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**Data Sheet**
August 13, 2026

STANFORD RESEARCH SYSTEMS

# Stanford Research QCM100

Stanford Research Systems QCM100 Quartz Crystal Microbalance Analog Controller The SRS QCM100 is an analog quartz crystal microbalance controller used with the QCM25 5 MHz crystal oscillator. It measures mass and viscoelastic loading by providing a 5 MHz TTL frequency output andalogarithmic conductance voltage related to series resistance. Unlike the QCM200 digital controller, the QCM100 requires an external frequency counter and precision voltmeter. Automatic gain control sustains series resonance under heavy loads up to 5000 ohm, with shunt-capacitance cancellation from 10 pF to 40 pF. The SRS QCM100 is an analog quartz crystal microbalance controller used with the QCM25 5 MHz crystal oscillator. It measures mass and viscoelastic loading by providing a 5 MHz TTL frequency output andalogarithmic conductance voltage related to series resistance. Unlike the QCM200 digital controller, the QCM100 requires an external frequency counter and precision voltmeter. Automatic gain control sustains series resonance under heavy loads up to 5000 ohm, with shunt-capacitance cancellation from 10 pF to 40 pF. Thin-film adsorption and desorption; electrochemical QCM (EQCM) withapotentiostat via crystal-face bias; liquid and polymer viscosity/elasticity studies; real-time nanogram-class mass monitoring; teaching and OEM setups that already haveacounter and DVM.


| | |
|---|---|
| MODEL<br>**Stanford Research Systems QCM100** | CALIBRATION<br>**Available on request** |
| CONDITION<br>**Used** | STATUS<br>**In stock** |
| RFQ / SKU<br>**QCM100** | LISTING<br>**https://aumictechlabs.com/products/qcm100-2/** |

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## This unit

The Stanford Research Systems QCM100 is a quartz crystal microbalance (QCM) instrument that measures mass and viscosity changes at surfaces and within thin films in real time. Operating at 5 MHz with an AT-cut quartz resonator, it detects mass variations from fractions of a nanogram to micrograms, with sensitivity extending to sub-monolayers of atoms. The system quantifies both frequency shifts - proportional to deposited mass - and changes in series resonance resistance, which correlate directly to material viscosity and elasticity.A Q-factor exceeding 60,000 in liquid environments ensures measurement stability even in demanding chemical and biological applications.Technical Specifications Resonator Frequency: 5 MHz nominal, AT-cut plano-plano geometry Crystal Diameter: 1 inch Mass Detection Range: Fractions of a nanogram to micrograms Detection Limit: Sub-monolayers of atoms Heavy Load Capability: Maintains oscillation up to 5 kΩ resistance Aqueous Stability: Sustained operation in solutions exceeding 88% glycerol (w/w) Q-Factor: >60,000 typical in liquid environments Crystal Surface Finish: Optical polish (<10 Å RMS) Electrode Materials: Cr/Au standard; Ti/Au, Ti/Pt, and ITO optional Frequency Output: 2.4 Vpp square wave, 50 Ω, TTL levels Conductance Output (Vc): 0 to 10.625 VDC, 1 kΩ source impedanceKey Features Measures resonant frequency shifts linearly proportional to surface mass deposition Converts resistance changes to viscosity and elasticity data via: R = 10,000 × (10 – Vc/5) – 75 Ω Flat (non-planoconvex) crystal geometry for uniform measurement fields Compatible with liquid and gas environments through compact crystal holder Supports alternative frequencies (6 MHz, 9 MHz) and specialized electrode coatingsTypical Applications Thin-film deposition monitoring Corrosion studies Biosensing and biofilm characterization Chemical sensing and detectionCompatibility & Integration The complete system comprises the QCM100 analog controller, QCM25 crystal oscillator, crystal holder, and three 5 MHz quartz crystals. External instrumentation required: precision frequency counter for frequency measurement and high-resolution digital voltmeter (minimum 6-digit resolution with computer interface) for conductance measurement.

## Features & description

From manufacturer datasheet

### Features

• Analog controller plus QCM25 oscillator, Kynar holder, and three 5 MHz Cr/Au crystals • Frequency output isaTTL square wave (about 2.4 Vpp into 50 ohm) for any commercial counter • Conductance voltage Vc maps series resistance: R = 10000 x (10^(-Vc/5)) - 75 ohm • Ten-turn capacitance-cancellation dial and Adjust-mode lock-in null of Co • Same 5 kOhm heavy-load capability as QCM200 • Cat-5 cable (about 3 ft) between controller and QCM25

# QCM100 Characteristics / Specifications

| PARAMETER | VALUE |
|---|---|
| **Model** | QCM100 |
| **Manufacturer** | Stanford Research Systems |
| **Instrument Type** | Quartz Crystal Microbalance Analog Controller |
| **Companion Oscillator** | QCM25 5 MHz crystal oscillator |
| **Alias** | QCM100; SRS QCM100 |
| **Crystal Frequency** | 5 MHz, AT-cut, plano-plano |
| **Crystal Diameter** | 1 inch |
| **Electrode Materials** | chromium/gold standard (polished/unpolished); Ti/Au, Ti/Pt, indium tin oxide optional |
| **Frequency Output Frequency** | 5 MHz nominal |
| **Frequency Output Level** | TTL square wave; about 2.4 Vpp into 50 ohm |
| **Frequency Output Impedance** | 50 ohm |
| **Frequency Output Connector** | BNC |
| **Resistance Calculation** | R = 10000 x (10^(-Vc/5)) - 75 ohm |
| **Resistance Range** | 0 to 5000 ohm |
| **Conductance Voltage Level** | 0 to 10.625 VDC, logarithmic scale |
| **Conductance Output Impedance** | 1 kOhm |
| **Conductance Output Connector** | BNC |
| **Capacitance Cancellation Range** | 10 pF to 40 pF (20 pF nominal) |
| **Achievable Cancellation** | 0.01 pF |
| **Typical Parasitic Capacitance Co** | about 20 pF (electronics on holder; no cable C) |
| **Typical Motional Capacitance Cm** | 33 fF (1 inch 5 MHz crystal) |
| **Typical Motional Inductance Lm** | 30 mH |
| **Typical Motional Resistance Dry** | 10 ohm |
| **Typical Motional Resistance Water** | 400 ohm (one face in water) |
| **Typical Motional Resistance Glycerol** | 3500 ohm (one face in 88 % glycerol) |

| PARAMETER | VALUE |
| --- | --- |
| **Sauerbrey Sensitivity Factor** | 56.6 Hz per ug per cm^2 (5 MHz AT-cut at room temperature) |
| **Frequency Mass Coefficient** | 0.057 Hz per (ng/cm^2) (theory note) |
| **Crystal Holder Material** | KynarORing Material: Viton |
| **Holder Connector** | BNC |
| **Controller Oscillator Cable** | Cat-5, approximately 3 ft |
| **Line Voltage** | 90 to 132 VAC or 175 to 264 VAC, 47 to 63 Hz |
| **Power Consumption** | 20 VA total |
| **Operating Mode** | analog; external counter and DVM required (not included) |
| **Heavy Load Capability** | up to 5000 ohm series resistance |
| **Dry Dial Preset** | ten-turn dial 8.0 (dry operation setting per setup procedure) |
| **Varactor Fixed Bias Preset** | ten-turn dial 5.0 yields about 6.0 V reverse bias, Cv about 18 pF |
| **Adjust Mode Modulation** | 75 Hz sine on varactor bias with High/Low/Nulled LEDs |
| **Standard Crystals Included** | three chromium/gold QCM crystals Notes Specs from SRS QCM100/QCM25 operation manual, QCM100/QCM200 combined catalog, and QCM theory/calibration note. Do not invent counter resolution: frequency accuracy is that of the user-supplied counter and timebase. Forabuilt-in 0.01 Hz counter use QCM200. |
| **Conductance voltage Vc maps series resistance** | R = 10000 x (10^(-Vc/5)) - 75 ohm |

# Full OEM specifications

Complete technical content extracted from the manufacturer datasheet. Sparse OEM tables are reconstructed as tables below; other text is preserved as paragraphs.

Specifications

### Technical Specifications

| PARAMETER | VALUE |
|---|---|
| **Model** | QCM100 |
| **Manufacturer** | Stanford Research Systems |
| **Instrument Type** | Quartz Crystal Microbalance Analog Controller |
| **Companion Oscillator** | QCM25 5 MHz crystal oscillator |
| **Alias** | QCM100; SRS QCM100 |
| **Crystal Frequency** | 5 MHz, AT-cut, plano-plano |
| **Crystal Diameter** | 1 inch |
| **Electrode Materials** | chromium/gold standard (polished/unpolished); Ti/Au, Ti/Pt, indium tin oxide optional |
| **Frequency Output Frequency** | 5 MHz nominal |
| **Frequency Output Level** | TTL square wave; about 2.4 Vpp into 50 ohm |
| **Frequency Output Impedance** | 50 ohm |
| **Frequency Output Connector** | BNC |
| **Resistance Calculation** | R = 10000 x (10^(-Vc/5)) - 75 ohm |
| **Resistance Range** | 0 to 5000 ohm |
| **Conductance Voltage Level** | 0 to 10.625 VDC, logarithmic scale |
| **Conductance Output Impedance** | 1 kOhm |
| **Conductance Output Connector** | BNC |
| **Capacitance Cancellation Range** | 10 pF to 40 pF (20 pF nominal) |
| **Achievable Cancellation** | 0.01 pF |
| **Typical Parasitic Capacitance Co** | about 20 pF (electronics on holder; no cable C) |
| **Typical Motional Capacitance Cm** | 33 fF (1 inch 5 MHz crystal) |
| **Typical Motional Inductance Lm** | 30 mH |
| **Typical Motional Resistance Dry** | 10 ohm |
| **Typical Motional Resistance Water** | 400 ohm (one face in water) |
| **Typical Motional Resistance Glycerol** | 3500 ohm (one face in 88 % glycerol) |

| PARAMETER | VALUE |
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| **Sauerbrey Sensitivity Factor** | 56.6 Hz per ug per cm^2 (5 MHz AT-cut at room temperature) |
| **Frequency Mass Coefficient** | 0.057 Hz per (ng/cm^2) (theory note) |
| **Crystal Holder Material** | Kynar |
| **O Ring Material** | Viton |
| **Holder Connector** | BNC |
| **Controller Oscillator Cable** | Cat-5, approximately 3 ft |
| **Line Voltage** | 90 to 132 VAC or 175 to 264 VAC, 47 to 63 Hz |
| **Power Consumption** | 20 VA total |
| **Operating Mode** | analog; external counter and DVM required (not included) |
| **Heavy Load Capability** | up to 5000 ohm series resistance |
| **Dry Dial Preset** | ten-turn dial 8.0 (dry operation setting per setup procedure) |
| **Varactor Fixed Bias Preset** | ten-turn dial 5.0 yields about 6.0 V reverse bias, Cv about 18 pF |
| **Adjust Mode Modulation** | 75 Hz sine on varactor bias with High/Low/Nulled LEDs |
| **Standard Crystals Included** | three chromium/gold QCM crystals |

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Notes
Specs from SRS QCM100/QCM25 operation manual, QCM100/QCM200 combined catalog, and QCM theory/calibration note. Do not invent counter resolution: frequency accuracy is that of the user-supplied counter and timebase. Forabuilt-in 0.01 Hz counter use QCM200.

## Available from Aumictech

Used and refurbished unit evaluated in-house. Calibration: Available on request. Used · In stock.

Request a quote: **sales@aumictech.com** · +1 (484) 841-9341

**Aumictech**
788 S 500 E, Pleasant Grove, UT 84062
sales@aumictech.com · +1 (484) 841-9341
https://aumictechlabs.com

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