INFICON

Making Excellence Repeatable

Cygnus® 2

Thin Film Deposition Controller for OLED Applications

The Best Measurement Precision Possible for OLED Applications

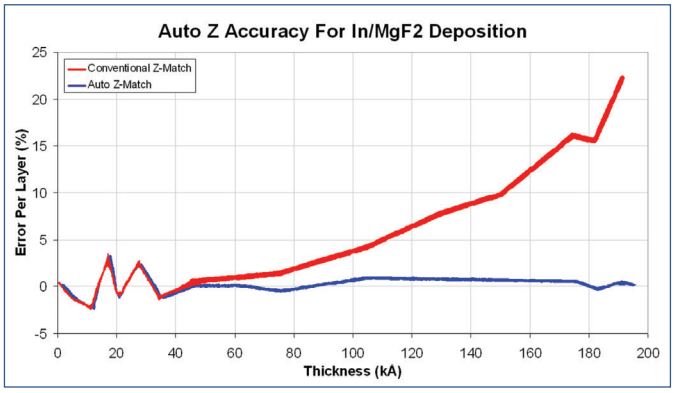
Cygnus 2 Thin Film Deposition Controller provides exceptional value by combining the proven performance of INFICON thin film controllers with unique features, all designed for you to achieve the most from your OLED process. Cygnus 2 uses our ModeLock frequency measurement system to provide stable, high-resolution rate and thickness measurement with an industry-leading rate resolution of .00433 A/s every 1/10 second. No other quartz crystal controller has the performance, quality, and features of Cygnus 2, allowing you to make excellence repeatable.

POWERFUL PERFORMANCE

Cygnus 2 can control up to six sources simultaneously, independently or in any combination; reducing system complexity and cost by eliminating the need for two or three controllers.

The optional INFICON Crystal 12 Sensor switches crystals automatically without interrupting your process. This allows for continuous rate monitoring, extending the time between tool venting. For source control, rate or thickness monitoring and recording, Cygnus 2 has twelve assignable analog outputs, 6 standard and 6 additional (optional). In addition, I/O capabilities provide up to 24 relay outputs, 28 TTL inputs, and 14 TTL outputs. A 4 meter XIU option enables you to use long in-vacuum sensor cables for large systems.

For stable, high resolution rate and thickness measurement and control at extremely low rates, Cygnus 2 has measurement rate averaging; valuable for low density materials deposited at very low rates (up to 30 seconds for use with stable sources for very low rate OLED dopant material deposition).



Auto Z dramatically improves the accuracy of measured thickness for multiple materials and layers.

The instrument's Auto Z function can automatically determine the Z-ratio for organic materials, maintaining thickness and rate accuracy during the deposition of layered or doped materials. Auto Z provides greater thickness accuracy during processes where the Z ratio for the material is not known or when co-depositing two or more materials.

FEATURES AT A GLANCE

- INFICON ModeLock technology ensures the most stable, highest resolution rate and thickness measurement available, even at very low rates
- Auto Z improves thickness accuracy by automatically determining the Z-ratio as material is deposited
- Up to six sources can be controlled simultaneously, independently or in any combination by one Cygnus 2, relieving the need for two or three controllers
- Color TFT LCD display makes it easy to see what's going on with your process
- 10 Hz measurement
- +/-0.0035 Hz over 100ms sample
- USB data storage for screen shots, recipe storage and data logging
- Thickness summing of multiple sources
- Measurement rate averaging for low density, very low rate materials (up to 30 seconds for use with stable sources for very low rate OLED dopant material deposition)
- Display rate resolution of up to 0.001Å/s
- 4 meter XIU option provides the ability to use long in-vacuum sensor cables for large systems
- Non-deposit control allows for continuous source control as substrates are cycled through the deposition chamber
- 6 DAC outputs standard, 6 additional optional for source control, rate or thickness monitoring
- Optional Ethernet communications
- RoHS compliant

All these features make it easier to measure low density materials at low rates and communicate these measurements back to the system computer for reliable process control.

EFFORTLESS PROCESS SETUP

Operating Cygnus 2 is easy and intuitive with a color TFT LCD display and menu-driven navigation. Information is displayed on a clear, brightly lit, screen for easy viewing. Soft keys help you maneuver quickly through the software's menus for efficient programming.

The brightly lit TFT LCD display delivers information in an easy-to-read format.

ORDERING INFORMATION

Cyg2 - ___ ___ ___ ___ ___ ___ ___

Basic Configuration
- 115V 50/60 Hz — 1
- 230V 50/60 Hz — 2

Sensor Measurement Module
(Each has 2 sensor inputs)
- Standard Module — 1
- 2 Standard Modules — 2
- 3 Standard Modules — 3

Additional Computer Communications Module (RS232 standard)
- None — 0
- Ethernet — 1

Additional I/O Relay Module
(Base unit includes 8 Relay Outputs / 14 TTL Inputs)
- None — 1
- 8 Relay Outputs / 14 TTL Inputs — 2

Optional TTL Relay Module
- None — 0
- 8 Relay Outputs / 14 TTL Outputs — 1

Optional DAC Module
(Base unit includes 6 DAC Outputs)
- None — 0
- Additional 6 DAC Outputs — 1

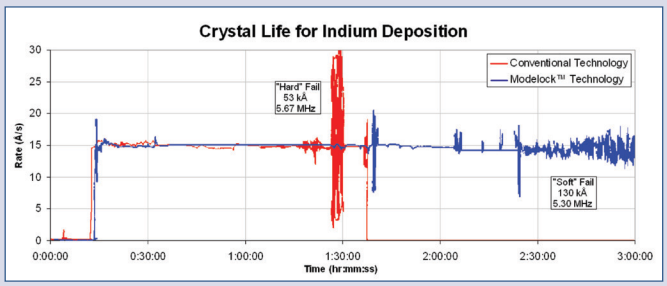
Expansion Slot
- Optional Feature (not currently available) — 0

HOW MODELOCK WORKS

The proven INFICON ModeLock measurement system provides crystal-frequency information with precision not possible from conventional "active oscillator" systems. It eliminates "mode hopping," a failure to maintain crystal oscillation at the fundamental frequency. ModeLock continuously tests the monitor crystal for resonance at the fundamental frequency, thereby eliminating weaknesses inherent in the conventional measurement method.

Conventional measurement methods incorporate the quartz monitoring crystal as an active element of the oscillator circuit. Consequently, the crystal controls the oscillator circuit. So, as the electrical characteristics of the crystal change during deposition, the oscillator circuit becomes less stable and may "hop" to another resonant frequency or fail completely, resulting in an inaccurate film thickness.

More powerful and precise—yet faster—than the conventional method, ModeLock continually tests and analyzes the phase-frequency relationship of the crystal. The crystal is not an active part of the oscillator circuit. The ModeLock measurement system determines and applies a precise frequency to the crystal, preventing the crystal from "hopping," or operating at a frequency other than the fundamental. This process takes place thousands of times per second to determine the resonant frequency to a precision of 0.0035 Hz/100 ms.



INFICON ModeLock measurement technology provides significantly longer crystal life, illustrated here in the deposition of indium.

SPECIFICATIONS

Measurement Performance	
Resolution (A/s/M)[1]	0.00433
Max. crystal frequency shift	1.5 MHz
Crystal range & precision (per 100-ms sample)	6.0 to 4.5 MHz +/- 0.0035 Hz
Thickness accuracy[2]	0.5%
Measurement frequency	10 Hz
Multiple measurement averaging	0.1, 0.4, 1.0, 4.0, 10.0, 20.0, and 30.0 sec. averaging allowed
Design Features	
Multiple sensor measurement	yes (up to 6 sensors)
Auto Z	yes
Co-deposition	yes (up to 6 sources)
Process Recipe & Data Management	
Material programs	6 independent materials
USB memory	yes
Data logging	yes
Hardware Features	
Sensors[3]	
Single	6
Dual w/CrystalTwo®	6 (with one CrystalTwo Switch per sensor input)
CrystalSix®	6
Crystal 12®	6
Generic	6
Source Controls	
Number of sources[4]	up to 6
Source control voltages	0 to +/-10 V, adjustable
Output resolution	15 bits over full range (0 to 10V)
Crucible positions	64
Inputs / Outputs	
Inputs	14 standard, up to 28 optional; TTL/CMOS logic compatible or closure to ground
Outputs	8 standard, up to 24 optional programmable SPST relays rated at 30 V(dc) or 30 V(ac) RMS or 42 V peak @ 2.5 amps; 14 optional TTL outputs
Recorder output[4]	0 to +10 V, adjustable
Logic statements	100 fully programmable; up to 5 actions, 5 events per statement
Communications:	
Standard	RS232
Optional	Ethernet
Display	
Thickness resolution	1 A for 0 to 9.999 kA
	10 A for 10.00 to 99.99 kA
	100 A for 100.0 to 999.9 kA
	1 kA for 1000 to 9999 kA
Rate resolution	0.001 for 0 to 9.999 A/s
	0.01 for 0 to 99.99 A/s
	0.1 for 100 to 999.9 A/s
Operation	
Power requirements	100 – 230 V (ac) +/- 15%
	50 / 60 Hz +/- 3 Hz
Operating temperature	0 to 50 C (32 to 122 F)
Dimensions, excluding mounts (h x w x d)	5.25” x 19” x 13” (133mm x 483mm x 330 mm)
Weight	13 lbs (5.9 kg)

[1]Material density = 1.0; z ratio =1.0; crystal frequency = 6 MHz, A/s/M = Angstroms / second / measurement
[2]Varies according to process; figures reflect typical accuracy
[3]Maximum configuration of each type
[4]Cygnus2 has 6 DAC outputs standard, 6 more can be added as an option. Any of the 12 can be configured as source control voltages or recorder outputs however the number of sources that can be controlled simultaneously is 6.

INFICON Instruments for Intelligent Control®

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