



# 7520 PRECISION AUTOMATED VOLTAGE DIVIDER

First Automated and Self Calibrating Voltage Divider



## FEATURES

- Automated Self-Calibrating Routines Incorporated Into the Divider (Patent Pending)!
- Sub-ppm Ratio Uncertainties!
- Provides for Wide Range of Operating Specifications!
- Fully Automated Operation!
- Complete Manual Touch Menu Operation!
- IEEE-488.2, SCPI Compliant!
- Includes USB Ports!
- Built-in Voltage Reference and Built-in Null Detector
- Replaces Old Voltage Divider Technology such as the Fluke 752A and Measurements International (MI) 8000B and 8100B

**GUILDLINE INSTRUMENTS 7520 PRECISION AUTOMATED VOLTAGE DIVIDER** is the latest innovation in DC Voltage Dividers. Designed to not only replace the old Fluke 752 models, the 7520 is a unique patent pending voltage divider containing a Zener based voltage source, voltage divider, and null detector. These 7520 components provide the self-calibration functionality which is used to achieve long term sub-ppm ratio measurements.

Eliminating the need to calibrate before use, the 7520 Divider can be used at specified uncertainties by simply using the built-in self-Calibration Routine.

**GUILDLINE'S NEW 7520 VOLTAGE DIVIDER PROVIDES THE LATEST IN NEW PATENT PENDING TECHNOLOGY AND INNOVATION – ACHIEVING INDUSTRY LEADING MEASUREMENTS WITH BUILT-IN SELF-CALIBRATION!**

With the built-in voltage reference and null detector, all voltage ratios are self-calibrating. The new Guildline 7520 Voltage Divider includes a wider ratio range up to 1000:1, wider voltage ranges up to 1000 V, and is fully automated with a touch screen and IEEE and USB interfaces. This fully automated self-calibrating instrument is priced in the range of a traditional voltage divider.

Guildline's 7520 Precision Voltage Divider, with extremely low thermal offsets and built-in temperature controlled chamber, is ideal for voltage ratio measurements to sub-ppm accuracy. Input voltages in the range of 10 to 1100 volts can be divided by ratios of 1:1, 10:1, 100:1 and 1000:1 with respective uncertainties of 0.05, 0.1, 0.2 and 0.5  $\mu\text{V}/\text{V}$ .

Special care has been taken to minimize thermal offsets and noise. The voltage reference and resistive voltage divider networks are all inside a thermally regulated chamber. The switches used are high isolation, low thermal relays. Several systems are used to protect the devices connected to the divider from being damaged by operator error or internal failure.

## Model 7520 Precision Automated Voltage Divider

To allow use in automated testing and calibration setups, the 7520 is controllable via the IEEE 488.2 bus interface, or USB interface. Additionally, full manual operation is achieved via an internal micro-processor and front panel touch sensitive screen.

The self-calibration incorporated into the 7520 is a true self calibration. Unlike the Fluke 752A or MI 8000B/8100, no additional standards are needed. The MI divider unit requires a separate voltage reference standard and long scale DMM for calibration. Additionally, the MI divider requires a DMM for operation and also a second standard (8100B) is required for voltages operation up to 1000 Volts. The Fluke 752A requires a separate voltage reference standard and null detector for calibration. In comparison to the competition, the 7520 is a true self calibrating voltage divider with better performance and huge cost savings in terms of procurement, operation and maintenance.

### ***New Design Provides for Self-Calibration***

The 7520 has a built-in voltage reference and built-in null detector which are used to automatically perform a self-calibration of the voltage ratios. The built-in multiple Zener voltage standard is temperature stabilized and its short term stability enables the self calibration of the voltage divider networks.

Alternatively the internal voltage reference can be bypassed and an external voltage reference, such as Zener's or a Josephson Junction, can be used to calibrate the internal voltage divider ratios, also in a completely automated manner.



The 7520 also has a built-in optical based null detector. This null detector, along with the internal or an external voltage reference, is used for the self-calibration of the voltage ratios. If a customer chooses, the 7520 also allows for an external null detector to be used to automatically calibrate the 7520 voltage ratios.

Exit	0.01V (1000:1) Ratio
	0.1V (100:1) Ratio
View	1V (10:1) Ratio
	10V (1:1) Ratio
Calibrate	100V (10:1) Ratio
	1000V (100:1) Ratio

All operations are performed via a front panel touch screen or can be automated via a computer connected by IEEE or USB. Manual configuration and control of the divider output is performed by simply pressing the appropriate screen entry. Both the touch screen and USB/GPIB interfaces are controlled by a microprocessor which is kept isolated from the temperature controlled analogue circuits that are part of the voltage divider chain and

self-calibration circuitry. This high isolation ensures no noise or offsets will be present in measurements conducted with the 7520 due to heat and noise from the rest of the circuitry inside the 7520.

### ***Circuit Protection***

The 7520 has several protection features to help ensure the equipment used with the 7520 Voltage Divider, as well as the 7520 itself, will be safe from damage. This includes the external voltage reference and external device being calibrated. Critical voltages are monitored through the micro-processor which will disconnect inputs and outputs when over voltages are sensed.

The divider chain itself is protected from over voltages on the input as there is only one high impedance input that is used for all divider ratio configurations. Voltages within the various lower sections of the divider chain are monitored to ensure that improper divider output configurations are detected.

**Model 7520 Precision Automated Voltage Divider****Voltage Divider Ratio Uncertainties**

Ratio	Output Uncertainty (Relative) <sup>1</sup>	Output Uncertainty (Absolute) <sup>2</sup>
	After Self-Calibration <sup>3</sup>	
1:1	0.05	1.55
10:1	0.1	1.6
100:1	0.2	1.7
1000:1	0.5	2.0

**General Specifications**

Voltage Divider Ratios	1:1, 10:1, 100:1, 1000:1 (maximum 1100 Vdc)		
Resistance	Ratios	Input <sup>4</sup>	Output
	1:1 ratio	direct connection to input	
	10:1 ratio	6 M $\Omega$ $\pm$ 0.1 %	600 k $\Omega$ $\pm$ 0.1 %
	100:1 ratio	6 M $\Omega$ $\pm$ 0.1 %	60 k $\Omega$ $\pm$ 0.1 %
	1000:1 ratio	6 M $\Omega$ $\pm$ 0.1 %	6 k $\Omega$ $\pm$ 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 50 % RH	15 % to 80 % RH (Non-Condensing)	
Power Requirements	VAC: 100 V to 240 V $\pm$ 10 % / 50 or 60 Hz $\pm$ 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 Reference Standard used (throughout the interval w/o adjustment). 2 Sigma.

2 - Using external 10-Volt Reference Standard at  $\pm$  1.5 ppm of value uncertainty (at time of measurement). Specifications are listed at 2 Sigma (95 %). Mathematically summation applied (worst case). Absolute uncertainty based on actual Reference used.

3 - Automated Self-Calibration takes < 5 minutes.

34- Applies to Both the Divider Chain and Driven Guard.

**ORDERING INFORMATION**

<b>7520</b>	Precision Voltage Divider
/RC	Report of Calibration Available at Additional Charge
/TM7520	Technical Manual included

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