

# PS-Cal<sup>®</sup> Release Notes

## PS-Cal v4.9, August 2024 Release

### Features and Enhancements

Added driver and calibration template for TEGAM 2850A feedthrough standard

### Bug Fixes, Corrections, and Incidental Changes

Improved calculation for "Scale < 100%" for power sensor Cal Factors

Corrected R&S NRVS power measurement response handling for reported incorrect high measured values.

## PS-Cal v4.8.3, June 2024 Release

### Features and Enhancements

Added performance verification to Keysight U2021XA/22XA/22XA\_H50 templates.

### Bug Fixes, Corrections, and Incidental Changes

Corrected Boonton 4532 power meter's read EEPROM "Calibration Failed, would you like to repeat test?" error.

Corrected Agilent PNA N5245A stopping and showing a spinning cursor during configuration problem.

Corrected "unknown range" error when running linearity test on the Keysight U2021XA/22XA/22XA\_H50.

Added a check for the "H1K" to extend frequency minimum limit to 100KHz for Keysight E8257D generator.

Corrected R&S ZR41 "Unable to find sensor." error during initialization using NRP2 power meter.

## PS-Cal v4.8.2, December 2023 Release

### Features and Enhancements

Added support for Agilent N524xB Low Frequency Extension

Added R&S NRX driver with support for R&S USB sensors

Added multi-path R&S and HP 848xB sensor support to 2818A

### Bug Fixes, Corrections, and Incidental Changes

Corrected EEPROM process for Agilent 9300B

Corrected EEPROM process for R&S NRPxS sensors

## PS-Cal v4.8, September 2023 Release

### Features and Enhancements

Added templates for Keysight U2020XA family of power sensors

Added Keysight P9374B and P5005A drivers

Added support for Keysight N9640D E-Cal module

Added driver and calibration template for TEGAM 2818A feedthrough standard

Added support for PMX18-CS calibration system

Implemented ability to detect if HP 478 Series sensors cause a "Power Underload" condition

- If condition is detected, PS-Cal will attempt to re-zero the meters

- If condition persists, PS-Cal will halt test

Added capability for "CalResults" files to be imported as Standard files (TEGAM Thermistor Mounts)

Included statement on reports indicating k=2 confidence factor

Enhanced N522xB driver to act as signal generator at low frequencies

### Bug Fixes, Corrections, and Incidental Changes

Corrected Boonton sensor templates that use 1 GHz as calibration frequency.

Renamed HP 83600 Series from "8360Series"

Notated E4412A/E4413A upload process

Clarified attenuator file dialog

Ladybug LB59xx driver reconfigured for cal factor tests

Corrected "unhandled exception" charting error if invalid CalResults file is loaded

Changed Ref CF on printed sensor labels from 0 to value of 50 MHz reference

Fixed inconsistencies between rho and cal factor tables on some sensors.

## PS-Cal v4.7, August 2022 Release

### Features and Enhancements

Added custom VSWR/Gamma parameter for NoMismatch templates (Input 0 or 1 for v4.6 behavior)

Improved Boonton driver compatibility

Added import capability for splitter and bolometer .DAT files from MET/CAL

1830/478A changes:

- 432 Comp/Bias mode parameter added

- Added 478-H75 Template

Added Anritsu ML2495 driver

Added PASS/FAIL limits in live charting for Performance Verification and Power Accuracy templates/techniques

Added Uncertainty check to Ladybug sensors

Templates added for N8481A-CFT, N8482A-CFT, N8485A, N8485A-033-CFT, N8487A-CFT

## Bug Fixes, Corrections, and Incidental Changes

Corrected Halt button behavior during test

E9327A template updated

Feedthrough calibration factor resolution changed to 4 digits in related reports

Updated limits on Ladybug sensors

Ladybug LB59xx driver reconfigured for cal factor tests

Corrected "unhandled exception" charting error if invalid CalResults file is loaded

Changed Ref CF on printed sensor labels from 0 to value of 50 MHz reference

Fixed inconsistencies between rho and cal factor tables on some sensors.

## PS-Cal v4.6, December 2020 Release

### Features and Enhancements

Chart Device Under Test (DUT) cal factors in real-time during calibration

Compared cal factors in real-time against a user-selected historical calibration data file (historical data must be another PS-Cal calibration results file)

Compared two historical calibration data files (both files must be PS-Cal calibration results files)

Added view modes for comparison charts:

- Single calibration results data file
- Cal factor comparison of two data files
- Cal factor difference between two data files
- Combination chart with cal factor comparison plotted against the left y-axis, and cal factor difference plotted against the right y-axis

Implemented limited calibration process log file capability

Added calibration frequencies to the TEGAM 1505A RF and 2505A RF Power Standards calibration templates

### Bug Fixes, Corrections, and Incidental Changes

Corrected numerous typographical errors

Removed 10 MHz and 30 MHz frequencies from the Keysight E9327A template

Corrected rho limits for Anritsu MA2473A, MA2472A, MA2473D, MA2474D templates

Implemented sequential program build numbers

Fixed minor bugs in various workflows

Improved error handling in various workflows that resulted in fatal program errors or other unexpected behavior

Corrected upper and lower limits for all Ladybug series sensors

Removed Ceyear AV1464 driver

Updated PS-Cal to Microsoft .Net Framework 4.6.2

Upgraded Grape City ActiveReports library from version 8.x to 13.x

## PS-Cal v4.5, October 2019 Release

### Features and Enhancements

Added LadyBug power sensor support and required files

Added EEPROM Table 0 read/write for Anritsu power sensors

Added support for Keysight N5222B Opt 205 (Low Frequency Extension)

Added measurement uncertainty lookup tables and verification against Statement of Accreditation

Added support for the Fluke 96000 high frequency signal generator

Added / Updated mismatch uncertainty calculations for 1805 & 1806 calibrator

Added U2002A-Option H26 power sensor calibration template

Added Gigatronics 80350A power sensor

Added Agilent U2002A Option H26 power sensor

Added verification only support for R&S NRVS power meters and sensors

Added Marconi 6960 power meter driver and support for Marconi power sensors

Added bridge support for the HP thermistors

Updated 478 and 8478 thermistor features

Added PCS-K150-II switched amplifier support

Updated the PNA-X network analyzers to support external amplifiers

Added calibration support for E4P41xA power sensors templated at <+ 16 dBm

Updated leveling loop to support power sensor calibrations at +18 dBm

Added support for the Keysight E5080A PNA

Added command to default Agilent power meter settings

Added E441x high power verification templates

Added power standard Cal-Factor calibration with thermistor or bridge  
Added Agilent\_PNA\_E836xA to equivalent port match  
Changed amplifier safety levels  
Updated linearity measurements with the PCS-K150  
Added frequency limits button to high power calibration with directional coupler  
Added error handling for uncertainty lookup and fixed naming errors  
Added equivalent port match and power standard reports  
Added measurement method for high power calibrations using high power VNA  
Update voltmeter drivers for to improve calibration times  
Updated power standard calibration & 3458A ratio voltage measurements  
Added high power measurement capabilities to the VNA cal factor measurement

## Bug Fixes, Corrections, and Incidental Changes

Resolved 100 kHz minimum frequency error  
Resolved maximum level error for Keysight H-series sensors  
Changed install requirements to .NET 4.0  
Added 50 MHz to 80701A template  
Updated 1830A driver to support thermistors in the correct mode  
Resolved 1830A error when calibrating Tegam bolometers  
Resolved issue with start over crashing  
Resolved issue using 1830A as the UUT in bridge mode  
Resolved issue with 1830 averaging unlimited zero values  
Resolved issue with Bridge-Averaging tool not removing zero measurement  
Resolved localization issue setting the application to US English  
Resolved issue of setting the power level on the 8757 network analyzer  
Resolved I/O errors with 8757D  
Resolved connection message issue with Fluke 5790A  
Resolved EEPROM upload issue for Giga-tronics power sensors  
Modified station verification method from +/- 0.05 dB to < RSS of instruments  
Resolved issue with E9302A\_H18 having two frequency lists  
Updated test process selection to scale  
Resolved error calculating mismatch uncertainties scaled to %  
Corrected typo in the Anritsu upload tool  
Added CRLF to the end of all calls to the CETC AV1464x signal generator  
Updated station calibration for Type-F and Type-G Cal-Factor  
Minor updates to the UI and application version

## PS-Cal v4.4, August 2018 Release

Add EEPROM programming support for the N1913A and N1914A power meters  
Add templates for TEGAM RF standards 1505A, 2505A, 1510A, 2510A, and 1807A  
Add support for Keysight U8481A, U8485A, and U8487A power sensors  
Add uncertainty data for E5071C at frequencies above 8.5 GHz  
Add user-definable reference frequency parameter to Giga-tronics 80701  
Update HP 8340A driver to set RF to OFF after preset command  
Update the Boonton power sensor calibration upload routine  
Update Boonton 4232 power meter driver  
Split Boonton power sensors into peak and CW groups  
Set calibration frequency to 1 GHz for select Boonton models  
Resolve type issue with Agilent PNA N5230C driver  
Correct attenuator math error  
Correct error in E9304A H18/H19/H20/H24/H25 sensor templates  
Update Keysight 34401A drivers  
Update Test Report user interface  
Improve EEPROM upload routines  
Add user prompt to restart PS-Cal after removing instrument(s) from Station  
Change E930xA cal level from -10 to -11 dBm  
Add EEPROM upload to the Anritsu MA248x power sensors  
Add extended frequency points to TEGAM bolometer templates  
Rename power splitter files  
Correct 1830A Measurement Error when Calibrating Power Sensors at -30 dBm  
Update Giga-tronics upload tool

## PS-Cal v4.3, February 2018 Release

Changed bridge measurement methodology to reduce measurement time per frequency  
Added amplifier support  
Added samples / measurement parameter  
Added dwell time parameter and set default to 13 s

Updated install package  
Updated Bridge Method verification process to set frequency on DUT power meter  
Fixed 13s delay setting in verification tests  
Changed order of inheritance for Direct Comparison  
Updated TEGAM 2510 lower frequency limit  
Updated and tested TEGAM 1806 bridge measurement methods  
Split E9304A into two templates to allow use of TEGAM 2505A  
Resolved calculation issues with 1806A bridge  
Added temperature in degrees Celsius to linearity test  
Added zero and power averaging tool  
Updated main form error handling  
Resolved issue with template for 2002A  
Updated I/O for Keysight meters writing data to EEPROMS  
Added Rohde &Schwarz .NET header to files to interact with DLL files  
Added notification stating that Boonton 4500B can only read EEPROM  
Resolved Z51 upload issue  
Updated leveling loops to 0.05db  
Changed voltmeter drivers to 6.5 Digits  
Added new driver for CETC\_AV1464x series signal generator  
Resolved timeout settling errors with Rohde &Schwarz EEPROM upload and HP 3458A  
Resolved problem with 9640A setting signal source to +6 dbm  
Resolved 1830A Com Port setting errors when VISA resource is not available  
Resolved issue with Boonton 4500A programming EEPROM  
Modified DMM drivers for a 10V range and 2.5V measurement default for TEGAM hardware  
Updated power sensor template e932xa  
Increased scroll bars on selection UI for Select Test Method screen  
Updated drivers so all have static creation classes  
Updated Boonton 4500B driver to support watts  
Added better error messages for exporting n553xx data