



3sigma Application Quick Reference

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Introduction

This document introduces the *3sigma Application Program*. The application, created for use with the Molelectron Detector, Inc. 3sigma Laser Energy/Power meter, provides real-time, two-way communication between the 3sigma and a computer. The program requires a Windows-based computer system with an available RS-232 communications port. Below is a description of the application program, as well as instructions on how to install, operate, and use it.

Features

- Displays real time instrument readings.
- Allows viewing of every pulse on a strip chart.
- Displays a histogram of instrument readings.
- Allows instrument readings to be easily stored in a file.
- Permits easy analysis of previously saved readings.
- Allows control of 3sigma from the computer, eliminating the need for manual control.
- Easy to use.

Installation

This section discusses the host system requirements and provides instructions for installing the program.

Host Computer System Requirements

- 32-bit Microsoft Windows operating system.
- One available RS-232 serial port.
- Mouse or other pointing device.
- 1024 by 768 screen resolution.

To install the program onto your hard drive

1. Download the *3sigma Application Install.exe* file from the Molelectron web site.
2. Run the *3sigma Application Install.exe* file.
3. Follow the on-screen instructions to complete the installation.

The following files should appear on your hard drive after a successful install

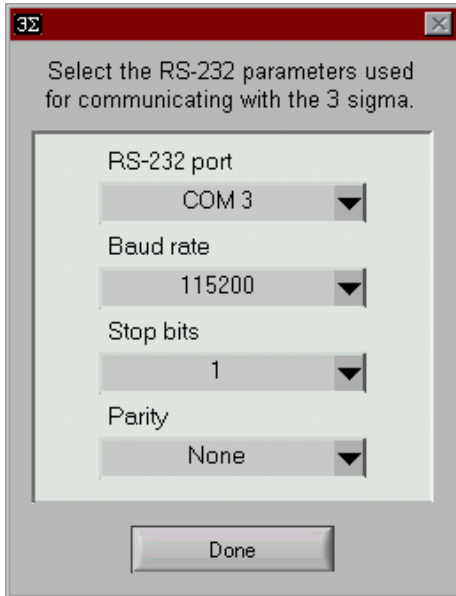
- | | |
|-------------------------------------------------------|-------------------------------|
| • <i>3sigma Application.exe</i> | Main application |
| • <i>3sigma Application.hlp</i> | Help file |
| • <i>3sigma App Quick Reference.pdf</i> | Document file |
| • <i>Serpdrv</i> | Serial port driver file |
| • <i>Uninstall files</i> | Used to uninstall application |
| • <i>National Instruments™ Labview™ Runtime Files</i> | Runtime files for application |

Program Operation

The following sections give a general description of how to use the program. The best way to learn is by trying the different operations while actually running the program.

Select Communications Window

This window, which appears after starting the program, allows the selection of the communication interface settings. Before making a selection, attach the appropriate cable between the 3sigma and the computer, and verify that the 3sigma is powered on.



The *RS-232 port*, *Baud rate*, *Stop bits*, and *Parity* settings must be properly set. The RS-232 port being used on the computer determines the *RS-232 port* setting. The other settings must match the settings of the 3sigma instrument. Refer to the *3sigma Reference Guide* to determine how to access the baud rate, parity, and stop bits settings.

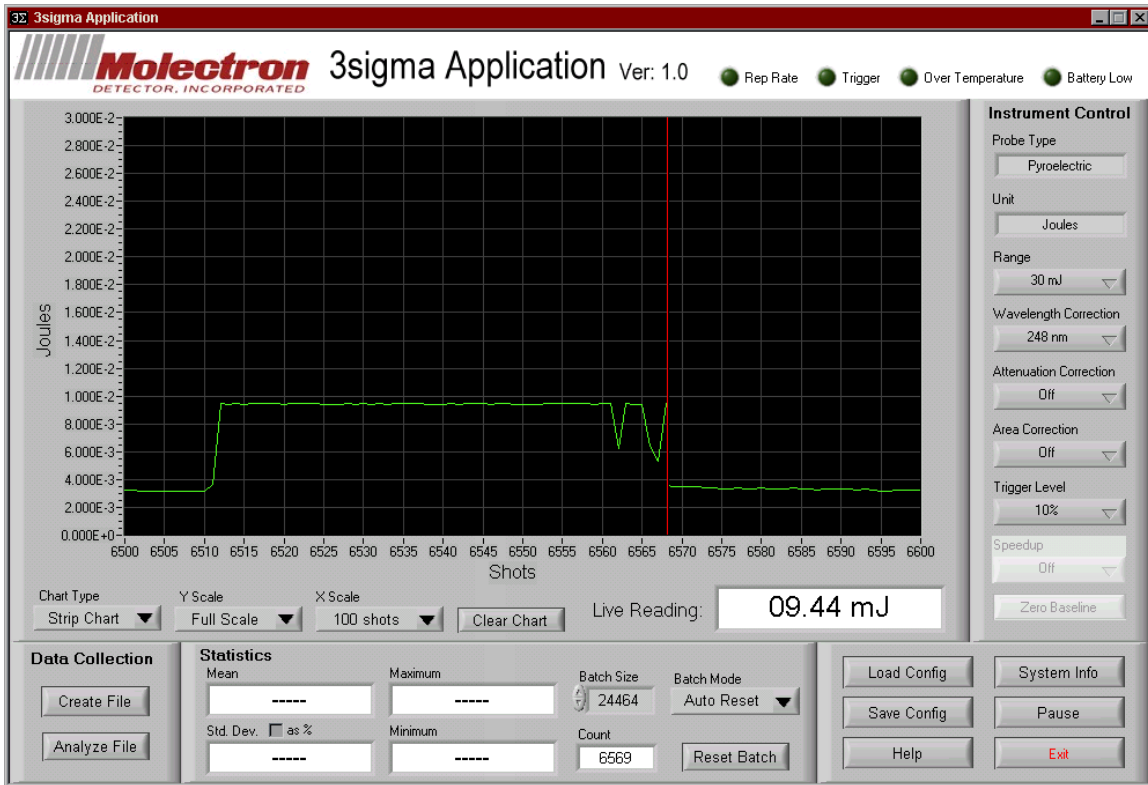
After selecting the communication settings, press the *Done* button. The program displays a message if the application program cannot detect the 3sigma at this point. If a problem does occur, verify the communication settings and check that all cable connections between the instrument and the computer are properly secure.

Once the program detects the instrument, it displays the current state of the instrument in the main application window. If the instrument is triggering, the program begins displaying readings. If the instrument is triggering

at a high rep rate, readings may be lost due to an inadequate speed of either the communication interface or the application program. For the best performance at high rep rates, select the highest baud rate possible.

The 3sigma Application Window

The 3sigma application window has five main sections: *Instrument Control*, *Display*, *Data Collection*, *Statistics*, and *Miscellaneous Controls*.

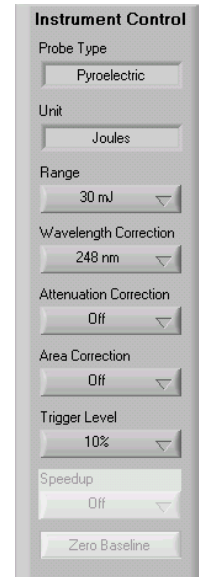


Main Application Window

Instrument Control Section

The *Instrument Control* section has several controls and indicators that control the instrument and display the current instrument settings. To change an instrument setting, select the appropriate control in this section. Instrument settings will change accordingly.

Some controls may be grayed out if they do not apply to the current state of the instrument. For example, when a pyroelectric probe is connected, the *Speedup* and *Zero Baseline* controls are unavailable and are grayed out. These controls only apply to a thermopile or an optical probe.



Instrument Control

The *Instrument Control* section contains the following items:

- *Probe Type* - displays the type of probe currently connected to the 3sigma.
- *Unit* - displays the measurement unit of the instrument.
- *Range* – displays and allows the selection of the full-scale range of the instrument.
- *Wavelength Correction* - displays and allows the selection of the instrument's wavelength correction.
- *Attenuation Correction* - displays and allows the selection of the instrument's attenuation correction.
- *Area Correction* - displays and allows the selection of the instrument's area correction.

Available only with a pyroelectric probe:

- *Trigger level* - displays and allows the selection of the instrument's trigger level.

Available only with a thermopile/optical probe:

- *Speedup* – displays and allows the selection of the instrument's speedup mode.
- *Zero Baseline* – allows the baseline of the instrument to be set.

Display Section

The *Display* section displays a live strip chart or a histogram of the data received from the instrument.

The *Display Type* control is used to select the type of display that will appear. When the strip chart is selected, the *y scale* control sets the vertical limits of the strip chart, and the *x scale* control sets the maximum number of readings (seconds for thermopile/optical probe) that appear on the chart.

Pressing the *Clear Chart* button clears the strip chart.

When the histogram is selected as the display type, the *No. of bins* control determines the number of bins displayed on the histogram.



Display Section

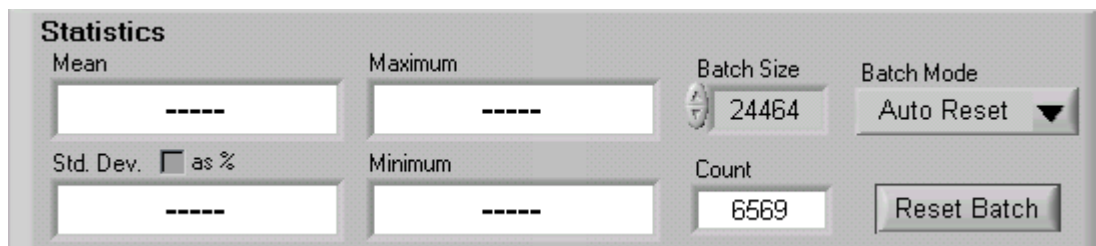
Statistics Section

The *Statistics* section displays the mean, standard deviation, maximum, and minimum values calculated from a batch of readings.

To change the number of readings (seconds for thermopile/optical probe) included in a batch, enter a new number in the *Batch Size* control.

The *Batch Mode* setting determines how the batch is reset after a batch is complete. A counter indicates how many readings (seconds for thermopile/optical probes) have been collected for the current batch.

Press the *Reset Batch* button to clear the current batch. A new batch will then start.



Statistics Section

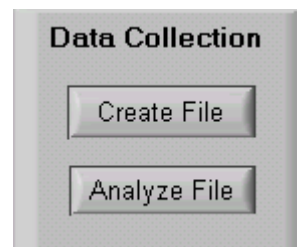
Data Collection Section

The *Data Collection* section is used to create and analyze a data log file.

Pressing the *Create File* button creates a data log file. The number of readings to collect or the amount of time for collection must first be selected. The interval used for data logging must also be selected. The interval setting determines the number of pulses or the amount of time between readings saved to the data log file. A file name for the log file must also be specified.

Once a data file is created, pressing the *Analyze File* button allows the file to be examined. The *File Analysis* window appears after this button is pressed.

Any program that is capable of reading ASCII text files can read a data log file.



Data Collection Section

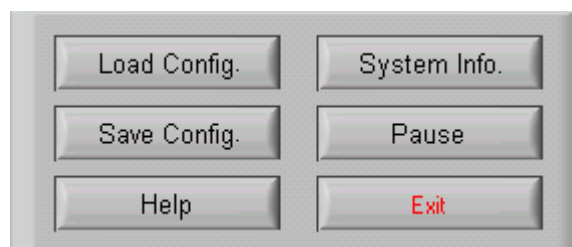
Miscellaneous Controls Section

The *Miscellaneous Controls* section contains several options for controlling the application.

Selecting the *Load Config.* button loads a previously saved configuration file. A configuration file has information for setting up the application and the instrument.

Selecting the *Save Config.* button saves the current configuration of the application and instrument to a file for later recall.

The *Help* button allows a help file relating to the application to be displayed.



Miscellaneous Controls Section

The *System Info.* button allows information relating to the probe and instrument to be displayed.

Selecting the *Pause* button suspends data collection from the instrument.

The *Exit* button allows the termination of the application.

File Analysis Window

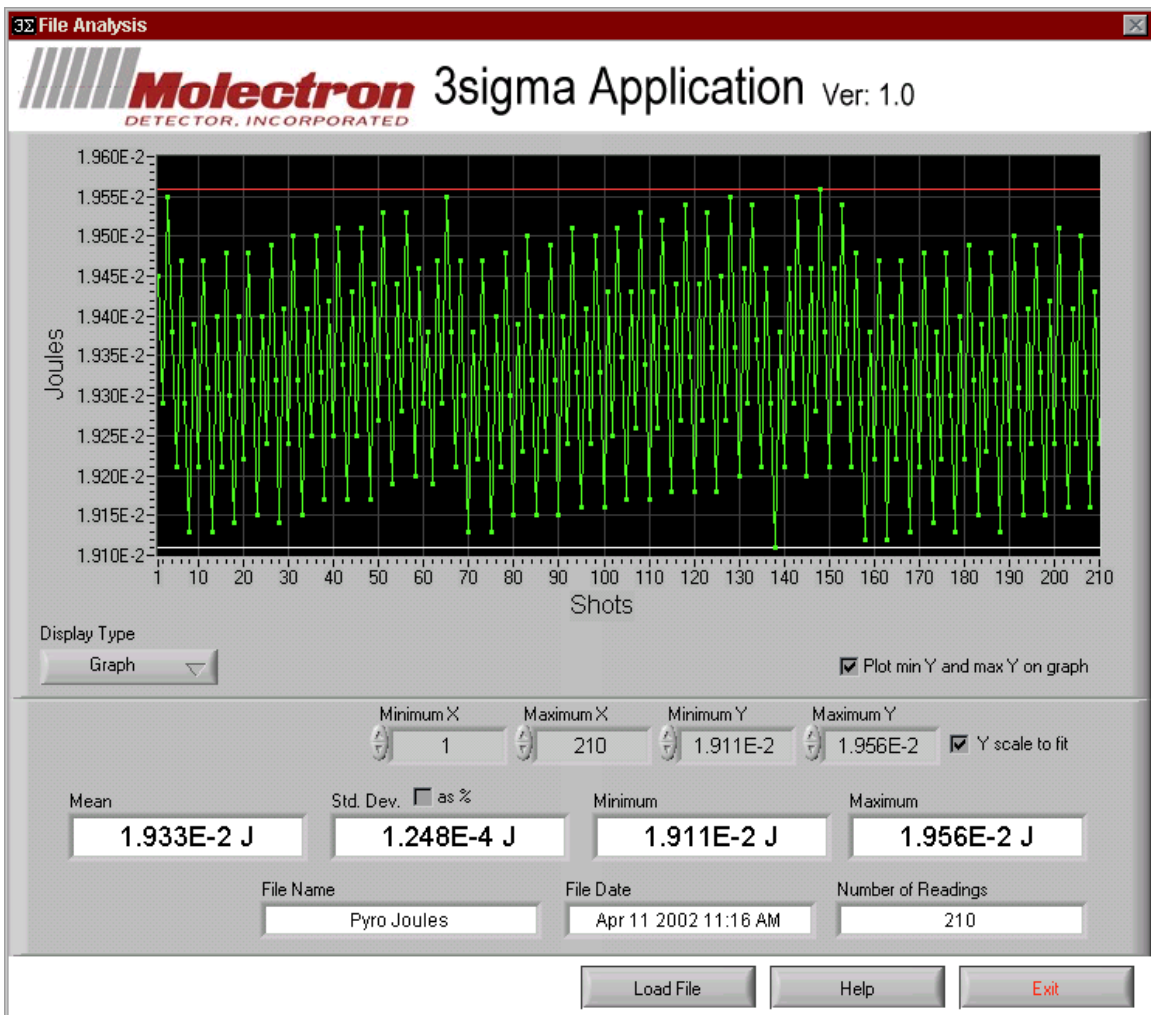
The *File Analysis* window allows the examination of a previously created data log file. After entering a file name, the data log file loads and displays on a graph. The graph axes are set so the data will fit within the graph window.

The scale controls allow the minimum and maximum x scales, and the minimum and maximum y scales to be set manually.

The *Display Type* control allows the selection of a graph or a histogram to be displayed. The number of cells displayed on the histogram can be changed, as desired.

At the bottom of the window is the *Statistics* section. This section displays the mean, standard deviation, and the minimum and maximum values, as calculated from the readings appearing on the chart.

Pressing *Exit* will exit the window and return the program to the Main Application window.



File Analysis Window