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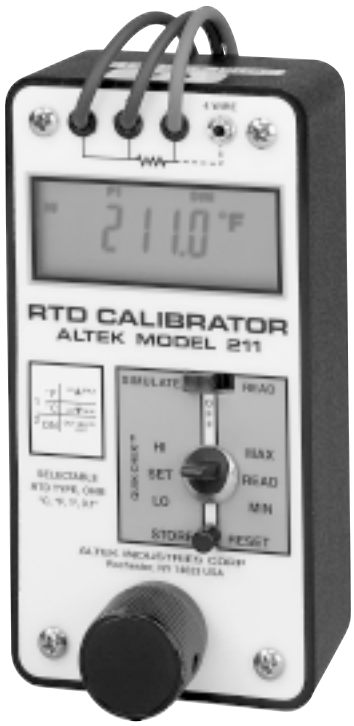
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Find the *Altek Model 211* at our website: ***Click HERE***

ALTEK

RTD CALIBRATOR
MODEL 211



- **8 RTD TYPES & OHMS**
  Select Pt, Cu, or Ni
- **TEMPERATURE INPUT & OUTPUT**
  Directly in degrees
- **"QUIK CHEK® " SWITCH**
  Three Points, HI, LO, & Set
- **0.025% ACCURACY,1° OR 0.1° RESOLUTION**
  Field Selectable °F or °C
- **THREE YEAR WARRANTY**
  Toolbox tough
- **CUSTOM RANGES AVAILABLE**

GENERAL DESCRIPTION

Altek's Model 211 RTD Calibrator lets you SIMULATE and READ RTDs over the entire industrial temperature range. Use with transmitters, recorders, controllers, alarms, indicators, data acquisition and computer systems. Switch between four Platinum 100, one Pt 1000, one Cu 10, two Ni RTD curves or OHMs ranges from 0.00 to 410.00 and 0.0 to 2010.0.

Field customize the Model 211 to lock-in 1° resolution, fixed ° C or ° F or front selectable ° F/° C operation. Read and simulate 2-Wire and automatically compensate for 3-Wire RTDs with built-in leads. A plug-in lead is supplied for 4-Wire RTD measurements.

The Model 211 turns on in the RTD type last used. Other RTD types may be selected each time the unit is turned on. If you always use one RTD curve, lock-in the selected RTD type with the internal DI P switch to prevent accidental change to an unwanted RTD type.

"SIMULATE" MODE ACTS LIKE AN RTD SENSOR

Resolution is 0.1° over the full range for Platinum 100 ohm RTD simulation, with 1 mA current supplied from the external device. Ohms range, at 1 mA current, provides 0.01 resolution from 0.00 to 410.00 and autoranges to 0.1 resolution from 410.0 to 2010.0. (See graph for other excitation currents).

"QUIK-CHEK" function stores THREE output temperatures for real convenience. The ALTEK Model 211 simulates key temperatures for repetitive calibrations. Turn the knob to check trip points, controller action or hysteresis. The fast response 211 sets quickly without overshoot. Memory is retained even when power is off.

The Model 211 has a unique circuit which lets you simulate RTD's with most transmitters, recorders and other RTD inputs with fixed or intermittent excitation currents.

"READ" MODE MEASURES RTDs DIRECTLY

The Model 211 display gives you fast, accurate temperature measurement with 0.1 and 1 degree or with 0.01 and 0.1 ohm resolution. Two, three and four wire hookups assure accuracy in long cable runs. Open RTDs and leads are detected and indicated on the LCD display. Two readings per second track fast moving temperatures.

"MAX" and "MIN" memories are continuously updated from turn-on or whenever the " RESET" button is pressed. Model 211 gives you a handy tool to monitor temperatures for drift or control deviation. Just flip the QUIK-CHEK switch to display the MINimum and MAXimum temperature measured since reset.

TURN-ON SEQUENCE

Each time the Model 211 is turned on, the LCD displays all segments for 1 second. It then displays the sensor material and Alpha (ohms at 100°C/ohms at 0°C) for the currently selected RTD type for approximately 3 seconds. Any of 8 built-in RTD types and alpha values plus ohms may be selected during the RTD turn-on mode.

CUSTOM RANGES

Custom ranges for additional RTD types, Dew Cell or other resistive sensors are also available. The Metal, Base Resistance and Alpha value for the custom RTD curve must be specified. Adding a custom range to a 211 may require removing one of the standard ranges. Unless otherwise specified the Ni 110 (Bristol 7 NA) will be replaced with the custom range if necessary.

ALTEK INDUSTRIES CORP
A TRANSMATION COMPANY

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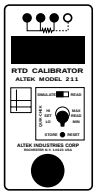
DATA SHEET 211 Additional RTD Simulators: See Data Sheet 11

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OPERATING INSTRUCTIONS

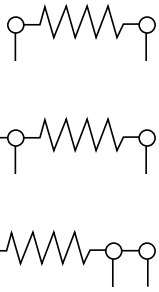
GENERAL

CONNECTIONS



The Model 211 accurately simulates and reads 2, 3, or 4 wire RTDs. It has three leads permanently attached and a socket for a fourth wire (supplied). The LCD indicates “4-WIRE” when the fourth wire is connected. The fourth wire must only be plugged in when simulating or reading 4-Wire RTDs. All connecting wires must be the same length and of the same material running along the same path to insure maximum accuracy.

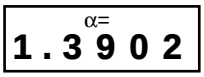
TWO, THREE OR FOUR WIRE



Two wire RTD measurements are less accurate than other RTD measurements because of the errors introduced by the resistance of the lead wires. The third wire in a three wire hookup provides the instrumentation with a reference connection for the lead wires. The measuring instrumentation uses this reference to infer the actual resistance of the RTD element without the leads. Four wire RTD measurements take into account all wires other than the RTD sensing element. This makes four wire RTDs best suited for precision measurements.

CHANGING RTD TYPES

Eight RTD types or ohms may be selected each time the Model 211 is turned on. An internal DIP switch may be used to disable the front panel selection to permanently lock in a single RTD type (see below).



To change RTD types:

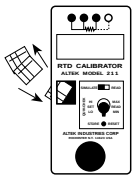
1) Press & hold the STORE pushbutton while switching the unit on or while α= is blinking during the first 3 seconds after the unit is turned on.
2) Continue to hold the STORE pushbutton. The LCD will scroll through the 8 RTD types and ohms, displaying the Sensor material and value for each RTD type.
3) Release the STORE pushbutton when the desired Metal and value are displayed.
4) After 2 seconds, the Model 211 will store the RTD type you selected and will begin Simulating or Reading RTD signals.
5) Each additional time the Model 211 is turned on without holding the STORE pushbutton, the newly selected RTD type will be displayed and used. If an incorrect type is selected, repeat steps I through 3. Note: For Pt 100 ohm, α= 1.3850 the word DIN will appear on the LCD.

OPERATING WITH INTERMITTENT EXCITATION CURRENTS



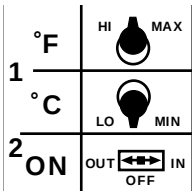
Some transmitters, recorders and other RTD input devices use intermittent, or pulsed, excitation currents to measure the resistance of the RTD. The Model 211 may be internally configured to operate with both fixed excitation currents (default operation) and with intermittent currents (see Setting Operating Mode below).

SELECTING °F OR °C



The Model 211 may be internally configured in one of three modes. The first two modes are for full-time use in °F or full-time use in °C. The third mode allows front panel selection of ° F or °C each time the unit is turned on. If your facility is completely in °F or °C, set the internal DIP switches of the 211 to operate as a dedicated °F or °C instrument (see Setting Operating Mode below).

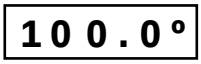
USING F/C MODE

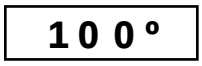


In F/C mode the temperature scale is selected by setting the “ QUIK-CHEK” switch before turning the unit on. Place the switch to HI/MAX to select° F or LO/MIN to select °C. If the unit is turned on with the switch in the SET/READ (center) position the temperature scale most recently used will be displayed.

Hint: The Model 211 will automatically convert the temperatures in memory between °F and ° C. For example, if 212° F is stored in HI and the Model 211 is switched to°C, 100°C will be displayed.

SELECTING AUTORANGING OR 1° RESOLUTION





The Model 211 may be internally configured to autorange or to constantly display with fixed resolution. When autoranging is selected, the Model 211 will display temperatures with 0.1° or 1° and ohms with 0.0Ω or 0.1Ω resolution. When fixed range is selected, the Model 211 will display temperatures with 1° and ohms with 0.1Ω resolution.

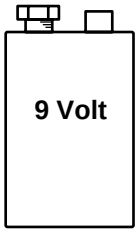
Note: Some ranges are always displayed with 1° resolution.

OVER RANGE/UNDER RANGE



Out-of-range temperatures are indicated by - - - - - and OVER or UNDER on the display during READ mode. If this occurs check for proper connections and RTD type selection. During SIMULATE mode excitation currents below 0.090mA are indicated by the word SIM flashing on the display. Excitation currents above 5.8mA are indicated by - - - - - and SIM flashing on the display. Check for proper connections.

CHANGING BATTERY



Low battery is indicated by BAT on the LCD display. Approximately 10 hours of operation remain before the LCD goes blank and the Model 211 shuts itself down. Turn the Model 211 off. Remove the four corner screws and lift the unit out of the case. The battery is fastened to the bottom printed circuit board and is easily removed.

Hint: If the new battery is installed within 30 seconds of removing the old battery the “QUIK-CHEK” values will remain in memory.

SETTING OPERATING MODE (DIP SWITCHES)

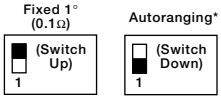
*Factory Settings (All Switches Down)
²Factory Settings-All Other Countries.



1) Turn the Model 211 OFF
2) Remove the 4 corner screws and lift faceplate assembly out of the case.
3) Set the DIP switches for your options as diagrammed below.

Note: °C/°F selection is the default for shipments in the U.S.A., °C for all other countries.

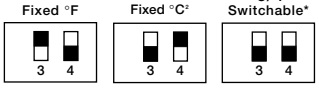
AUTORANGING
Switches between autoranging 0.1°/1° (0.01Ω/0.1Ω) and fixed 1°(0.1Ω).



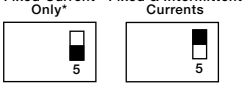
FIXED RTD TYPE
Switches between a single RTD type and RTD type selection at turn on.



TEMPERATURE SCALE
Switches between fixed °F, fixed °C or °C/°F selection at turn on.



EXCITATION CURRENT
Switches between simulating with fixed excitation currents and excitation current selection at turn on.



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OPERATING INSTRUCTIONS

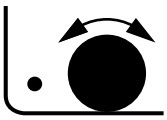
SIMULATE MODE (RESISTANCE OUTPUT OR RTD TEMPERATURE EQUIVALENT)

SIMULATE



1)Set up the Model 211 for the correct RTD type and temperature scale (°C or °F).
2)Disconnect the input wires from the device to be calibrated or checked.
3) Connect the Model 211 to the device to be calibrated, being careful to observe proper connections for 2, 3 or 4-Wire hookups.
4) Adjust the digital pot to the desired output value.

OUTPUT



Whenever SIMULATE mode is selected the word SIM will appear on the LCD. SIM will flash when the Model 211 is measuring the external excitation current and will be steady when accurately simulating a resistance. To change the output value, turn the speed sensitive digital pot. Turning the pot slowly will cause a gradual change in the output. A faster change will occur when the pot is turned faster. A filter circuit limits response when the pot is turned too fast. This function operates in all three output positions (HI, SET & LO).

NOTE: SIM flashing on the LCD indicates that the excitation current is missing, out of range or is intermittent. Check to see that the device being calibrated has operating power and that the 211 is properly connected. Also check the manual for the device to make sure that the excitation current is in the range of 0.090 to 5.800 milliamps.

Hint: Some "smart" transmitters and scanning recorders or indicators use intermittent currents to measure RTD's. Try putting recorders into a calibrate mode or lock them into one channel. The Model 211 can be configured to accept intermittent excitation with mininum 125 msec fixed current at a mininum repetition rate of 1/sec (see OPERATING WITH INTERMITTENT EXCITATION CURRENTS).

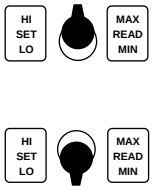
STORE





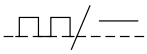
1) Switch to HI (or LO).
2) Turn the digital pot to desired value.
3) Press STORE push button.
If a value is in the SET position and you want that value in HI or LO, press and hold the STORE button while moving the switch to HI or LO. Then release the STORE button. When there is no excitation current or the current is less than 90µA, SIM will flash on the LCD. "QUIK-CHEK" values may still be stored with SIM flashing.

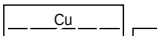
"QUIK-CHEK"

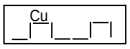


Any time you need a stored value just throw the "QUIK-CHEK" switch. Any value in the RTD range may be stored in HI & LO. The Model 211 remembers the HI, LO and SET values for you with the power on or off. The resolution of the stored value will be based on the excitation from the receiver. When a new RTD type is selected, the resistance of the sensor at O°C is stored in all "QUIK-CHEK" positions. When the ohms range is selected,100 will be the initial setting for all "QUIK-CHEK" positions.

SELECTING FIXED/INTERMITTENT CURRENT

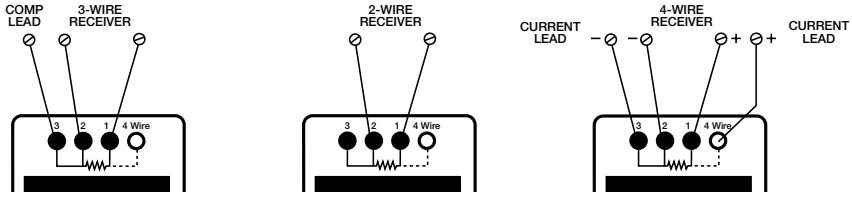


Operation with fixed or intermittent currents may be chosen after the unit is turned on and the RTD type has been selected.
Fixed currents are indicated by 

Intermittent currents are indicated by 

To keep the excitation selection: Wait 3 seconds To change the excitation selection: Press the STORE pushbutton Note: Cu indicates *Cu*rrent while selecting fixed or intermittent currents. Hint: Choose intermittent excitation *only* when device to be calibrated uses intermittent currents. Most devices require that fixed current operation is selected.

HOOKUP-SIMULATE MODE



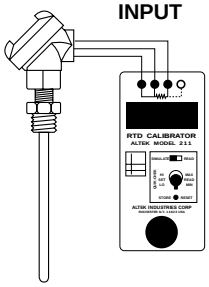
READ MODE

READ



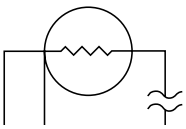
1) Set up the Model 211 for the correct RTD type and temperature scale (°C or °F).
2) Disconnect the wires from the resistance sensor to be read or checked.
3) Connect the Model 211 to the sensor to be measured, being careful to observe proper connections for 2, 3 or 4-Wire hookups.
4) Display present reading, Maximum or Minimum temperature.

INPUT



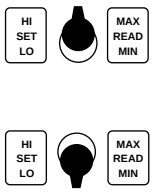
Whenever READ mode is selected the word READ will appear on the LCD. The Model 211 can measure temperatures in two ranges with resolution of 0.1° and 1°.The display is updated twice per second to continuously track fast moving temperatures. Using three or 4-Wire hookups provides accurate readings in long cable runs.

OPEN RTDS



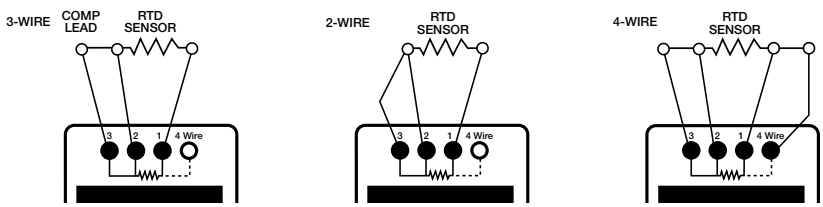
The Model 211 checks for open or high resistance connections. Open or burned out RTDS are indicated by - - - - - on the display. Temperatures out of range for the RTD selected will be indicated by OVER and UNDER on the display.

MIN/MAX



To read the Maximum or Minimum temperature since READ mode was entered, simply switch to MAX or MIN. The value will appear on the LCD along with the word MAX or MIN. The MAX/MIN values are automatically updated and may be viewed at any time without disturbing the other values. Pressing RESET will transfer the present temperature into both MAX and MIN and will update them as the measured temperature changes.

HOOKUP-READ MODE



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SPECIFICATIONS

(Unless otherwise indicated, specifications are in % of Span in ohms at 1.0mA excitation current @ 23°C)

GENERAL

ACCURACY: ±0.025%; ±0.013% Typical
TEMPERATURE DRIFT: ±0.01 %/°C
OPERATING TEMPERATURE RANGE: -5 to +140° F (-20 to -60° C)
STORAGE TEMPERATURE RANGE: -22 to +175° F (-30 to +80° C)
RELATIVE HUMIDITY: 10 to 90%, non-condensing
WARM UP TIME: 30 seconds to maximum accuracy
OVERLOAD PROTECTION: Electronically protected to 40 VDC between leads 1 & 2, fuse protected to 125 VAC, 5A between leads 2 & 3 and between leads 1 & 4
BATTERY LIFE: 9 Volt Alkaline: Nominal 50 hours
LOW BATTERY: "BAT" indication on LCD at 7 Volts nominal, approximately 10 hours left. Batteries should be removed when storing the unit >3 months.
OVERALL SIZE: 2 1/2 x 2 5/8 x 5 1/8 inches (63.5 x 66.7 x 130 mm)
WEIGHT: 11.5 oz. (0.33 kg)
CARRYING CASE: Included, zippered with belt loop

SOURCE MODE (SIMULATION OF RESISTANCE OUTPUT)

OUTPUT RESISTANCE RANGE: 0.00 to 2010.0 Ohms
ALLOWABLE EXTERNAL EXCITATION CURRENT: 0.090 to 5.800mA, DC
INTERMITTENT EXCITATION CURRENT MODE: Accepts intermittent excitation currents with minimum 125 msec fixed current at minimum repetition rate of 1/sec from 0.090 to 5.800mA

READ MODE (MEASUREMENT OF EXTERNAL RTD)

EXCITATION CURRENT SUPPLIED: 1 mA, nominal
NORMAL MODE REJECTION: 50/60 Hz, 50 db
COMMON MODE REJECTION: 50/60 Hz, 100 db

Specifications subject to change without notice

TYPES, RANGES, RESOLUTION AND ACCURACY

RTD TYPE	ALPHA	DEGREES C RANGE	DEGREES C TYPICAL ACCURACY	DEGREES F RANGE	DEGREES F TYPICAL ACCURACY
Pt 100 (DIN/IEC/JIS 1989)	1.3850	-200.0 to 850.0°	±0.15°	-328.0 to 1562.0°	±0.25°
Pt 100 (Old JIS 1981)	1.3916	-200.0 to 648.9	0.15	-328.0 to 1200.0	0.25
Pt 100 (Burns)	1.3902	-195.6 to 648.9	0.15	-320.0 to 1200.0	0.25
Pt 100 (US Lab)	1.3926	-200.0 to 862.0	0.15	-328.0 to 1584.0	0.25
Pt 1000 (HVAC)*	1.3750	-184 to 275	0.10	-300 to 527	0.15
Cu 10 (Minco)*	1.4274	-200 to 260	1.10	-328 to 500	2.00
Ni 120 (Pure)	1.6720	-80.0 to 273.0	0.10	-112.0 to 524.0	0.15
		273 to 316	0.10	524 to 600	0.15
Ni 110 (Bristol 7 NA)	1.5801	-106.7 to 315.6	0.10	-160.0 to 600.0	0.20

		ACCURACY	TYPICAL ACCURACY
OHMs	0.00Ω to 410.00Ω	±0.10Ω	±0.05Ω
	0.0Ω to 2010.0Ω	±0.50Ω	±0.25Ω

*These ranges have fixed 1° resolution

Note: Above ranges are for READ mode in which the Model 211 provides a 1 mA excitation current. SIMULATE mode operates in these ranges with external excitation currents between 0.090 and 1.1 mA. Resolution will be 1°, or 0.10Ω, in all ranges for excitation currents between 1.1 and 5.8mA

1000Ω RTDs: The maximum excitation current to source the full range of the Pt 1000 1.375 is 1 mA. Currents exceeding 1 mA will lower the maximum temperature.

The symbol Alpha (α) is used to identify the particular RTD curve. The value is derived by dividing the resistance of the sensor at 100°C by the resistance at 0°C (α = R100°C/R0°C). For Pt 100 DIN/IEC/JIS this is 138.50/100.00 = 1.3850 (which is also shown as 0.00385).

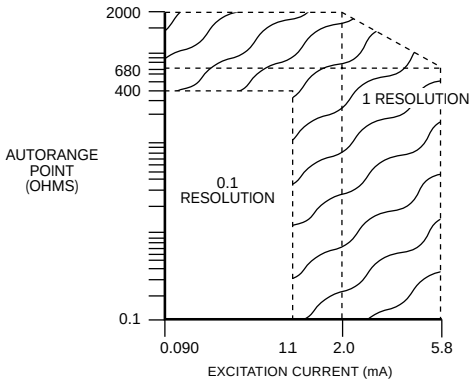
THREE YEAR WARRANTY

Our equipment is guaranteed against defective material and workmanship (excluding batteries) for a period of three years from date of shipment. Claims under guarantee can be made by returning the equipment prepaid to our factory. The equipment will be replaced, repaired or adjusted at our option. The liability of Altek is restricted to that given under our guarantee. No responsibility is accepted for damage, loss or other expense incurred through sale or use of our equipment. Under no condition shall Altek be liable for any special, incidental or consequential damage.

OTHER PRODUCTS

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AUTORANGE POINT VS. EXCITATION CURRENT SIMULATE MODE



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