

Successful Customers, Successful Companion



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Electron Paramagnetic Resonance Spectrometer

Benchtop EPR Spectrometer

EPR200M

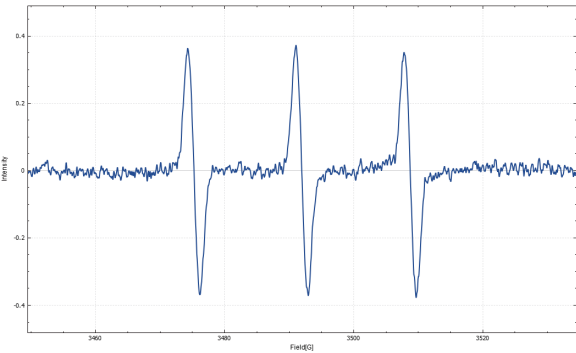


The EPR200M is an integrated and compact CW benchtop spectrometer designed for quick and easy installation and operation. The model fits in both laboratory and industrial settings, providing sufficient sensitivity.

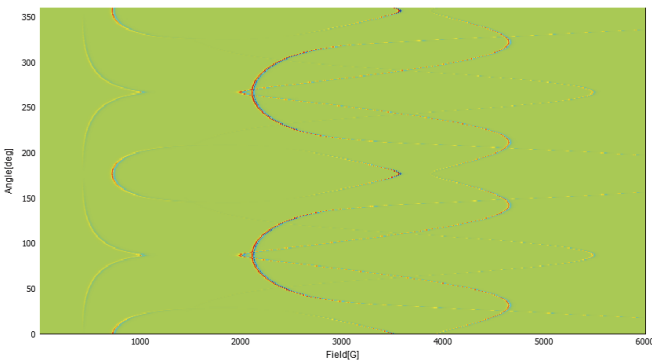
Instrumental features

Microwave frequency range	9.2-9.9 GHz
Microwave power range	1 μ W-100 mW
Magnetic field range	-1000-6500 Gauss
Maximum modulation field amplitude	10 Gauss
Modulation field frequency	10 kHz, 50 kHz, and 100 kHz
Maximum field scan points	256000 points
Auto tune	Available

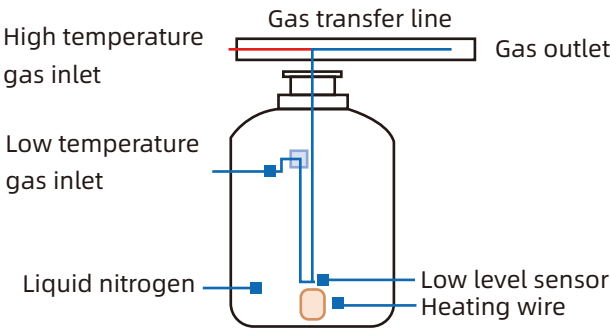
A single scan of 1 μ M TEMPO aqueous solution using 10 mW microwave power.



Crystal rotation data of ruby (Cr^{3+} in Al_2O_3) with angular resolution of 1°.



Liquid Nitrogen Cryogenic System



Accessories available to EPR200M

Optics

- Xenon lamp
- UV-enhanced Xenon lamp
- Mercury lamp

Nitrogen Variable Temperature System (93-573 K)

Flat cell series

- Flat cell
- Mixing cell
- Electrolytic cell
- Tissue cell
- Flow cell

All accessories



X-Band CW-EPR Spectrometer EPR300



The EPR300 is a standing EPR spectrometer with enhanced sensitivity for robust CW EPR measurements. The model can be configured with two different sizes of electromagnet. The EPR300 can be optionally equipped with a more advance microwave bridge to further increase the signal-to-noise ratio to 10,000:1, and an optional Q-band extension.

1 CW control and readout system

- Maximum modulation field amplitude: 20 Gauss
- Detection of 0° and 90° modulation phase
- Modulation frequency range: 0.5-120 kHz

3 Electromagnet options

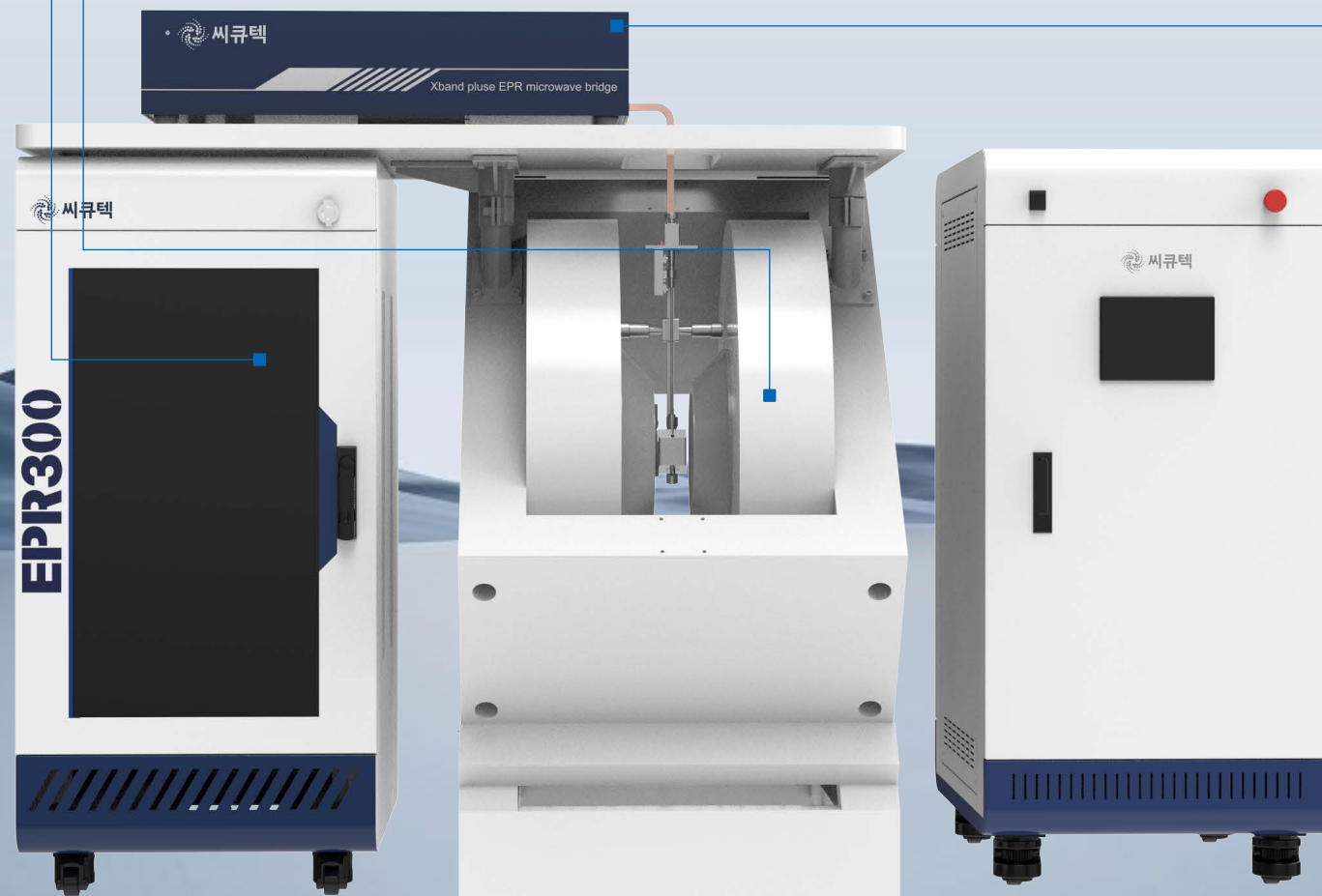
- 0.7 T & 60 mm airgap, 500 kg
- 1.5 T & 72 mm airgap, 2000 kg
- 1.8 T & 65 mm airgap, 2900 kg
- Field resolution: 256000 points
- Scan rate range: 320 μ s/points-5 s/points
- Zero-cross scanning
- Magnetic field stability: ≤ 10 mG/hr, under $\pm 1^\circ\text{C}$ temperature fluctuation

2 Microwave bridge

- Frequency range: 9.2-9.9 GHz
- Maximum power output: leveled to 200 mW
- Attenuation range: 0-60 dB

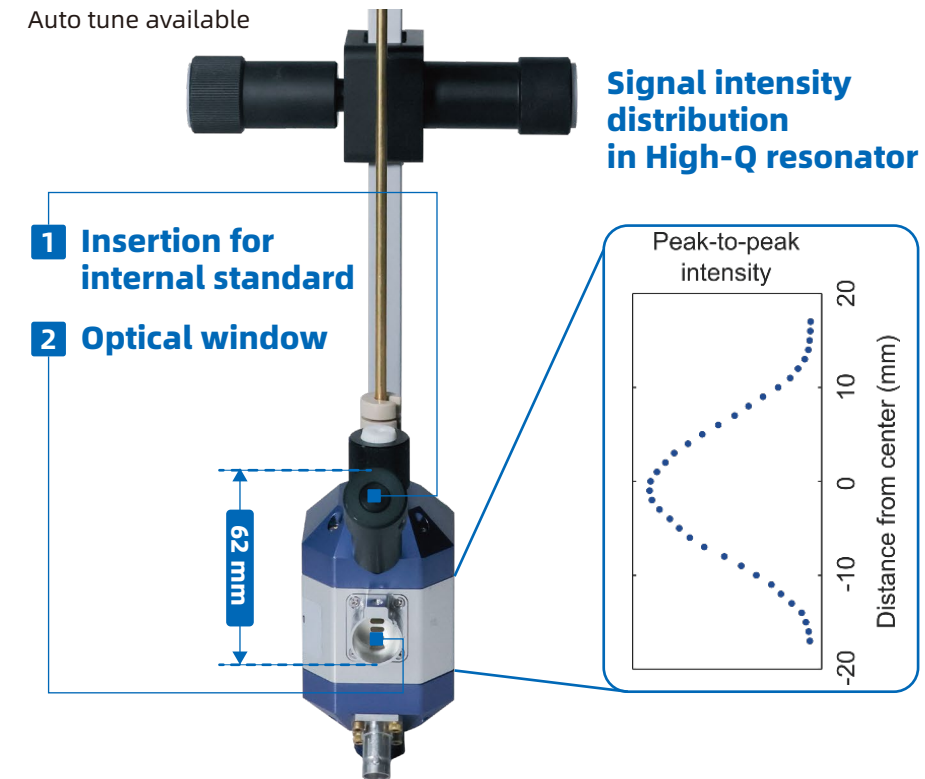
Q-band extension (optional) specifications

- Microwave frequency: 33.5-34.5 GHz
- Microwave power: 100 mW
- Microwave attenuator: 0-50 dB in 0.5 dB steps
- Cavity resonance frequency: 34 GHz



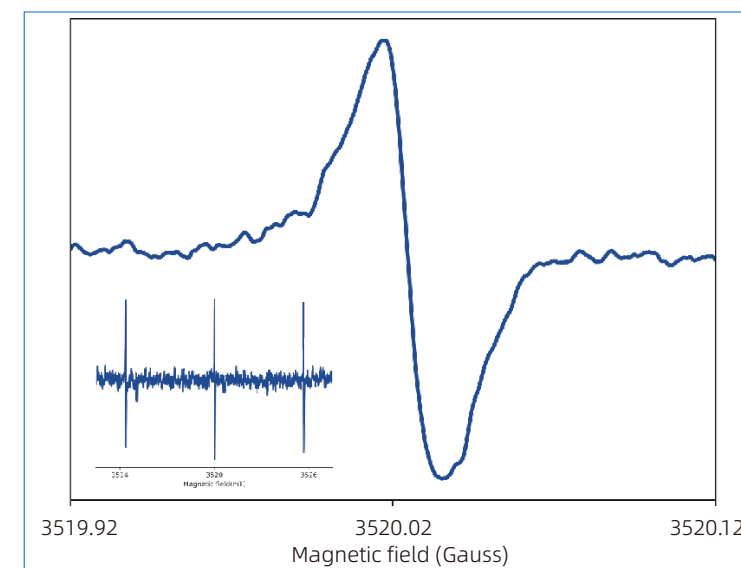
High-Q resonator

Cavity resonance frequency: 9.5-9.9 GHz
Unloaded Q ≥ 16000 (critically coupled)
Maximum modulation field amplitude: 20 Gauss
Nitrogen and helium variable temperature systems available
Auto tune available

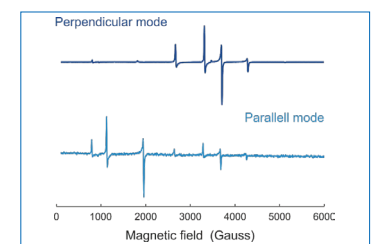


Dual mode resonator

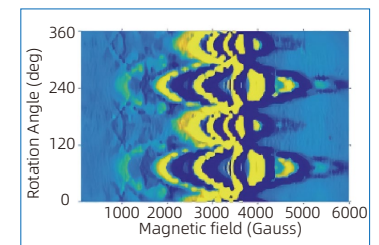
Cavity resonance frequency
9.6-10 GHz (perpendicular mode)
9.4-9.8 GHz (parallel Mode)
Maximum modulation field amplitude: 10 Gauss



$^{14}\text{N}@C_{60}$ in solution with dimensions of $\varnothing = 4$ mm and $L=10$ mm showing a line width of 16 mG



Cr^{3+} in $\text{CsAl}(\text{SO}_4)_2$ in different transition modes.



Angular dependence of the single crystal $\text{Gd}_{0.02}\text{Y}_{1.98}(\text{pydc})_6(\text{H}_2\text{pip})_3 \cdot 20 \text{H}_2\text{O}$ at 10 K.

X-Band Pulse EPR Spectrometer EPR100



The EPR100 is a powerful and versatile spectrometer with both CW and pulsed EPR capacity. The model is engineered to meet the expectation of high-resolution EPR experiments and contemporary applications.

1 Microwave bridge

- CW and pulsed setup
- Frequency range: 9.2-9.9 GHz
- Maximum power output: leveled to 200 mW
- Attenuation range: 0-60 dB
- DEER source (optional)

2 Solid-state power amplifier (SSPA)

- 450 Watt output
- Maximum pulse length: 1 s
- Detection dead-time: ≤ 100 ns

3 RF amplifier (optional)

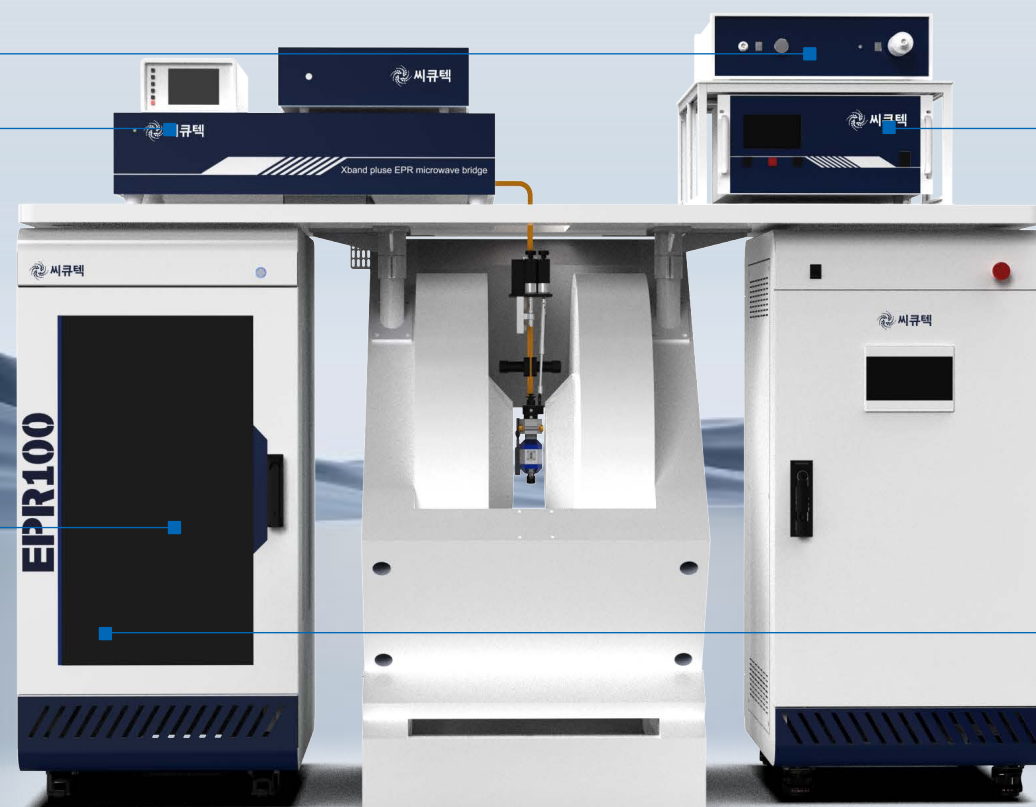
- Two configurations available:
- 150 W for 0.1-100 MHz frequency range
- 175 W for 0.1-400 MHz frequency range

5 RF source and control (optional)

- RF frequency range: 0.1-1000 MHz

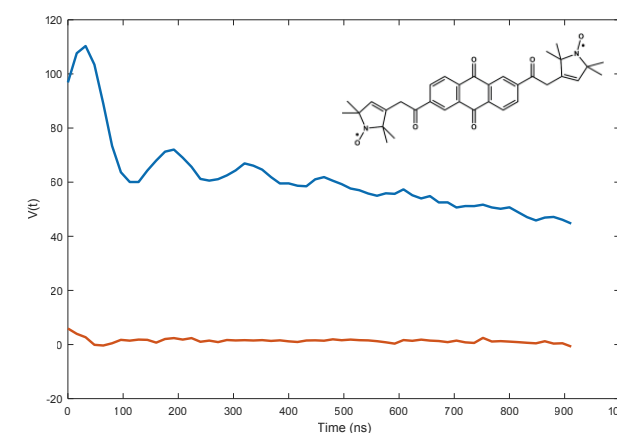
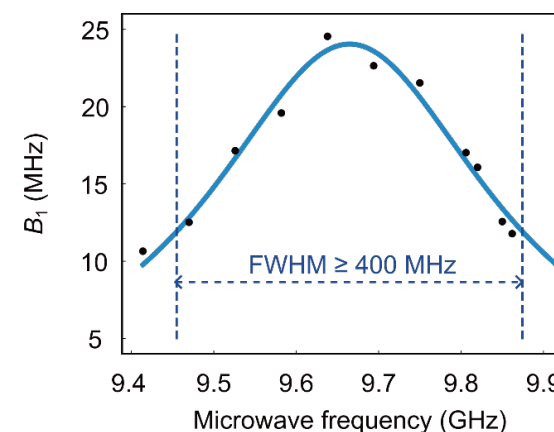
4 Pulsed control and readout system

- Pulse resolution: 50 ps
- Pulse forming unit: 4 channels with 90° phase shift (+X, -X, +Y, -Y)
- Maximum number of pulses: 20000 per channel
- Detection time resolution: 1 ns
- Receiver bandwidth: 20 or 200 MHz

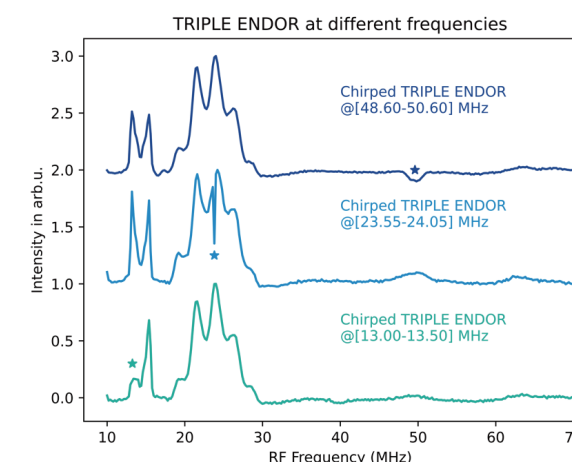


PW-4201-DR pulsed resonator

The DR pulsed resonator is the standard pulsed resonator built to fulfill different pulsed EPR experimental requirements. The full-width-half-maximum of the B_1 field distribution reaches 400 MHz, providing enough bandwidth for double-resonance experiments.



Four-pulse DEER experiments performed on ACERT biradical standards for EPR distance measurements



TRIPLE ENDOR results of the CuTPP sample at 15 K.

High-resolution ENDOR experiment is attainable with the X-band ENDOR system, including resonator (EN-4202-DR), RF amplifier, RF source and control system.

Q-Band Pulse EPR Spectrometer EPR-Q400

Compared with conventional X-band EPR, high-frequency EPR offers significant advantages and provides important capabilities across biological, chemical, and materials research.

The EPR-Q400 is a Q-band high-frequency pulse EPR spectrometer equipped with both continuous-wave (CW) and pulse EPR measurement modes (for CW-only experiments, the EPR-Q300 CW spectrometer is available). It supports variable-temperature experiments from 4 to 300 K.

The EPR software platform is the same as the other CIQTEK X-band pulse spectrometers, making it simple and user-friendly.

1 Microwave Bridge

- › Compatible with both CW and pulse operation
- › Microwave frequency range: 33.7–34.4 GHz
- › Maximum output power: 100 mW
- › Microwave power attenuation range: 0–50 dB

3 Solid-State Power Amplifier (SSPA)

- › Operating frequency: 33.5–34.5 GHz
- › Output power: 200 W

5 RF Source (Optional)

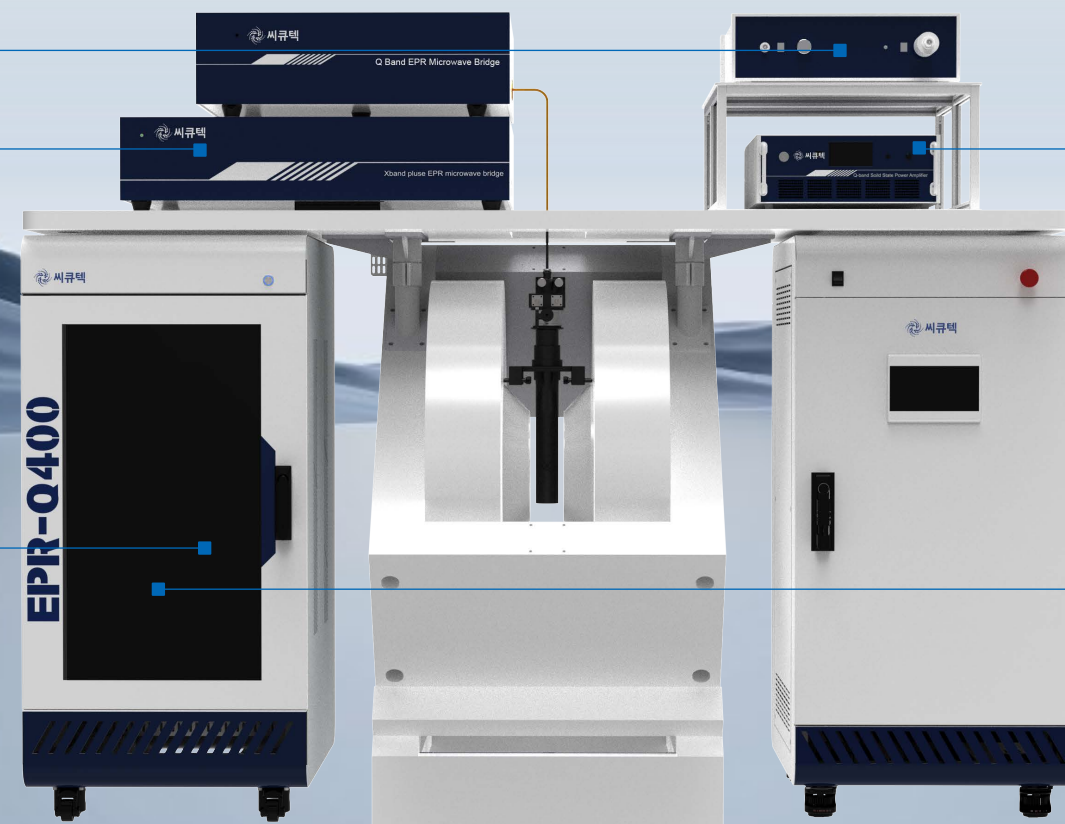
- › Frequency range: 0.1–1000 MHz

2 RF Amplifier (Optional)

- › Two configurations available:
- › 150 W output power, frequency range 0.1–100 MHz
- › 175 W output power, frequency range 0.1–400 MHz

4 Pulse Control and Detection System

- › Pulse generator time resolution: 50 ps
- › Microwave pulse channels: Four equal-amplitude channels with 90° phase increments (+X, +Y, -X, -Y), supporting full phase cycling
- › Maximum number of pulses: 20,000 per channel, with unlimited loop playback
- › Detection time resolution: 1 ns
- › Pulsed-mode receiver bandwidth: selectable 20 MHz or 200 MHz



W-Band High-frequency EPR Spectrometer EPR-W900



W900 is an EPR spectrometer operating at 94 GHz. The high-field and high-frequency instrument enables measurements with enhanced spectral and orientational resolution of disordered systems. The model may be acquired as an extension to EPR100 or as an independent spectrometer.

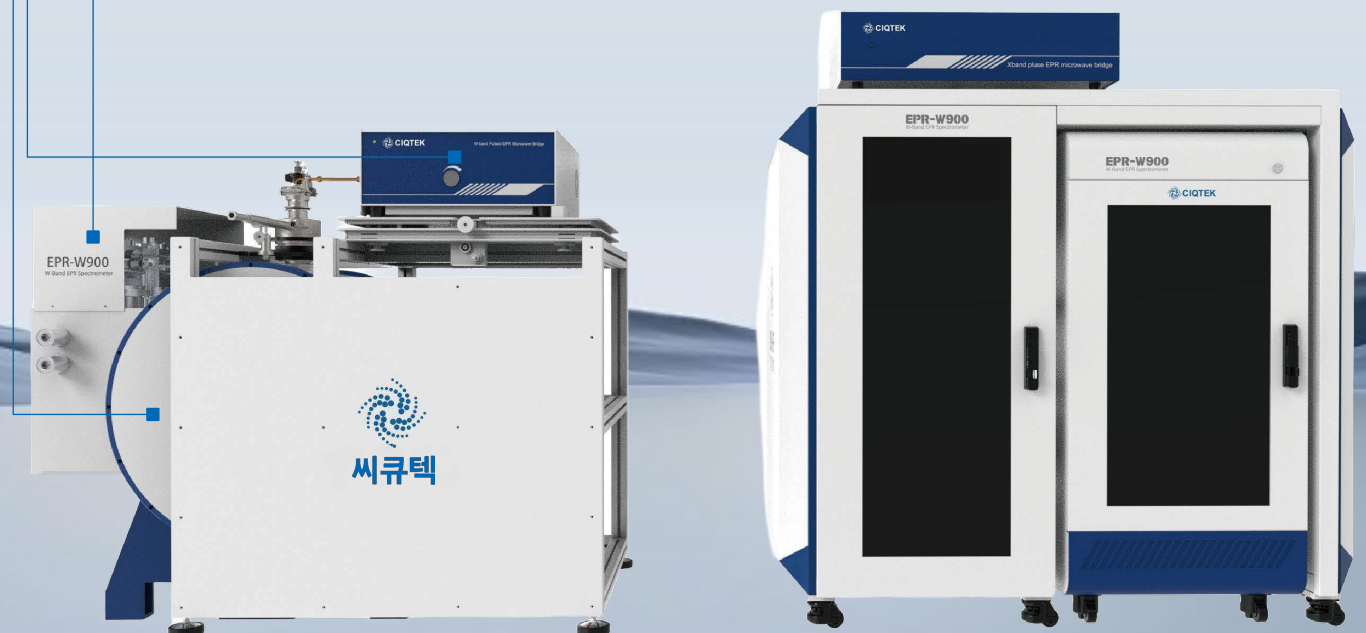
1 W-band microwave bridge

- › Microwave frequency range: 93.5–94.5 GHz
- › Maximum microwave power output
- › 30 mW in CW mode
- › 2 W in pulse mode

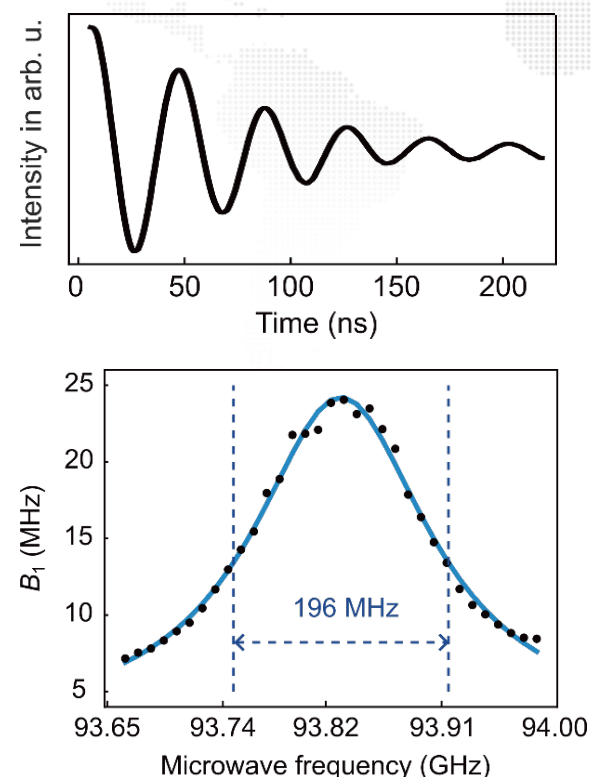
3 Superconducting magnet

- › Liquid helium-free cryogenic system
- › 6 T superconducting magnet and independent sweep coil with ± 1000 Gauss range

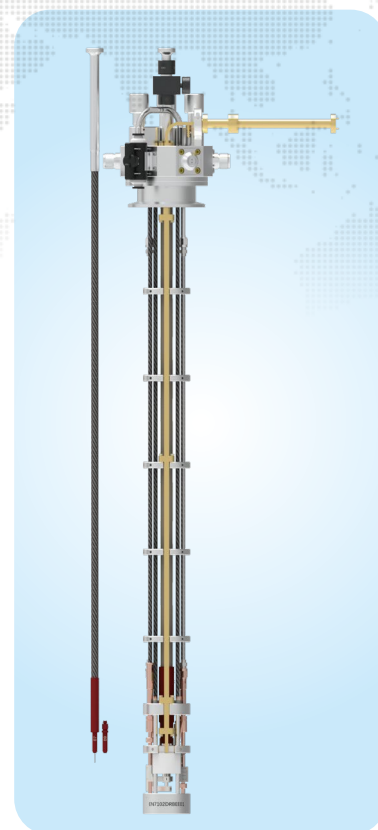
2 Cold head for superconducting magnet



W-band CW and pulsed EPR resonator



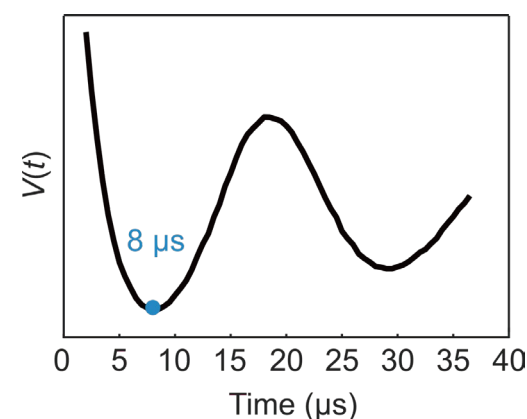
Resonator bandwidth measured by Rabi oscillation frequency at different frequency.



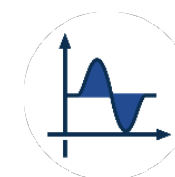
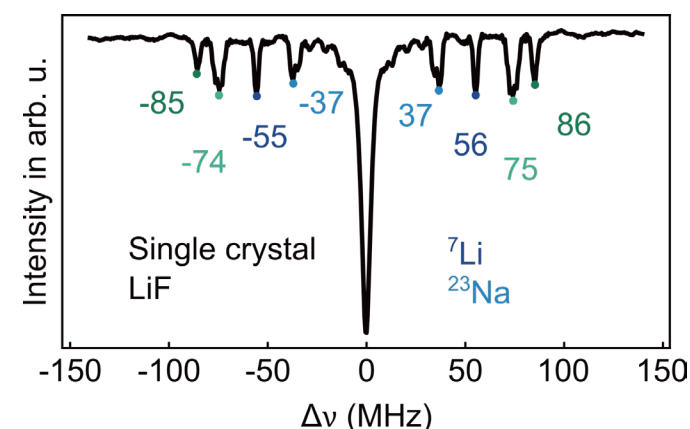
- Cavity resonance frequency 93.7–94.4 GHz
- Unloaded Q-value ≥ 4000 (critically coupled)

ENDOR and EDNMR at W-band

Shortest RF π -pulse at ^1H frequency at 33781 Gauss.



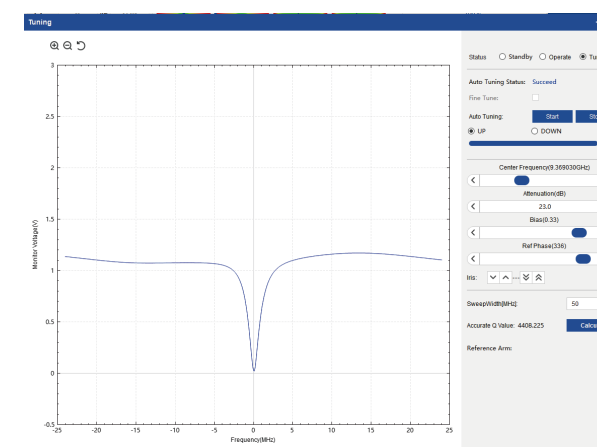
EDNMR of LiF single crystal measured at 94.76 GHz



EPR ProCt. is the control software for operating all CIQTEK EPR spectrometers. The interphase and the utilities are tailored for new and experienced users to set up experiments in an efficient manner. While EPR ProCt. includes basic data processing tools, it allows file transfer to the data processing software EPR ProPr. via a single click.

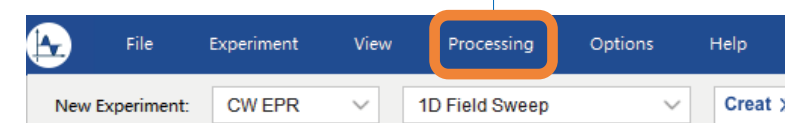
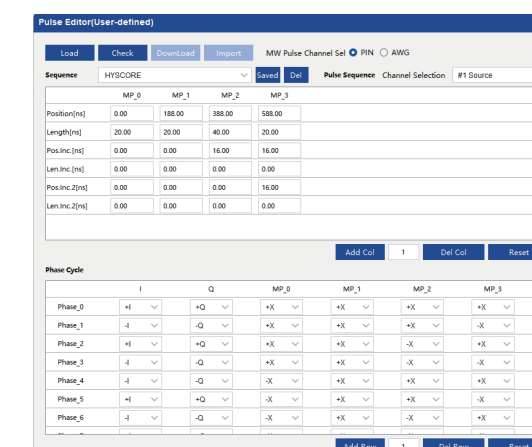
Tune window in CW mode

Auto tune available
Optional Q-value calculation

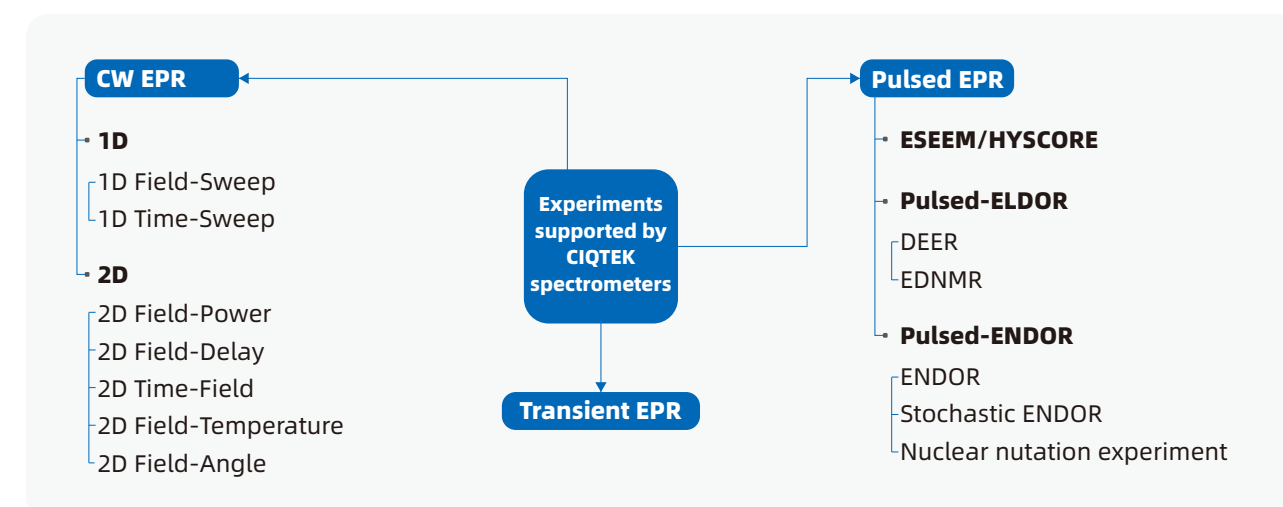


Pulse Editor for programming

time-domain experiments and acquisition.



Transfer data file to EPR ProPr.





Independent from the control software, EPR ProPr. is dedicated to process EPR spectra and time-domain data. EPR ProPr. can be installed on any laptop for easy access, providing a toolbox that meet users needs.

All processing tools included in EPR ProPr.

Baseline

1D FFT

2D FFT

Hyscore

SNR

Peak

Smoothing

RC Filter

Savitzky-Golay_Filter

Integral

Double Integral

Differential

X-Axis Update

Polynomials

Exponential

Exponential Decay

Biexponential Decay

Stretched Exponential Decay

Arrhenius

Gaussian

Lorentzian

Mixed Gaussian Lorentzian

Dysonian Derivative

User-Defined

Phalf Fitting

Compare

Constant Operation

Difference

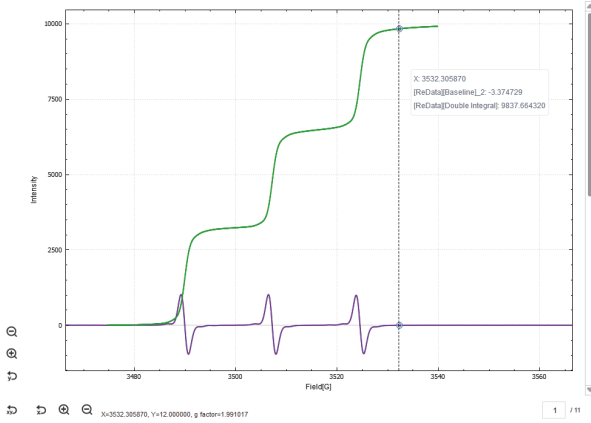
Background Subtraction

Absolute Quantitative EPR

Relative Quantitative EPR

g-Factor Calibration

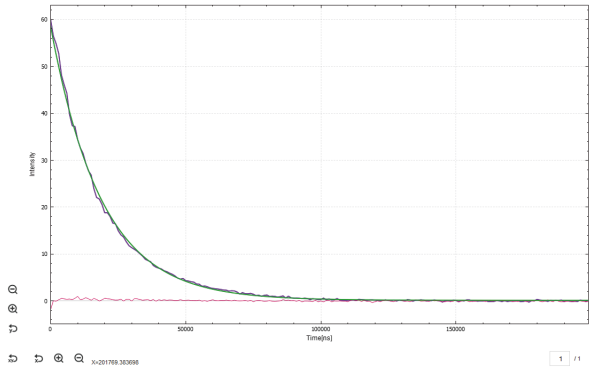
Spectral Fitting



DI Calculation of TEMPOL solution spectrum using the **Double Integral** program.

B The solution-state spectrum is baseline-subtracted via **Baseline** program.

S Fitting T_2 relaxation data of diamond NV-center with **Stretched Exponential Decay** fitting function of other predefined models.



Other exponential fitting functions

E
Exponential

B
Bi-exponential

EP
Exponential Decay

[illegible]