

Sweep Frequency Response Analyzer



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Sweep Frequency Response Analyzer

- Standalone high accuracy transformer analyzer
- Leading wideband accuracy: basic 0.02dB with class leading high frequency performance
- Leading phase accuracy: 0.05 degrees basic
- Wide frequency range: 5Hz to 45MHz
- Full colour VGA display enabling engineer to perform and store measurement in the field without a PC
- PC software included: remote control, tables, graphs and database management of results
- USB, RS232 and LAN interfaces
- LCR mode: fully functional LCR meter to measure transformer LCR parameters
- Various measurement modes: FRA, RMS, LCR, Scope
- Compliant to IEC60076-18 standard
- Light and easy to carry

System Description

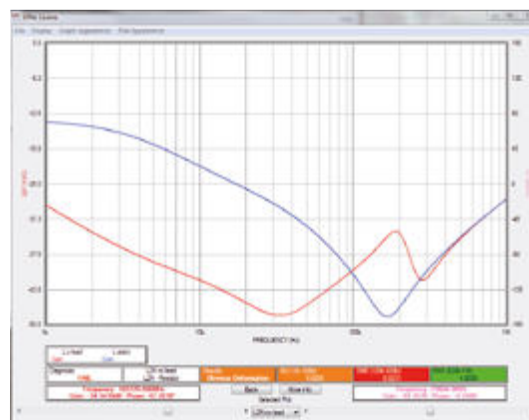
SFRA 5000 is a standalone sweep frequency response analyzer for the high accuracy transformer analysis and integrates the STS and TD 5000 family test sets. The SFRA 5000 offers both high precision and portability in a single package, providing all the accessories required for fast, easy to use, reliable and repeatable measurements.

Without the need for a PC to compare transformer fingerprints, the SFRA 5000 decreases test time enabling the engineer to complete testing in a much shorter period of time than previously possible. The SFRA 5000 has the ability to utilise existing plots saved to internal memory or USB memory stick and use them as a reference during a live measurement. If a problem is detected the test can be interrupted without wasting any time by comparing the plots real time, point by point.

The Software

SFRA 5000 is provided with its own embedded software, giving the possibility to the engineer to zoom into a portion of the sweep in order to inspect any differences in the plot in more detail during or after a sweep. This enables diagnosis of transformer faults early on in a transformer sweep, without the need for a PC. In fact, the SFRA 5000 does not run on a generic operation system, it is based upon embedded software which is more reliable in the field, especially when used as a standalone instrument.

SFRAComm Software provides excellent fault diagnosis assistance, ranging from a sophisticated database including multiple search options to automatic fault diagnosis algorithms in accordance with DLT - 911/2004 and also provides excellent graphing functionality for the more experienced user. SFRAComm provides simple, swift and user intuitive diagnosis of transformer sweeps. The user is able to filter out unwanted sweeps from the built in database and select up to 9 sweeps to be plotted on one graph.



IEC 600-76-18 Compliance

The SFRA 5000 and accompanying accessories and software have been developed alongside the IEC60076-18 international standard for sweep frequency analysis of power transformers.

Connecting Cables

The SFRA 5000 measurement system includes colour coded interconnecting leads and cable storage reel. This facilitates quick setup times for testing. The SFRA 5000 and cable reel are designed so that they can be used in site in the rugged field case, ensuring the test equipment remains clean when operating in the sometimes challenging field environment.

Technical Specifications

Measurement Specification

Frequency Response Analyzer

- Measurement: Magnitude, Gain (CH1/CH2, CH2/CH1), Gain (dB), offset gain (dB), phase(°)
- Frequency Range: 5Hz - 45MHz
- Gain Accuracy in dB: 0.02dB <50kHz



- 0.02dB + 0.05dB/MHz < 5MHz
- 0.1dB + 0.04dB/MHz < 45MHz
- Phase Accuracy:
 - 0.05° < 10kHz
 - 0.07° + 0.0009°/kHz < 5MHz
 - 5.05° + 0.0001°/kHz < 45MHz
- Frequency Source: Generator
- Measurement: Real Time DFT, no missing data
- Speed: Up to 100 readings per second
- Filter: Selectable from 0.2 seconds
- Resolution: 5 or 6 digits
- Input Impedance: 50 Ohm or 1M Ohm High Impedance (Selectable)
- Dynamic Range: 120dB
- Repeatability: between 0 and 100 dB

L C R Meter

- Functions: L, C, R (AC), Q, Tan Delta, Impedance, Phase - Series or Parallel Circuit
- Frequency Range: 5Hz - 5MHz
- Current Shunt: 50R Internal or External
- Ranges: Inductance, Capacitance, Resistance
- Basic Accuracy: 0.5% + 2%/MHz
- Sweep Capability: All AC functions
- Impedance Range: 100mOhm to 100kOhm

True RMS Voltmeter

- Channels: 2 (Ground Referenced)
- Frequency Range: 5Hz -5MHz
- Measurement: AC RMS, Peak, CF, Surge, dBm
- Basic Accuracy (AC):
 - 0.05% range + 0.05% reading + 0.1mV < 1kHz
 - 0.15% range + 0.15% reading + 0.1mV < 10kHz
 - 0.5% range + 0.5% reading + 0.025%/kHz + 0.4mV < 5MHz

Signal Generator

- Type: Direct Digital Synthesis, Single Frequency or Sweep
- Frequency: 5Hz to 45MHz
- Waveforms: Sine, Square, Triangle, Ramp, White Noise
- Accuracy: Frequency 5ppm over all temperature range
- Amplitude $\pm 5\%$ < 10MHz, Amplitude $\pm 10\%$ < 45MHz
- Impedance: 50 Ohm $\pm 2\%$
- Scaling: 1×10^{-9} to 1×10^9
- Output Level: 50mVpk to 10Vpk

Input Ranges

- Inputs: 2 x 10Vpk
- Connectors: Ground referenced BNC
- Coupling: AC
- Input: 10Vpk from earth
- Input Ranges: Peak Ranging 3mV, 10mV, 30mV, 100mV, 300mV, 1V, 3V, 10V
- Scaling: 1×10^{-9} to 1×10^9
- Ranging: Full auto, Up only or Manual
- Input Impedance: 50 Ohm or 1M Ohm High Impedance Selectable

Accessories and Ports

Instrument Accessories

- Probes: 2x Probes
- Leads: 3x BNC to BNC (Output, CH1, CH2), RS232, Power
- Software: CommView, SFRACoMM
- Documentation: Calibration Certificate, User Manual

SFRA 5000 Transformer Connection System

- Bushing Clamps: 2x Bushing Connection Clamps
- BNC Cable Reel: N4L 18m Cable reel (Signal, CH1, CH2)
- Earth Braid: 2x 5 metre Earthing Braid
- Earth Clamps: 2x
- Spare Earth Braid: 2x 500mm
- USB Stick: 2 GB

Ports

- RS232: Baud Rate to 19200, RTS/CTS flow Control
- USB: USB Port
- LAN: 10/100 base-T Ethernet auto sensing RJ45

System Specification

Sweep

- Functions: FRA, Impedance
- Steps: Up to 2000 Steps
- Window: From 50ms with no gap between each log
- Memory: 1 GB Internal or External USB

General Information

- Display: 5.7" ¼VGA colour high brightness backlit
- Dimensions (Instrument): 305Hx230Wx45D mm "Tablet Style"
- Weight (Instrument): 2.7kg
- Dimensions (Carry Case): 760mm x 420mm x 150mm
- Weight (Full system including case): 14.9kg
- Program Stores: 100, Location 1 loaded on power up
- Sweep Stores: 2000, all parameters in any sweep function
- Remote Operation: Full Capability, Control and Data
- Power Supply: 9 – 18V @ 3A, AC adapter or 12V dc from car or external batteries

Applicable Standard

Electromagnetic Compatibility: Directive no. 2004/108/EEC.
 Applicable Standard: EN 61326: 2006 Class A.
 IP Protection of Inputs and Outputs: IP30.
 Operating Temperature: -5° to 50° C.
 Storage Temperature: -10° to 70° C.
 Relative humidity: 20-90%, non condensing
 Max Altitude: 2.000 m.

Ordering Information

CODE	MODULE
90175	SFRA 5000 supplied with software, cables and case

10Vpk 5Hz to 45MHz Generator

CH1 + CH2 Input, 50Ω or High Impedance

5.7" Full Colour Screen.
Perform measurement with or without a PC and view sweeps on screen

Simply user interface, with ability to view Graph, Real Time and table views of sweeps

Rugged, metal case ideal for field use

FRA, LCR, RMS and SCOPE modes

Keypad for entering transformer details to fully comply with IEC60076-18

