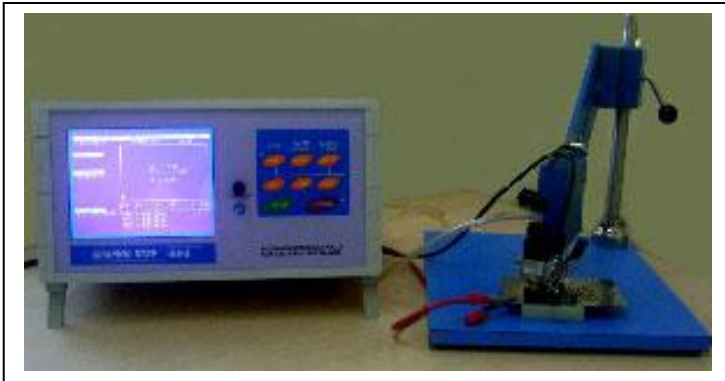# Model GStep / GGedet
Graphic Step / Graphic Generalized Destructive Tester

Graphic Step is an advanced version of our earlier Smart Step. It works on Coulometric Principle. It measures plating thickness of various metallic coatings on variety of base materials. Step measurement of Duplex and Triplex Nickel is also possible in this instrument.

In Duplex Nickel on Steel / Copper combination, it measures thickness of bright and semi-bright nickel and measures electrochemical potential between these two layers. In Triplex Nickel on Steel / Copper combination, instrument measures the thickness of bright nickel, active layer and semi-bright nickel and measures electrochemical potential between two layers. Graphic Gedet is similar to Graphic Step except cannot perform Step Measurement.

Graphic Gedet Mode
(Thickness Measurement)

More than 20 plate/base combinations can be tested on Graphic Step. Combinations are listed on next page. Instrument is very easy to operate. It has a setup mode to select the plate—base combination. Using UP/Down/Scroll keys, required plate-base combination can be selected. After selection, instrument goes into measurement mode. Air agitation is necessary to maintain proper electrochemical contact and to maintain constant rate of de-plating. After setting up the sample, just press the Start key. Measurement will start.

No further adjustment of any kind is necessary. Constant current passes through the cell and etching takes place. Instrument stops automatically whenever base material is reached. During measurement cycle, instrument displays the thickness in microns as well as mils. Also displays the cell voltage. Operator can selectively store the reading which can be used for generating statistical information. Statistics like MIN, MAX, AVG and Standard Deviation will be done automatically and displayed on LCD screen.

Graphic Step
(Duplex / Triplex Step Measurement)

Instrument goes into Step measurement mode whenever the user selects Duplex / Triplex Nickel plate - base combination. In Step measurement, setup the sample. Use reference electrode and SN-15 electrolytic solution for measurement of electrochemical potential between two layers. Press Start key to start measurement. Instrument shows graph of electrochemical potential versus thickness on LCD screen. Typical graph for Duplex Nickel is shown in the picture. Instrument passes constant current through cell and etching starts.


First the bright Nickel layer gets removed. Then etching of the semi-bright nickel layer starts. Cell voltage rises at this time. Rise in cell voltage can be observed on LCD screen. After etching of semi-bright layer, base material is exposed to the solution. At this point, cell voltage rises for copper or drops for steel base material. Instrument detects this change and stops automatically. Step change in voltage is calculated automatically. Also the thickness of bright and semi-bright nickel layer is calculated and displayed on screen. For Triplex nickel layer, instrument measures the thickness of bright nickel, active layer and semi-bright nickel and measures electrochemical potential between two layers.

Precautions :
Silver/Silver Chloride Electrode and the Gasket are the key components in step measurement. Periodic reconditioning of electrode is necessary for accurate measurement. Instrument has a facility to recondition the electrode. Care should taken while handing the rubber gasket. SS cell should be cleaned after every measurement. Conditioning of Silver/Silver Chloride Electrode, cleaning of cell and gasket and proper setup of sample will lead to successful step measurement.

Software :

Graphic Step stores data in a non-volatile memory. Even after switching off the instrument, the data array is preserved. Data can be transferred to PC via USB port. Data retrieval software will be supplied for data storage and transfer. All the calculations for determination of step(s) or layer thickness are done automatically at the end of the measurement.
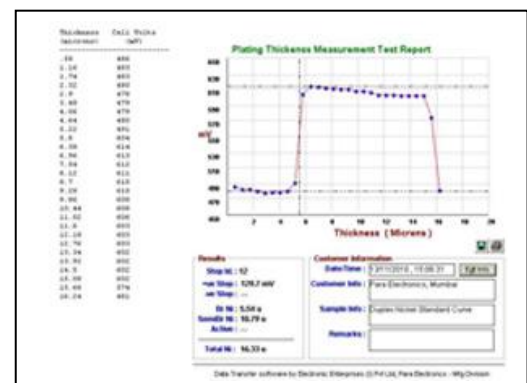
Instrument determines the points (thresholds) at which change in layer takes place. Due to non-uniform coating, sometimes the instrument may show wrong results. In such cases, transfer the data to PC and run the software. In the software, user can change the thresholds by looking at the graph displayed on screen. This helps to get the proper and more accurate results.

Metallic Coating	Base Metal / Material
CADMIUM	Nickel, Steel
CHROMIUM	Nickel, Steel, Brass, Copper
COPPER	Aluminium, Steel, Nickel, Zinc, ABS
LEAD	Aluminium, Copper
NICKEL / ELECTROLESS NICKEL / DUPLEX / TRIPLEX NICKEL	Copper, Steel
SILVER /THIN SILVER	Brass, Copper, Steel
TIN	Brass, Copper, Nickel, Tin
ZINC	Aluminium, Copper, Nickel, Steel
BRASS	Steel
LEAD + ZINC ALLOY	Steel
TIN + ZINC ALLOY	Steel

- ❖ **Supply Voltage** — 110/230 Volts , 50/60 Hz AC
- ❖ **Display** — 320 x 240 pixel Graphic LCD
- ❖ **Keypad** — 8 Keys pad for solution set up, measurement & data transfer
- ❖ **Gasket Diameter** — 1.5mm / 3.5 mm
- ❖ **Accuracy** — Better than +/- 7% for thickness measurement
  0.1 microns for thick coatings, 0.01 microns for thin coatings
- ❖ **Area of Deplating** — Approx. 10mm2 Circular with 3.5 mm Diameter gasket
- ❖ **Electrolyte Required** — Less than 2cc / measurement
- ❖ **Air Agitation** — Built-in, Bellow driven air pump
- ❖ **Stand Assembly** — For setting up the sample & air agitation
- ❖ **Data Transfer to PC** — Through USB Port
- ❖ **Dimensions** — 29 L x 20 D x 15 H cm
- ❖ **Weight** — GStep / GGedet Unit = 1 Kg
  Stand Assembly with wooden block = 2.15 Kg

Due to continuous R&D, specifications are likely to change without notice

Manufactured by :

Para Electronics Manufacturing Division
Electronic Enterprises(I) Pvt. Ltd.

306, Nimesh Industrial Estate
Vidyalaya Marg, Mulund (East)
Mumbai 400 081
Phone : 022-2563 5600/ 2741
Fax   : 022-2563 7835
Website : www.eeipl.in
Email: pemd@eeipl.in

BRANCHES

Mumbai	**Hyderabad**	**Bangalore**
022-25639904	040-23243352	080-23380451
eemulund@eeipl.in	eehyd@eeipl.in	eebng@eeipl.in

Kolkata	**Delhi**	**Kota**
033-25770551	011-27240436	0744-2501113
eecal@eeipl.in	eedelhi@eeipl.in	eekota@eeipl.in