

New Product Technical Analysis 41-760 and 41-761 Millivolt Thermocouple Simulators

The models 41-761-001, 41-761-002, 41-761-003, 41-761-004 are the latest family of PXI high precision, high density, fully isolated millivolt Thermocouple Simulators




Model 41-761-001 shown

Pickering's first family of Thermocouple Simulators was the 41-760 series. This module family was warmly welcomed by users and was widely used in simulation systems in power generation, new energy vehicles, power electronics, aerospace and other fields, for simulating multiple types of thermocouples, shunts and other devices, achieving a controlled voltage output of the μV -level resolution in the output range of $\pm 100\text{mV}$.

The latest 41-761 series offers several significant improvements but keeps the basic technical specifications consistent, uses the same software drivers, and is pin-compatible with the 41-760 series. Here are the improvements:

1. Each output channel is completely isolated. Through this technology, interference due to the common ground of the output signal can be completely removed, and the acquisition equipment being tested can be matched arbitrarily, regardless of the electrical characteristics of the acquisition terminal. It can also be used to simulate devices that were previously not simulated in the 41-760 series, such as a thermopile.
2. The output impedance is reduced from 50Ω to 2.6Ω , closer to the output characteristics of the thermocouple. This improvement avoids false positives in some acquisition equipment with open-circuit detection. In addition, isolation relays on each channel allow for simulating an open circuit.

Both the 41-760 and 761 module families support external hot junction compensation using the 40-965-912 Compensation block. This block allows the temperature of the front panel junction to be read back through the provided driver, enabling compensation of settings to increase the accuracy of the test.

Model	# of channels	Output specificity	Product page
41-761-001	32	3 optional output ranges: $\pm 20\text{mV}$, $\pm 50\text{mV}$, $\pm 100\text{mV}$ Safety voltage: 100V	
41-761-002	24		
41-761-003	16		
41-761-004	8		

Link to new 41-761 datasheet:

<https://www.pickeringtest.com/content/downloads/datasheets/41-761D.pdf>

Pickering also offers standardized thermocouple-style connection accessories for these products. Our online Cable Design Tool (pickeringtest.com/cdt) is also available for designing custom cable cabling.

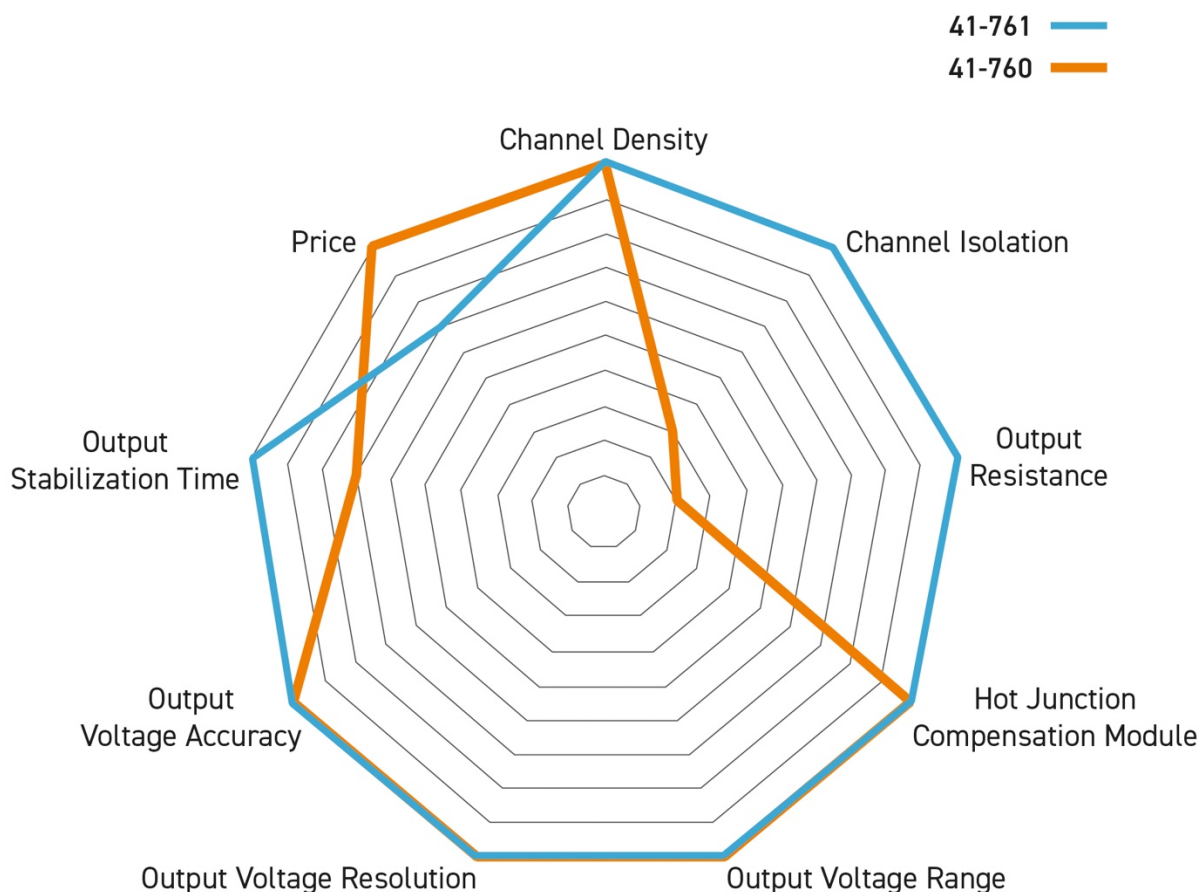


The following table compares the 41-760 series with the 41-761 series, and the red text represents the advantage of the characteristics of the 41-761.

	41-760	41-761
Channel density	Up to 32 channels	
Channel isolation	Common Ground	Isolated
Safety voltage	Common mode voltage 1V	100V
Output resistance	50Ω	2.6Ω
Support for junction compensation modules	Yes	Yes
Output voltage range	±20mV, ±50mV, ±100mV	
Output voltage resolution	0.7μV (±20mV range), 1.7μV (±50mV range), 3.3μV (±100mV range).	
Output voltage accuracy	0.1% ±5μV (±20mV range), 0.1% ±10μV (±50mV range), 0.1% ±15μV (±100mV range).	
Output settling time	780μs typical (output range unchanged) 3.7ms typical (output range change)	
Price	\$ 1,645 – 3,805 (US domestic pricing – please see website for price in your region)	\$2,375 - \$5,425 (US domestic pricing – please see website for price in your region)

The following image shows the product characteristics comparing the radar map and moving away from the center of the circle indicates that the item has an advantage.

41-761 vs 41-760 Performance Comparison



As can be seen from the figure above, the new 41-761 series—while maintaining the technical advantages of the original 41-760 series—has a substantial performance optimization. While the added hardware means that it is slightly more expensive than the 41-760, it supports a wider range of applications thanks to the improved performance.

The new 41-761 series and the original 41-760 series are currently within six weeks ARO and can be selected according to actual application needs. Both series support all compliant PXI chassis and PXIe hybrid chassis, as well as Pickering's LXI modular chassis & LXI/USB modular chassis shown below.



The thermocouple modules are compatible with mainstream operating systems such as Windows^(R) 8/10, Linux, and real-time systems such as LabVIEW RT™, and the LXI chassis can also support any operating system access and program operations over an SSH network connection.