

1.2 IC/4 Specifications

| Measurement | IC/4 PLUS | IC/4 |
|-----------------------------|---|---|
| Crystal Frequency | 6.0 MHz(new crystal) to 4.5 MHz | 6.0 MHz (new crystal) to 4.75 MHz |
| Internal Precision | ± 0.004657 Hz over 100ms sample for fundamental and anharmonic. | ± 0.0282 Hz over 200ms sample for fundamental |
| Thickness & Rate Resolution | 0.00577 Å (new crystal); 0.01016 Å (crystal @ 4.5 MHz) over 100ms sample for material density = 1.0, Z-ratio = 1.0. | 0.0348 (new crystal) 0.0612Å (crystal @ 4.75 MHz) over 200ms sample |
| Thickness Accuracy | 0.5% typical, (dependent on pro- cess conditions and materials; especially sensor location, material stress and density) | |
| Measurement Frequency | 10 Hz. | 5 Hz |
| Set Up Parameters | | |
| Processes | 4 | |
| Layers | 250 | 100 |
| Materials | 24 | 12 |
| Density | .500 to 99.99 gm/cc | |
| Z-ratio | 0.100 to 15.000 or Automatic | 0.100 to 15.000 |
| Sources | 2 standard, 2 (optional hardware) | |
| PID Control Mode | Fast or Slow Source | |
| Process Gain | .01 to 100 Å/sec/%Power | |
| Primary Time Constant | 1.0 to 200.0 seconds (Slow Source) | |
| System Dead Time | 1.0 to 50.0 seconds (Slow Source) | |
| Tooling Factor | 10.0 to 399.9% | |
| Secondary Tooling Factor | 10.0 to 399.9% | |
| Sensors | 2 standard, 2 (optional hardware) | |
| Maximum Power | 0 to 99% | |
| Power Ramps | 2 per material | |
| Soak Power | 0 to 99% | |
| Rise Time | 00:00 to 99:59 min:sec | |
| Soak Time | 00:00 to 99:59 min:sec | |
| Shutter Delay | Until rate control established within $\pm 5\%$ or 60 seconds. | |
| Feed Ramps | 1 per material | |
| Feed Power | 0 to 99% | |
| Feed Ramp Time | 00:00 to 99:59 min:sec | |
| Feed Time | 00:00 to 99:59 min:sec | |

| Set Up Parameters | IC/4 PLUS | IC/4 |
|--|--|-------------|
| Idle Ramps | 1 per material | |
| Idle Power | 0 to 99% | |
| Idle Ramp Time | 00:00 to 99:59 min:sec | |
| Rate | 0.0 to 999.9 Å/sec | |
| Final Thickness | 0.0 to 999.9 kÅ | |
| Thickness Limit | 0.0 to 999.9 kÅ | |
| Time Limit | 00:00 to 99:59 min:sec | |
| Co-deposition | Optional Hardware Required (available on IC/4 PLUS only) | |
| Ratio Control | 0 to 999.9% | |
| Cross-Sensitivity | 0 to 99.9% | |
| RateWatcher(TM) | Sample and Hold Feature | |
| RateWatch Time | 00:00 to 99:59 min:sec | |
| RateWatch Accuracy | 1 to 99% | |
| Rate Ramps | 2 per layer | |
| New Rate | 0 to 999 Å/sec | |
| Start Ramp | 0 to 999.9 kÅ | |
| Ramp Time | 00:00 to 99:59 min:sec | |
| Crucible Selection | 1 to 64, each source | |
| Display | | |
| Type | CRT, Amber, 5" H x 9" W | |
| Thickness Display Range | 0.000 to 999.9 kÅ | |
| Thickness Display Resolution | 1 Å | |
| Rate Display Range | 0.0 to 99.9 Å/sec; 100 to 999 Å/sec | |
| Rate Display Resolution | .1 Å for 0 to 99.9 Å/sec 1 Å for 100 to 999 Å/sec | |
| Power Display Range | 0.0 to 99.9% | |
| Graphic Display | Rate Deviation at ± 10 or ± 20 Å/sec or Power at 0 to 100% | |
| Display Data Update Rate | 1 Hz | |
| Source Controls / Recorder Output | | |
| Configuration | 2 source channels, 1 recorder; 2 additional channels, 1 additional recorder (optional) | |
| Analog Ranges | | |
| Sources | 0 to 10V, 0 to -10V, 0 to 5V, 0 to -5V, 0 to 2.5V, 0 to -2.5V | |
| Recorders | 0 to 10V | |
| Resolution | 15 bits over full range (10V) | |
| Update Rate | 10 Hz, maximum, (dependent on source characteristics). 5 Hz | |
| Recorder Outputs | Rate or Thickness or Rate Deviation | |
| Rate Ranges | 0 to 100 Å/sec, 0 to 1000 Å/sec | |
| Thickness Ranges | 0 to 100 kÅ, 0 to 1000 kÅ | |
| Rate Deviation Range | Desired rate ± 50 Å/sec | |

| Relays / Inputs | IC/4 PLUS | IC/4 |
|---|---|------------------------|
| Relays | Sixteen 240V relays; 120 VA inductive; 2A maximum. | 8 standard, 8 optional |
| Inputs | Sixteen lines; 10 to 24VAC(30VDC) | 8 standard, 8 optional |
| Update Rate | 10 Hz. | 5 Hz |
| Remote Communications | | |
| RS232 Serial Port | Standard; Inficon protocol with or without checksum | |
| RS422 Serial Port | Optional; replaces RS232 | |
| IEEE488 Parallel Port | Optional; replaces RS232 | |
| Accessories | | |
| Manual Power Control | Front panel connect wired handheld remote | |
| IC Memory Card Connector Kit | Optional external storage Connectors for Inputs, Relays and Source Control. | |
| Power | 100-120 VAC or 200-240 VAC, 50/60 Hz | |
| Operating Temperature | 0 to 50°C (32-122°F) | |
| Warm Up Period | None required; 5 minutes for maximum stability. | |
| Size | | |
| (not including mounts or user connectors) | 5.25" H x 17.625" W x 18.5" D / 13.3cm H x 44.77cm W x 47cm D. | |
| (including mounts, but no user connectors) | 5.25" H x 18.85" W x 18.5" D / 13.3cm H x 47.88cm W x 47cm D. | |
| Weight (with all options) | 10.5 kg / 23 lb | |