

# mti instruments

A WORLDWIDE LEADER IN PRECISION MEASUREMENT SOLUTIONS

## 1520 Precision Signal Simulator

Laboratory Grade Accuracy | WiFi Connectivity | Ruggedly Built

Get proven reliability, performance, and remote operation in a portable signal simulator for testing and calibrating sensor-driven systems.



# Product Overview

## Extreme Precision and Remote Operation

**MTI Instruments' 1520 Precision Signal Simulator** lets you test and calibrate sensor-driven systems with precision, portability, and ease. This NIST-traceable signal source lets you bring laboratory-grade precision into the field and simulate accelerometers, pressure transducers, strain gauges, tachometer generators, flow meters, microphones, and more. An intelligent sensor database makes it easy to simulate a wide variety of sensor types, and you can readily build your own simulations using SQL queries.

**MTI's 1520 Precision Signal Simulator** features a rugged but ergonomic design, a dependable battery for all-day use, and remote control via smartphone so that a single technician can perform diagnostics and troubleshooting. This WiFi-enabled device has an intuitive user interface, a touchscreen that's easy to use with a gloved hand, and a field-upgradeable design for software updates and additional sensors and features. For extreme precision with remote operation, choose MTI Instruments.

### Additional Features Include

#### *Remarkable Functionality*

- **Signals**—Dual Voltage, Single Current Loop, and Single Charge Amp in both Single Ended and Differential Forms.
- **Waveforms**—Custom, Sine, Square, Triangle, Pulse, Tachometer, and Sawtooth from 0.1Hz to 100kHz in 0.1 Hz increments
- **Jog Function**—Vary the signal amplitude in increments to determine system gain, or vary the signal frequency to determine filter response
- **Sweep Function**—Customizable time, voltage or charge
- **Bridge Circuit Simulation**—Easily command microvolts to simulate strain gauges
- **High Accuracy**—Voltage and charge signals with accuracies to 0.05%
- Build your own applications using common SQL queries
- Light and dark modes to accommodate user preference and lighting conditions
- Languages supported: English; additional languages coming soon
- UI designed with color vision deficiency users in mind
- A/B channels are color mapped for ease-of-use
- Annual calibration plans available to help meet NIST regulatory requirements.

#### *WiFi Capability Provides*

- Securely connect to your internal network and open the web page interface of the 1520 through on any internet enabled device.
- Remotely login and control the full functionality of the 1520 for fast and easy testing of hard to reach sensors and devices.

## Applications

- Cabling and wiring troubleshooting
- Vibration signal simulation-accelerometers
- Machinery rotational speed signal simulation
- Low-voltage bridge sensor signal simulation
- Audio signal simulation
- Simulate alarm and shutdown conditions to verify machine controls during FAT (Factory Acceptance Testing)
- Simulate instrument outputs to verify HMI (Human Machine Interface) displays
- Calibration of:
  - Monitoring systems
  - Charge amplifiers
  - Avionics equipment

Environmental Characteristics	
Operating Temperature	-10°C to+ 60°C (+14°F to +140°F)
Power	
Power	External charger operates from 115/230VAC, 50-60Hz up to 36W
Battery	Rechargeable, Lithium Ion battery Non-Removable
Battery Life	8 hours (typical) from full charge (dependent on use of the display/ back-light, and wireless)
Connector/Charger type	USB-C (PD2.0)
Controls	
User Display	320x240 TFT Color Resistive Touchscreen, Glove Compatible Color transfective LCD white back-light
Connectivity	USB-C, WiFi, Bluetooth
Key Pad Input	Directional and numeric with power and function keys.
Set-Up Memory	100 locations to save settings for all outputs and functions
Memories (non-volatile)	Save program setups - any combination of instrument settings
Physical	
Case	Molded Plastic
Grips	Molded Rubber
Connections (Outputs)	Standard BNC ( $\pm 10V$ Voltage), Banana (4-20mA Current), 10-32 Coaxial (Single Ended Charge), MS3102A-10SL-3P (Differential Charge)
Connections (Inputs)	USB-C Power supply, PC and Network Interface
Dimensions	257 mm L x 155.2 mm W x 55.9 mm H 10.12 in L x 6.11 in W x 2.22 in H
Weight	Approximately 1 kg (2.2 lbs), excludes interface cables/ connectors/charger

## What's in the Box

- 1520
- USB-C Connector/Charger
- Carrying case
- User manual

Waveform: Sine Wave	Channel A	Channel B
Voltage Range (0.1 Hz to 100 kHz)	0 to 9.9999 Volts pk	
Loop Connector Range	0-24 mA	
Voltage Accuracy (of setting, 10mV to 10V) (1Hz to 20Hz)	0.15% $\pm$ 0.1 mV	
(20Hz to 30kHz)	0.05% $\pm$ 0.1 mV	
(30kHz to 50kHz)	0.07% $\pm$ 0.1 mV	
(50kHz to 80kHz)	0.08% $\pm$ 0.1 mV	
(80kHz to 100kHz)	0.10% $\pm$ 0.1 mV	
Charge Range (1 Hz to 100 kHz)	1 to 9,999.9 pC pk	
Charge Accuracy (of setting) (10pC to 10,000pC, 10Hz to 30kHz)	0.20% $\pm$ 0.1pC	
Resolution	0.1 mV, 46 nA	
Level Types	RMS, peak or pk-pk units	
Frequency Range	0.1 Hz - 99,999.9 Hz	
Channel B frequency can also be set and locked to any ratio of Channel A. Refer to Speed synthesizer specifications.		
Distortion (10 Hz to 50 kHz)	<0.5%	<0.75%
(50 kHz to 100 kHz)	<3.0%	
Frequency Accuracy (of setting) (3 Hz to 100 kHz)	$\pm$ 0.005%	
Variable phase (all waveform types)	0 to 360°	

Channel A phase on any waveform type can be synchronized and locked to Channel B phase, at any phase setting 0-360°, Step 1°. In Sweep mode, Channel A & Channel B can be swept together, preserving phase relationship.

Waveform: Square	Channel A	Channel B
Voltage Range	0 to 9.9999 Volts pk	
Loop Connector Range	0-24 mA	
Charge Range	1 to 9,999.9 pC pk	
Resolution (voltage & charge)	0.1 mV or 0.1 nC	
Level Types	RMS, peak or pk-pk units	
Frequency Range	0.1 Hz - 20,000 Hz	
Frequency Accuracy (of setting) (3 Hz to 100 kHz)	$\pm$ 0.005%	
Rise/Fall Time (10% to 90%)	$\leq 3.0$ usec.	
Asymmetry	Less than 3% at 10 kHz	
Overshoot	Less than 2%	
Voltage Accuracy (of setting)	0.1% typical, 0.25% max	

Output Connectors	Channel A	Channel B
Impedance	50 ohms	
Connector	BNC coaxial	
Differential Charge (DE)	MS3102A-10SL-3P	
Single-ended Charge (SE)	RMS, peak or pk-pk units	

DC Output (and DC offset)	Channel A	Channel B
Voltage Range	+9.9999 VDC	
Voltage Accuracy (of setting)	0.05% + 0.1mV	
Resolution	0.2 $\mu$ volt	

DC voltage can be generated alone or simultaneously with AC signal to simulate offsets.

Microvolt DC Output - Bridge Mode	Channel A	Channel B
Voltage Range	+1 $\mu$ volt to +99.999 mVDC	
Voltage Accuracy (of setting)	0.05% + 5 $\mu$ volt	
Resolution	0.1 $\mu$ volt	

To ensure accuracy for testing of strain gage and other low level bridge circuits.

## Channel B - Speed Synthesizers Signals Ratio Speed Signal Function

### Single Pulse Signal Function

Signal Type	1-cycle sine or 1/2 cycle square/TTL
Signal Range	0 to 9.9999 Volts Pk
Resolution	0.1 mV
Pulse Duty Cycle	3% to 100%
Frequency Range (ratio)	0.1x to 100x Ch A Frequency Step 0.1
Frequency Range (fixed)	1 Hz to 100kHz
Units	RMS, peak or pk-pk

### Odd Pulse Signal Function

Odd Pulse Type	Long or short
Odd Pulse Size	0 to 9.9999 Volts Pk
Number or Base Pulses between Odd Pulse	0.1 mV
Frequency Range (ratio)	3% to 100%
Frequency Range (fixed)	0.1x to 100x Ch A Frequency Step 0.1
Range	1 Hz to 100kHz
Resolution	.01 mV
Voltage Units	RMS, peak or pk-pk
Waveform	Sine Wave

### Sweep Functions (Channels A & B)

Sweep time	1 + 999 sec (116.67 min)
Sweep time Sec	1 Second
User Controls	Set START Frequency Set STOP Frequency Set SWEEP time (seconds) GO PAUSE CANCEL
Channels	A alone or A & B together

Channel B can be swept synchronously with Channel A, if Channel B frequency is set to any Ratio of Channel A Frequency.  
Phase between Channel A and Channel B is preserved during sweep.



A WORLDWIDE MANUFACTURER OF PRECISION MEASUREMENT SOLUTIONS

325 WASHINGTON AVENUE EXTENSION  
ALBANY, NY 12205-5505  
PH. +1-518-218-2550  
OR USA TOLL FREE: 1-800-342-2203

FAX: +1-518-218-2506  
EMAIL: SALES@MTIINSTRUMENTS.COM  
WWW.MTIINSTRUMENTS.COM