



- Co-deposit up to 6 materials
- Monitor up to 8 quartz crystal thin film sensors
- Monitor up to 4 analog inputs
- Unlimited processes, layers, films, and rate ramps
- Windows® user interface
- Ethernet, RS232, and Active-X interfaces
- PLC based digital I/O

SID-242 Thin Film Co-Deposition Controller

Sigma Instruments SID-242 provides a level of thin film process control, ease of use, and features not found in any other deposition controller:

Co-deposit up to six materials using quartz sensor inputs, analog inputs, or timed power. Any output can be mapped to any input, and configured for deposition control, or as a recorder output for data logging.

Use up to eight quartz crystal thin film sensors for deposition control and rate/thickness monitoring. Each source material can be monitored by a single sensor, or by multiple sensors, to provide accurate source distribution monitoring. Four optional analog inputs can be used to monitor temperature, power, optical spectra, end-point, or other process parameters.

Setup and operation are controlled by six context-sensitive softkeys (pushbuttons), an integral touchpad, and a convenient parameter setting knob. The familiar Windows® user interface provides complete process setup from a single clearly labeled dialog box. There are no

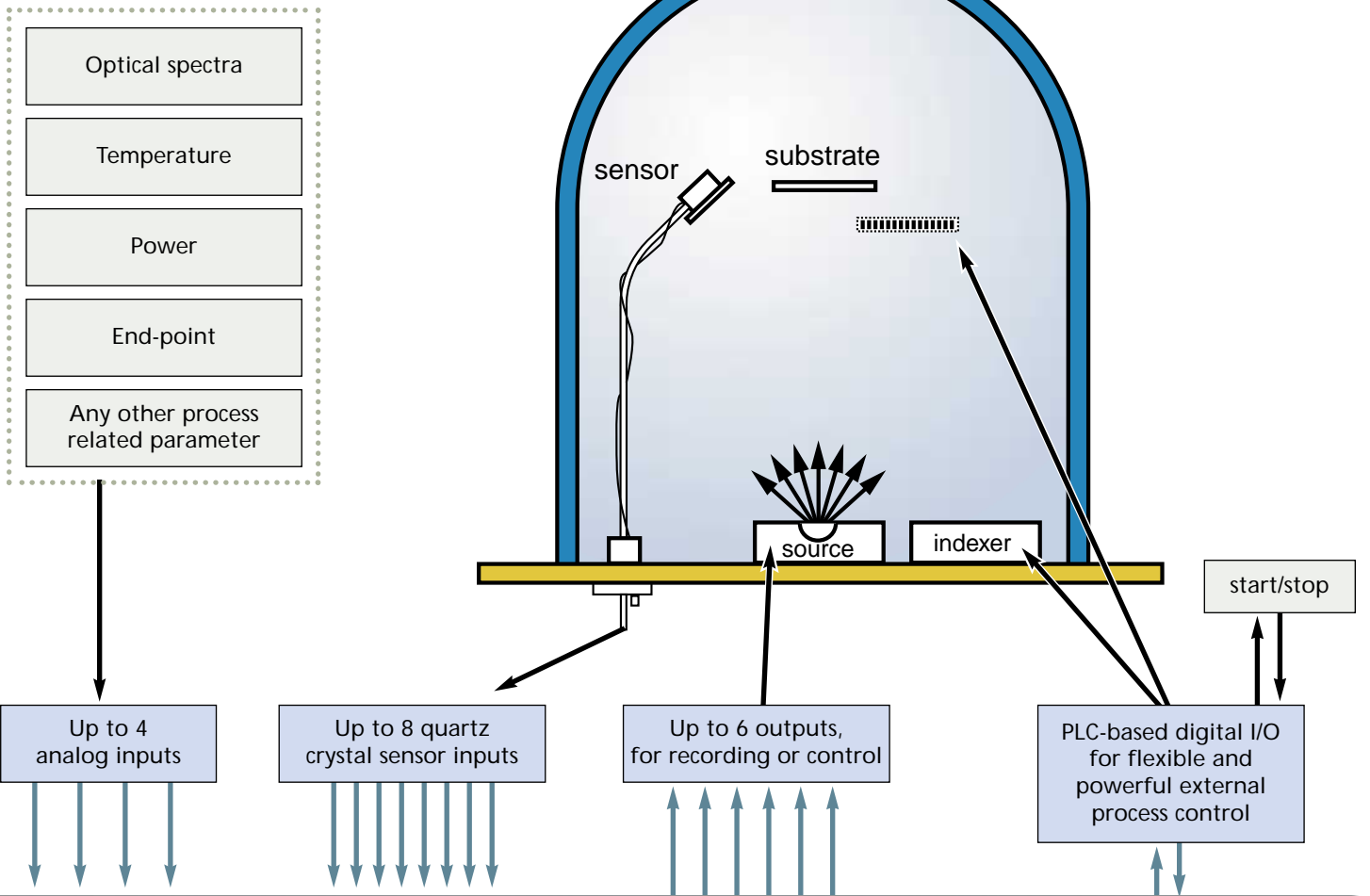
multiple layers of buried menus and cryptic numbered films to navigate. Three levels of customizable user access security protect process setup and operation.

An unlimited number of processes, layers, films, and rate ramps can be created and stored in a Microsoft Access database for easy offline editing and reporting. Process events and time-based data are logged to the SID-242 hard disk, for process analysis and troubleshooting.

A process simulate mode allows you to develop and test processes at the instrument, or offline on your own PC.

Common digital I/O functions, such as external process start/stop, and control of up to four 16-pocket indexers, are provided through an inexpensive PLC (Programmable Logic Controller). The PLC's internal ladder logic program can be adapted to address virtually any process I/O requirement.

Programmatic control of the SID-242 is available via RS-232, Ethernet, or Windows® ActiveX using a simple ASCII (text) protocol.



6 context sensitive SoftKeys (pushbutton switches)

Familiar Windows® user interface provides simple and intuitive setup and operation

RS232 and Ethernet interfaces for on-line control or off-line process development

Parameter Setting Knob

Built-in touchpad

Color VGA display

Feature: 3 levels of customizable user access security

Feature: Control up to 6 materials / sources based on quartz sensors, analog inputs, or timed power.

Feature: Process event and time based data are logged to hard disk for analysis and troubleshooting.

Feature: Create and store an unlimited number of processes, layers, films, and rate ramps.

SID-242 Thin Film Deposition Control System and Components

SID-242 Controller



The SID-242 Co-Deposition Controller is packaged in a standard 19 inch rack mount, using only 5-1/4 inches (133mm) of panel height. A bright 6.4" (163mm) diagonal color VGA display, 1.44 MB floppy disk, and integral touchpad are standard. Included in the standard configuration is a single SQM-242 controller card (four inputs, two outputs) and our SQS-242 Deposition Control Software (see below) running under Microsoft Windows® 98. An additional SQM-242 controller card and SAM-242 analog input card can be added.

SQS-242 Software



The SQS-242 Software, included with each SID-242 Controller, provides extensive capabilities for graphing, data logging, and security, as well as complete setup and operation of the process and system. Six SoftKeys along the left of the display control common operations such as Start/Stop/Restart, Manual/Auto modes, and film parameter edits. A single tabbed dialog box with cut/copy/paste capabilities allows easy process recipe development. This powerful thin film deposition process control software may also be purchased separately, to run on any Pentium or better computer running Windows® 98 or higher.

SQM-242 Controller Card



The heart of the SID-242 Controller is the SQM-242 Card, which plugs into a standard PCI slot inside the instrument. Each card has four BNC input connectors for industry standard quartz crystal sensors. A dual phone plug provides two output voltage signals for recording or controlling source power supplies. The SQM-242 measures each sensor input, compares actual deposition rate against the setpoint, and adjusts the output signal based on the PID control loop calculations. Two SQM-242 Cards can be used in a SID-242 Controller, to allow monitoring up to eight sensors, and provide up to four outputs signals.

For OEMs and system integrators, SQM-242 Cards can be installed in your own system control computer, at significant cost and space savings.

SAM-242 Analog Input/Output Card

An additional card can be added to one SQM-242 Card to provide four analog inputs and two additional outputs. These analog inputs allow monitoring of temperature, power, endpoint, or any other process parameter that provides a 0 to ± 10 Vdc signal. The two outputs can be configured as recorder outputs, or as PID control outputs for controlling the process based on these other parameters

PLC Digital Input/Output

Digital I/O for the SID-242 is handled through serial communications with an inexpensive external Programmable Logic Controller (PLC). This simplifies complex rack wiring, and provides the SID-242 with electrical isolation and fail-safe process operation. The PLC also provides extensive I/O processing capabilities with its ladder logic programming. The PLC provides 12 relay outputs and 18 inputs; for additional outputs, 8-relay expansion modules can be added. To facilitate programming the PLC, Windows® programming software for the PLC is available as an option.

Specifications

SID-242 Thin Film Co-Deposition Controller

Computer	Minimum: 1GHz Celeron® CPU, 128MB RAM, 20GB hard disk, Windows® 98
Expansion card slots	6 PCI
Display	Color VGA TFT LCD, 6.4 inch (163 mm) diagonal
Communication ports	2 serial, 1 parallel, 1 Ethernet, 2 USB
Dimensions (W x D x H)	424 x 406 x 133 mm (16.7 x 16 x 5.25 inches)
Weight	6.8 Kg (15 lbs)
Power	90-135 / 172-264 VAC, 50-60 Hz, 200W

SQS-242 Software (included with SID-242)

Provides complete setup and deposition control for one or two SQM-242 cards, and one SAM-242 card.

Provides support for co-deposition, pre and post conditioning, digital I/O, graphing, and data logging.

ActiveX interface allows control by virtually any Windows® programming language, such as Wonderware, LabView, Visual Basic, or C/C++.

Display	Graphs - Rate, Deviation, Power, Sensor Readouts - Rate, Deviation, Power, Thickness
Digital Inputs	Process Start & Stop; Layer Start & Stop; Thickness Zero & Final.
Relay Outputs	Process Running; Deposit Phase; Thickness Limit; Time Setpoint; All Crystals Good or Fail; Sensor Shutters 1 to 8; Source Shutters 1 to 4; more.
Material Parameters	Name; Density; Z-Factor; more.
Film Parameters	Name; Ramp Time; Soak Time & Power; Shutter Delay Time & Error; Control Terms (P, I, D, Error, Error Set); Feed Power, Ramp, & Ramp Time; Idle Power & Ramp Time; Tooling Factor; Maximum Power; Slew Rate; more.
Layer Parameters	Start Mode; Rate; Thickness & Limit; Time Setpoint; unlimited number of Rate Ramps - Start Rate, New Rate, & Time; more.
Process Parameters	Name; unlimited number of Processes & Layers, Sensors 1 to 8; Sources 1 to 6.

SQM-242 Thin Film Controller Card

One SQM-242 card is included in standard SID242. One additional SQM-242 Card may be added.

Inputs	Four active oscillators	Outputs	Two analog signals
Connectors	BNC	Signal	0 to ±10Vdc, 1 KΩ impedance
Frequency	1 to 10 MHz	Resolution	15 bits
Sample period	0.1 to 2 sec	Connector	Dual 1/4" phone jack
Thickness resolution	0.2Å at 0.25 sec 0.025Å at 2 sec		
Thickness accuracy	0.5% + 1 count		

SAM-242 Analog I/O Card

One SAM-242 Card may be added to a SID-242 Controller

Inputs	Four analog signals	Outputs	Two analog signals
Signals	0 to ±10 Vdc	Signal	0 to ±10Vdc, 1 KΩ impedance
Connectors	BNC	Resolution	16 bit
Resolution	16 bit	Connector	Dual 1/4" phone jack

Optional PLC Programmable Logic Controller (Omron CPM2A)

Power required	AC: 100-240 VAC, 50/60 Hz, 60 VA
Inputs	18 isolated; ON = 14.4VDC min. into 2.7kOhm; OFF = 5.0VDC max.
Outputs	12 1FormÅ, 2Å, 24VDC/250VAC max.

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

