IST-300 - User manual

2 channel portable function generator

Manual version	2.0
Date	22-7-2019
Hardware version	IST-300-VC-V02

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1. A portable vibration calibrator

The IST-300 is portable vibration signal simulator to simulate axial displacement, acceleration and velocity vibration signals (2oo2 testing). The 2-channel vibration calibrator sends out a pure sine wave with a programmable amplitude, frequency and offset. Signals can either be send through field wiring or directly to the vibration protection system.

The 8-hour battery lifespan and its compact lightweight design makes the IST-300 a fast and reliable tool to verify the system logic and safety functions of vibration protection systems.

Why we designed the IST-300

In a number of situations determining the loop accuracy in the field is required. A simple battery powered DC voltage simulator allows only static signals to be simulated e.g. axial displacement and/or bias voltage. For dynamic acceleration, velocity and/or radial vibration signals a function generator is needed. The standard available function generators, specific portable versions, do not allow a sufficient DC span in combination with AC superimposed signals.

The IST-300 vibration calibrator solves these issues.

Figure 1 – IST 300: Two channel calibrator

2. A user-friendly hardware interface

2.1. Front panel

The front panel consists of two parallel simulator units. Each channel consists of:

- LCD display 1 – Shows frequency value
- LCD display 2 – Shows AC amplitude value
- LCD display 3 – Shows DC offset value
- Peak output LED– Lights up when output is clipping (See 3.5)
- Display switch – To toggle between the LCD displays for setting the right values
- Output switch – To toggle between RMS or peak-to-peak
- Incremental rotary knob – For adjusting the values of the LCD displays

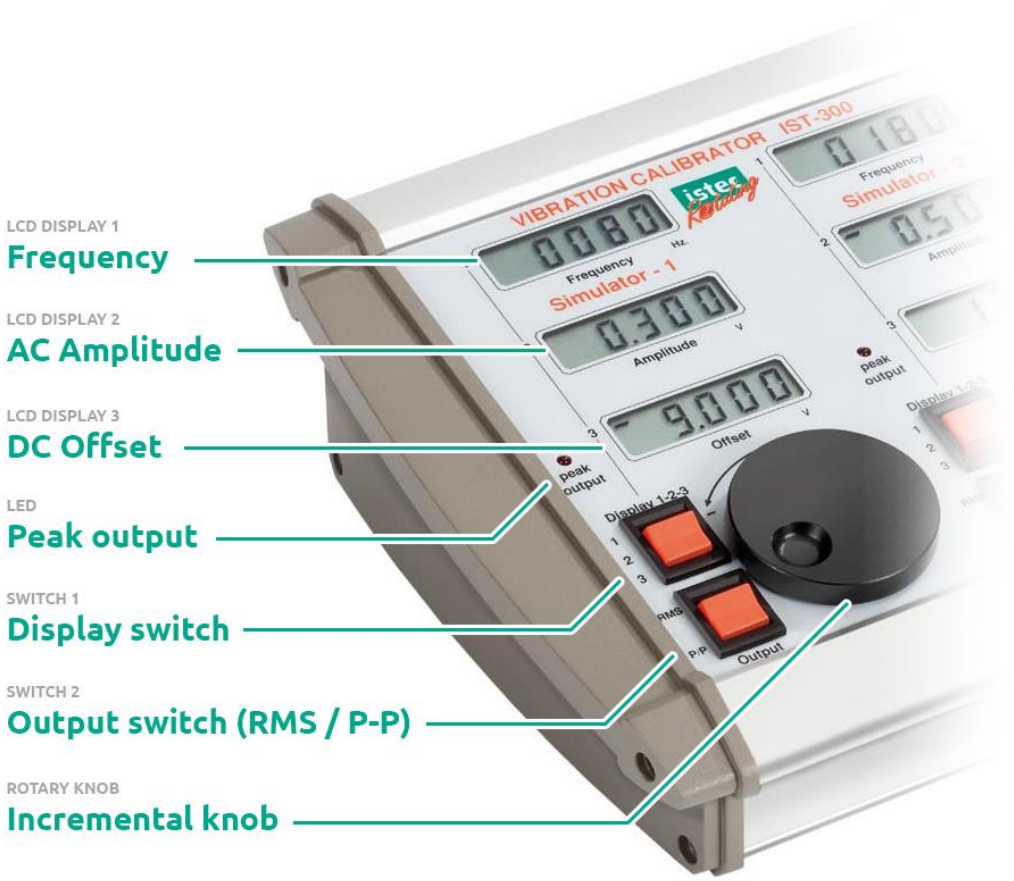


Figure 2 – Hardware interface

2.2. Top Panel

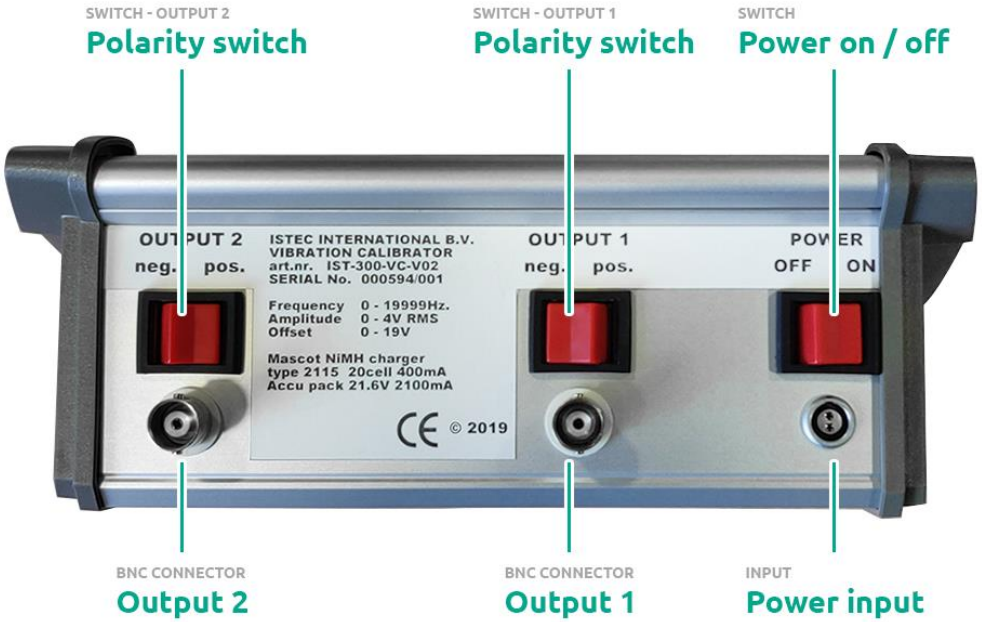


Figure 3 – Top View

At the top we find the following switches and sockets:

- One polarity switch per channel – To define the output voltage: positive or negative.
- Power on / off switch – To turn on and off the device
- One BNC output per channel (50 Ohm) – To connect the output to the device to be tested
- Power input socket – To connect the adapter for charging the battery

3. Using the IST-300

To use the IST-300 either the batteries need to be charged or the unit needs to be connected to the power adapter. The interface is very user-friendly and identical for both channels.

3.1. Turn on the device

After turning on the IST-300 by toggling the power switch, several data is shown on the LCD displays. These values are only for startup purposes. You will see the following data:

Channel 1	Channel 2
Display 1 Serial number PCB (project number)	**Display 1** Serial number PCB (project number)
Display 2 Serial number PCB	**Display 2** Serial number PCB
Display 3 Shows 1.000	**Display 3** Shows 0.000

Note: Battery status is shown every 60s in display 1 of channel 1.

3.2. Connect the output

Connect the BNC output(s) to the device to be tested.

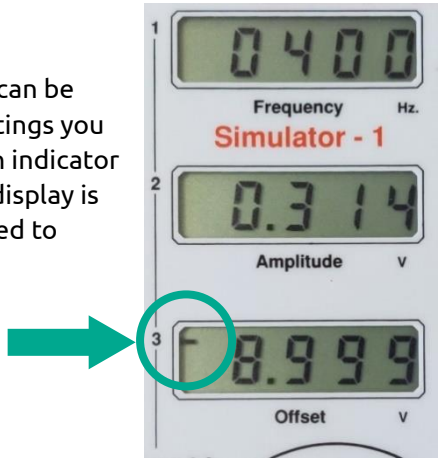
Note: Power output signals needs either to be disconnected or switched off.
For ICP loops the power mode on the device to be tested needs to be switched to off or to external.

3.3. Set vibration signal parameters

To simulate the right vibration signal, 3 parameters need to be set correctly:

1. Frequency
2. Amplitude
3. Offset

The values of these parameters are shown in the LCD displays and can be changed via the rotary knob. To change the value of one of the settings you first need to select the right parameter using the *Display switch*. An indicator is shown in the top left corner of the LCD display indicating which display is selected. After selecting the right parameter, the rotary knob is used to change the value.



- Frequency
  - Range: 0 … 19.999 Hz
- Amplitude
  - Range: 0 and 4.000 mV
  - When the offset output and the amplitude (Pk) output together exceeds 19.000 mVolt the Peak output LED will turn on and the amplitude value will start flashing.

- Offset
  - Range: 0 mV … 19.000 mV or 0 mV … -19.000 mV
  - When the polarity switch on the top of the IST-300 is set to negative the output is a negative voltage. (see 3.4)
    E.g. required for Eddy Current Probe loops using -24 volt power.
  - When the polarity switch on the top is set to positive the output is positive voltage. (see 3.4)
    E.g. required for ICP sensors loops using 4 mA Power supply and 12 Volt Bias Voltage

3.4. Combined output

The 3 different parameters are combined into one output:
DC value + AC value are defining the voltage output. Either in RMS or PEAK depending on the RMS/PEAK switch:

Figure 5 – RMS/Pk-Pk Switch

The output polarity may be changed at any time from positive to negative polarity or vice versa.

Figure 6 – Polarity switch

Each value can be changed at any time by selecting the applicable LCD display and changing the value by using the rotary knob.

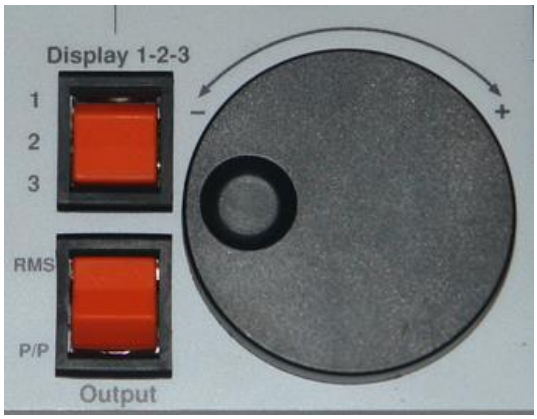


Figure 7 – Rotary knob

Limitations are either the range values of each parameter or in case of clipping (see 3.5)

3.5. Clipping

When the offset output and the amplitude (Pk) output together exceeds 19.000 mVolt the Peak output LED will turn on and the amplitude value will start flashing.

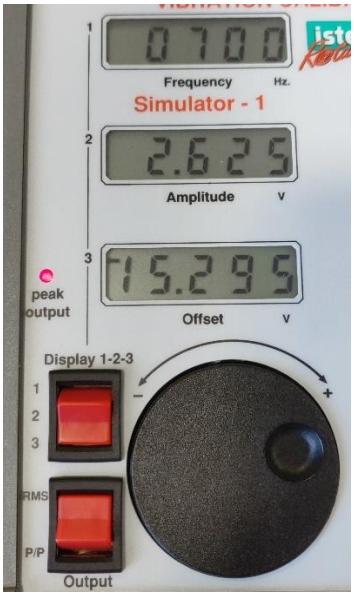


Figure 8 - Peak Output Function

In the example above the offset value + the RMS AC value exceed the 19.000 mVolt.
15.295 mV DC + (2.625 mV RMS * 1,414) = 19.007 m Volt

Note: The factor 1,414 is the square root of two (√2) which is the difference between the RMS and Peak value for pure sinus shaped signals.

4. Specifications

Digital Amplitude 14 bit:	0 … 4.000 mV Pk-Pk / RMS selectable
Accuracy:	100 mV + / - 3% 200 mV … 4000 mV better than + / - 1%
Digital Offset 16 bit:	0 … 19.000 mV + / - selectable
Accuracy:	Full range + / - 1%
Temperature drift:	30 µV/°C Typical
Maximum output current:	20 mAmp
Frequency range:	0 … 19.999 Hz
Tolerance:	@ 19.999 Hz < 0.001 % (+ / - 1 Hz)
Operating temperature range:	5 °C … 55 °C
Storage @95% humidity:	-10 °C … +80 °C with batteries removed
Battery:	ReCyko+ battery ▪ Holds power up to 90% after 1 year ▪ >8 hour continuously ▪ Rechargeable: NI-MH fast charge

5. Declaration of conformity

Declaration of Conformity

Istec International B.V.

Meeren Duin 8, 2163 HA Lisse

Declare under our sole responsibility that the product range

ISTCAL-300-AXX-XXX

Field Calibrators

Note: AXX-XXX indicates all models which are covered by any number variation of the X's

To which this declaration relates is in conformity with the following standard(s)

EN-55022, EN-61000-4-2, ENV50140, EN61000-4-4, ENV50141

Following provisions of the Electromagnetic Compatibility (89/336/EEC) Directive

Lisse , Netherlands 30-09-2008

D.Verschuren
Managing Director