

7520 PRECISION AUTOMATED VOLTAGE DIVIDER

First Automated and Self Calibrating Sub-ppm Voltage Divider



FEATURES

- Patented Automated Self-Alignment (i.e. True Self-Calibration) Incorporated into the Divider
- NO External Standards Required for Self-Alignment!
- Built-In Wheatstone Bridge, Built-in Voltage Reference, and Built-in Null Detector
- Advanced Internal Temperature Control Chamber for Resistive Divider Networks
- Sub-ppm Ratio Uncertainties
- Provides for Wide Range of Ratios: 1:1, 1:10, 1:100, 1:1000 and Reverse
- Fully Automated Operation with SCPI Command Set
- Automates Calibration of Voltage References
- Calibrates Precision Sources Including Calibrators
- Calibrates Voltage Measurements including DMMs
- Color Screen Touch Menu Operation
- Ethernet / IEEE-488.2 and USB Ports
- Replaces Old Divider Technology such as the Fluke 752A and Measurements International (MI) 1340A

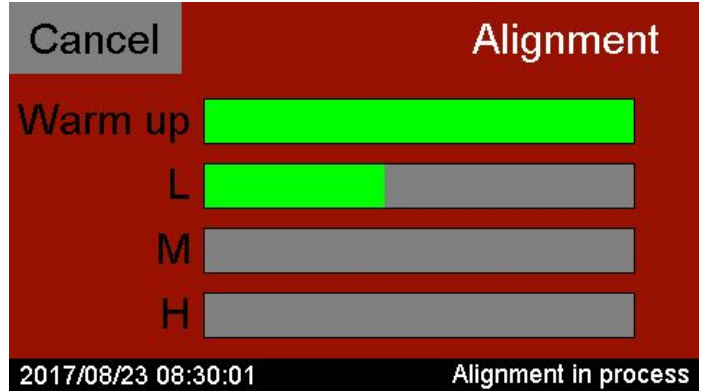
GUILDLINE INSTRUMENTS 7520 PRECISION AUTOMATED VOLTAGE DIVIDER is the latest innovation in DC Voltage Dividers. The 7520 is a unique, patented Divider that provides self-alignment (i.e. true self-calibration) via: internal Wheatstone bridge, internal Zener based voltage source, and an internal optical null detector. The 7520 Voltage Divider can divide an input voltage ranging from 1 to 1100 volts into ratios of 1:1, 10:1, 100:1 and 1000:1 with corresponding uncertainties of 0.05, 0.1, 0.2, and 0.5 $\mu\text{V/V}$. This fully automated instrument is priced in the range of a traditional voltage divider, making it an affordable option for sub-ppm ratio measurements.

The resistor voltage divider networks, Wheatstone Bridge, voltage reference, and optical null detector are all inside a thermally regulated and EMI shielded chamber. In addition, the use of a patented optical null detector guarantees high isolation and low noise during the self-alignment process. Internal safety circuits are used to protect the devices connected to the 7520 Divider from being damaged by operator error or internal failure.

The internal 7520 system automatically checks for temperature stability in the chamber during start-up, Ratio Alignment (i.e. Self Calibration), and operation. If there is instability in temperature, a warning or failure message will be displayed. Manual monitoring of temperature stability is not required. Progress of temperature warm-up and Ratio Self-Alignment/Calibration are displayed in real-time. The 7520 Voltage Divider is controllable via the Ethernet/IEEE 488.2 bus interface or via a USB interface, enabling automated testing and calibration setups. A complete SCPI command set enables customers to develop their own automated calibration or measurement processes. Additionally, full manual operation is achieved via an internal micro-processor and front panel, color, touch sensitive screen.

Model 7520 Precision Automated Voltage Divider

The self-alignment process incorporated into the 7520 is a true self-calibration. The 7520's built-in Wheatstone Bridge, voltage reference, and optical null detector are used to automatically perform the self-alignment of the voltage ratios, returning the 7520 to its original calibration state. No external standards are required and once started no operator intervention is required. In comparison to the competition, which requires frequent manual calibrations with external standards, the 7520 automated self-alignment process takes a few seconds to initiate and automatically returns the 7520 to its original calibration state. The self-alignment process can be initiated through the front panel or a SCPI command and takes about 2 hours to complete. Once performed, the self-alignment is good for at least 140 hours or one week. The process can be run at any time, such as at the end of the day or over the weekend.



7520 Divider Mode of Operation

In the "Divider" mode of operation, the 7520 is connected to a Voltage Reference, typically a 10 V Zener reference. The output voltage is based on the selected divider ratio. The Divider mode provides an accurate output voltage based on a reference voltage, with the divider contributing only a very small uncertainty to the overall measurement.

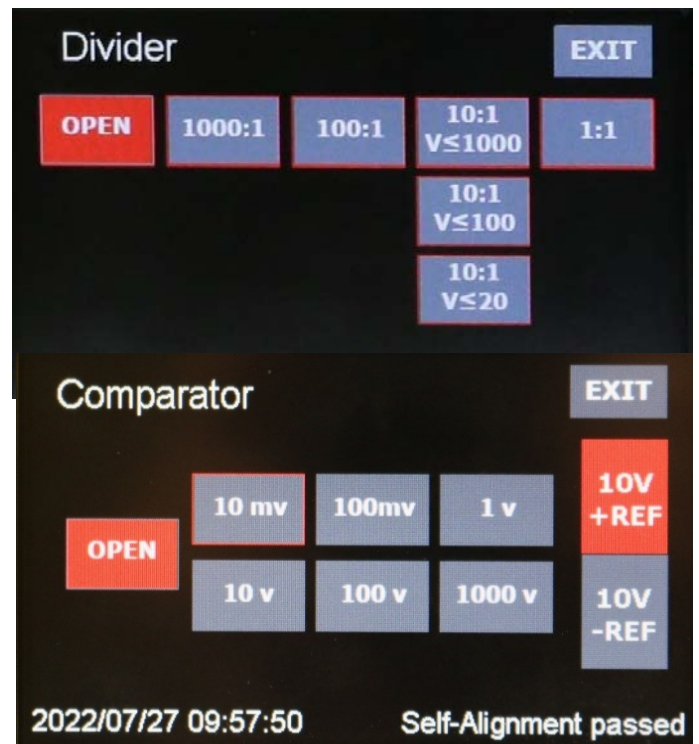
7520 Comparator Mode of Operation

In the "Comparator" mode of operation, an external voltage input (V_{in}) is connected to the Voltage Input Terminals and a second voltage standard (V_{ref}) is connected to the Voltage Reference Terminals. The 7520 automatically divides either the V_{in} or V_{ref} if they do not match, and then provides the voltage difference between the V_{in} and V_{ref} as V_{out} on the Null Detector Terminals. The voltage difference between V_{in} and V_{ref} can be measured with an external null detector or external long scale DMM.

In addition, the polarity of the Voltage Reference can be switched inside the 7520 manually or automatically. This enables automated polarity switching for the Voltage Reference, thus the wires connecting the Voltage reference do NOT have to be manually switched to change the polarity. This also speeds up the calibration process because there is no wait time required due to switching the Voltage Reference leads.

Unparalleled Support

Guildline Instruments provides an **industry leading two year warranty** on every 7520 Automated Voltage Divider and all associated standards. We know that the 7520 will work for you out of the box and in the future... and we back it up.



Model 7520 Precision Automated Voltage Divider

7520 SPECIFICATIONS

Voltage Divider Ratio	Voltage Divider Ratios Output Uncertainty ^{1,2}		
1:1	0.05		
10:1	0.1		
100:1	0.2		
1000:1	0.5		
Maximum Voltages	Voltage Input Terminals		1100 V _{dc}
	Reference Standard Terminals		12.5 V _{dc}
Divider Mode	Ratios	Input Impedance ³	Output Impedance
	1:1 ratio	2.303 MΩ	0 Ω
	10:1 ratio (V≤20)	43.2 kΩ	5.8 kΩ
	10:1 ratio (V≤100)	270 kΩ	43.2 kΩ
	10:1 ratio (V≤1000)	2.303 MΩ	270 kΩ
	100:1 ratio	2.303 MΩ	43.2 kΩ
	1000:1 ratio	2.303 MΩ	5.8 kΩ
Comparator Mode	Mode	Output Impedance	
	10 mV (1000:1 ratio)	5.8 kΩ ± 0.1 %	
	100 mV (100:1 ratio)	43.2 kΩ ± 0.1 %	
	1 V (10:1 ratio (V≤100))	43.2 kΩ ± 0.1 %	
	10 V (1:1 ratio)	0 Ω ± 0.1 %	
	100 V (10:1 ratio (V≤100))	43.2 kΩ ± 0.1 %	
	1000 V (100:1 ratio)	43.2 kΩ ± 0.1 %	
Communication	USB, IEEE 488.2, SCPI Based Language Instructions		
Environmental	Operating	Storage	
Temperature	+21 °C to +25 °C (69.8 °F to 77 °F)	-20 °C to +60 °C (-4 °F to 140 °F)	
Humidity	20 % to 70 % RH	15 % to 80 % RH (Non-Condensing)	
Power Requirements	VAC: 100 V to 240 V ± 10 % / 50 or 60 Hz ± 5 %, 60 VA		
Dimensions (Length x Width x Height)		Weight	
503 mm x 455 mm x 133 mm	19.8" x 17.7" x 5.2"	11 kg	24 lbs

1 – Relative to a 10 Vdc Voltage Reference Standard. Maximum input to the 7520 Voltage Reference terminals is 12.5 Volts.

2 – After Self-Alignment or within 140 hours (i.e. 1 week) from last Self-Alignment.

3 – Applies to Both the Divider Chain and Driven Guard.

GUILDLINE IS DISTRIBUTED BY:

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ORDERING INFORMATION

7520	Precision Voltage Divider
	Operation Manual available from www.guildline.com

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