

## USER MANUAL

### IST-101 3 channel speed calibrator



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IST-101-A03-MAN

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This manual is applicable for all calibrators with model number: IST101-A03-XXX

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## Index

1	Specification: .....	3
2	Introduction.....	5
2.1	Purpose.....	5
2.2	Quick Operation: .....	6
2.2.1	Selection Functions .....	6
2.2.2	Basic Functionality.....	7
2.2.3	XooX selection mode.....	9
3	Operation .....	10
3.1	Front panel .....	10
3.2	Top Panel.....	11
3.3	Setting up .....	12
3.3.1	Connection: .....	12
3.3.2	Function key .....	12
3.3.3	Program button.....	16
3.3.4	Machine factor .....	17
4	Probe Adapter .....	18
4.1	Description .....	18
4.2	Setting up .....	18
5	Declaration of conformity .....	19

## 1 Specification:

### Functions:

- 3 channel frequency generator
- All 3 channels are independent adjustable for frequency, amplitude, offset and phase
- Sweep function
- Loop current monitor

### Test functions:

- Over speed, 1001, 2002, 3003, 1002, 2003, 3003
- Under speed, 1001, 2002, 3003, 1002, 2003, 3003
- Zero speed, 1001, 2002, 3003, 1002, 2003, 3003
- Loop okay function, 1001, 2002, 3003, 1002, 2003, 3003
- Sensor okay (current monitoring per channel).
- Reverse rotation / Forward rotation
- Acceleration (speed)

### Technical details:

- Maximum DC adjust: 0-16 Volt DC
- Maximum AC adjust: 0-10 Volt (DC +AC Limited to 16 Volt)
- Accuracy: Full range + / - 1%
- Temperature drift: 30  $\mu$ V/ $^{\circ}$ C Typical
- Maximum Frequency adjust: 0-30000 Hz.
- Tolerance: @ 30.000 Hz < 0.001 % (+ / - 1 Hz)
- Maximum probe adapter output: appr. 15000 Hz.
- Acceleration: 0- Max 1500 Hz/s
- Phase: 360 degrees, per channel adjustable (only when the 3 outputs are coupled)
- Maximum load all outputs: 30mA (Fused 50 mAmp Fast)
- Pulses per Rev / Machine Factor: 1- 195 pulses per Rev / 0.0166 – 3.25

- Battery operation: Up to 12 hours continuously (low battery indication on the display)
- Battery Charger model Mascot type 2115
- Operating temperature range: 5 °C - 55 °C
- Storage @95% Humidity: -10 - +80 °C with batteries removed.

**Models:**

## IST-101-AXX

- Product includes:
- Battery charger
- Carrying case
- Probe adapter (Optional)
- 3 sets of leads with standard grips

## 2 Introduction

### 2.1 Purpose

In a number of situations determining functionality of speed monitoring applications in the field is required. To verify e.g. over- or underspeed functionality on a 2003 speed measuring system. The standard available function generators, specific portable versions, do not allow a 3 channel control of all function regarding e.g. overspeed, underspeed, speed acceleration.

The compact three channel battery powered speed calibrator has been build based on the input from field service engineers and for its purpose is truly one of the most easy to use and complete field service instruments in the field.

Following models are available:

- 3-channel portable: IST-101-A03-XXX



Figure 1 IST-101-A03-XXX Three channel speed calibrator with connection cables.

## 2.2 Quick Operation:

A quick overview of the different menus is shown below.

1.2.1 Handles the selection functions

1.2.2 Handles the basic functionality

1.2.3 Handles the different combinations between the speed outputs for the XooX tests.

### 2.2.1 Selection Functions



Figure 2 IST-101-A03-XXX Selection dials and switches

The IST-101 has followings means of operating the unit

- Selector – start button
  - Adjustment dial
  - Test Start
  - Test Program
1. With the Selector – start button following basic functions are performed:
    - Centre button; switch to next line in the display
    - Left – Right; move to the digit in the selected line which needs to be modified.
    - Up – Down; change de value of the digit.
  2. With the Adjustment dial the value of the selected line also may be changed. The dial has an incremental function. Slow turning results in slow change of the value. Fast turning results in fast change of the value.
  3. Test Function; with this push button generally the basic functions are chosen. Which only require change of numerical value per line or per channel.
  4. Test Program; with this push button any option, which requires a pre configuration like XooX control of the speed out puts or Sweep function is selected.

### 2.2.2 Basic Functionality

FUNCTION MENU'S						
Menu 1	Switch on			1e menu item		
Line 1	ISTEC				Remark	
Line 2	INTERNATIONAL B.V.				After 3 seconds the screen changes automatically	
Line 3	FREQUENCY					
Line 4	GENERATOR					
Menu 1	Switch on			1e menu item		
Line 1	Verion X.Z				Remark	
Line 2	month-year				Content may vary per revision and project After 3 seconds the screen changes automatically	
Line 3	PROJECT NUMBER					
Line 4	XXXXXXXXXX					
Menu	Selector Center Button			Next menu		
Line 1	Frequency	Cursor	Marker	Unit	Phase	Remark
Line 2	00000	<		Hz	000	Use selector center button to change field. Use dial to change value, or use selector left right to move to numeric value. Then use selector up down to change digit
Line 3	12,000			V DC	120	
Line 4	00.000			V AC	240	
Menu 2	Selector Center Button			Next menu		
Line 1	Frequency	Cursor	Marker	Unit	Phase	Remark
Line 2	00000			Hz	000	Use selector center button to change field. Use dial to change value, or use selector left right to move to numeric value. Then use selector up down to change digit
Line 3	12,000	<		V DC	120	
Line 4	00.000			V AC	240	
Menu 3	Selector Center Button			Next menu		
Line 1	Frequency	Cursor	Marker	Unit	Phase	Remark
Line 2	00000			Hz	000	Use selector center button to change field. Use dial to change value, or use selector left right to move to numeric value. Then use selector up down to change digit
Line 3	12,000			V DC	120	
Line 4	00.000	<		V AC	240	
Menu 4	Press function button			Next menu		
Line 1	Phase	Cursor	Marker	0-360.0		Remark
Line 2	000,0	<		Phase	ch 1	Use selector center button to change field. Use dial to change value, or use selector left right to move to numeric value. Then use selector up down to change digit
Line 3	120,0			Phase	ch 2	
Line 4	240,0			Phase	ch 3	
Menu 5	Selector Center Button			Next menu		
Line 1	Phase	Cursor	Marker	0-360.0		Remark
Line 2	000,0			Phase	ch 1	Use selector center button to change field. Use dial to change value, or use selector left right to move to numeric value. Then use selector up down to change digit
Line 3	120,0	<		Phase	ch 2	
Line 4	240,0			Phase	ch 3	
Menu 6	Selector Center Button			Next menu		
Line 1	Phase	Cursor	Marker	0-360.0		Remark
Line 2	000,0			Phase	ch 1	Use selector center button to change field. Use dial to change value, or use selector left right to move to numeric value. Then use selector up down to change digit
Line 3	120,0			Phase	ch 2	
Line 4	240,0	<		Phase	ch 3	

Menu 7	Selector Center Button			Next menu		
Line 1	Sensor	Cursor	Marker	mA/Volt		Remark
Line 2	10.00	<		--,--	1	Use selector center button to change field. Use dial to change value, or use selector left right to move to numeric value. Then use selector up down to change digit
Line 3	10.00			--,--	2	
Line 4	10.00			--,--	3	
Menu 8	Selector Center Button			Next menu		
Line 1	Sensor	Cursor	Marker	mA/Volt		Remark
Line 2	10.00			--,--	1	Use selector center button to change field. Use dial to change value, or use selector left right to move to numeric value. Then use selector up down to change digit
Line 3	10.00	<		--,--	2	
Line 4	10.00			--,--	3	
Menu 9	Selector Center Button			Next menu		
Line 1	Sensor	Cursor	Marker	mA/Volt		Remark
Line 2	10.00			--,--	1	Use selector center button to change field. Use dial to change value, or use selector left right to move to numeric value. Then use selector up down to change digit
Line 3	10.00	<		--,--	2	
Line 4	10.00			--,--	3	
Menu 10	Press function button			Next menu		
Line 1	FREQ. SEPERATE		Marker			Remark
Line 2	00000	<		Hz	ch 1	Use selector center button to change 3oo3 2oo3 1oo3 channel selection. PRESS PROGRAMM to activate selection Chosen selection is indicated by markers (  )
Line 3	00000	<		Hz	ch 2	
Line 4	00000	<		Hz	ch 3	
Remark See Frequency channel selection chapter for detailed selection procedure						
Menu 15	Press function button			Back to first menu		
Line 1	Frequency	Cursor	Marker	Unit	Phase	Remark
Line 2	00000	<		Hz	000	Use selector center button to change field. Use dial to change value, or use selector left right to move to numeric value. Then use selector up down to change digit
Line 3	12,000			V DC	120	
Line 4	00.000			V AC	240	
PROGRAM MENU'S						
SWEEP MODE						
PRESS PROGRAMM						
Menu 16	Press function button			Terug naar 1e menu item.		
Line 1	Sweep	00000		0,000	Sec	Remark
Line 2	00000			Hz	Ready	Use selector center button to change field. Use dial to change value, or use selector left right to move to numeric value. Then use selector up down to change digit
Line 3	0000	<		MAX. HZ		
Line 4	0000			Hz/S		
Menu 17	Selector Center Button			Door naar volgende menu item		
Line 1	Sweep	Cursor		0,000	Sec	Remark
Line 2	00000			Hz		Use selector center button to change field. Use dial to change value, or use selector left right to move to numeric value. Then use selector up down to change digit
Line 3	0000			MAX. HZ		
Line 4	0000	<		Hz/S		
MENU 18	Press function button			Door naar volgende menu item		
Line 1	MACHINE FACTOR				Remark	
Line 2	00000					Use selector center button to change field. Use dial to change value, or use selector left right to move to numeric value. Then use selector up down to change digit
Line 3	PULSES ROTATION					
Line 4	0000	<				
Menu 19	Selector Center Button			Door naar volgende menu item		
Line 1	MACHINE FACTOR				Remark	
Line 2	00000	<				Use selector center button to change field. Use dial to change value, or use selector left right to move to numeric value. Then use selector up down to change digit
Line 3	PULSES ROTATION					
Line 4	0000					

### 2.2.3 XooX selection mode

FUNCTION MENU's						
Menu 1	Switch on		1e menu item			
Line 1	ISTEC			Remark		
Line 2	INTERNATIONAL B.V.			After 3 seconds the screen changes automatically		
Line 3	FREQUENCY					
Line 4	GENERATOR					
Menu 1	Switch on		1e menu item			
Line 1	Verion X.Z			Remark		
Line 2	month-year			Content may vary per revision and project After 3 seconds the screen changes automatically		
Line 3	PROJECT NUMBER					
Line 4	XXXXXXXXXX					
Note: press Function Button untill FREQ. SEPARATE MENU is reached						
Menu 10	Press function button			Next menu		
Line 1	FREQ. SEPERATE	Marker				Remark
Line 2	00000	<		Hz	ch 1	Use selector center button to change 3oo3 2oo3 1oo3 channel selection. PRESS PROGRAMM to activate selection Chosen selection is indicated by markers (  )
Line 3	00000	<		Hz	ch 2	
Line 4	00000	<		Hz	ch 3	
Menu 10	Selector Center Button			Next menu		
Line 1	FREQ. SEPERATE	Marker				Remark
Line 2	00000	<		Hz	ch 1	Use selector center button to change 3oo3 2oo3 1oo3 channel selection. PRESS PROGRAMM to activate selection Chosen selection is indicated by markers (  )
Line 3	00000	<		Hz	ch 2	
Line 4	00000	<		Hz	ch 3	
Menu 10	Selector Center Button			Next menu		
Line 1	FREQ. SEPERATE	Marker				Remark
Line 2	00000	<		Hz	ch 1	Use selector center button to change to 1oo3 channel selection. PRESS PROGRAMM to activate selection Chosen selection is indicated by markers (  )
Line 3	00000	<		Hz	ch 2	
Line 4	00000	<		Hz	ch 3	
Note: press Selector Center Button to change control from channel 1 to channel 2 or 3, solid marker indicate selected channel						
Menu 10	Selector Center Button			Next menu		
Line 1	FREQ. SEPERATE	Marker				Remark
Line 2	00000	<		Hz	ch 1	Use selector center button to change to 1oo3/2oo3 channel selection. PRESS PROGRAMM to activate selection Chosen selection is indicated by markers (  )
Line 3	00000	<		Hz	ch 2	
Line 4	00000	<		Hz	ch 3	
Note: press Selector Center Button to change control from channel 1 and 2 to channel 3, solid marker indicate selected channel						
Menu 10	Selector Center Button			Next menu		
Line 1	FREQ. SEPERATE	Marker				Remark
Line 2	00000	<		Hz	ch 1	Use selector center button to change to 2oo3/1oo3 channel selection. PRESS PROGRAMM to activate selection Chosen selection is indicated by markers (  )
Line 3	00000	<		Hz	ch 2	
Line 4	00000	<		Hz	ch 3	
Note: press Selector Center Button to change control from channel 1 and 2 to channel 3, solid marker indicate selected channel						
Menu 10	Selector Center Button			Next menu		
Line 1	FREQ. SEPERATE	Marker				Remark
Line 2	00000	<		Hz	ch 1	Use selector center button to change to 2oo3/1oo3 channel selection. PRESS PROGRAMM to activate selection Chosen selection is indicated by markers (  )
Line 3	00000	<		Hz	ch 2	
Line 4	00000	<		Hz	ch 3	
Note: press Selector Center Button to change control from channel 1 and 3 to channel 2, solid marker indicate selected channel						
Menu 10	Press function button			Next menu		
Line 1	FREQ. SEPERATE	Marker				Remark
Line 2	00000	<		Hz	ch 1	Use selector center button to change 3oo3 2oo3 1oo3 channel selection. PRESS PROGRAMM to activate selection Chosen selection is indicated by markers (  )
Line 3	00000	<		Hz	ch 2	
Line 4	00000	<		Hz	ch 3	
Menu 10	Press function button			Next menu		
Line 1	FREQ. SEPERATE	Marker				Remark
Line 2	00000	<		Hz	ch 1	Use selector center button to change 3oo3 2oo3 1oo3 channel selection. PRESS PROGRAMM to activate selection Chosen selection is indicated by markers (  )
Line 3	00000	<		Hz	ch 2	
Line 4	00000	<		Hz	ch 3	

## 3 Operation

### 3.1 Front panel



Figure 3 IST-101 Three channel speed calibrator Front View.

The front panel consists of two parallel simulator units.

Each unit consists of:

- Multi function LCD display
- FUNCTION key
- PROGRAM key
- DIAL (Incremental Dial)
- Multi function selection switch ( up-down-right-left and center button)

### 3.2 Top Panel



Figure 4 IST-101-A03 Three channel speed calibrator Top View.

The top panel consists of:

- 3 sets of 4 mm connection sockets
- On-off switch
- Power input socket.( NIMH Battery Charger model Mascot type 2115 )
- Probe adapter connector (extern)
- Product label (containing product number, serial number, charger make and model, CE label)

V = Power connection

S = Signal connection

Gnd = Common connection

### 3.3 Setting up

To operate the unit either the batteries need to be charged or the unit needs to be connected to the power adapter

#### 3.3.1 Connection:

Connect the banana plug output to the device to be tested.

#### 3.3.2 Function key

The Function button is used to select the basic operation menus

In each menu the values can be modified by using the:

- Incremental dial
- Multi function selection switch ( up-down-right-left and center button)

After switching on the IST-101-A03 the version and serial/project number will be displayed

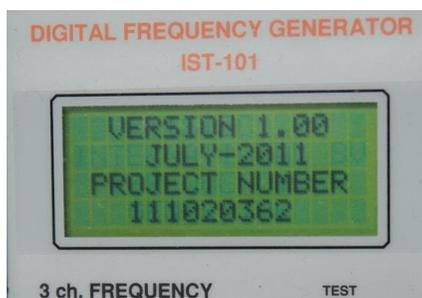


Figure 5 IST-101-A03 Start-up screen.

Automatically the screen changes to the selection screen for RPM / Hz. Make a selection by using the center button and use the function button to continue to the menu.

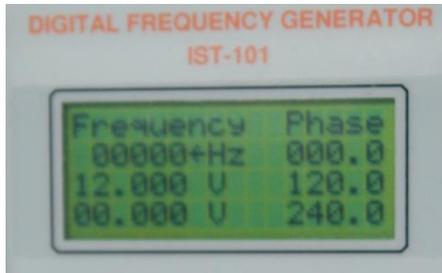


Figure 6 IST-101-A03 Frequency menu

Note: the unit is now active. Changing the dial or numerical values will change the outputs immediately.

In this menu following can be set:

- Frequency for 3oo3 mode.
- DC value of the signal
- AC amplitude of the signal.

The shown phase information is for information only.

With the Function button the following menus are selected:

### Phase angel selection

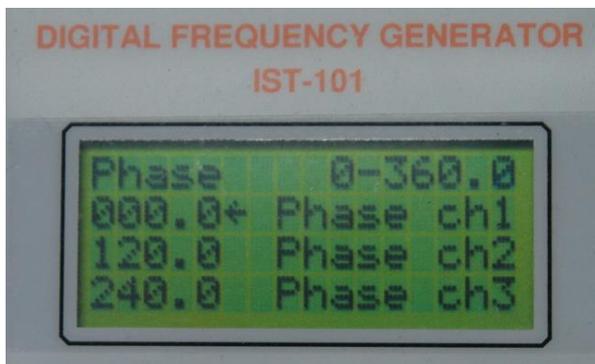


Figure 7 IST-101-A03 Phase menu screen

### Sensor power consumption

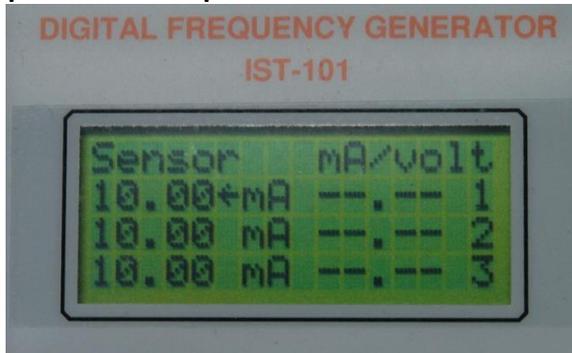


Figure 8 IST-101-A03 current use.

### Frequency mode menu

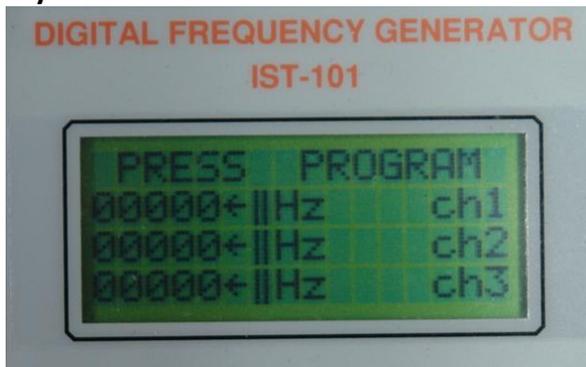


Figure 9 IST-101-A03 Frequency mode menu.

After pressing Function the frequency menu appears again

In the frequency mode menu the various options may be selected:

3003 (default)

1003 (each channel can be varied independent)

1003/2003 (channels can be varied as follows 1-2 and 3 coupled, 2-1 and 3 coupled 3-1 and 2 coupled)

**Note: in the 3003 menu it is possible to reverse the rotation by turning the INCREMENTAL DIAL counter clock wise.**

Various selections are made using the Center button of the selector. The chosen function is activated with the Program button.

See various screens below:

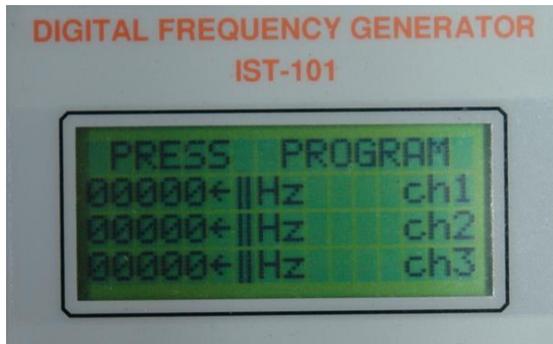


Figure 10 Frequency mode menu

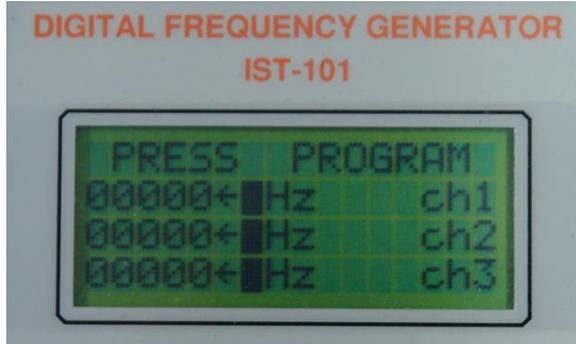


Figure 11 Frequency mode menu 3003 active

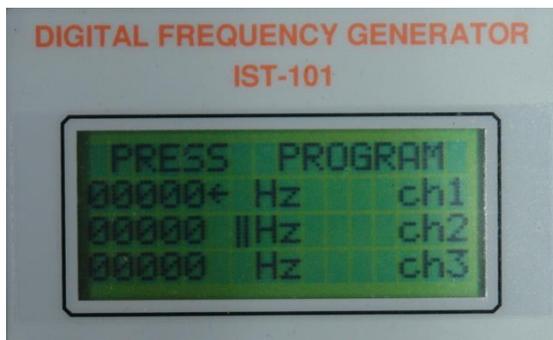


Figure 12 Frequency mode menu 1001

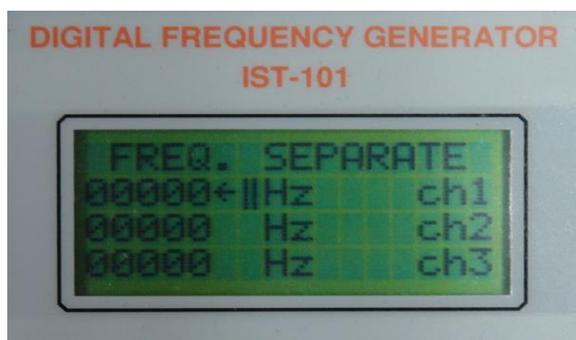


Figure 13 Frequency mode menu 1001

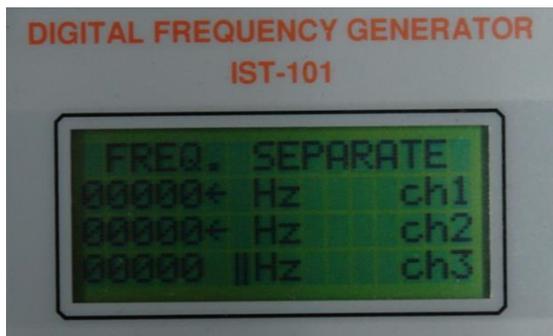


Figure 14 Frequency mode menu 2003

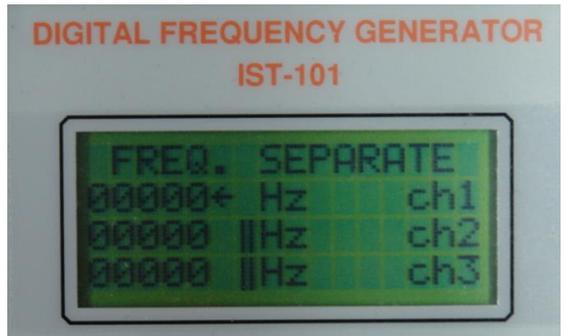


Figure 15 Frequency mode menu 1001

**Note: The Center button selects the required function. The Program button activates the selected function.**

### 3.3.3 Program button

The Program button is used to select the Sweep mode.

The Sweep mode can be activated from the frequency menu. The sweep menu can only be entered when the unit is in 3003 mode.

While in the frequency mode menu, press the Program button to enter the sweep menu.

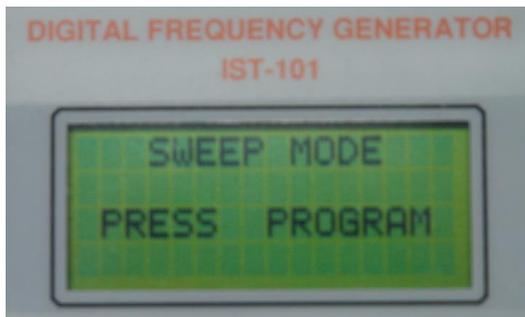


Figure 16 IST-101-A03 Sweep mode

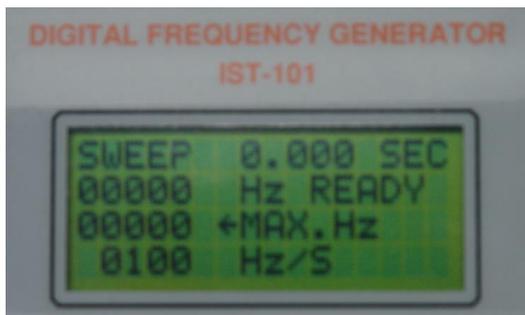


Figure 17 IST-101-A03 Sweep mode menu

**Note, line two is the start frequency; the starting frequency is taken from the frequency menu.**

**To change the starting frequency you have to return to the frequency menu by pressing the Function button.**

**The Center button allows you to stop the sweep function and reset the reached value.**

### 3.3.4 Machine factor

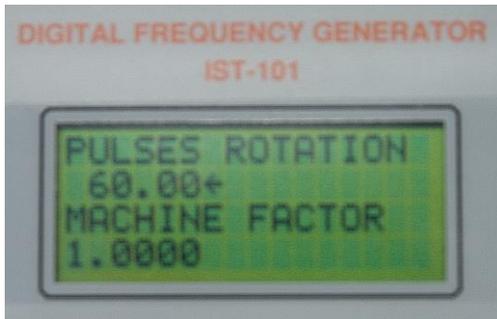


Figure 17 IST-101-A03 Machine factor menu

**Note: The Machine Factor is a calculation module only. In version 2 and up, it is possible to display in both RPM and Hz.**

## **4 Probe Adapter**

### **4.1 Description**

The probe adapter is a separate device that can be connected to the Extern slot of the IST-101. The adapter works as a three channel electrical pole wheel, that allows the user to test a complete overspeed system and ESD connections. The probe adapter is controlled by the IST-101.

### **4.2 Setting up**

The adapter must be placed on a stable, flat surface. Avoid any vibrations, other movements or electrical fields that can influence the sensors.

Place the sensors in the holders.

Connect the adapter to the Extern slot of the IST-101. The IST-101 will now automatically use the adapter to generate the output.

Switch on the IST-101.

Use the IST-101 as described in this manual to control the adapter output signals.

## 5 Declaration of conformity



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### Declaration of Conformity

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**Istec International B.V.**

Meer en Duin 8, 2163 HA Lisse

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Declare under our sole responsibility that the product range

**ISTCAL-101-A03-XXX**

**Speed Calibrator**

Note: A03-XXX indicates all models which are covered by any number variation of the X's

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

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

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

Lisse , Netherlands 13-07-2011

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D.Verschuren  
Managing Director