech 7120U	Scientech 7325N	Scientech 7445N
Analog Interface	2x1 M Ω (POD)		2 x1 M Ω + 4 x 100 k Ω (POD)	2 x1 M Ω (BNC) +2 x 100 k Ω (POD)		2 x1 M Ω (BNC) +2 x 100 k Ω (POD)
Logic Interface	8 x 3.3/5 V 100 k Ω			8 x 3.3/5 V 100 k Ω (POD)		
Control Interface	3.3V, 5V, GND	3.3V, 5V, GND, WavePort, Serial I/O		12V, 5V GND, WavePort, Serial I/O		12V, 5V GND, Serial I/O
PC Host Interface	USB 2.0 (USB 1.1 compatible)			Isolated USB 2.0 (USB 1.1 Compatible)	Isolated ethernet	
Data Upload Speed (max)	5 Mb/s			1200 kb/s	1200 kb/s	
General	Scientech 710S	Scientech 710P	Scientech 710U	Scientech 7120U	Scientech 7325N	Scientech 7445N
Included PC Software [15]	Software (Student Edition)	Scientech Virtual Instruments software				
Optional PC Software [16]	Scientech Meter	Scientech Logic, Meter, Chart, BitGen & Library				
Power Requirement	5V USB powered			9~ 12 VDC @ 500mA (max), 2.5mm CP	12 VDC@ 1A (max), 2.5mm CP	
Operating Temperature	0°C to 40°C			0°C to 40°C or 20°C to 30°C (for quoted accuracy)		
Storage Requirements	- 40°C to +50°C/5% to 85 % RH			- 40°C to +50°C / 5% to 85 % RH		
Dimensions (W x D x H) (net)	65 x 5 x 15mm			140 x 105 x 35 mm	140 x 140 x 35 mm	225 x 180 x 42 mm
Weight (net)	65g			310g	432g (980g with rackmount)	1.05 Kg (1.85 Kg with rackmount)

- Maximum bandwidth of analog channels captured using equivalent time sampling or used with the RF spectrum analyzer with waveform amplitude captured to 10% full-scale.
- Scientech 710U and Scientech 710P can capture 10 channels in mixed signal mode; 2 analog + 8 logic. Scientech 710S is limited to 9 channels; 1analog+8 logic. Scientech 710U can also capture up to 6 analog channels in data acquisition mode.
- Scientech 710U can support 5 Input voltage ranges, Scientech 710P has 4 and Scientech 710S has 3 The differences relate to their respective input circuit designs.
- Maximum sensitivity refers to the smallest measurable waveform voltages in the most sensitive range with enhanced data mode enabled at frequencies below 1 MHz. Using the spectrum analyzer signal levels below these limits can be measured.
- Scientech 710P and Scientech 710U include software switchable 5 MHz anti-alias filters for the analog inputs.
- Probe attenuation allows the inputs of the analog channels to be rescaled when attenuating probes are used.
- Compact MSO have DC coupled inputs. Scientech 710P and Scientech 710U include input sensing and auto offset control to allow software synthesized AC coupling. Scientech 710S support manual offset control.
- Native resolution is the maximum resolution of the A/D converters used. Scientech 710U has both 8 and 12 bit converters, the latter used for macro high resolution capture
- Effective resolution is the maximum possible resolution of captured waveforms using DSP based filtered decimation applied to the highest resolution native capture data at sample rates below 200Ksps.
- Timebase range includes the time scales available across all capture modes. Scientech 710P and Scientech 710U support a much wider timebase range than Scientech 710S because they support sub-sampled and mixed signal streaming capture.
- Up to four type of trigger; COMP= analog comparator trigger, MASK = multi-channel logic state trigger, SALT=sampled analog level trigger and fuse = fuse map logic state sequence trigger.
- Up to three types of waveform generator; CLK= variable mark -space clock generator, DCV=digital controlled voltage generator, VSR= variable sampled rate waveform generator.
- Wave-function are the function prototypes used to synthesize analog waveforms. All expect "Loadable" are built-in. Loadable is a user definable 512 or 1024 point wave-table which can accept an arbitrary waveform.
- Uncalibrated frequency accuracy is specified (as defined by the Scientech 710 reference crystal). May be calibrated to better than this if precision frequency reference is available.
- All Specifications are quoted on the basis that the product is used with included PC software.
- Some models may not be compatible with all the features provided by the software listed here.

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Subject to Change.

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