

Thin Film Monitoring

Hositrad Thin Film Deposition products offer high accuracy and flexibility with great value. Hositrad monitors and controllers deliver greater accuracy than similarly priced products from other sources. Windows software is standard with Hositrad Thin Film Deposition Products.

NEW Film Thickness Monitor with Temperature Measurement

The Eon-LT™ PC-Based™ Monitor is a temperature measuring film thickness monitor. This surpasses conventional monitors that are blind to thermal changes of the crystal. The combination of frequency and temperature measurement allows unprecedented accuracy in real-time rate and film thickness monitoring.



Ordering Information

Eon-LTC™ Temperature measurement
 & Source control

Eon-LTM™ Temperature measuring
 film thickness monitor

Features

- Temperature measuring quartz oscillator
- Communicates with latest, intuitive Eon Cactus™ software
- Real time graphing of temperature and frequency alongside corresponding rate and thickness values
- Shutter on/off support (relays)
- Widely expandable systems - up to 255 Eon-LTs™ can be networked
- All connecting cables, software, and instruction manual included

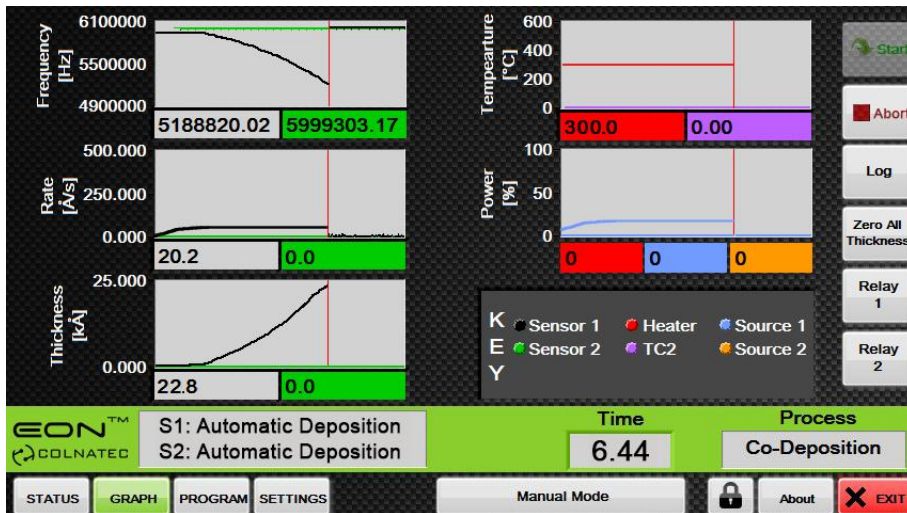
Specifications

- Drives crystals 1-10 MHz, 1-200 Ω, any type (Quartz, SuperQuartz™)
- Two type K thermocouple input; accurate to +/-0.25°C
- Two high resolution sensor head input accurate up to .001 Hz
- 24 volt power (supplied)
- Industry Standard RS232 communication protocol
- 4.5" X 2.5" X 1"
- Two user-selectable relays
- Two status LEDs

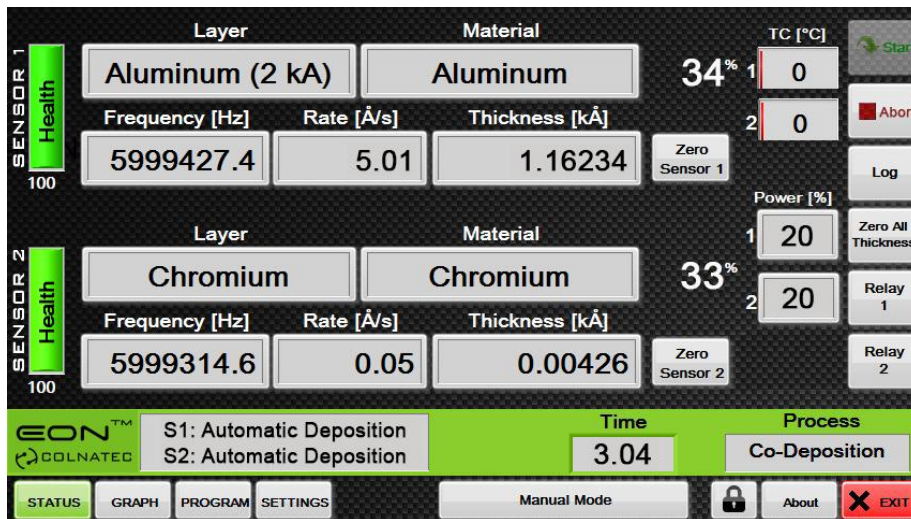
Why measure temperature? Because the frequency change of a crystal by process heating can easily be equal to the frequency change caused by coating. In normal operation there is a built-in 10% error in most rate measurements. In the worst case it can be 100%. Why measure if your measurements are always wrong?

While Eon-LT™ Monitor is compatible with industry standard crystal sensors, it was also specifically created to be paired with the Colnatec Phoenix™ sensor in combination with AT or RC™ 6 MHz crystals for a degree of precision never before imagined in the world of thin film.

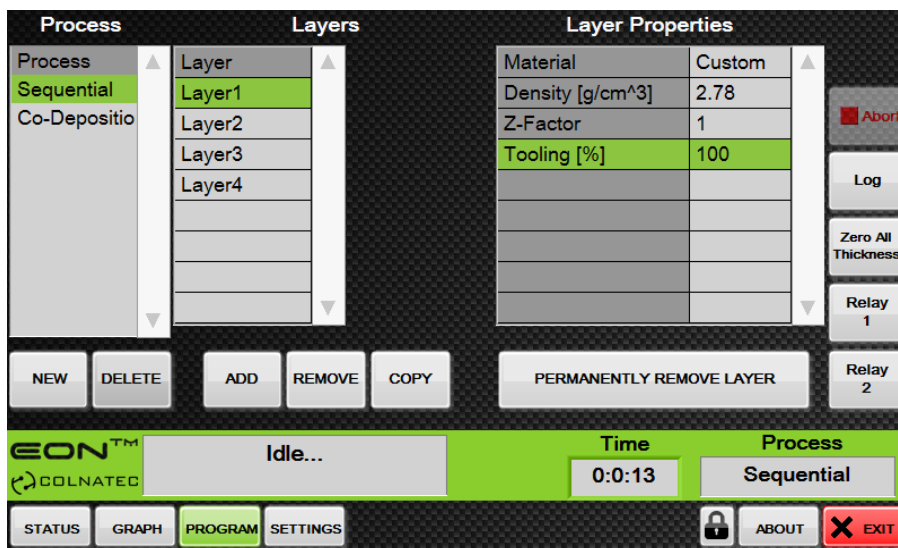
Eon Cactus™ software



Graph Screen



Status Screen



Program Screen

Thickness Monitors TM13 & TM14



Technical data

Power Supply	5V DC
Current Consumption	Max 500 mA
Communication Interface*	RS232
Dimensions [mm]	W: 80.0 mm, H: 50.0 mm, D: 27.0 mm

* Only one comms interface can be used at one time and is chosen at time of order.

Description

The TM13 and TM14 devices comprise: quartz oscillator, frequency measuring system and communication interface. It is connected to the input element of a quartz resonator. The measurement results are transmitted via RS232 or RS485 (depending on configuration) to the master device: either a PC or TMC13 controller.

Features TM13

- **Frequency Resolution: 0.1 Hz**
- Number of measurements per second: 4 (fixed)
- Maximum frequency of quartz oscillator: 6 MHz
- Stability: 0.5 ppm

Features TM14

- **Frequency Resolution: 0.01 Hz**
- Number of measurements per second: 0.5, 1, 2, 4, 10 (selectable)
- Maximum frequency of quartz oscillator: 6 MHz
- Stability: 0.5 ppm

Remote control via Thickness Monitors Controller TMC13 controller or PC.



Figure 2.4: Connecting to the PC

Thickness Monitors Controller TMC-13



Description

TMC13 is the newest technology electronics designed for monitoring and controlling any coating and deposition processes. Up to six channel inputs and two additional vacuum gauge channels together with 7" TFT display makes this unit really unique and universal. Sensor inputs can be assigned to different materials with individual parameters as well. High speed and high accuracy measuring process controlled by DSP processor improves the film quality and repeatability. It brings also the features of accuracy, stability and instrument configuration.

Features

- Six channels for quartz balance
- 7" TFT touch panel display
- intuitive & multilanguage interface
- compact design
- two inputs for most active vacuum gauges
- up to 8 shutters and I/O reprogrammable
- relay outputs
- two reprogrammable analog outputs for rate and thickness monitoring with 16 bits resolution
- communication interfaces: RS232/485, Ethernet IP
- industry standard 6 MHz Crystal
- frequency resolution: 0.1 Hz (for TM13) or 0.01 Hz (for TM14)
- Rapid SE and LabVIEW libraries
- **operation of up to two multi-crystal sensor heads (pneumatic or stepper motor)**

- 19" rack mounting or stand-alone
- one-touch material change
- favourites list for frequently used materials
- one-touch units change
- save individual user profile
- built-in video tutorials

Software for TMC-13 available, please request

Technical data

Supply voltage 100 - 240VAC 50/60HZ 2.2A

User interface TFT LCD 7", 800x480px with integrated touch panel

Communication Interface RS232/485, EtherNet/IP

Dimensions [mm] W: 212.6 mm (42HP), H: 128.4 mm (3HU), D: 260.9 mm

TM sensor inputs 6

Thickness 0 - 9999000 Å

Rate 0 - 9999 Å/s

Frequency resolution 0.1 Hz (for **TM13**), 0.01 Hz (for **TM14**)

Frequency Range 2-6 MHz

Thickness Resolution 0.1 Å (for **TM13**), 0.01 Å (for **TM14**)

Rate Resolution 0.1 Å/s (for **TM13**), 0.01 Å/s (for **TM14**)

Tooling Factor 1 - 400%

Measurement units Å, kÅ, nm

Measurement period 100 ms - 2 s (depends on TM type)

Shutter control manual, time, thickness

Shutter Time 1 - 1000000 s

Shutter Thickness 0 - 9999000 Å

Pressure channels inputs	2
Compatible sensors	CTR90, TTR91, TTR211, PTR225, PKR251, PCR280, PTR90, ITR90, ITR100, Baratron, ANALOG IN, MKS 937A, PG105, ATMION
Measurement units	mbar, Pa, Torr, Psia
Degas Time	1 - 3 min
Output	<ul style="list-style-type: none"> • 8 relay outputs (2 outputs with COM NC and NO contacts, 6 outputs with COM and NO contacts) • 2 analog outputs: 0-10V (retransmission thickness, rate, pressure)
Inputs	4 digital inputs (in 24V logic)
Operating temperature	15 - 40°C
Weight, approx	3 kg

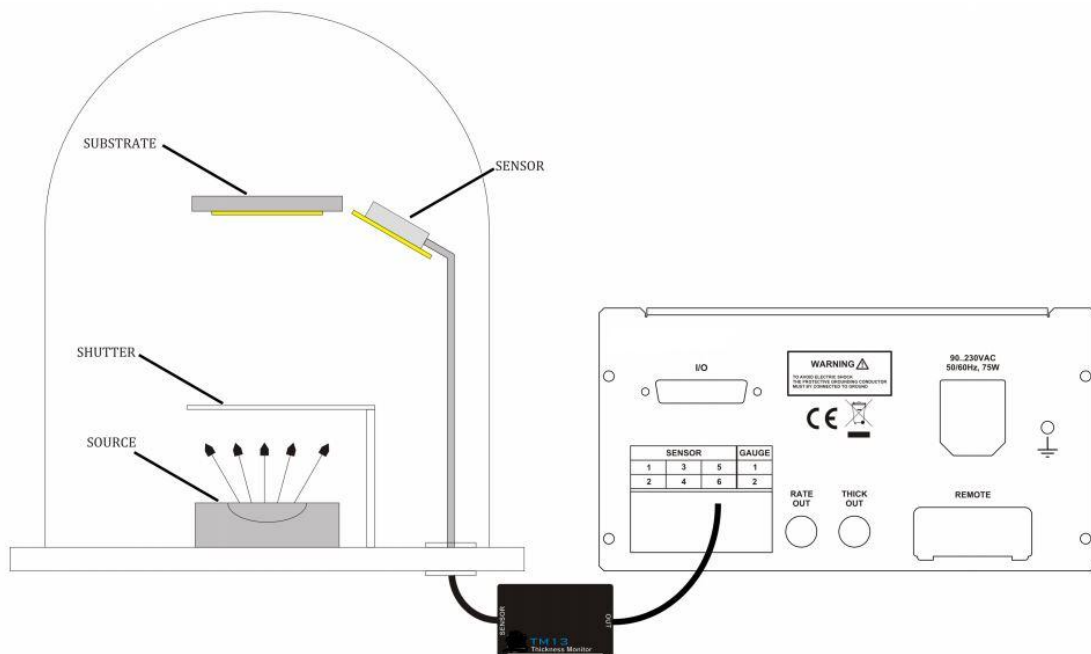


Figure 2.3: Connecting to TMC13

Hositrad SENSORS / FEEDTHROUGHS AND CRYSTALS



Using industry standard 6 MHz crystals Hositrad supplies quality sensors and feedthroughs that support the vacuum coating industries. All products are made with vacuum safe materials, Stainless Steel, Teflon and Alumina ceramics. Hositrad carries a full standard line of products and will create customized sensor packages for more exotic configurations. Our sensors are designed for easy crystal changes while remaining rugged enough for demanding depositions. Hositrad's compact shutter designs give the ability to have a crystal saving shutter without taking up valuable vacuum space. The long life shutter actuator is vacuum tight compact assembly with thousands of shutter cycles, for carefree operation. Robust design of all products will handle the tough jobs.

Sensors / Feedthroughs / Crystals High Quality Sensors and Feedthroughs

FEATURES

- High quality construction
- Single and dual designs
- Non bake able and bake able designs
- Fully Leak Checked feedthroughs
- Shuttered sensors, dual and single
- Easy Crystal changes
- Industry standard 6 MHz crystals
- Custom Bake able and standard arrangements per customers specification

Crystal Sensor	Industry standard 6 MHz
Max. Temperature	200°C non-bakeable
	250°C bakeable
	150°C InVac Oscillator
Sensor Monitoring	Rear of body,#4-40 tapped
Materials	304 SS, Alumina, Teflon
Crystal	Quartz with Gold Electrodes
Water Temp.	50°C
Connection	Microdot Miniature

