



SQM-160

Multi Film Rate/Thickness Monitor

- Two Measurement Channels Standard, Six Optional
- Analog Outputs for Rate/Thickness Recording
- High Accuracy Option: 0.03Hz at 10 readings/sec
- RS-232 Standard, USB or Ethernet Optional

Multi-Channel Quartz Crystal Monitor

Easy to Use

The SQM-160 uses Sigma's proven quartz crystal sensor technology to measure rate and thickness in thin film disposition processes. Two sensor inputs are standard. A user-installable option provides four additional sensor inputs. Two recorder outputs provide analog rate and thickness signals.

To start rate and thickness measurements, press Zero to null the last thickness reading, then Shutter to open the source or sensor shutter. The large, bright LEDs simultaneously show thickness and rate readings that are visible from across the room. When the desired thickness is reached, or time has elapsed, the shutter closes and the appropriate front panel annunciators light. Press the Xtal Life button at any time to view the remaining crystal life.

Sensor inputs can be assigned to different materials, averaged for accurate deposition control in large systems, or configured for a dual sensor. The rate sampling mode allows a shuttered sensor to extend sensor life in high rate processes. Rate displays of 0.1Å/s or 0.01Å/s are user selectable. In addition, Frequency or Mass displays can be selected.

Two menu control instrument setup for the nine stored films. To access the menus press Program. Turn the setting knob to select/edit parameters. The main display shows menu prompts, and values are shown in the auxiliary (Time) display.

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

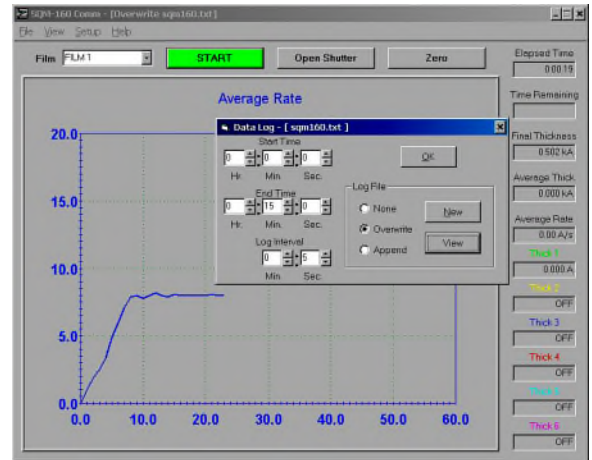
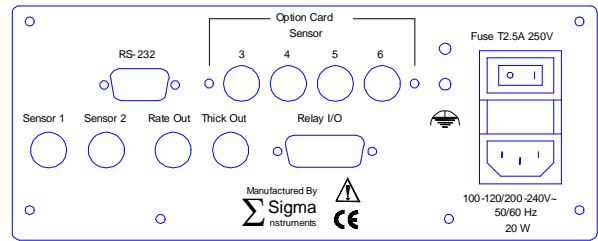
High Accuracy, Low Cost

The SQM-160 comes with an RS-232 port 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 data in Excel file format. USB or Ethernet options add to the communications flexibility.

Standard frequency resolution is 0.12Hz at four readings per second. The high accuracy option increases resolution to 0.03Hz at 10 readings per second. Temperature stability is 2ppm over the entire operating range. This combination of high accuracy and high stability are unmatched in an instrument at this price!

Specifications

| | |
|-----------------------------|--|
| QCM Sensor Inputs | standard: 2 optional: 6 |
| Frequency Range | 4 to 6 MHz |
| Frequency Resolution | standard: ± 0.12 Hz at 4 readings/sec optional: ± 0.03 Hz at 10 readings/sec |
| Frequency Stability | ± 2 ppm total, over 0 to 50°C |
| Measurement Period | 0.10 to 2 sec |
| Measurement Filter | 1 to 20 readings |
| Stored Films | 9 |
| Analog Outputs | two 0 to 10 VDC, rate & thickness |
| Digital Inputs/Outputs | two inputs, four relay outputs |
| Digital Interface | standard: RS-232 optional: USB, or Ethernet |
| Power | 100-120/200-240 VAC, 50/60 Hz, 20 W |
| CE Compliance | Class 1 Equipment, 73/72/EEC LVD, 89/336/EEC ECD |
| Housing / Mounting | 1/2-rack cabinet, 3 1/2" high, 89x213x197mm (3 1/2" x 8 1/2" x 7 3/4") |
| Weight | 2.7 Kg (6 lbs) |
| Windows Software (included) | Provides remote setup and operation, datalogging functions - see sample screenshot at right. |



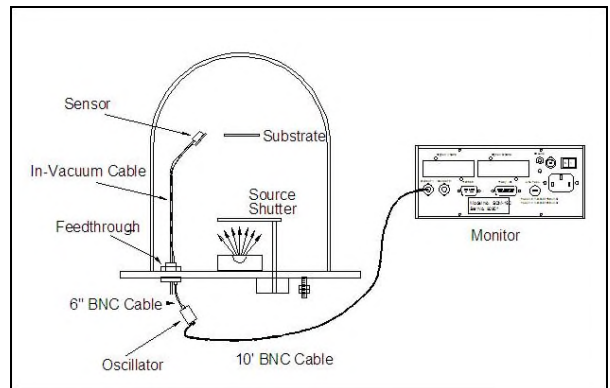
Ordering Information

| | | |
|---------------------------|---|-----------|
| | | SQM-160 - |
| Base Controller | | ↑ |
| Standard Resolution | S | |
| High Resolution | H | |
| Number of Channels | | ↑ |
| Standard | 2 | |
| Optional | 6 | |
| Interface | | ↑ |
| Standard RS-232 | R | |
| Optional USB | U | |
| Optional Ethernet | E | |

Accessories

| | |
|---------|--|
| 900-008 | 19" Rack Mount for one SQM-160 |
| 900-014 | 19" Rack Mount for two SQM-160 |
| 502-062 | 4-Sensor Option Card (converts a 2-channel SQM-160 to the 6-channel configuration) |
| 900-042 | High Resolution Option (converts a standard resolution SQM-160 to high resolution - this option must be factory installed) |
| 900-040 | USB Option Card |
| 900-041 | Ethernet Option Card |

Typical SQM-160 System



A typical QCM system consists of the SQM-160 monitor (choose your configuration at left), at least one sensor and feedthrough, and one "sensor kit" for each sensor. (The sensor kit contains an oscillator, a set of cables, and a 10-pack of crystals.) Refer to our Sensors & Accessories Brochure for options available.

Example of a typical system:

| | |
|---------------|-------------|
| SQM-160-S-2-R | Monitor |
| 932-000 | Sensor |
| 930-000 | Feedthrough |
| 934-003 | Sensor Kit |

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