

KEYSIGHT TECHNOLOGIES (AGILENT HP)

N4431B

The Keysight (Agilent/HP) N4431B is an RF electronic calibration (ECal) module for vector network analyzers (VNAs). It provides a single-connection electronic calibration technique that performs full three- or four-port calibrations faster than mechanical cal kits while preserving comparable accuracy.

SPECIFICATIONS

General

Interfaces	USB (direct control by Keysight PNA and ENA series VNAs)
Display	None (no local user display)

Identification

Manufacturer	Keysight Technologies (formerly Agilent/HP)
Model Number / Part Number	N4431B
Series	ECal module series
Product Name	RF electronic calibration (ECal) module
Manufacturer legacy note	Originally marketed under Agilent/HP; now Keysight Technologies

Overview

Intended use	Provide fast, single-connection electronic calibration for vector network analyzers; transfer-calibration standard
Supported measurements / calibration scope	Full three- or four-port calibrations (single-connection ECal)
Key features	Single-connection ECal, fast 3- or 4-port calibration, solid-state switching, NIST-traceable accuracy, USB control
Typical applications	VNA calibration and verification; laboratory and production VNA setups where reduced calibration time and connector wear are desired
Switching technology	Reliable solid-state switching (no mechanical switching required for internal standards)
Typical workflow	Connect the single ECal module to the VNA test port and perform automated calibration via VNA control software
Recommended use case	Laboratory and production environments requiring frequent calibrations and reduced downtime
Benefit vs mechanical cal kits	Fewer operator connections and less operator interaction reduces human error during calibration

Electrical / RF Performance - General

Frequency range (overall)	9 kHz to 13.5 GHz
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Calibration Functions and Standards

Transfer-standard capability	ECal module serves as a transfer standard capable of transferring factory calibration accuracy to the network analyzer
Traceability	NIST-traceable accurate calibrations
Factory data / factory calibration	Factory calibration data / transfer-standard calibration supplied (module is a transfer standard)
Included / provided calibration capability	Provides the internal standards required to perform VNA automated calibration sequences (single-connection ECal)

Control, Interfaces and Communication

Control interface details	USB interface for direct control by Keysight PNA and ENA series VNAs
VNA compatibility notes	Directly controlled by Keysight PNA and ENA series network analyzers
Notes on control	Controlled by the VNA over USB; the VNA software automates the ECal sequence (operator only connects module)

Mechanical & Physical

Connector arrangement (external)	Four RF test ports (one per VNA port); user connects each VNA port to a corresponding ECal port
Nominal impedance	50 ohm
Effect on connector wear	Reduces connector wear versus repeated mechanical calibrations (single external connection)

TECHNOLOGY

Electronic calibration (ECal) module for VNAs

APPLICATIONS

Calibration of vector network analyzers (PNA and ENA series); transfer-standard VNA calibrations

Generated by SpecAtlasHub (specatlashub.com). Specifications are compiled from available sources and are subject to change — verify critical values against the manufacturer before purchase.