



SQM-160 Multi Film Rate/Thickness Monitor

- Two Measurement Channels Standard, Six Optional
- High Stability Low Temp Coefficient 2ppm Oscillator
- Dual Analog Outputs for Rate/Thickness Recording
- Displays Rate/Thickness, Frequency, or Mass
- RS-232 Port and Windows™ Software Standard

Multi-Channel Quartz Crystal Monitor

The SQM-160 uses proven quartz crystal sensor technology to measure rate and thickness in thin film disposition processes. The base unit includes two independent measurement channels for 4MHz to 6MHz quartz crystals. A user-installable option card provides an additional four measurement channels.

The sensor inputs can be configured for dual sensors, assigned to different materials, or averaged for accurate deposition control in large systems. A rate sampling mode uses shuttered sensors to extend sensor life in high rate processes.

Rate displays of 0.1 Å/s or 0.01Å/s are user selectable, as are Frequency and Mass display. Large, bright LED displays are visible from across the room. Active crystals, and their operating status, are clearly displayed beside the readings.

Four relay outputs allow the SQM-160 to control source or sensor shutters, and signal time and thickness setpoints. Digital inputs allow external signals to start/stop and zero readings.

Easy to Use

Two menus control instrument configuration and setup for the nine stored films. To adjust values, press Program, then turn the setting knob to select/edit parameters. The main LEDs display menu prompts, settings are shown in the auxiliary (Time) display. Menu selections are grouped so that frequently changed process parameters are easily accessed. Seldom changed system settings are out of the way.

Press Zero to null the last thickness reading, then Shutter to open the source or sensor shutter. When the desired thickness is reached, or time has elapsed, the shutter closes and the appropriate front panel annunciator lights.

Press the Xtal Life button to view remaining crystal life. Our user-settable minimum and maximum crystal frequencies allow you to define acceptable operating ranges.

The SQM-160 comes with an RS-232 port, cable, and Windows software that allows instrument setup from your computer. The software can be used to set and store all parameters, operate the instrument, and save process readings in Excel file format.

New Features

- A high stability oscillator provides a temperature coefficient of 2ppm total frequency drift over a 0 to 50°C operating range, a useful feature for low deposition rates or microbalance applications.
- An analog output card provides independent rate and thickness signals for chart recorders and deposition monitoring.

Accessories

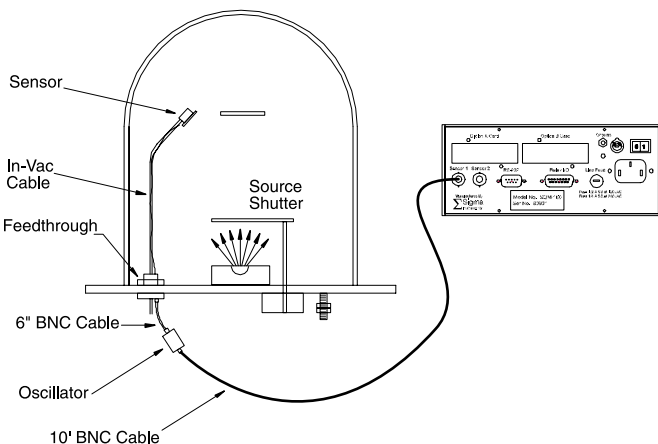
An Optional Four Sensor Input Card increases measurement capability to six sensors, and can be factory installed or user installed at a later time. Rack Mount Kits facilitate mounting the SQM-160 in standard 19 inch racks. Sigma Instruments also provides a complete selection of sensors, feedthroughs, cables, and other accessories to support your thin film process.

Ordering Information

SQM-160 Two Channel Rate/Thickness Monitor

Options:

- 502-020 Four Sensor Option Card
 900-008 Full Rack Extender
 (mounts one SQM-160 in 19 inch rack)
 900-014 Half Rack Extender
 (mounts two SQM-160s in 19 inch rack)



A typical system consists of the SQM-160 Monitor, Sensor, Feedthrough, and Sensor Kit. (The Sensor Kit includes all the cables, an oscillator, and a package of 10 crystals.) Consult our Sensors & Accessories Brochure for more information on these components, or contact Sigma or our local representative for assistance in configuring your system.



SQM-160 Specifications

Measurement

Number of Sensors	2 standard, +4 optional
Frequency Range	4.0 to 6.0 MHz
Reference Frequency Accuracy	0.002%
Reference Frequency Stability	±2ppm (total, 0 to 50°C)
Frequency Resolution*	0.06Hz @ 6MHz
Rate Resolution*	0.055 Å/s
Rate Display	0.01 or 0.1 Å /s
Thickness Resolution*	0.027 Å
Thickness Display	1 Å

* at 2 readings/sec, density = 2.70 gm/cc

Film Parameters

Stored Films	9
Density	0.5-99.99 gm/cc
Tooling	10 - 399 %
Z-Factor	0.10 - 10.00
Final Thickness	0.000 - 99.999 kÅ
Thickness Setpoint	0.000 - 99.999 kÅ
Time Setpoint	0:00 - 99:59 mm:ss
Sample/Hold	0-9999 sec.
Sensor Average	Select any 1-6

System Parameters

Measurement Period	0.15 to 2 sec.
Simulate Mode	On/Off
Display Mode	Rate/Thk, Frq, Mass
Rate Resolution	0.01 Å/s or 0.1 Å/s
Measurement Filter	1 to 20 rdgs.
Dual Crystal 1 / 2	On/Off
Rate Sampling	On/Off
Baud rate	2.4/4.8/9.6/19.2 kb/s
Etch Mode	On/Off
Tooling 1-6	10-399%
Crystal Fail Min/Max	4-6MHz/4.1-6.1MHz

General

Power	100-120/200-240 VAC 50/60 Hz, 20W
Environment	0°C to 50°C 0 to 80% RH
CE Approvals	Class 1 Equipment 73/72/EEC LVD 89/336/EEC ECD
Dimensions	88.5x213x197mm
Weight	2.7 kg. (6 lbs)

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Want to Know More?

We've only touched on the possibilities. Contact Sigma Instruments with your application. We're ready to help.

Telephone: 970-416-9660
 Fax: 970-416-9330
 e-mail: sales@sig-inst.com
<http://www.sig-inst.com/>

Sigma Instruments
 120 Commerce Drive
 Unit 1
 Fort Collins, CO 80524

