



# SQM-160

## Multi-Film Rate/Thickness Monitor

### MULTI-CHANNEL QUARTZ CRYSTAL MONITOR

SQM-160 uses proven INFICON quartz crystal sensor technology to measure rate and thickness in thin film deposition processes. Two sensor inputs are standard and four additional sensor inputs are optional. Two recorder outputs provide analog rate and thickness signals.

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 0.1 Å/s or 0.01 Å/s are user-selectable. In addition, frequency or mass displays can be selected. Four relay outputs allow 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.

SQM-160 comes with an RS-232 port and Windows® software that allow instrument setup from a computer. The software can be used to set and store all parameters, operate the instrument, and save process data in an Excel® file format. USB or Ethernet options add to the communications flexibility.

#### FEATURES AT A GLANCE

- Two measurement channels standard, an additional four optional
- Analog outputs for rate/thickness recording
- High resolution option: 0.03 Hz at 10 readings/s
- RS-232 standard, USB or Ethernet optional

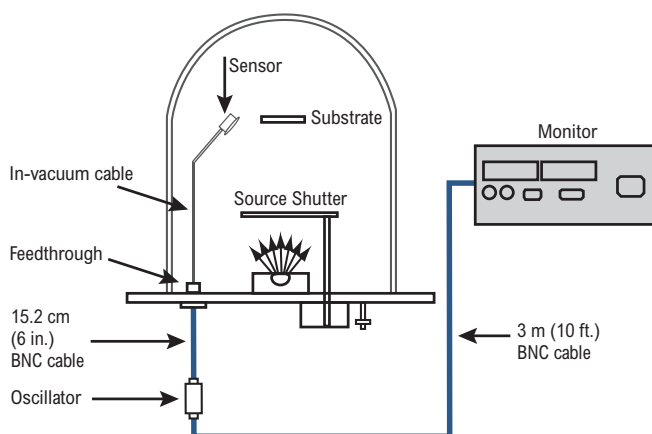
#### EASY TO USE

The large, bright display simultaneously shows thickness and rate readings that are highly visible. Using SQM-160 is simple. To start rate and thickness measurements, 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 indicators illuminate. Press the Xtal Life button at any time to view the remaining crystal life.

Two menus control instrument setup for the 99 stored films. To access the menus, press Program. Rotate the control knob to select/edit parameters. The main display shows menu prompts, and values are shown in the auxiliary (Time) display.

#### HIGH ACCURACY, LOW COST

SQM-160 is offered in a standard frequency resolution version (SQM160-S) and a high resolution version (SQM160-H). The standard frequency resolution is 0.30 Hz at 10 readings per second. The high resolution option increases resolution to 0.03 Hz at 10 readings per second. Temperature stability is 2 ppm over the entire operating range. This combination of high accuracy and high stability are unmatched in an instrument at this price!



A typical QCM system consists of the SQM-160 monitor, at least one sensor/feedthrough combination, and an oscillator kit for each sensor.

## SPECIFICATIONS

Sensor inputs	Standard: two; optional: six
Measurement frequency range	6.5 to 1.0 MHz (adjustable)
Frequency resolution <sup>1</sup>	Standard: ±0.30 Hz @ 6 MHz High resolution option: ±0.03 Hz @ 6 MHz
Thickness and rate resolution/measurement <sup>2</sup>	Standard: ±0.37 Å High resolution option: ±0.037 Å
Measurement interval	0.10 to 2.0 s (adjustable)
Measurement filter	One to 20 readings
Stored films	99
Analog outputs	Two 0 to 5 V (dc), rate and thickness
Digital inputs/relays	Two inputs, four relay outputs
Communications interface	Standard: RS-232 Optional: USB or Ethernet
Power	100 to 120/200 to 240 V (ac), 50/60 Hz, 20 W
CE compliance	Class 1 equipment, 73/72/EEC LVD, 89/336/EEC ECD
RoHS compliance	Yes
Housing / mounting	1/2 rack cabinet, 3.5 in. high, 89 x 213 x 197 mm (3.5 x 8.5 x 7.75 in.)
Weight	2.7 kg (6 lb.)
Windows software	Provides remote setup and operation, (included) datalogging functions — see sample screenshot below.

<sup>1</sup> Resolution given for 0.10 s measurement interval

<sup>2</sup> Tooling/density = 100/1, fundamental frequency = 6 MHz, 0.10 s measurement interval

## ACCESSORIES

782-900-008	2U Rack Extender – mounts one SQM-160 or CI-100 instrument in a 48.3 cm (19 in.) rack
782-900-014	2U Rack Extender – mounts two SQM-160 or CI-100 instruments in a 48.3 cm (19 in.) rack
783-500-109-10	3 m (10 ft.) Oscillator Kit – includes Oscillator, 15.2 cm (6 in.) BNC, and 3 m (10 ft.) BNC

## ORDERING INFORMATION

### Base Controller

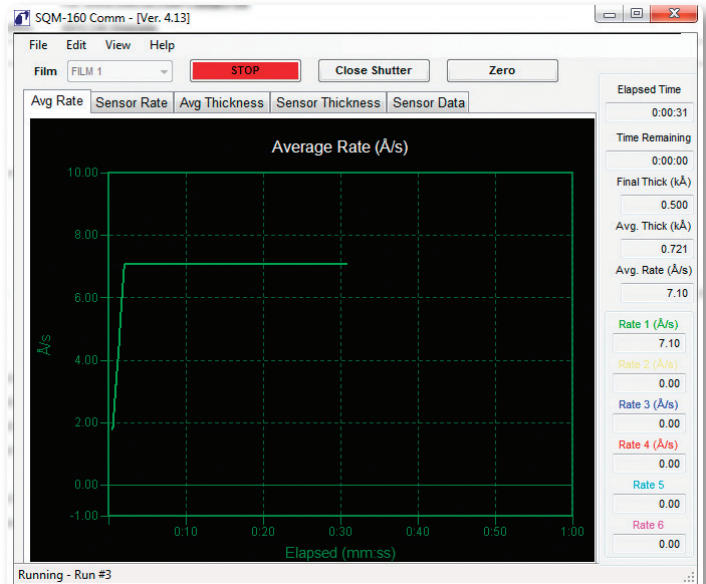
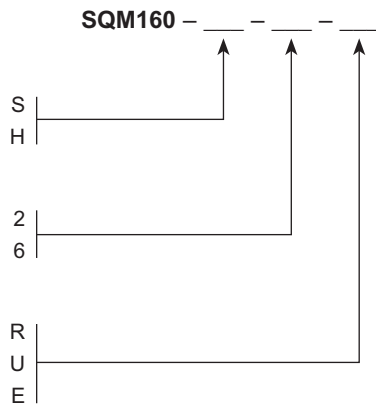
Standard resolution  
High resolution

### Number of Channels

Two (standard)  
Six

### Interface

RS-232 only  
RS-232 and USB  
RS-232 and Ethernet



Enhanced software provides a visual display of process data for easy process analysis and documentation. Backup of the SQM-160 setup data allows for process consistency.

