ALTEK

FREQUENCY CALIBRATOR WITH TOTALIZER MODEL 942

0.001% ACCURACY
Locked to high stability crystal

SIX REAL-WORLD RANGES
1 to 20000 Counts-per-Hour
0.1 to 2000.0 Counts-per-Minute
0.01 to 999.99 Hertz
0.1 to 9999.9 Hertz
0.001 to 99.999 kilohertz
0.01 to 250.00 kilohertz

CALIBRATE TOTALIZERS
Output an adjustable number of pulses
Incremental counter totalizes

"QUIK-CHEK®" SWITCH
Store 18 values for instant recall
Three memories for each range

THREE OUTPUT WAVEFORMS
Sine Waves, Zero Crossing
Square Waves, Zero Based
Square Waves, Zero Crossing

SIMULATE & MEASURE DRY CONTACTS
Optional Dry Contact Module for relay contacts

GENERAL DESCRIPTION

Calibrate your turbine meters, frequency counters, vibration systems, tachometers, vortex shedders, integrators and any other frequency devices in the shop, plant or field. Measure from 0.01 Hz to 250.00 KHz with resolution down to 0.01Hz. For your slower signals, source or measure from 0.1 to 2000.0 Counts per Minute (CPM) or from 10 to 20000 Counts per Hour (CPH). Quickly indicate process signals...no more waiting around with stopwatch and calculator.

"READ MODE" MEASURES WIDE RANGE OF FREQUENCIES AND WAVEFORMS

Use in the field to check the signals from your flowmeter pickups, velocity and motion detectors, Frequencies can be directly measured from 0.01 Hz to 250.00 KHz in four frequency ranges.

Measure extremely slow frequencies (<1 Hz) with high resolution using CPM & CPH. Instead of displaying 1/2 Hz as 0.5 Hz (1 digit of resolution) as most with frequency counters you can display it as 30.0 CPM (3 digits of resolution) or as 1800 CPH (4 digits of resolution). You can now measure these slow signals in seconds with the Model 942 instead of many minutes needed with a totalizer, stopwatch and calculator. Measure signals from 30 mV to 240 V peak-to-peak with a minimum pulse width of 2 microseconds.

Months of normal use on one set of batteries. Six "AA" alkaline cells provide more than 40 hours of continuous output or more than 80 hours of continuous frequency measurement. An optional AC adaptor can be used when the battery is low or for continuous bench and field use.

"SOURCE MODE" FUNCTION GENERATOR

Select sine wave outputs to simulate vibration pickups, variable speed drives and square waves to simulate flowmeters and magnetic pickups. Any frequency from 0.01 Hz to 250.00 KHz can be sourced in four frequency ranges to calibrate tachometers, counters, data loggers, turbine meters and frequency transmitters. For low frequency applications such as positive displacement flowmeters, Watt-hour meters, slow rate integrators and assembly line counting, the Model 942 sources signals as low as 1 CPH (0.0002777 Hz). Amplitude is adjustable from 50 millivolts to 12 Volts peak-to-peak.

Three "QUIK-CHEK" output values are remembered for each range. Turn the knob to check trip points, controller action and to control variable speed drives. The fast response 942 sets quickly without overshoot but allows slow changes at your own rate. Memory is retained for each range even when power is off.

CALIBRATE TOTALIZERS

Calibrate your totalizers & integrators faster and more accurately with the Model 942. Verify totalizer readings by outputting a number of pulses over1 to 99 minutes. The Model 942 will automatically stop when the selected number of pulses have been sent to the totalizer. This eliminates waiting several minutes with a stopwatch to try to catch the total.

You can also use the 942 as a timed totalizer to check the output rate from your flowmeters or integrators.

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A TRANSMATION COMPANY

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DATA SHEET 942 Additional Frequency Calibrators: See Data Sheets 941 & 40A

OPERATING INSTRUCTIONS

GENERAL

TURN-ON

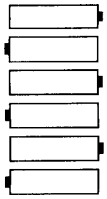
Each time the Model 942 is turned on, the LCD will display all segments for about 1 second. It then displays the currently selected waveform (Source Mode) for approximately 3 seconds.

1) Move the power switch to SOURCE or READ. All segments on the LCD are turned on during self test.
2) (SOURCE MODE ONLY) The display will indicate the selected waveform for 3 seconds. Repeatedly press or press and hold the SCROLL/STORE pushbutton to change to the desired waveform.
3) (SOURCE MODE ONLY) The three QUIK-CHEK frequency outputs will be the same as previously stored. Each time a different range is selected, the three QUIK-CHEK outputs for that range will be recalled.
4) Move the mode switch to RANGE and repeatedly press or press and hold the SCROLL pushbutton to change to the desired frequency range.
5) Return the mode switch to FREQ/TRIG to source or read frequency signals.

CONNECTIONS

The Model 942 has built-in test leads with alligator clips for attachment to instruments or sensors with terminal blocks or flying leads. An optional BNC connector attaches to instruments or sensors equipped with BNCs for fast connections.

CHANGING BATTERY



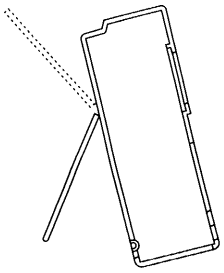
Low battery is indicated by BAT on the LCD Display. Approximately 10 Hours of operation remain before the LCD goes blank and the Model 942 shuts itself down. Turn the 942 off, loosen the three captive screws securing the battery compartment cover. The six "AA" batteries are easily removed and replaced. Replace the battery compartment cover, tighten the screws and turn on when ready to use.

RESET

The Model 942 may be reset from the front panel to factory default settings. This will reset all the "QUIK-CHEK" memories to display 1000 and will set the output and trigger levels to 1 V p-p.

1) Press and hold the SCROLL/RESET pushbutton while turning the Model 942 on to SOURCE or READ
2) Keep pressing the STORE pushbutton for 10 seconds
3) All segments on the LCD will remain displayed until the Model 942 has been reset

FIELD & BENCH USE



The Model 942 comes with a carrying case and a built-in tilt stand/hanger. The 942 is held securely in the case by Velcro® even with the carrying case open. The carrying case also has a snap-on belt loop which can also be looped around a pipe or rail. The tilt stand is easily raised by pulling the stand until it locks into place. The stand can also be reversed for use as a hanger to suspend the Model 942.

OPERATING HINTS

READ MODE

In order for the Model 942 to obtain the most accurate readings you must correctly set the ATTENUATOR, TRIGGER LEVEL and RANGE. Signals from 50mV to over 240 Volts p-p, with or without DC offsets can be displayed.

SYMPTOM	CHECK	SOLUTION
GATE on LCD, Display shows 0.0	Connections	Make sure all power and signals are properly connected.
	Attenuator	Set at x1 for signals from 50mV to 12 Volts p-p, x10 for signals over 12 V p-p.
	Input level	Turn knob until GATE pulses and readings are displayed.
	DC Offset	Small signals with large DC offsets may require a series capacitor.
OVER/UNDER Range on LCD	Range	Move the mode switch to RANGE and press the SCROLL/RESET pushbutton until the correct range appears in the LCD.
Unstable reading	Trigger Level	Turn knob until GATE pulses and readings are displayed.

SOURCE MODE

Some receivers can only detect signals that go from positive to negative (Sine Wave or Zero Crossing Square Waves) while other receivers require only positive signals (Zero Based Square Waves). The Model 942 provides a choice of these outputs.

SYMPTOM	CHECK	SOLUTION
Lack of Response	Connections	Make sure all power and signals are properly connected.
	Waveform	Turn Model 942 OFF and back on to SOURCE. Repeatedly press the SCROLL/STORE pushbutton until the correct waveform is displayed.
Wrong Range	Range	Move the mode switch to RANGE and press the SCROLL/RESET pushbutton until the correct range appears in the LCD.
Lack of response or jittery signal	Peak Voltage	Move the mode switch to LEVEL and turn the knob while observing the logarithmic bar graph to match the input level of the device being calibrated. Return the mode switch to FREQ.

CPM/CPH CONVERSIONS

To Convert	From:	To:	Divide By:
	CPM	Hz	60
	CPH	Hz	3600

To Convert	From:	To:	Multiply By:
	Hz	CPM	60
	Hz	CPH	3600

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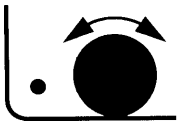
Rochester, NY 14624 USA

OPERATING INSTRUCTIONS

FREQUENCY OUTPUT (SOURCE MODE)

SOURCE

1) Move the POWER switch to SOURCE
2) Move the mode switch to RANGE and repeatedly press or press and hold the SCROLL/STORE pushbutton to change to the desired frequency range. Return the mode switch to FREQ.
3) Move the mode switch to LEVEL (AMPLITUDE) and turn the Digipot (Knob) until the logrithmic bargraph on the display reaches the desired level.Return the mode switch to FREQ.
4) Connect the Model 942 to the input terminals of the instrument or meter to be calibrated
5) Adjust the digital pot to the desired output value or QUIK-CHEK with previously stored frequency outputs (see below)



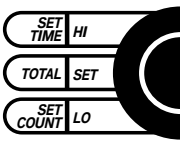
Whenever SOURCE mode is selected the word SOURCE will appear on the LCD display. To change the output value, turn the speed sensitive digital pot. Turning the pot slowly will cause a gradual change in the output. A faster change will occur when the pot is turned faster. This function operates in all three output positions (HI, SET & LO).

STORE

1) Switch to HI or LO
2) Turn the digital pot to desired value
3) Press the STORE/SCROLL pushbutton
   The LCD will flash once to show that the value was saved

If a value is in the SET position and you want that value stored in HI or LO, press and hold the STORE/SCROLL pushbutton while moving the switch to HI or LO. The display will flash once to indicate the value has been stored. Then release the STORE/SCROLL button.

QUIK-CHEK



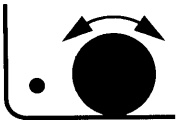
Any time you need a stored value just throw the QUIK-CHEK switch. Any value in the frequency range may be stored in HI & LO. The Model 942 remembers the HI, LO and SET values for all ranges (18 memories) for you with the power on or off. Each time a different frequency range is selected, the last three QUIK-CHEK values for that type will be recalled.

Hint: Pressing the STORE/SCROLL pushbutton will disable the Model 942's frequency generator. Releasing the pushbutton will re-enable the output.This is useful for synchronizing with displays for slow (< 1 Hz) signals

FREQUENCY COUNTER (READ MODE)

READ

1) Move the POWER switch to READ
2) Move the mode switch to RANGE and repeatedly press or press and hold the SCROLL/RESET pushbutton to change to the desired frequency range. Return the mode switch to TRIG.
3) Switch the MODE switch to LEVEL (AMPLITUDE) to toggle between x1 & x10 attenuation (Use x1 for signals from 30 mV to 12 V p-p, x10 for signals from 12 V to 240V p-p). Return the mode switch to TRIG.
4) Connect the Model 942 to the output of the instrument or sensor to be measured.
5) Adjust the trigger level to obtain a stable frequency reading by turning the Digipot (knob). A bargraph on the display will show the approximate trigger level.
6) Use the "QUIK-CHEK" switch to display present reading, MAXimum or MINimum frequency.



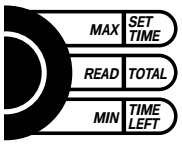
The word GATE will appear on the display whenever the Model 341 is measuring the frequency signal and will flash each time the displayed reading is updated.

PERIOD READINGS

CPM
CPH

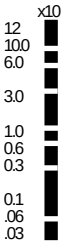
Select Counts-per-Minute (CPM) or Counts-per-Hour (CPH) to measure slow frequency signals. Frequencies as low as 0.1 CPM (0.001666 Hz) and 10 CPH (0.002777 Hz) can be measured (See CPM/CPH CONVERSIONS for conversion factors).

MIN/MAX



To read the Maximum or Minimum frequencies 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 the RESET/SCROLL pushbutton will cause the 942 to stop counting frequencies and will display zeros. Upon releasing the RESET/SCROLL the Model 942 will display GATE, resume counting frequencies and update the MAX & MIN values as the measured frequency changes.

TRIGGER LEVEL



The adjustable TRIGGER LEVEL is used in measurements of noisy signals, AC signals superimposed on DC levels and to select Voltage threshold for all other signals. The bargraph on the display shows the approximate level from 0 to over 12 V positive peak with the attenuator set at x1. This bargraph should be read as 0 to over 120 V positive peak with the attenuator set at x10. For quickest readings, determine or estimate the voltage level to be detected and set the ATTENUATOR and TRIGGER LEVEL to match.

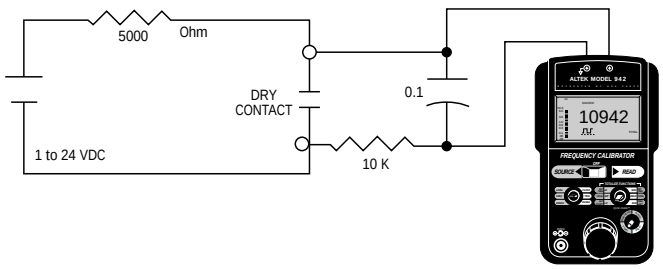
OUT OF RANGE SIGNALS

OVER
UNDER

Frequencies above or below those available for the currently selected range will be indicated by OVER and UNDER on the display (See OPERATING HINTS).

READING DRY CONTACTS

Isolated dry contact, open collector transistor or opto-isolated frequencies may be measured with the Model 942 with the optional DRY CONTACT MODULE (see section on Model C-41) or with the circuit shown. In order to detect contact opening or closing, an external battery or power supply, in series with a 5000 Ohm resistor, may be used. Select connection polarity to provide desired signal upon contact transfer. Relay or switch contacts may require a resistor-capacitor filter in order to eliminate contact bounce errors. Typical filter values for mechanical contacts are 10 K Ohms and 0.1 microfarads.



OPERATING INSTRUCTIONS

CALIBRATE TOTALIZERS (SOURCE MODE)

CALIBRATE TOTALIZERS (OUTPUT PULSES)

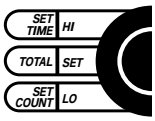
1) Move the POWER switch to SOURCE
2) Move the mode switch to RANGE and repeatedly press or press and hold the SCROLL pushbutton until the word TOTAL appears on the LCD. The ouput waveform will automatically change to a zero based square wave. Return the mode switch to FREQ.
3) Move the mode switch to LEVEL (AMPLITUDE) and turn the Digipot (Knob) until the logrithmic bargraph on the display reaches the desired level. Return the mode switch to FREQ.
4) Move the TOTALIZE FUNCTIONS switch to SET TIME. Adjust the digital pot to the number of minutes (1 to 99) that you require the 942 to output pulses.
5) Move the TOTALIZE FUNCTIONS switch to SET COUNT. Adjust the digital pot to the number of pulses (1 to 99999) that you require the 942 to output. Return the TOTALIZE FUNCTIONS switch to TOTAL.
6) Connect the Model 942 to the input terminals of the instrument or meter to be calibrated.
7) Reset to zero or record the value from the readout of the totalizer or device being calibrated.
8) Press the START/STOP pushbutton to start outputting pulses. The display of the 942 will increment with each output pulse. The Model 942 will automatically stop outputting pulses when the selected time has elapsed.

Whenever CALIBRATE TOTALIZER mode is selected the words SOURCE and TOTAL appear on the LCD display. You can recall the settings for TIME and COUNTS without interrupting the output pulses by moving the TOTALIZE FUNCTIONS switch to SET TIME and SET COUNTS.

RESTARTING CALIBRATE TOTALIZERS

The Model 942 will automatically stop outputting pulses when the selected time has elapsed.To restart CALIBRATING TOTALIZERS press the START/STOP bushbutton while the QUIK-CHEK switch is in the TOTAL position. The display on the Model 942 will reset to 0 and will automatically begin outputting pulses.

CHANGING CALIBRATE TOTALIZER SETTINGS



The settings for TIME and COUNTS can be changed whenever the Model 942 isn't outputting pulses. Move the TOTALIZE FUNCTIONS switch to SET TIME and SET COUNTS and turn the digital pot to set the new values as in steps 4 and 5.

INTERRUPTING CALIBRATE TOTALIZER

Press the START/STOP pushbutton while the QUIK-CHEK switch is in the TOTAL position to interrupt the output pulses at any time. The Model 942 will stop sending the pulses and will display the number of pulses which have been put out. This can be done to verify the device being calibrated without waiting the entire selected number of minutes.

TOTALIZE (READ MODE)

TOTALIZE (COUNT PULSES)

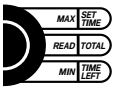
1) Move the POWER switch to READ
2) Move the mode switch to RANGE and repeatedly press or press and hold the SCROLL pushbutton until the word TOTAL appears on the LCD. Return the mode switch to FREQ.
3) Switch the MODE switch to LEVEL (AMPLITUDE) to toggle between x1 & x10 attenuation (Use x1 for signals from 30 mV to 12 Vp-p, x10 for signals from 12 V to 240 Vp-p). Return the mode switch to TRIG.
4) Adjust the trigger level by turning the Digital pot (knob). A bargraph on the display will show the approximate trigger level.
5) Move the TOTALIZE FUNCTIONS switch to SET TIME. Adjust the digital pot to the number of minutes (1 to 99) that you require the 942 to count pulses. Return the TOTALIZE FUNCTIONS switch to TOTAL.
6) Connect the Model 942 to the output of the instrument or sensor to be measured.
7) Press the START/STOP pushbutton to begin counting pulses.
8) If the Model 942 doesn't increment the LCD display adjust the trigger level by turning the Digital pot until the display starts incrementing. A bargraph on the display will show the approximate trigger level. Press the Start/Stop pushbutton twice to restart totalizing.

Whenever TOTALIZER mode is selected the words READ and TOTAL appear on the LCD display. You can recall the settings for the SET TIME without interrupting the output pulses by moving the TOTALIZE FUNCTIONS switch to SET TIME. You can also see how much time is remaining by moving the TOTALIZE FUNCTIONS switch to TIME LEFT.

RESTARTING TOTALIZE

The Model 942 will automatically stop counting pulses when the selected time has elapsed. To restart TOTALIZE press the START/STOP bushbutton while the QUIK-CHEK switch is in the TOTAL position. The display on the Model 942 will reset to 0 and will automatically begin counting pulses.

CHANGING TOTALIZE SETTINGS



The setting for TIMEcan be changed whenever the Model 942 isn'tcounting pulses. Move the TOTALIZE FUNCTIONS switch to SET TIME and turn the digital pot to set the new value as in step 5.

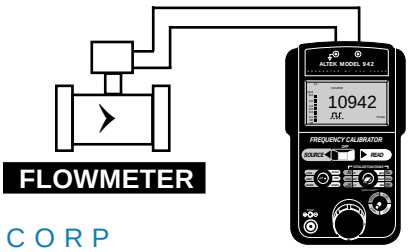
INTERRUPTING TOTALIZE MODE

Press the START/STOP pushbutton while the QUIK-CHEK switch is in the TOTAL position to interrupt the pulse counting at any time. The Model 942 will stop counting the pulses and will display the number of pulses which have been counted. This can be done to verify the device being calibrated without waiting the entire selected number of minutes. To restart TOTALIZE press the START/STOP bushbutton while the QUIK-CHEK switch is in the TOTAL position (see RESTARTING TOTALIZE above).

CONNECTIONS

CALIBRATE TOTALIZERS

TOTALIZE



ALTEK INDUSTRIES CORP
Rochester, NY 14624 USA

SPECIFICATIONS

(Unless otherwise indicated, specifications are in ±% of Reading @ 23°C)

GENERAL

FREQUENCY STABILITY: <10 PPM/Year drift

TEMPERATURE EFFECT: ±0.001%/°C based on 23°C±25°C
BATTERIES: Six "AA" batteries (Alkaline supplied and recommended)
BATTERY LIFE:
READ MODE: >80 hours, nominal
SOURCE MODE: >50 hours, nominal at 250 KHz at 12V p-p
LOW BATTERY: "BAT" indication on the display at6.5 V nominal, approximate 10 hours left
ATTENUATOR: Logarithmic for smooth input/output signal level control
OPERATING TEMPERATURE RANGE: -5 to +140°F (-20 to +60°C)
STORAGE TEMPERATURE RANGE: -13 to +149°F (-25 to +65°C)
RELATIVE HUMIDITY: 10 to 90%, non-condensing, for 24 hours
WARM UP TIME: 5 seconds to rated accuracy
OVERALL SIZE: $7^{3}/_{16}$ x 4 x $2^{7}/_{16}$ inches (183 x 102 x 62 mm)
WEIGHT: 1lb, 7oz (0.650 kg)

READ MODE

ACCURACY: ±(0.001% of reading + 1 LSD)
SENSITIVITY: Triggers on positive peaks down to 40 mV peak, DC coupled
MAXIMUM USABLE INPUT VOLTAGE: 240 VAC
MINIMUM PULSE WIDTH: 2 microseconds
MINIMUM TIME BETWEEN PULSES: 2 microseconds
TOTALIZER: Incremental counter to 99999 counts, timed operation from1 to 99 minutes at a maximum rate of 1666.65 Hz
INPUT IMPEDANCE: > 1 Meg Ohm + 60pF
TRIGGER LEVEL ADJUSTMENT: x1 & x10 Attenuator plus logarithmic control
NOTE: High signal noise and low slew rate (Volts-per-second) may affect reading uncertainty

SOURCE MODE

ACCURACY: ±0.001% of reading

OUTPUT WAVEFORMS:
Sine, Zero Based Square, and Zero Centered Square Waves
TOTALIZER OUTPUT: from 1 to 99999 pulses for a period from 1 to 99 minutes up to a maximum rate of 1666.65 Hz
OUTPUT AMPLITUDE: 50 mV to 12 V p-p, 50% ±1% duty cycle
RISETIME: <1microsecond @ 12V peak-to-peak
OUTPUT IMPEDANCE: 600 Ohms
SOURCE CURRENT: 8 mA maximum
SHORT CIRCUIT DURATION: Infinite
VOLTAGE PROTECTION: Protected against misconnection to 240 Volts peak AC/DC without fuses for 30 seconds

Specifications subject to change without notice

RANGES

RANGE	SOURCE	READ	GATE TIME
KHz	0.01 TO 250.00	0.01 TO 250.00	0.2 seconds
KHz	0.001 TO 99.999	0.001 TO 99.999	1 second
Hz	0.1 TO 9999.9	0.1 TO 9999.9	1 full cycle
Hz	0.01 TO 999.99	0.01 TO 999.99	1 full cycle
CPM	0.1 TO 2000.0	0.1 TO 2000.0	1 full cycle
CPH	1 TO 20000	10 TO 20000	1 full cycle
TOTAL	Up to 99999 counts in 99 minutes	Up to 99999 counts	1 full cycle

TYPICAL APPLICATIONS

Turbine Flowmeters
Vortex Shedders
Positive Displacement Flowmeters
Watt-Hour Meters
V to F and F to V Converters
Integrators
Tachometers
Uninterruptable Power Supplies
Counters
Frequency Transmitters
Variable Speed Drives
Telemetry Systems
Event Recorders
Vibration Monitors
Totalizers
Data Loggers
Velocity Detectors
Magnetic Pickups
DC Contact Closures

TYPICAL INDUSTRIES

Chemical Plants
Petroleum Refineries
Food Processing
Pipelines
Utilities
Water & Waste Treatment
Public Works
Steel Mills
Paper Mills
Textile Mills
Automotive Plants
Aerospace
Pharmaceutical
Glass & Ceramics
Metrology
Beverages
Plastics
Machinery
Ordinance
Computers

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

Altek designs and manufacturers 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, Frequency Sources and Pressure Pumps and Indicators. 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.

ORDERING INFORMATION — Part No.

MODEL 942 FREQUENCY CALIBRATOR	**942**
WITH OPTIONAL BNC CONNECTOR	**942-BNC**

Included with each Model 942 are:
Carrying Case (Part No. 09-3784)
NIST Traceable Certificate and Three Year Warranty

OPTIONAL ACCESSORIES — Part No.

AC ADAPTOR: 120 VAC, 50/60 Hz	9V-0120
AC ADAPTOR: 240 VAC, 50/60 Hz	9V-0240
DRY CONTACT MODULE	C-41

AVAILABLE FROM:

100889-900 REV:A

OPTIONAL DRY CONTACT MODULE
MODEL C-41

- **COMPANION TO THE MODEL 942**
  Adds Dry Contact functions
- **SIMULATE DRY CONTACTS**
  Replaces signal contacts in powered circuits
- **MEASURE DRY CONTACTS**
  Read unpowered circuits

GENERAL DESCRIPTION

Extend the usefulness of your Model 942 Frequency Calibrator to measure and simulate a wide variety of relays, mechanical pickups and other dry contact frequency devices.

SIMULATE DRY CONTACTS

Calibrate inputs to your flowmeters, totalizers, SCADA, telemetry systems, supervisory control systems and other frequeny control devices using the Model 942 with the Model C-41 to simulate the remote sensor. Many of these systems provide an excitation current or voltage which the sensor interrupts to generate the frequency signal. Coupled with the Model 942 Frequency Calibrator, the Model C-41 Dry Contact Module simulates the contacts of these sensors to calibrate these devices from 1 Count-per-hour to 5 KHz.

READ DRY CONTACTS

Check all your relays, mechanical contacts, cam driven switches, photoconductive cells, and momentary contact switches. The Model C-41 supplies an excitation current which allows the Model 942 to read your dry contacts from 10 Counts-per-hour up to 2 KHz. An adjustable filter on the Model C-41 combined with the trigger level adjustment of the Model 942 allow a wide variety of electronic and mechanical contacts to be measured.

OPERATING INSTRUCTIONS

SIMULATE DRY CONTACTS

1) Set the 942 to SOURCE, Waveform to Zero Based Square Wave and Output Level to >6 Volts
2) Connect the Module to the Model 942
3) Switch the Module to SOURCE
4) Disconnect the receiver from the contacts
5) Connect the Module to the receiver
6) Select the correct frequency range on the 942

READ DRY CONTACTS

1) Set the Model 942 to READ, Attenuator to x1 and set the Trigger Level to 5 Volts
2) Connect the Module to the Model 942
3) Switch the Module to READ
4) Disconnect the contacts from the circuit providing power
5) Connect the Module to the contacts
6) Select the correct frequency range on the 942

Note: Noisy readings may be indicating contact bounce. See FILTERING CONTACT BOUNCE.

CALIBRATION

The Model C-41 Dry Contact Module doesn't require calibration. An annual performance check is recommended.
Note: Calibration is required of the Model 942 Frequency Calibrator which is used in conjunction with the Model C-41 Dry Contact Module.

FILTERING CONTACT BOUNCE

Mechanical contacts bounce when they are closed, sending a large pulse as well as a series of smaller pulses to the measuring equipment. These small pulses can cause the measuring equipment to measure the frequency incorrectly. The Model C-41 has the ability to filter these small pulses out and measure the true frequency signal.

1) Set the Model 942 to READ, Attenuator to x1 and set the Trigger Level to 5 Volts
2) Connect the Module to the Model 942
3) Switch the Module to READ
4) Disconnect the contacts from the circuit providing power
5) Connect the Module to the contacts
6) Select the correct frequency range on the 942
7) Start with the FILTER knob set at MIN (fully counter clockwise)
8) Slowly increace the filter until stable readings are measured on the 942.

Note: Higher frequencies need less filtering than lower frequencies. Some adjustment of the filter may be necessary as the frequency of the signal changes.

BATTERY CHECK

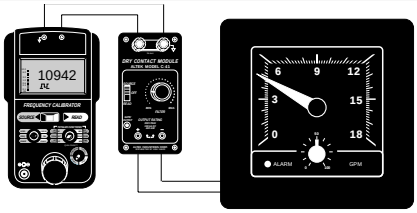
The LED will pulse at the same rate as the simulated or measured frequency (it will appear to be constantly lit above 30 Hz). To check the battery without connecting the C-41 to any devices:

1) Switch the module to READ
2) Connect the red & black output leads together
3) The battery needs replacement if the LED doesn't light

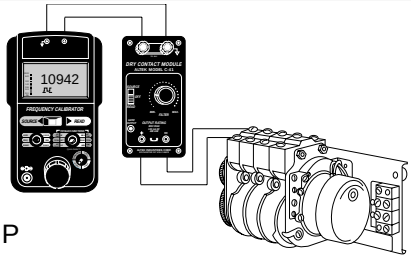
Note: Remember to turn the C-41 module off when you turn off the Model 942.

CONNECTIONS

SIMULATE DRY CONTACTS



READ DRY CONTACTS



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