



Cygnus[®] Thin Film Deposition Controller

MAXIMIZE THROUGHPUT IN OLED APPLICATIONS

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Cygnus is the only thin film deposition controller designed specifically for OLED manufacturing. Features important to OLED production allow Cygnus to meet the needs of the most complex, demanding, and unique OLED applications. The patented ModeLock measurement system, available on all INFICON deposition controllers, gives Cygnus the most stable, highest resolution rate and thickness measurement available. OLED manufacturers now have a reliable controller with features essential for maximizing production throughput.

COMPREHENSIVE PROCESS CONTROL

With its extensive capabilities, Cygnus can initiate pumpdown, control valves, activate substrate heaters, etc. This enhanced functionality may eliminate the need for ancillary instruments, reducing system complexity and cost. Cygnus offers up to twelve assignable analog outputs for simultaneous rate control from up to six sources or for rate or thickness tracking and system integration. Cygnus logic and process control capabilities include 100 programmable logic statements, 20 counters, and 20 timers. I/O and TTL relay boards provide up to 24 relay outputs, 28 TTL inputs, and 14 TTL outputs. The logic statements can be used in conjunction with external inputs or outputs. Each statement can include up to five functions and can be linked using Boolean logic.

KEY FEATURES / BENEFITS

- Up to 6 source co-deposition—as many as 6 sources can be controlled simultaneously, independently, or in any combination. One Cygnus controller can do what used to take two or three controllers, lowering the cost of ownership.
- Multiple measurement averaging—each control channel can be averaged over multiple measurements, providing the increased rate resolution (to 0.0006 Å/s with 10 second averaging) necessary when depositing very low rates.
- Display resolution to 0.001 Å/s—the target control rate can be entered to 0.001 Å/s, necessary when controlling low dopant rates.
- Non-deposit rate control—the source material can be kept under continuous rate control as substrates are cycled through the deposition chamber. This saves time by eliminating the need to reheat source material with every substrate.
- Flexible deposition sequencing—as substrates are cycled through the deposition chamber, the deposition sequence can be toggled between deposit and non-deposit rate control. This exposes the substrate to the deposition material only when needed.
- Thickness summing—often OLED materials must be deposited at low rates. Summing the thickness from two or more sources of the same material allows reduced Takt time.
- Auto Z*—Z-ratios for organic materials are not well known. Using INFICON Auto Z can improve thickness accuracy by automatically determining the Z-ratio.
- Cygnus Editor Applications Software—large production systems will have multiple Cygnus controllers. The Cygnus Editor Applications Software allows multiple Cygnus controllers to be programmed and monitored from a single PC.

*Auto Z—U.S. patent #5,112,642



SPECIFICATIONS

Measurement Performance	
Resolution (Å/M)	0.00577 (new crystal); 0.01016 (crystal @ 4.5 MHz) over 100 ms sample for material density = 1.0, Z-ratio = 1.0
Max. crystal frequency shift	6.0 MHz (new crystal) to 4.5 MHz
Crystal range & precision	6.0 to 4.5 MHz; ± 0.0047 Hz (per 100-ms sample)
Thickness accuracy	0.5% typical, (dependent on process conditions, especially sensor location, material stress, temperature and density)
Frequency accuracy	± 2 ppm 0-50°C
Measurement frequency	10 Hz
Multiple measurement averaging	0.1, 0.4, 1.0, 4.0 and 10.0, 20.0 and 30.0 sec averaging is allowed
Design Features	
Auto Z	yes
Codeposition	yes (up to 6 sources)
Data Management	
Disk drive available	yes
Data logging	yes
Hardware Features	
Sensors	2 standard, 4 additional with optional hardware
Sensor type	1 / 2 / 6 / 7 / 12 (Single, CrystalTwo, CrystalSix, Rotary and Crystal12)
Source /Recorder outputs	6 outputs standard, 6 additional with optional hardware
Function - configurable	Power /rate for 6 channels, power/thickness for 6 channels, rate/thickness for 6 channels, power/rate/thickness for 4 channels
Input/Output:	
TTL inputs	14 standard, 14 additional optional; TTL compatible
TTL outputs	14 with optional I/O card. Internally pulled up to 5 V(dc). May be pulled up externally to 24 V(dc) through 2.4k resistor.
	Minimum high level 0.5mA load @3.75 V; maximum low level 10mA load @1.1 V
Relays*	8 standard, an additional 16 optional with 2 additional I/O cards; *SPST 2.5 A relays rated @30 V(dc) or 30 V(ac) RMS or 42 V(peak) maximum; D sub connector; relays are normally open in the power off state, but may be programmed to normally open or normally closed during operation.
Relay ratings	100 VA inductive; 2.5A maximum.
Communications	
Standard	RS232C Serial Port
Optional	IEEE488 Parallel Port
Display	
Thickness resolution	1 Å
Rate resolution	0.001 Å/s for 0 to 9.999 Å/s; 0.01Å/s for 10.00 to 99.99 Å/s; 0.1 Å/s for 100.0 to 999.9 Å/s;
Operation	
Power requirements	
50/60 Hz ± 3 Hz (unless otherwise noted)	100 +10%, -15% V(ac); 120 +10%, -10% V(ac) 220 +10%, -10% V(ac); 240 +10%, -15% V(ac)
Operating temperature	0° to 50° C (32° to 122° F)
Dimensions, excluding mounts or connectors	5.25"H x 17.625"W x 17.13"D; (13.3 cm H x 48.8 cm W x 43.51 cm D); full rack
Weight	29 lbs (13.2 kg) with all options



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Due to our continuing program of product improvements, specifications are subject to change without notice.

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