



IT5241 Multi-Channel Temperature Simulator

Precision programmable NTC simulation for BMS temperature sensing and protection tests



Set the resistance. Simulate the temperature.

Designed for BMS temperature testing, the IT5241 programmable resistor array emulates the resistance of NTC thermistors to provide repeatable, programmable temperature inputs.

8 / 16 / 32 / 48 CH

Four channel configurations. Same performance.

B: 3435 / 3950 / 4250 | R25: 1-100 kΩ

0.1%
Resistor accuracy

5 Ω
Resistance step

0.2 ms
Max. switching time

3 ms
Typical response

How resistance simulates temperature

The BMS measures NTC resistance through a voltage divider and ADC, then converts it to temperature using the R-T curve. The IT5241 outputs the resistance for the target temperature, reproducing the sensor input without heating or cooling.

01 Set temperature
Set a temperature or NTC resistance.

02 Output resistance
The resistor network switches rapidly.

03 BMS reads temperature
ADC sampling and MCU conversion.

Product Lineup

Model	Channels	Resistance	Series	NTC range
IT5241-8CH	8	0-300 kΩ	Yes	R25 1-100 kΩ
IT5241-16CH	16	0-300 kΩ	Yes	R25 1-100 kΩ
IT5241-32CH	32	0-300 kΩ	Yes	R25 1-100 kΩ
IT5241-48CH	48	0-300 kΩ	Yes	R25 1-100 kΩ

Scan / Sequence: Automated Temperature Profiles

SCAN

Automatic range sweep

Set A/B values, step size and interval; select channels and Normal / Last. For protection thresholds and range tests.

SEQUENCE

Up to 100 steps

Set resistance/temperature and time per step; select channels, repeats and Normal / Last. For repeatable profiles.

Applications: BMS / CMU · EVs · Industrial Automation · Temperature Sensors · HIL / EOL

Flexible Series Connection for Multiple NTC Ranges

Connect up to 16 adjacent channels per card via software or the front panel. No rewiring.

48 parallel channels / Up to 16 in series / Range up to 4.8 MΩ

R25: 1-100 kΩ; B: 3435 / 3950 / 4250. Temperature follows the selected NTC R-T curve.

Typical Series Configurations (48CH Model)

Up to 16 adjacent channels per card

Single Channel	0-300 kΩ Resistance range	48 groups Independent groups	R25 10 kΩ Typical R25	3435 / 3950 / 4250 Supported B values
2CH Series	0-600 kΩ Resistance range	24 groups Independent groups	R25 100 kΩ Typical R25	3435 / 3950 / 4250 Supported B values
3CH Series	0-900 kΩ Resistance range	16 groups Independent groups	R25 100 kΩ Typical R25	3435 / 3950 / 4250 Supported B values
4CH Series	0-1.2 MΩ Resistance range	12 groups Independent groups	R25 100 kΩ Typical R25	3435 / 3950 / 4250 Supported B values

Why Use Software Series Connection?

Fixed Low Range Limited high-resistance coverage for the low-temperature region of 100 kΩ NTCs.	Fixed High Range Higher cost; low-resistance resolution may also depend on range design.	IT5241 Flexible Series Set via software or front panel. Balance channel density and high-resistance coverage.
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IT5241 Technical Specifications

Refer to the official product specifications

Resistance & Channel Performance		NTC Compatibility & System Setup	
Channel options	8 / 16 / 32 / 48 CH	B values	3435 / 3950 / 4250
Card architecture	Up to 3 cards; up to 16 CH/card	R25 range	1-100 kΩ
Single-channel range	0-300 kΩ	Channel isolation	48 VDC / 30 VAC
Max. series range	0-4.8 MΩ (16 CH)	Programming response	3 ms (typ.)
Resistor accuracy	0.1%	Interfaces	USB / LAN / RS232 / Digital I/O
Resistance step	5 Ω	Automation	Scan / Sequence
Switching time	0.2 ms (max.)		

Typical BMS Tests

- Sensing accuracy
- Temp. alarms
- Trip thresholds
- Temp. difference
- Sensor faults
- HIL / EOL

Note: 10 kΩ / 100 kΩ are typical examples. Supported NTCs: B = 3435 / 3950 / 4250, R25 = 1-100 kΩ.

Temperature coverage depends on the selected NTC R-T curve and series configuration.