# EON-LT™

pc-based monitor

# user guide

for vers. 3.0.11 software

COLNATEC

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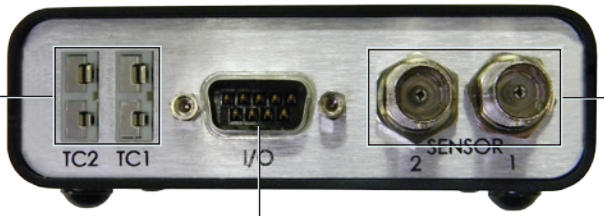
# Eon-LT™ at a Glance

# 1

This guide describes Eon-LT™ monitor with temperature control (3rd generation) and Eon-LT™ software version 3.0.11.

## Eon-LT™ Connectors

### Eon-LT™ Front

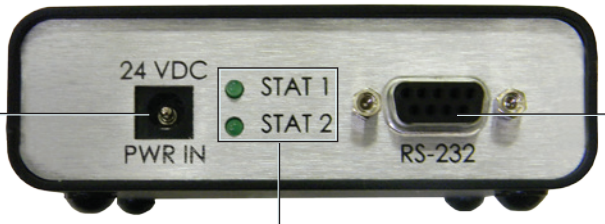



**Type K Thermocouple Inputs**
Measures temperature using thermocouples.

**BNC Sensor Inputs**
Connects to sensor head via external oscillator.

**Outputs**
For relay and source outputs

### Eon-LT™ Back




**Power Input**
Connects to 24 VDC power input

**RS-232**
Connects Eon-LT™ to PC. (Always use the provided USB-to-RS232 cable).

**LED Indicator**
Displays status

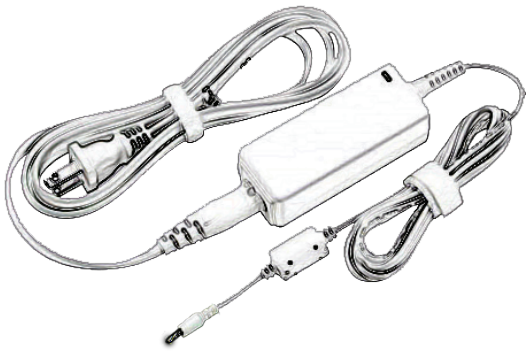
**WARNING** Make sure the correct hardware is used with Eon-LT™ inputs and outputs. See proper setup procedures in this manual and in the Phoenix-Eon-LT™ quick reference guide.

**WARNING** Only the provided power supply should be used with Eon-LT™. Not doing so will damage product and void warranty. Make sure power supply has a 24 VDC.

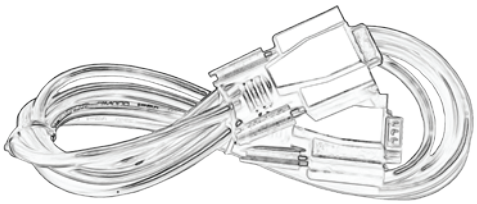
## Accessories

The Eon-LT™ ships with a variety of accessories.

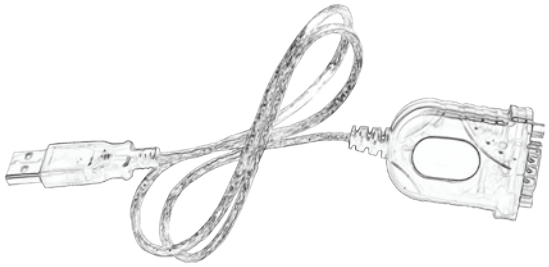
**Power supply and cable**. Input 100-200 VAC, 50/60Hz, 2 A. Output 24V, 3.75 A, 90W Max.



**RS-232 extension cable**. Male-to-female serial cable.

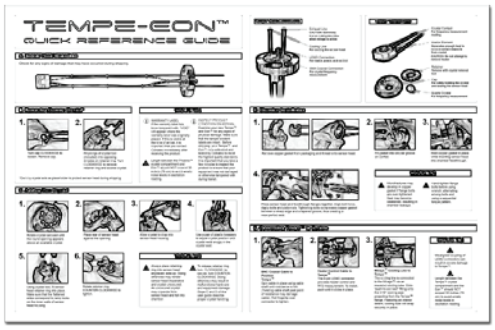


**USB to RS-232 adapter**. Connects RS-232 cable and PC.



**External oscillator (optional)**. Replaces the Eon-LT™ internal oscillator.

**Phoenix-Eon**-LT™ **quick reference guide**. Instructs user in quickly assembling and integrating Eon-LT™ into existing system.




**Software CD**. Contains Eon-LT™ software suite.

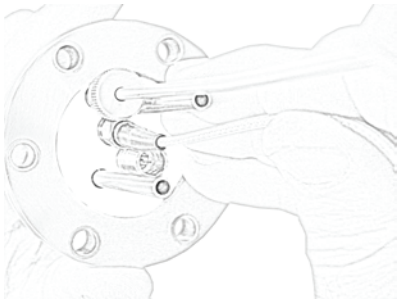
# Getting Started 2

## Eon-LT™ System Assembly

The following guide will describe in detail how to integrate the Eon-LT™ monitor into a basic QCM configuration. The QCM depicted below is the Colnatec Phoenix™ sensor head featuring temperature monitoring technology. (See Appendix A for connection map of a fully assembled Phoenix-Eon-LT™ system).

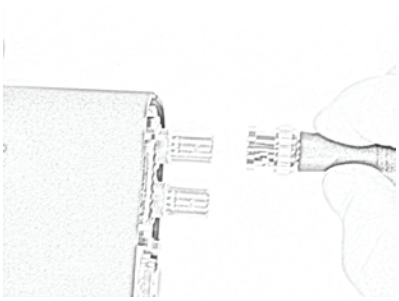
### 1. Connecting to QCM

**Connect SMA Coaxial Cable to QCM**
Spin cable in place using cable shaft until resistance is felt. (Twisting cable shaft past point of resistance may damage cable). Roll fingertip over connector to tighten.



### 2. Connecting to Eon-LT™

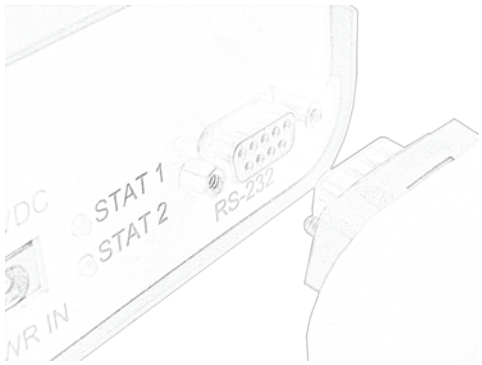
**Connect QCM to Eon-LT™**
Connect BNC extension cable to SMA, which then connects to the BNC adapter cable using the provided BNC union. Then, connect the other end of the BNC extension cable to the Eon-LT™ coaxial input (either sensor 1 or 2).



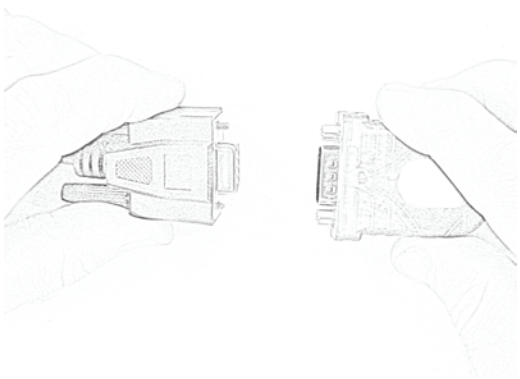
## Connecting Eon-LT™ to PC

1. **Install Eon-LT™ Software onto PC**
   Insert the accompanying Eon-LT™ software CD into disc drive. Follow prompts to install software onto PC.

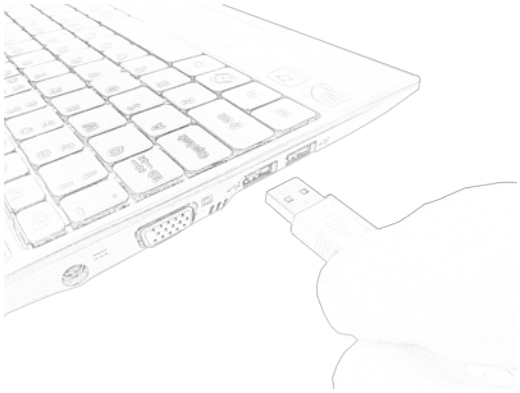

2. **RS-232 to Eon-LT™**
   Plug RS-232 connector into female serial port on rear panel. Tighten integrated screws.



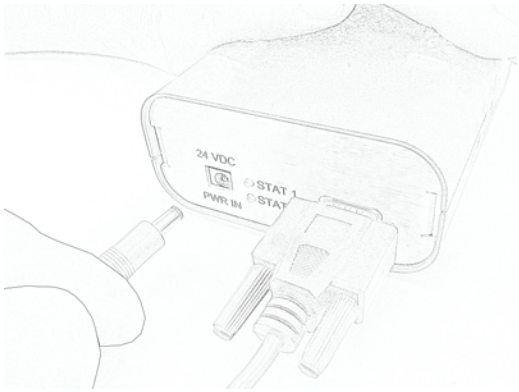

3. **RS-232 cable to USB Adapter**
   Plug the other end of the RS-232 cable into the USB-to-RS-232 adapter. Tighten integrated screws.



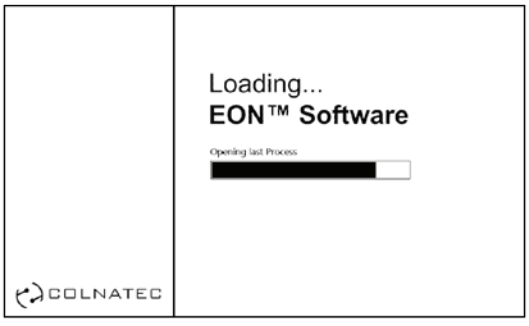
4. **Plug USB-to-RS-232 Adapter into PC**
   Plug USB-end of the USB-to-RS-232 adapter into PC.



5. **Connect Power to Eon-LT™**
   Plug Eon-LT™ power adapter into AC outlet. Then plug DC connector into the Eon-LT™.




6. **Start Eon-LT™ Software**
   Start Eon-LT™ software and navigate to the Program Control screen to begin creating your processes (see Chapter 3).



If drivers are already installed, simply update the drivers when installing software.

Use only the provided USB cable.

Ensure that the software has been fully installed before connecting Eon-LT™ to your PC.

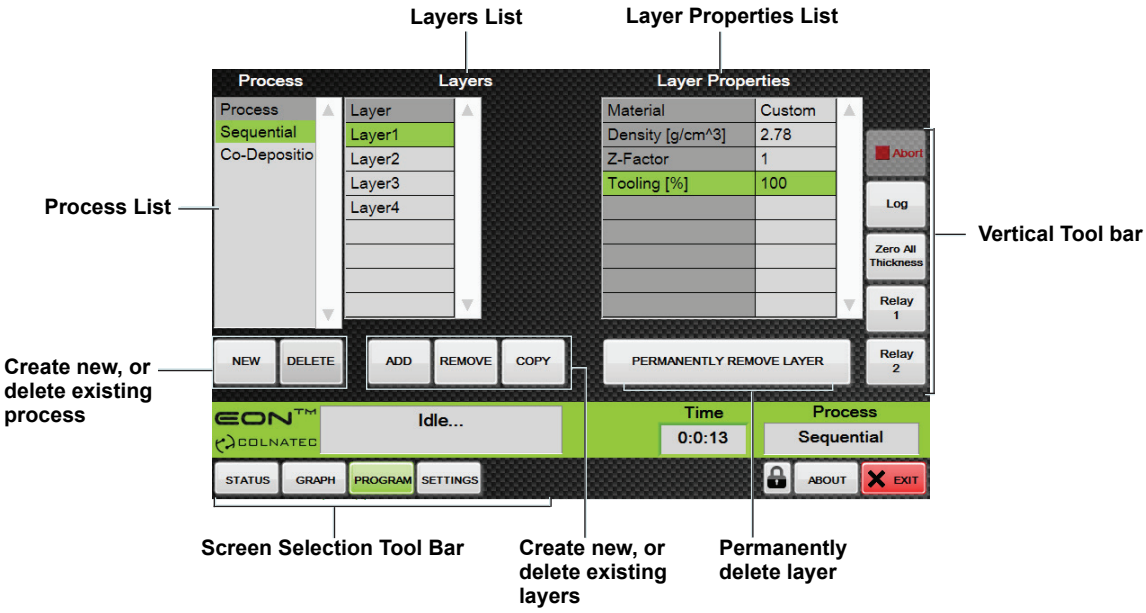
Reboot PC following Eon**-LT™** software installation.

# Program Control

# 3

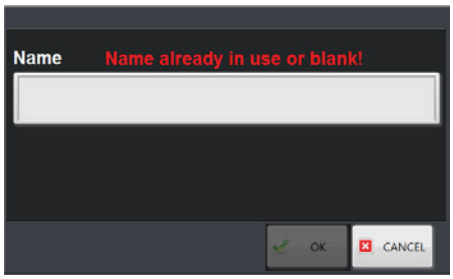
## Program Control Screen

Click the Program button in the Control Menu to access the Program screen. With this screen you will be able to create a new process, edit or delete an existing process, as well as add or remove layers and layer properties.



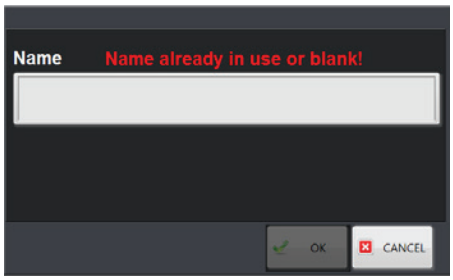

## Process List

**Create a new process**. Selecting the New button located below the Process List allows you to create and name a new process.



**Delete a process**. Pressing delete will permanently delete a process. Once deleted, a process is only recoverable if it was backed up prior.

**Renaming a process**. Double-click a process in the Process Layers List.



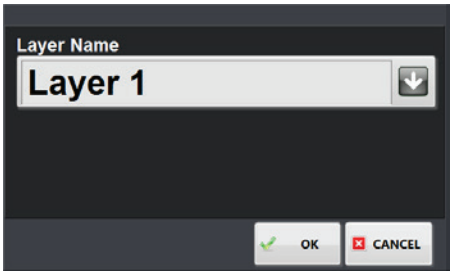

## Layers List

**Open the Layers List**. Click a process name. Layers List displays the current layers associated with a process. Set the rate, thickness, name, and order of the layers.

**Add a layer**. Click a process name.

**Select a layer**. Single-click.

**Edit layer name**. Double-click a layer. Modify the name, rate, and/or thickness. Click OK.

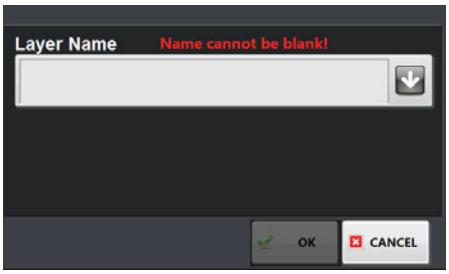



**Copy Layer**. Select an existing layer and press Copy to produce a copy in the list.

**Change order of layers**. On the Layers List click and hold a layer, drag the layer up or down the list, and release the layer where desired.

**Remove Layer**. On the Layers List click and hold a layer, drag the layer up or down the list, and release the layer where desired.

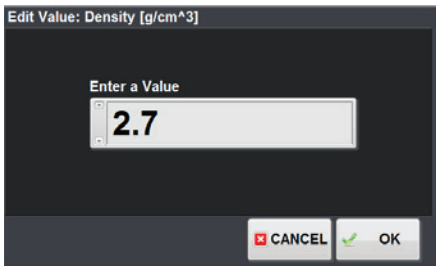
**Create new layer**. Select New button located below the Layers List. You can also use an existing layer by typing in the layer name or pressing the dropdown arrow to reveal a list of currently available layers.




## Layer Properties List

Enter or change values for layers. The Layer Property Value window allows you to enter or change the value of a layer property. (Note: Material, Source, and Sensor operate differently than the other items listed on the Layer Properties List).

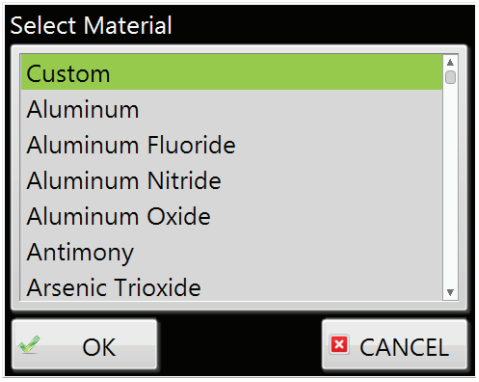
**Open Layer Property Value window**. Double-click a layer property at any time, even during a process run.




Enter a value and click OK or Cancel.

**Permanently remove layer**. Use the Permanently Remove Layer button to delete a selected layer. A deleted layer is removed from ALL processes (including those not selected). Once deleted, a layer is only recoverable if it was backed up prior.

**Select a material**. Scroll down and click on the Material row to open the Materials List. Select the applicable material and double-click a material or click OK. The correct density and Z-Factor is automatically set.




**Materials list.**

If the material being applied in your process is unlisted, select Custom and click OK. You can then manually enter your custom Density and Z-Factor settings in the Layer Properties List. Note also that whenever you manually change Density and Z-Factor settings to an unlisted material, the software will automatically classify the material as “Custom”.

## Layer Properties Defined

The following is a list of settings that defines the parameters of the deposition. All settings must be set correctly for the software to function properly.

- **Materials**
  The material being applied during the deposition process. This entry turns to “Custom” if the Density or Z-Factor is modified by the user, in order to prevent mismatch.
- **Density**
  The density of the selected material being applied.
- **Z-Factor**
  Acoustic impedance factor which is used to compensate for dense materials and is predefined based on the selected material.
- **Tooling [%]**
  The geometric relationship between the substrate and the positioning of the sensor.

# Settings

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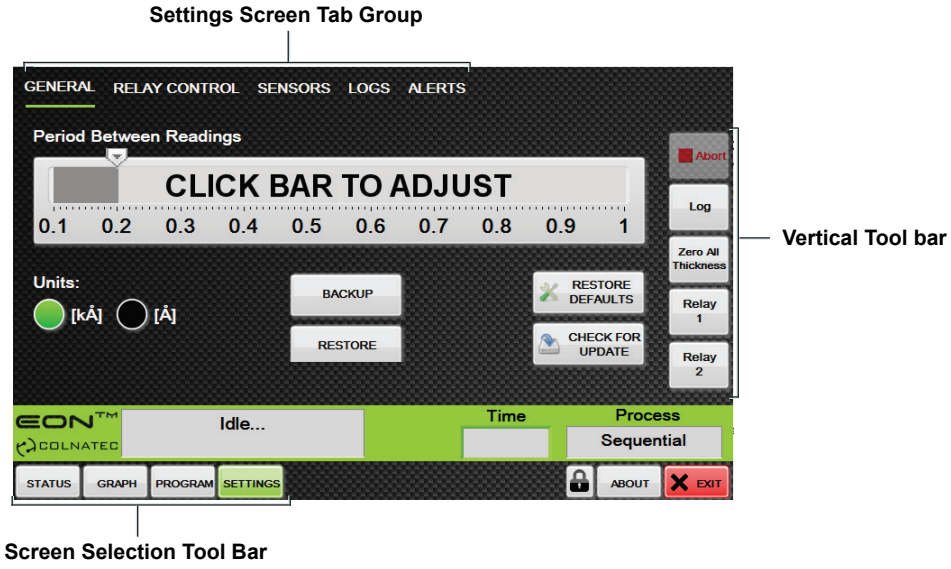
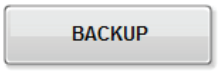
## Settings Screen

Click the Settings button in the Screen Selection tool bar to access the Settings screen. Use tabs to select settings operations. The Settings screen enables user to perform numerous tasks such as backing up and restoring settings, opening the log folder, adjusting period, and managing relays and sensor zeroing settings.

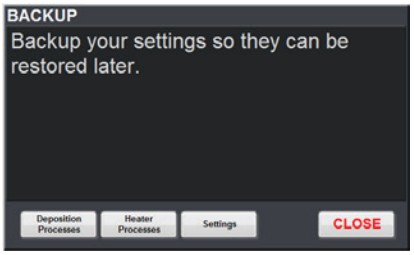



## Backup & Restore

The Backup and Restore commands enable the user to save deposition processes, heating cycles, and general settings in Eon-LT™ software.

Selecting Backup 

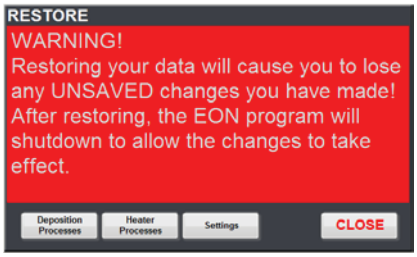
brings up the Backup screen.




On the Backup screen, click on the item you wish to save.

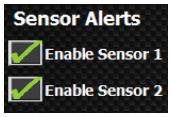
**Restoring backed up settings.** Selecting the Restore button 

opens the Restore screen.

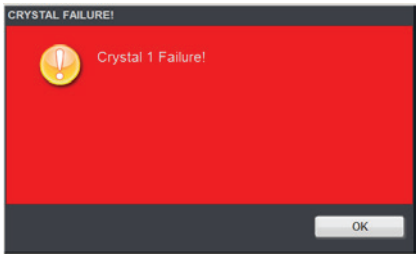



The user can now restore deposition processes, heating cycles, and general settings by clicking on the appropriate button. Note: The restoration process will overwrite any of the current settings you restore.

## Sensor Alerts




The **Sensor Alerts** setting provides the option of enabling or disabling the crystal failure alerts, which occur when the crystal frequency drifts out of the 5 MHz - 6 MHz range.




Although it is recommended that the sensor alerts generally remain enabled, the user can disable the notifications in the instance that the crystal is being used in a testing environment.

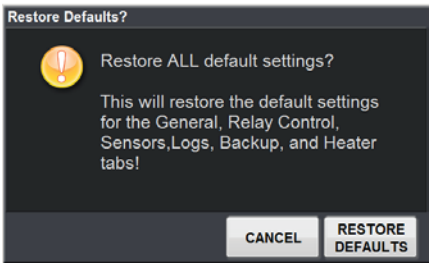
## Log

With the **Append Log Name** 

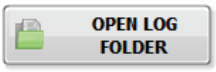
feature the user can add a specialized name to the end of the logs recorded by Eon-LT™ software.

**Note**: If a log recording is already underway, the logging must be restarted for the new name to take effect.

**Note**: Naming restrictions built into Microsoft Windows will prevent log recording if the following characters are used: **[ * / > " : | ]**. Eon-LT™ software raises a prompt to warn the user that the name is invalid. Log files with incorrect characters in the name will not save.




Removing the invalid character makes the warning disappear.

**Opening saved log files**. Selecting the **Open Log Folder** 

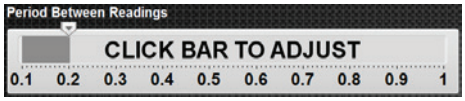
opens the folder to which the logs are currently being saved. By default this location is **"Public Documents\EON_LOGS\"**.

## Restore Defaults

The **Restore Defaults** button 

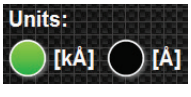
reinstates all of the settings to default values. This command is often used if the current settings are producing undesired results.

## Period Control

The **Period** control tuner 

is used to adjust data collection frequency in increments of 0.1 seconds. The period range is 100 milliseconds to 1 second.

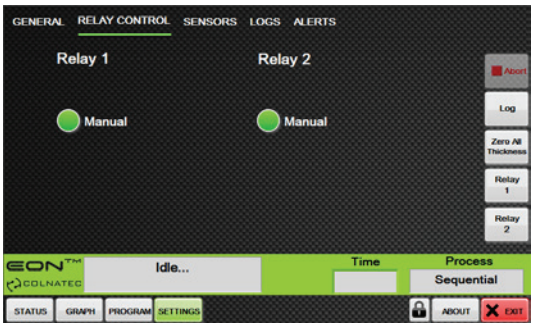
For precision adjustment, moving the slider 
produces an indicator showing the current value.

**Changing the measurement magnitude** 

only affects the Status screen. Log files will still be recording in kilo-angstroms.

## Relay Control

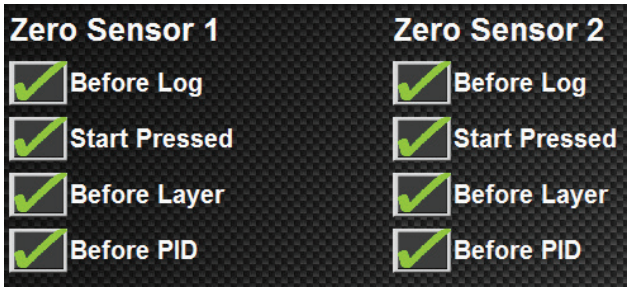
The **Relay Control** panel features two relays with independent settings.




**Manual**. When Manual is selected, the relay remains in its present state. The user can close (turn on) or open (turn off) the relay at will.

## Sensor Zeroing

With the **Sensor Zeroing** panel, the user can select when to zero Sensor 1 or Sensor 2. Settings for each sensor are identical.




**Before Log.** Pressing Log button 

zeros the sensor.

# Vertical Tool Bar

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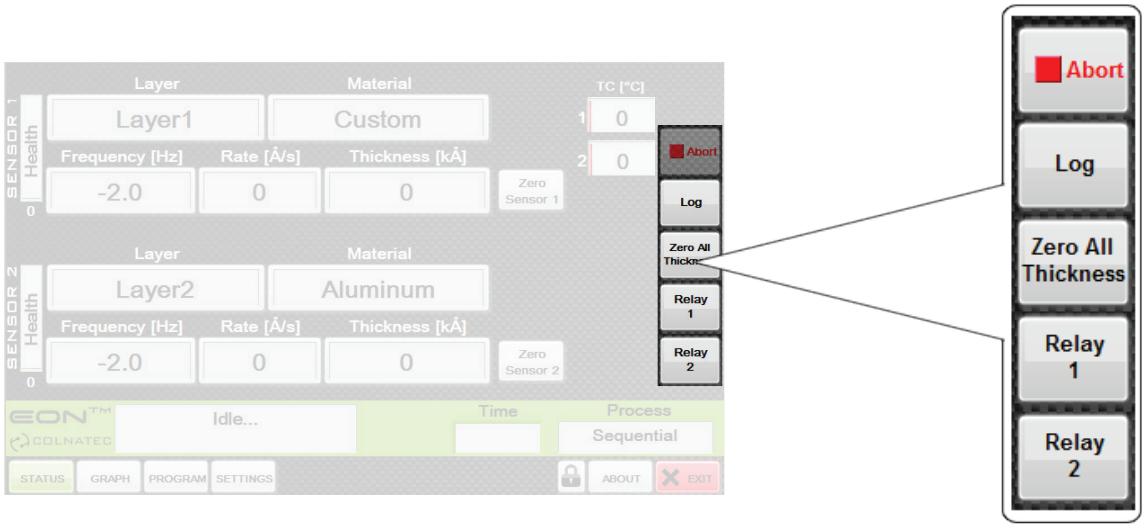
## Using the Vertical Tool Bar

Like the  Screen Selection tool bar, the vertical tool bar is always available. Use the vertical tool bar to start a deposition, abort a process, record a log, zero the sensors, activate the relays, or exit Eon-LT™ software.



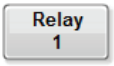

## Logging Eon-LT™ Status

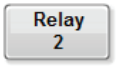
Eon-LT™ status can be logged to a monitor log from any screen. Pressing the Log button saves a monitor log to the monitor log save folder (Public/EON_LOGS/MONITORING”).


## Zeroing the Sensors

The sensors can be zeroed from any screen. Pressing the Zero All Thickness button zeros Sensor 1 and Sensor 2 at once.

## Activating Relay 1 and Relay 2

The Relay 1 and Relay 2 buttons 

, 

permit manual control of the relays.

## Exiting Eon-LT™ Software

Eon-LT™ software can be exited from any screen. Simply press the Exit button 

, and when prompted, press Exit again.

# Status

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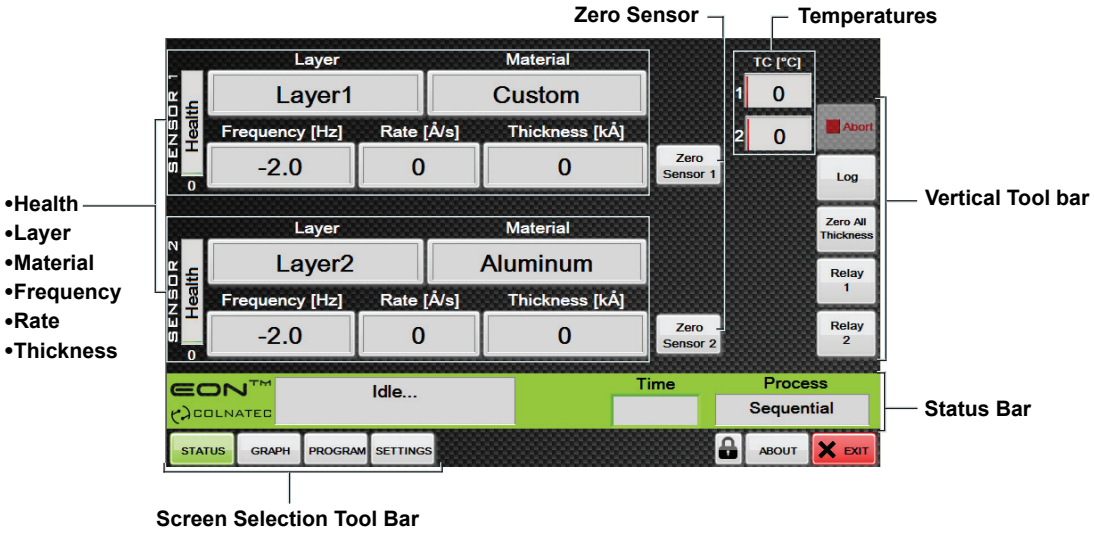
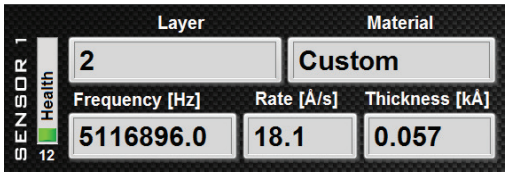
## Status Screen

Navigate to the Status screen by selecting the Status button in the Screen Selection tool bar. The Status screen displays real-time information on the progress of the process. Data for each sensor is represented - health, layer, frequency, material, rate, thickness, and percentage complete. Important information such as source power and temperature is also displayed.



## Health, Layer, Material, Frequency, Rate, and Thickness




**Layer.** The name of the layer being applied.

**Material.** When the sensor is being used during a deposition to apply material, the indicator will flash red, informing the user that the sensor is being used to control the selected source for the material being applied. During this process, the material being applied is also displayed.

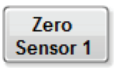
**Frequency.** Sensor frequency.

**Rate.** Rate of deposition.

**Thickness.** Thickness of deposition applied to sensor.

## Zero Sensor

The Zero Sensor buttons 

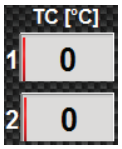


zero corresponding sensor thickness to zero.

## Temperatures

**TC1.** The current temperature of the sensor body, which is connected through TC1.

**TC2.** Axillary thermocouple connection.



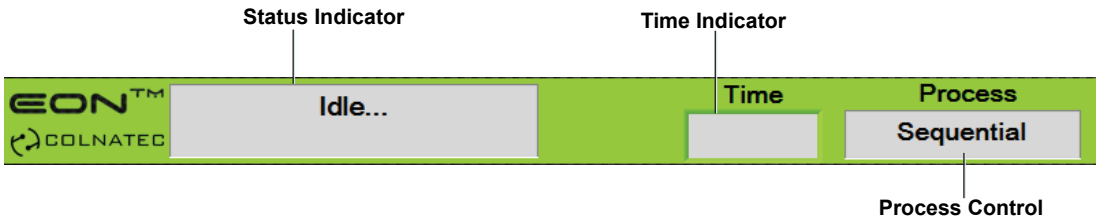

## Manually Zeroing Individual Sensors

Click the Zero Sensor button that corresponds to the sensor to be zeroed.

# Green Status Bar 7

## Status Indicators and Remote Process Control

A fixed menu available from any screen, the Green Status bar serves a variety of display and control functions.




**Status Indicator.** Displays process Eon-LT™ is currently performing. Information updates in real-time as Eon-LT™ performs each task.

**Time Indicator.** Displays the run-time of the current active process. The Time Indicator also retains the run-time of the last completed or aborted process.

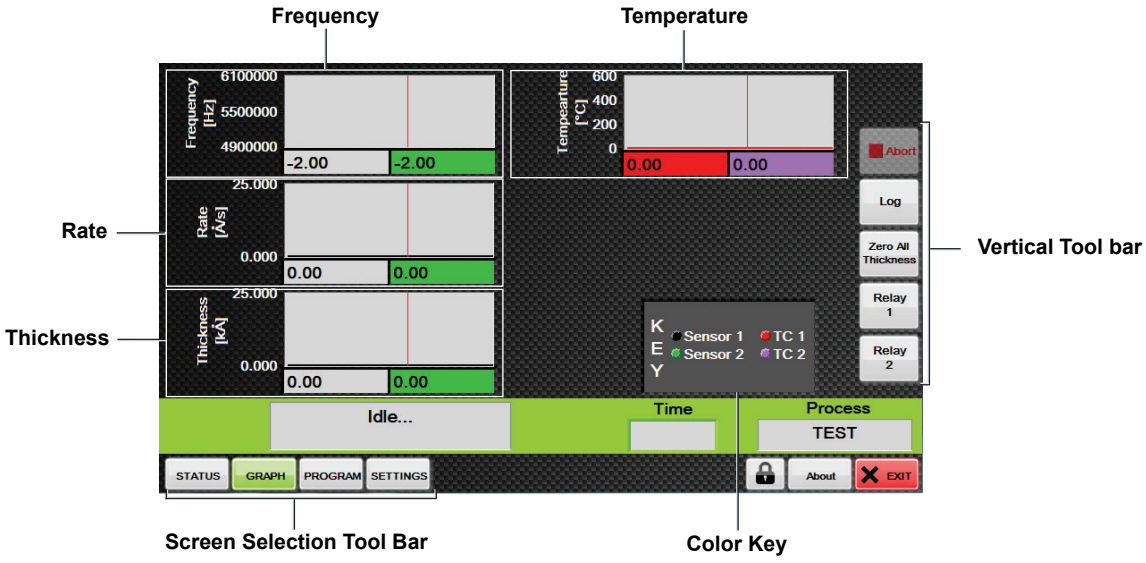
**Remote Process Control.** When a process is selected, the Status screen will display the first material to run on each sensor. If no materials are selected to be measured by one of the sensors, the sensor will display **None** in the Layer and Material indicator.

# Graphs

# 8

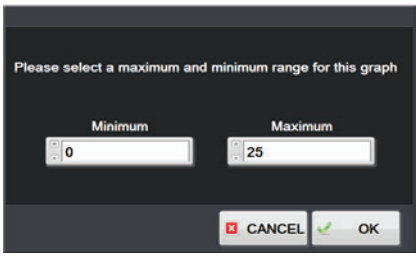
## Graph Screen

To view the Graphs screen, click on Graphs in the Screen Selection tool bar. The Graphs screen features line graphs for frequency, temperature, rate, power, and thickness. Unlike real-time data, data in graph-form can provide the user with a comprehensive, historical perspective on a developing deposition process.




## Adjusting Min/Max Range of Graphs

Click anywhere on a graph to produce the range adjustment window.

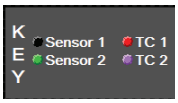


## Graphs

The graphs provide a visual representation of data gathered by Eon-LT™. The following data is presented by the graphs:

- **Frequency**
  Displays frequency over time in [Hz]
- **Rate**
  Displays the rate of the material application over time in [Å/s].
- **Thickness**
  Displays the thickness of material application over time in [kÅ].
- **Temperature**
  Displays the temperature over time in [°C].
- **Power**
  Displays the power of the sources and heater over time in percentages in [%].

## Color Key

The Color Key 

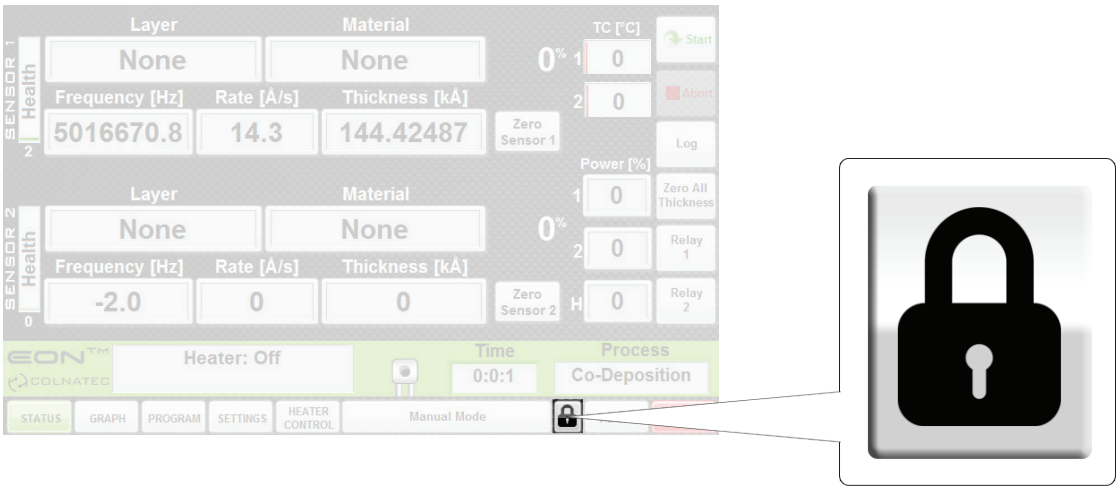
displays the color values representing the various devices being depicted on each graph.

# Screen Lock

# 9

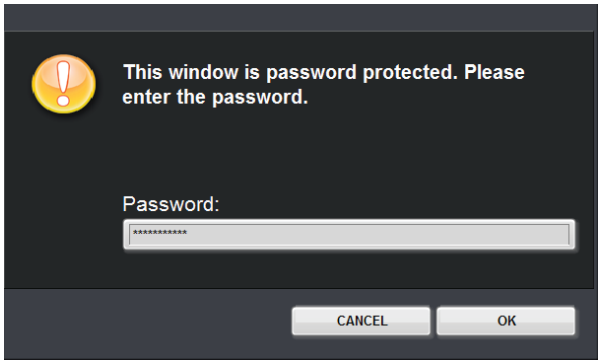
## Password-Protect Eon-LT™ Screens

The Eon-LT™ Screen Lock enables the user to lock any screen that appears on the Screen Selection tool bar. Locking a screen helps ensure that the controls and settings on each screen remain secure and under password protection.



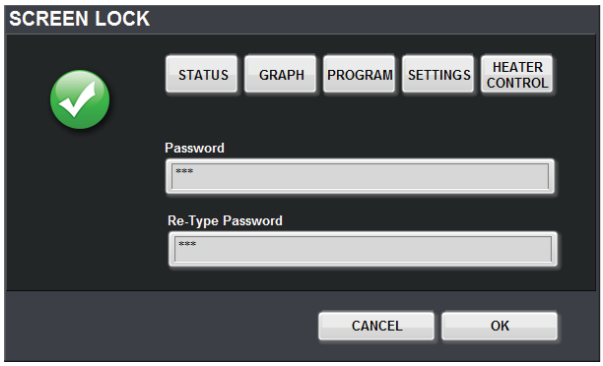

## Screen Lock Button

To access the Screen Lock controls, click on the Screen Lock button  . If a password is already in place, the password prompt appears.



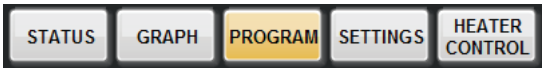

Entering the correct password will exit to the Screen Lock screen.

If a password is NOT already in place, the Screen Lock screen appears. Use these controls to lock and unlock screens and change the Screen Lock password.




## Locking a Screen

On the Screen Lock screen, select the screen(s) to be locked. Selecting a screen highlights it.




Click OK to engage Screen Lock protection. When clicked on, the *protected* screen(s) will now generate a password prompt.

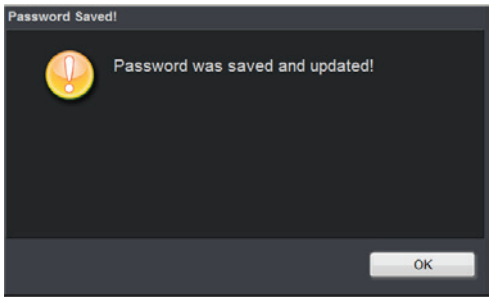
## Setting a New Password

The user may keep an existing password or enter a new password using the password controls. In order for a new password to be accepted, the Password and Re-Type Password fields must contain the same password.


Click OK to save new Screen Lock screen settings or Cancel to return to original settings.

**IMPORTANT** Leaving password fields empty DOES NOT disable the Screen Lock. Attempting to access a locked screen will continue to produce a passport prompt. Leave field blank and click OK to proceed to the Screen Lock menu. To disable the Screen Lock, unclick any locked screens.

Clicking OK saves screen lock and password settings.




## Resetting Password

To reset the Screen Lock controls password, click on the Screen Lock button and enter the following code into password prompt: **45647kyswx94272fyshq**

When the Screen Lock screen appears, enter a new password into the password fields.

# Troubleshooting 10

| Symptom | Cause | Solution |
|---|---|---|
| Frequency reads -2.0 [Hz] | Sensor not detected | Check sensor connection |
| No information displayed | Wrong COM port selected | Restart and select the correct ComPort. |
| Rate reads -1 | Improper settings | Restart software and Eon-LT™ |

If you cannot resolve an issue, please contact Colnatec support at support@colnatec.com, or call (480) 634-1449.

# Specifications 11

## Process Display

| | |
|---|---|
| **Film** | Selected Material |
| **Rate** | 0.00 to 99.9 [Å/s] |
| **Thickness** | 0.00 to 999.9 [KÅ] |
| **Frequency** | -3.00 to 6,500,000 [Hz] |
| **Run Time** | Hh/mm/ss |
| **Temperature** | 0 to 999.9 [°C] |
| **Health** | 0.00 to 100 [%] |

## Communications

| | |
|---|---|
| **Factory Set** | RS-232 [PC version] |

## Inputs and Outputs

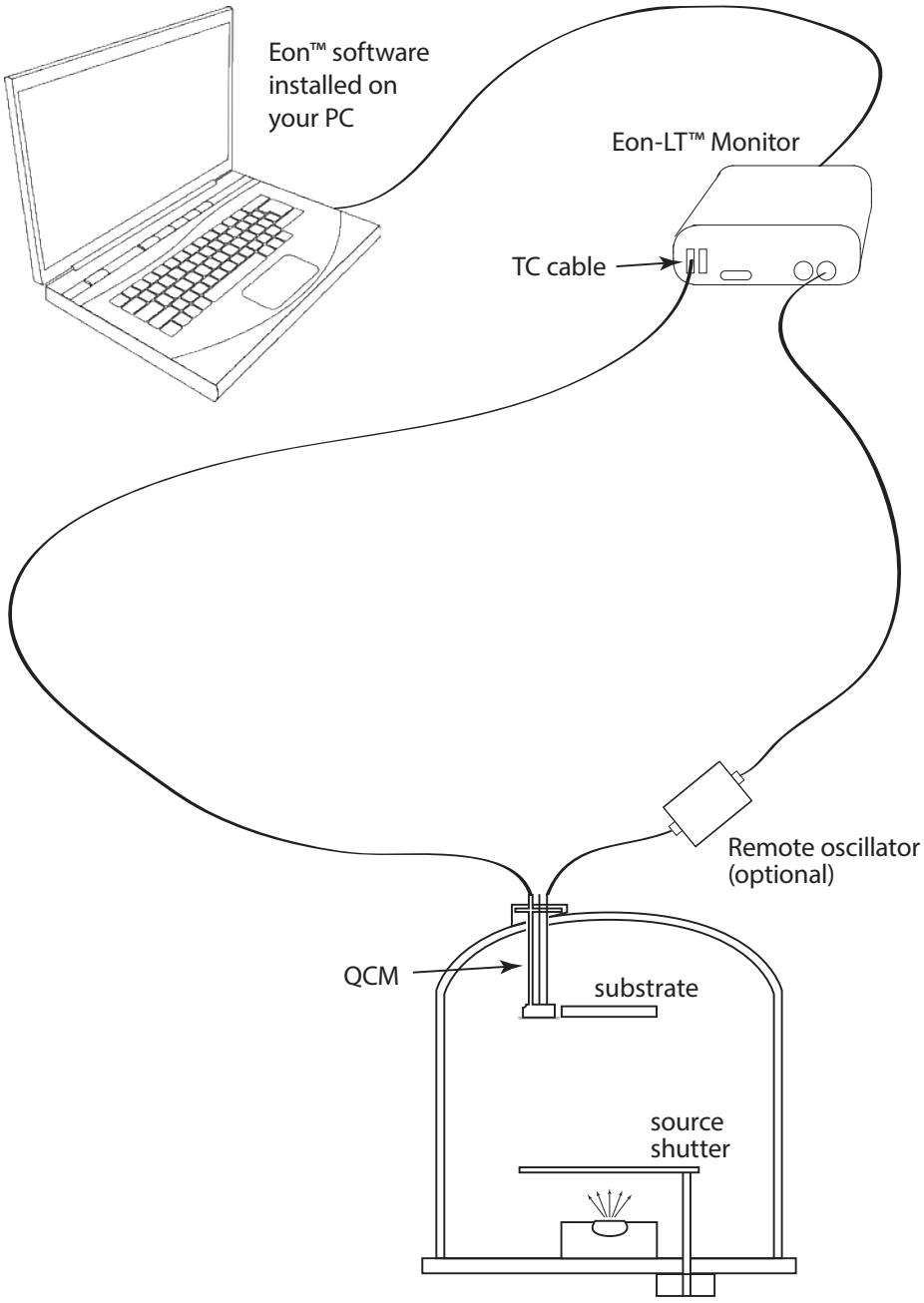
| | |
|---|---|
| **Voltage input** | 24 [VDC] |
| **RS232 Input** | One Half Duplex |
| **Sensor Input** | Two BNC Connector |
| **TC Output** | 2 Type K Connectors |
| **0-5 [VDC] Control Output** | One DB9 Connector |
| **Dual Relay Output** | |

# Phoenix-Eon-LT™ System

A Appendix

## Phoenix-Eon-LT™ System Configuration

Rendering illustrates basic connections of Phoenix-Eon-LT™ system.

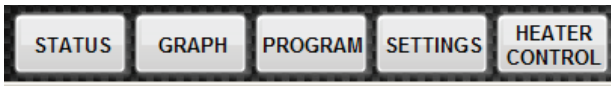


# Quick Info

B Appendix

## Screen Selection Tool Bar

The Screen Selection Tool Bar is the collection of buttons used to access the various screens in which the user will be working. The buttons consist of Status, Graph, Program, and Settings




## Adding a process

1. Press the Program button to enter the programming screen.
2. Press the New button located beneath the Process List.
3. Enter the desired name for the process.
4. Select the process type - Sequential or Codeposition.
5. Click OK.
6. This process is now selectable through the Process List or the Remote Process Control panel on the Green Status bar.

**Note**: In order for the program to update the source power, the user must enter a new value and then click away from the Source Power indicator.

## Renaming a process

1. Press the Program button on the Screen Selection tool bar.
2. Double click the process you wish to rename.
3. In the new window, enter the new name for the process.
   - Field must not be left blank
   - Name must not already exist
4. Click OK.

## Deleting a Process

1. Press the Program button in the horizontal tool bar.
2. On the Process List select the Process to be deleted.
3. Press the delete key directly beneath the Process List.

## Edit the name/rate/thickness of a process

1. Click the Program button to enter the Program screen.
2. Click the process that has the layer to edit.
3. Double-click the layer to be edited.
4. Modify the name, rate, and/or thickness.
5. Click OK to save changes.

## Adding a layer to a process

1. Press the Program button to access the Program screen.
2. Select the process from the process list. This will open the Process Layers list.
3. Press the New button under the Process Layers list.
4. Enter a new name to create a new layer, or select a layer that has already been created by clicking the arrow on right of the Name and selecting it from the list of layers.
5. Enter the desired Rate in [Å/s] and the Thickness in [kÅ]. Click OK.

**Note**: The name cannot be left blank. Typing the name of a layer that is already created will use that layer's settings.

## Copy Layer

1. Click the Program button to enter the Program screen.
2. Select an existing layer and press Copy to produce a copy in the list.

## Re-Ordering the layers

1. Click and drag the layer to the desired location in the list.
2. Layers are executed in numerical order, from top to bottom.

## Changing properties of a layer

1. Press the Program button on the bottom of the screen.
2. Select the process in the Process List containing the layer that requires editing.
3. From the Process Layers list select the layer to be edited.
4. Double-click on the Property to be edited.
5. In the new window that opens, enter the new value for the property.
6. Press OK.

**Note**: If an incorrect value is entered for the property selected, a notification window will appear displaying the acceptable values for that property.

## Layer property list

- **Materials**: The material being applied during the deposition process. This entry turns to “Custom” if the Density or Z-Factor is modified by the user.
- **Density [g/cm^3]**: The density of the selected material being applied.
- **Z-Factor**: Acoustic impedance factor which is used to compensate for dense materials and is predefined based on the selected material.
- **Tooling [%]**: The geometric relationship between the substrate and the positioning of the sensor.

## Removing a Layer

1. Press the Program button in the Screen Selection tool bar.
2. From the process list, select the Process with the layer that needs to be removed.
3. In the Process Layers, list select the layer that needs to be removed.
4. Press Remove directly beneath the Process Layers list.

**Note**: Removing the layer only removes the layer from the Process Layers list. The layer can be re-added to the list by pressing “New” and selecting the layer from the dropdown menu. See “Adding a Process” on the first page of this appendix.

## Deleting a Layer

1. Press the Program button on Screen Selection tool bar to enter the Program screen.
2. Select a process that contains the layer to be deleted.
3. After selecting the Layer from the Process Layers list, press Permarnently Delete Layer to delete the layer.

**Warning**: This action will permanently delete the layer from ALL processes. The layer will also be deleted from the list of layers. There is no way to recover a layer once it is deleted.

## Changing the material for a layer

1. In the Program screen, select the layer with the material to be changed.
2. Double-click on the Material row.
3. In the new window select a new material.
4. Click OK.

**Note**: When editing Density or Z-Factor, the material value defaults to Custom to prevent contradictions from occurring between the material and the material values.

## Vertical tool bar

### Logging the status of the Eon-LT™

1. Press the Log button on the vertical tool bar.

**Note**: Eon-LT™ status can be logged to a monitor log from any screen. Pressing the Log button saves a monitor log to the monitor log save folder ( PublicDocuments/eon_logs/monitoring").

### Zeroing Both Sensors Manually

1. Press the Zero All Thickness button on the Screen Selection tool bar.

### Activating Relays Manually

1. The relays can be activated from any screen.
2. On the Screen Selection tool bar, toggle the Relay # button to activate the relays.

### Exiting Eon-LT™ Software

1. Eon-LT™ software can be exited from any screen.
2. Press the Exit Button
3. When prompted, press Exit again.

## Settings

**Note**: All settings are automatically updated and saved as soon as they are changed.

### Adjusting Eon-LT™ period readings

1. Press the Settings button on the Screen Selection tool bar.
2. Select General tab.
3. Click and drag the marker on the Period control to adjust the period time in increments of 100ms.

### Changing Thickness Units [KÅ, Å]

1. Press the Settings button on Screen Selection tool bar.
2. Select General tab.
3. Select the desired thickness measurement units.

### Disable/Enable Sensor Failure Alerts

1. Press the Settings button on the Screen Selection tool bar.
2. Select Alerts tab.
3. Check or uncheck the checkmark box of the corresponding sensor to enable or disable failure alerts.
   - Checked: Shows sensor failure alerts
   - Unchecked: Hides sensor failure alerts

### Append a Log Name to Log files

1. Press the Settings button on the Screen Selection tool bar.
2. Select Logs tab.
3. Enter text to append a log filename

**Note**: Using the characters */>":| will cause the filename to be invalid and can prevent logs from being recorded.

**Restore Default Settings**

1. Press the Settings button on the Screen Selection tool bar.
2. Press the Restore Defaults button on the settings screen.
3. A prompt will appear warning the user that selecting OK will return all settings to a default state.

**Force Relays to shutoff when a process is started**

1. Press the Settings button on the Screen Selection tool bar.
2. In the Relay Control section, check Start Shutoff for the desired relay you wish to shutoff on process start.

**Set when relays activate during deposition process**

1. Press the Settings button on the Screen Selection tool bar.
2. In the Relay Control section, select the round radio button associated with the step during the deposition process when the relay should activate.
    - Manual: The relays will not activate during the deposition process automatically, but can still be controlled by the Relay # button.
    - Start: At the start of each layer/material in the process the relay will activate and will deactivate at the end of each material.
    - Predeposit: The relay will activate during the predeposit phase of the deposition process for each layer/material. The relay will then shutoff at the end of the deposition process.
    - Auto Deposition: The relay will activate during the dwell phase, just before the PID activation. This allows the dwell time to occur between shutters release and PID activation.

**Setting when Eon-LT™ automatically zeros sensor thickness**

1. Press the Settings button on the Screen Selection tool bar.
2. In the Sensor Zeroing menu, checkmark each setting associated with the sensor that is to have its thickness automatically zeroed.
    - Before Log: Eon-LT™ zeros thickness when Log button is pressed.
    - Start Pressed: Eon-LT™ zeros thickness when Start” button is pressed to start a new deposition.
    - Before Layer: Eon-LT™ zeros thickness each time a new layer/material engages during the process.
    - Before PID: Eon-LT™ zeros thickness each time a new layer/material activates the PID.

# Safety, Handling, & Support

C Appendix

**WARNING** All electrical components are to be considered extremely dangerous if tampered with in any way. Colnatec is not liable for any injury resulting from product misuse, modification, or disassembly.

**WARRANTY LABEL** If the warranty label has been tampered with, “VOID” will appear where the warranty label was originally placed. If this is visible at the time of arrival, it is important that you contact Colnatec immediately after receiving the product.

**EXAMINE YOUR NEW EON-LT™ FOR ANY SIGNS OF PHYSICAL DAMAGE. ALSO, ENSURE THAT THE TAMPER-EVIDENT LABELS ARE INTACT** Before shipping, your Eon-LT™ was calibrated and tested by Colnatec to meet the highest quality standards. It is important that you take a few minutes to inspect the product to ensure that your equipment was not damaged or otherwise tampered with during transit.

## About Eon-LT™

With the ability to sense deposition and temperature with high precision, the Eon-LT™ thin film monitor is one of the newest advancements in Thin Film deposition monitors. The Eon-LT™ provides features that help improve measurement accuracy for better process control.

## LabVIEW® Interface

The Eon-LT™ offers a simple LabVIEW® interface that provides an operating environment that is intuitive, efficient, and impressive. The Eon-LT™ is easy to set up right out of the box.

## Software Updates

The Eon-LT™ interface software can be upgraded on site to provide software improvements. There will be notifications when these updates become available.

## Inspection & Initial Setup

Examine Eon-LT™ for any signs of physical damage. Also, make sure that the tamper-evident labels are intact. In order to ensure safe, correct operation of your Eon-LT™, please follow the step-by-step instructions presented in the Eon-LT™ Quick Start guide included with your product.

## Warranty

Eon-LT™ is warranted to the original purchaser to be free of any manufacturing-related defects for one year from the date of purchase. Colnatec reserves the right to repair or replace the unit after inspection.

## Contact Colnatec Support

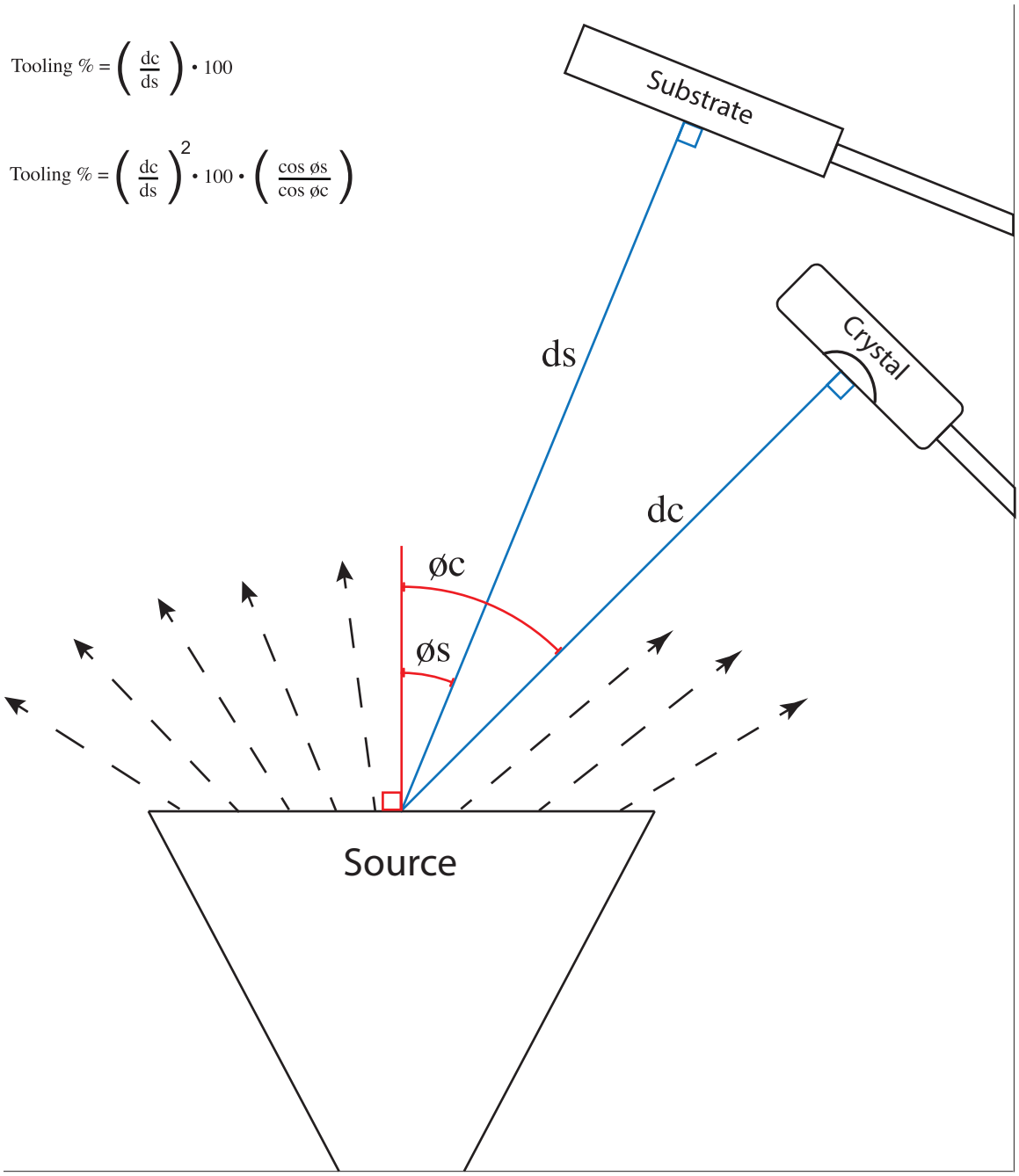
511 W. Guadalupe Road, Suite 23
Gilbert, AZ 85233
(480) 634-1449
support@colnatec.com
www.colnatec.com

# Tooling Factor

D Appendix

$$\text{Tooling } \% = \left(\frac{dc}{ds}\right) \cdot 100$$

$$\text{Tooling } \% = \left(\frac{dc}{ds}\right)^2 \cdot 100 \cdot \left(\frac{\cos \text{ø}s}{\cos \text{ø}c}\right)$$



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December 2014
Ver. 3.0.11