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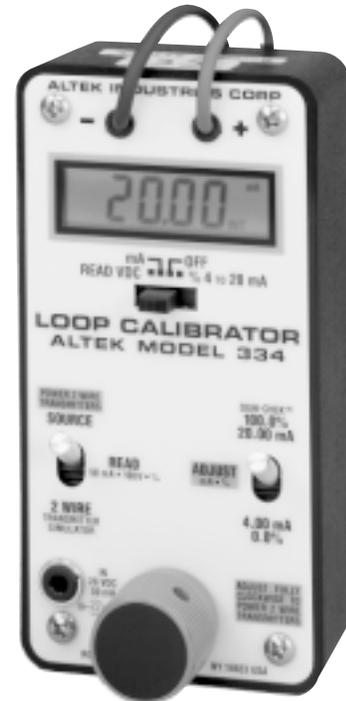
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# MILLIAMPER LOOP CALIBRATOR MODEL 334

- **ALL 4 TO 20mA LOOP FUNCTIONS**  
Source 0.00 to 24.00mA or -25.0 to 125.0%  
Read mA or Percent to 52.00mA  
Simulate 2-Wire Transmitters  
Measure -99.99 to 99.99 DC Volts  
Power and Read 2-Wire Transmitters
- **“QUIK CHEK®” SWITCH**  
Instant Zero and Span at 4.00 & 20.00mA
- **FULL 4 DIGIT ACCURACY**  
± 0.05% of 20.00mA Span  
± 0.03% “QUIK-CHEK”
- **STANDARD 9 VOLT BATTERIES**  
Months of use, no nightly recharging
- **OVERLOAD PROTECTED**  
Withstands 135 Volts AC/DC without fuses



## GENERAL DESCRIPTION

Altek's Model 334 Loop Calibrator has been designed to check, calibrate and trouble shoot all the signals present within a standard 4 to 20 milliamp process control loop. A 24 mA Source, mA meter, 2-Wire Transmitter Simulator and a DC Volt meter are combined into one easy-to-operate instrument.

Dual current ranges allow display of each current function in percent of 4 to 20mA signal, as well as directly in milliamps. In SOURCE MODE, percent range displays -25.0% to +125.0% with 0.1% resolution while the milliamp range displays from 0.00 to 24.00 mA with 10 $\mu$ A resolution. In READ MODE the milliamp range displays from 0.00mA to 52.00mA, or percent.

SOURCE MODE uses built in batteries to provide 0.00 to 24.00 mA into any load from 0 to 1200 Ohms. Three 9 volt alkaline batteries provide over 30 hours of continuous 12 mA output . . . more than 3 months of typical use. An optional AC adaptor plugs in for continuous bench use. True current source maintains set output independent of load, “QUIK-CHEK” switch provides instant zero (4.00mA) and full scale (20.00mA) in both SOURCE and 2 WIRE modes. Output in the PERCENT range displays 0.0% and 100.0% for “QUIK-CHEK” settings. ADJUST position selects a continuously adjustable 10 turn potentiometer to allow fast, easy setting to any exact value from 0.00 to 24.00mA. No range change at critical 20.00mA eliminates hysteresis error.

POWER & MEASURE 2-Wire Transmitters simultaneously in Source Mode. The Model 334 supplies the required voltage and displays the current as regulated by the 2-Wire Transmitter.

### 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.

The Model 334 may also be used when a controller is temporarily removed for repair or replacement. Simply substitute the Model 334 for the controller and use it as a manual loading station.

**SIMULATE 2-WIRE TRANSMITTERS** by modulating external power to pass 4 to 20mA. The Altek Model 334 uses any loop power from 2 to 100 Volts DC. True current design maintains set current independent of voltage or load changes.

**READ MILLIAMPS OR PERCENT** of the 4 to 20mA signal. Maximum read current is limited to (nominally) 55mA to minimize the possibility of damaging the device to be calibrated.

**MEASURE DC Volts** range displays from -99.99 to +99.99 VDC with 10mV resolution. Built in voltmeter is used to check loop power supplies, I/V converters, 1 to 5 Volt signals and battery voltages.

The Model 334 is protected in all ranges to 135 Volts AC or DC. Special protective circuitry withstands accidental misconnection in any mode *without fuses*.

Display digits are 0.4" (10.2 mm) high for readability from across the room. Non-glare Liquid Crystal Display is readable in any light. . . even in direct sunlight. The digital measuring circuit is independent of the current adjustment and measures the actual input or output.

Benchtop accuracy in a toolbox calibrator assures fast, precise setting of current trips, recorders, controllers, loggers, computers and final control elements. Altek brings you the handy Model 334 Loop Calibrator at a cost low enough for every bench and toolbox.

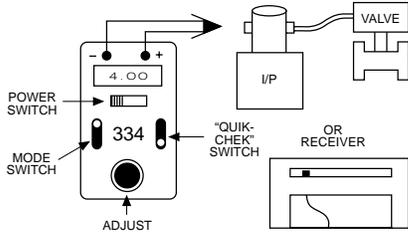
### OTHER PRODUCTS

Altek designs and manufactures fast, accurate instruments for measurement, generation and simulation of virtually every process control signal. Consult our factory directly or contact your local stocking representative to order precise, low cost Milliamp Calibrators, Voltage Sources, Direct Thermocouple Sources, RTD Simulators and Frequency Sources. Altek also produces calibrators for custom ranges and unique applications. Additional models and ranges are frequently added to the Altek instrument family to meet all of your critical calibration requirements. Altek products are made in the USA.

# OPERATING INSTRUCTIONS

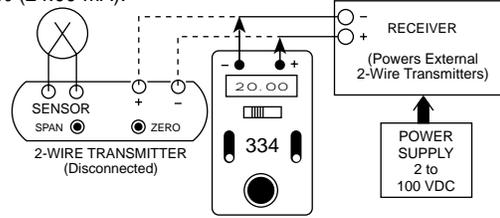
## SOURCE MILLIAMPS

- 1) Disconnect one or both input wires from the device to be calibrated
  - 2) Connect the red lead of the calibrator to the plus (+) input of the device and the black lead to the minus (-)
  - 3) Move the power switch to mA or %
- Output current is continuously adjustable with the "QUIK-CHEK" switch in the ADJUST position. Exact 0.0% (4.00mA) and 100.0% (20.00mA) outputs are available by using the 0.0 and 100.0% "QUIK-CHEKs."



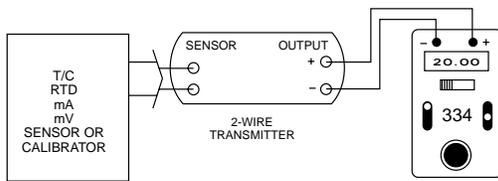
## SIMULATE 2-WIRE TRANSMITTERS

- 1) Disconnect existing 2-Wire transmitter from the loop
  - 2) Put the Mode selector switch into the 2 WIRE position
  - 3) Connect the red lead of the calibrator to the plus (+) terminal of the field connections and the black lead to the minus (-)
  - 4) Move the power switch to mA or %
- Select the 0.0% (4.00mA) and 100.0% (20.00mA) "QUIK-CHEK" switch positions to quickly calibrate the endpoints of your receivers. Use the ADJUST position and dial to select any value from -25.0 (0.00mA) to 125.0% (24.00 mA).



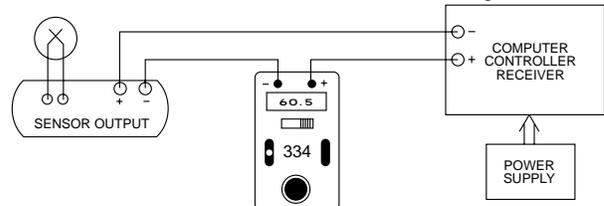
## POWER & MEASURE 2-WIRE TRANSMITTERS

- 1) Disconnect one or both output wires from the 2-Wire Transmitter to be calibrated
  - 2) Connect the red lead of the calibrator to the plus (+) and the black lead to the minus (-) power connections of the 2-Wire Transmitter
  - 3) Connect an appropriate sensor or calibrator to the input of the 2-Wire Transmitter
  - 4) Move the power switch to mA or %, the "QUIK-CHEK" switch to ADJUST, and rotate the knob fully clockwise (see shaded areas on face of unit)
- The Model 334 will supply a (nominal) 24 Volts DC to the 2-Wire Transmitter. The milliamp current passed by the transmitter will be accurately displayed. Calibrate the transmitter in the usual manner and disconnect the Model 334.



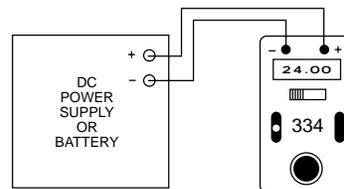
## READ MILLIAMPS

- 1) Open the current loop at any convenient point along the signal path
  - 2) Connect the red lead of the calibrator to the more positive point of the break and the black lead to the more negative
  - 3) Put the Mode selector switch into the READ position
  - 4) Move the power switch to mA or %. The Model 334 will read current in the loop from 0.00mA to 52.00mA or -25.0% to 300%. Loop current is automatically limited to approximately 55mA to avoid any damage to other devices within the loop. If the Model 334 is accidentally connected in the wrong polarity, the display will read 0.00 mA or -25.0% and no current will flow in the loop. Simply reverse the leads for correct operation.
- Note: "QUIK-CHEK" switch is disabled when reading



## MEASURE VOLTS DC

- 1) Put the mode switch to READ
  - 2) Move the power switch to READ DCV
  - 3) Connect the red and black leads across the voltage to be measured
- Any DC Voltage from -99.99 to +99.99 Volts may be measured. Loop power supplies, signal voltages at receivers, batteries and transmitter voltage drops may be measured. Signals exceeding  $\pm 100$  VDC will be indicated by OVRD on the LCD.
- Note: "QUIK-CHEK" switch is disabled when reading



# SPECIFICATIONS

(Unless otherwise indicated, specifications are in  $\pm$ (% of reading + 1 least significant digit) at 23°C)

## GENERAL

ACCURACY:  $\pm 0.05\%$   
 "QUIK-CHEK", Source & 2-Wire Modes, Accuracy  $\pm 0.03\%$   
 DISPLAY: Liquid Crystal; 4 Digit, 0.4" (10.2mm) high  
 TEMPERATURE EFFECT: Milliamp Ranges  $\pm 0.008\% \pm C$ ; Voltage Ranges  $\pm 0.012\% / ^\circ C$   
 BUILT-IN BATTERIES: 3 x 9 Volt Alkaline  
 AC ADAPTORS: Optional, 120 or 240 VAC, 50/60 Hz  
 BATTERY LIFE:  
 Batteries should be removed when storing the unit >3 months.  
 SOURCE MODE: Nominal 33 hours at 12mA, Nominal 20 hours at 20mA output  
 2-WIRE SIMULATOR or READ MODES: Nominal 150 hours  
 LOW BATTERY INDICATION: BAT indicated on LCD when approximately 1 hour remains driving 12mA into 800 Ohms  
 OVERVOLTAGE PROTECTION: Protected to 135 Volts AC or DC in all ranges without fuses  
 OVERLOAD PROTECTION:  
 SOURCE & 2-WIRE SIMULATOR MODES: Current limited to 25mA  
 READ MODE: Current limited to 55mA  
 OPERATING AMBIENT TEMPERATURE: -20 to +60°C (-5 to +140°F)  
 STORAGE TEMPERATURE: -30 to +70°C (-22 to +160°F)  
 RELATIVE HUMIDITY: 10 to 90%, non-condensing  
 WARM UP TIME: 3 seconds to rated accuracy  
 OVERALL SIZE: 2 1/2 x 2 5/8 x 5 1/8 inches (63.5 x 66.7 x 130mm)  
 WEIGHT: 12 oz. (0.35 kg)

## ORDERING INFORMATION

MODEL 334: LOOP CALIBRATOR	Part No.
AC Adaptor	334-2050
AC Adaptor	28-0120
AC Adaptor	28-0240
CARRYING CASE: Optional, zippered with belt loop	09-3781

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## SOURCE MODE

RANGES:  
 0.00 to 24.00 mA with 10  $\mu$ A resolution  
 -25.0 to 125.0% of 4-20mA with 0.1% resolution  
 TYPICAL DRIVE CAPABILITY: 1200 Ohms with fresh batteries or adaptor, 800 Ohms at low battery indication (BAT)  
 POWER TO EXTERNAL 2-WIRE TRANSMITTER: Nominal 24 VDC with fresh batteries or adaptor

## READ MODE

RANGES:  
 0.00 to 52.00mA with 10  $\mu$ A resolution  
 >24 mA read  $\pm 3$  least significant digits  
 -25.0 to 300.00% of 4-20mA with 0.1% resolution  
 -99.99 to 99.99 VDC with 10mV resolution, OVRD at +100 VDC  
 INPUT IMPEDANCE: VDC range, >2 Meg Ohms  
 VOLTAGE BURDEN: 0.9V at 4.00mA, 1.2 V at 20mA, 1.9 V at 50.00mA

## 2-WIRE TRANSMITTER SIMULATOR MODE

RANGES:  
 0.00 to 24.00mA with 10  $\mu$ A resolution  
 -25.0 to 125% of 4-20mA with 0.1% resolution  
 LOOP VOLTAGE LIMITS: Minimum, 2 VDC; Maximum 100 VDC

Specifications subject to change without notice

## AVAILABLE FROM