



# ***Model T150***

## ***Hand-held Frequency Calibrator***

***OPERATING INSTRUCTIONS***



## **General Description**

The T150 Frequency calibrator is designed to be a high accuracy, simple to use frequency standard for calibrating process control instrumentation. The T150 can generate or read frequencies ranging from 1 count per minute to 100 KHz allowing it to be used for a wide range of flow measuring instrumentation.

When operated in the source mode, the user can quickly step the output in 10% of range increments or make smaller changes using the scroll keys.

## **Customer Service**

### **Corporate Office:**

[www.martelcorp.com](http://www.martelcorp.com)

e-mail: [sales@martelcorp.com](mailto:sales@martelcorp.com)

Tel: (603) 434-1433 800-821-0023

Fax: (603) 434-1653

### **Martel Electronics**

3 Corporate Park Drive

Derry, NH 03038

## **Installation**

### **Unpacking**

Remove the Packing List and verify that all equipment has been received. If there are any questions about the shipment, please call Martel at 1-800-821-0023 or email [sales@martelcorp.com](mailto:sales@martelcorp.com).

When you receive the shipment, inspect the container and equipment for any signs of damage. Note any evidence of rough handling in transit. Immediately report any damage to the shipping agent.

**NOTE:** *The carrier will not honor any claims unless all shipping material is saved for their examination. After examining and removing contents, save packing material and carton in the event reshipment is necessary.*

## **Set-up**

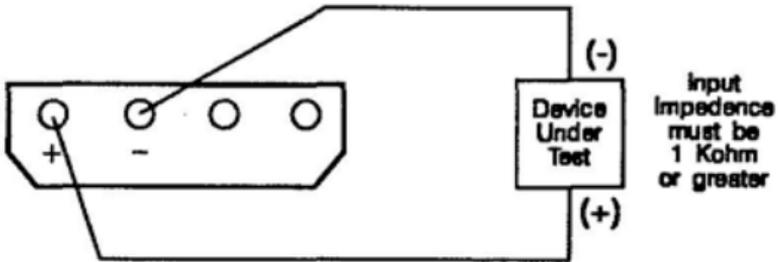
Before beginning, become familiar with the keypad layout and the configuration of the input/output jacks. Remember, these jacks are used in multiple configurations so pay careful attention to the jack identification label on back of unit and how the test leads are connected for the specific application.

## **Operating Procedure**

1. Turn on power and select the desired range by depressing the range select key. Your range choices are CPM, Hz, and KHz.
2. Make connections as required. Refer to the operating mode section or the rear jack identification label for connection information.
3. The step and scroll keys adjust the output value up or down. Holding the scroll key continuously for several seconds will increase the scroll rate. The step 'key' allows the user to make larger changes quickly and is preset to step in 10% of range increments.

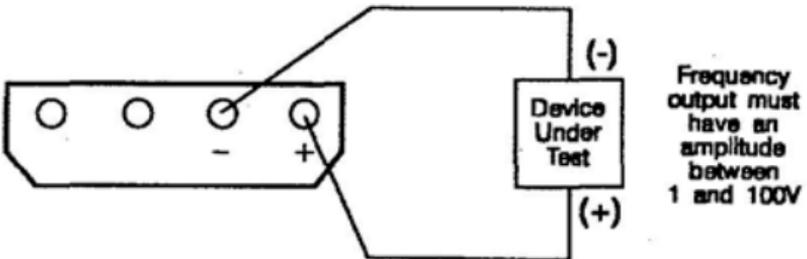
## Operating Modes

1. When operating in the output mode the T150 has the capability to drive loads up to 1 kOhm with TTL levels. The standard output amplitude is a 5 volt  $\pm$  10% p-p square wave.



**Figure 1**

2. When operating in the read (input) mode the T150 can monitor frequencies with amplitudes ranging from 1 to 100 volts. The waveform shape can be square, sine or triangular.



**Figure 2**

## Accuracy

The T150 is checked against an NIST Traceable reference before shipment to verify that each range falls within the 0.01%  $\pm$  1count of full scale. Since the accuracy of this particular product is based on a very stable quartz crystal, the T150 should stay well within its operating specification without the need for calibration for periods of 1 year or more.

# Specifications

<b>Input/Output Ranges</b>	0 to 1000 CPM 0 to 1000 Hz 0 to 100.0 kHz
<b>Accuracy</b>	$\pm 0.01\% \pm 1$ count
<b>Max Load Driving</b>	5 mA (1 kOhm load min)
<b>Input Signal Amplitude</b>	1 to 100 Volts
<b>Output Waveform</b>	5 V $\pm$ 10%, Square Wave
<b>Operating Temperature</b>	0 to 50°C
<b>Storage Temperature</b>	-20 to 60°C
<b>Temperature Stability</b>	0.005% of full scale/°C
<b>Power<sup>1</sup></b>	9 V Alkaline Battery
<b>Weight</b>	12 oz. / 340 g

Notes: <sup>1</sup> A low battery indication is given at 5.5 volts.

## **Maintenance**

Generally, with normal usage, the calibrator should hold its rated specifications for at least 12 months. Beyond this, it should be returned for re-calibration annually. If after the stated warranty period, the device falls out of calibration, or needs repair, it can be returned to Martel Electronics for re-calibration. Please use our website [www.martelcorp.com](http://www.martelcorp.com) under Customer Service for return information.

## **Warranty**

Martel Electronics Corporation warrants all products against material defects and workmanship for a period of twelve (12) months after the date of shipment. Problems or defects that arise from misuse or abuse of the instrument are not covered. If any product is to be returned, a "Return Material Authorization" form can be obtained from our website [www.martelcorp.com](http://www.martelcorp.com) under customer service. You can also call 1-800-821-0023 to have a form faxed. Martel will not be responsible for damage as a result of poor return packaging. Out of warranty repairs and recalibration will be subject to specific charges. Under no circumstances will Martel Electronics be liable for any device or circumstance beyond the value of the product.



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