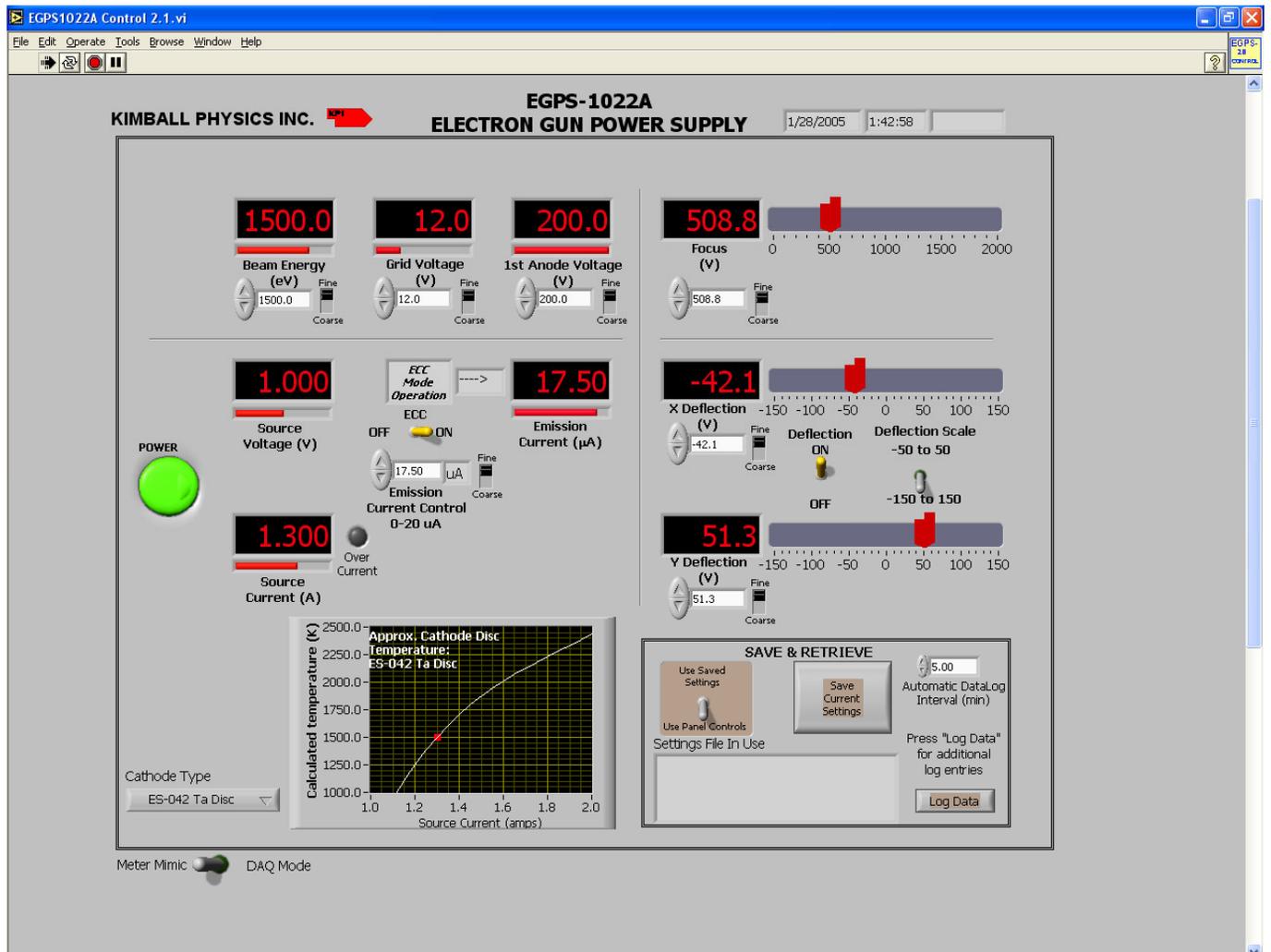


## 4.1 DESCRIPTION OF CONTROLS cont.

### EGPS-1022 Power Supply Remote Control Computer Panel



(ADDITIONAL CONTROLS AND INDICATORS BELOW MAIN PANEL)

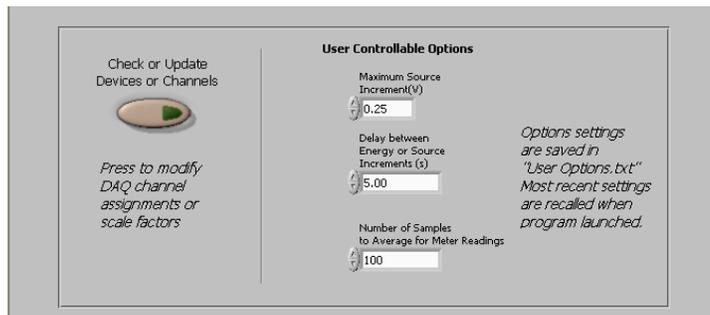


Fig. 4.1-4 Screen captures of LabVIEW™ program for EGPS-1022 Power Supply System remote control

## 4.1 DESCRIPTION OF CONTROLS cont.



Fig. 4.1-5 Virtual Panel of a typical LabVIEW program for computer remote control and metering (Particular controls may vary with gun model)

### EGPS-1022 Power Supply Remote Control Computer Panel

The following is a description of the function of the controls in the LabVIEW™ computer remote programming of the EGPS-1022 Power Supply.

**Power Button:** A pushbutton labeled **POWER** with a green arrow that lights when on. It is used to start or stop the LabVIEW™ program, after the Power switches on the EGPS-1022 have been physically turned on. Although switching the computer Power button to off sets all program voltages to zero, **this button does not energize or shut down the power supplies.**

#### ENERGY, GRID VOLTAGE, 1st ANODE VOLTAGE, SOURCE/ ECC, FOCUS, DEFLECTION X and Y

**Digital Controls:** Program input controls that voltage program the associated power supplies in the same way as the EGPS-1022 front panel potentiometers (see above). Labels below the control give the supply range. **It is strongly recommended that Beam Energy and Source be turned up gradually.** If too large an increase is entered, the program will automatically make the change in a more gradual series of steps.

The **Fine/Coarse** slide switch changes the input increments controlled by the up/down arrow switches by a factor of ten. For example with Energy on Fine, one click gives a 0.1 keV increase or decrease, and on Coarse, one click gives 1 keV.

#### Thumb Slide Controls: (Focus and Deflection only)

Program input controls that voltage program the associated power supplies in the EGPS-1022. The large slide controls with the red arrows have the same effect as the digital input controls but allow easier adjustment for alignment.

**Digital Indicators:** Digital meters that display the meter signals out of the associated supplies in the EGPS-1022 (see above). The indicator may not be linear with the input digital control, as it displays the actual output.

**Horizontal Fill Slides:** Horizontal slide bars that display the meter signals out of the associated supplies in the EGPS-1022. They display more visually the same data as the digital indicators.

**ECC (Emission Current Control) Switch:** A toggle switch labeled **ECC ON / OFF**. When the switch is in the **Off** position (Source mode), it allows the user to set the desired Source voltage directly. When the switch is in the **On** position (ECC mode), it allows the user to set the desired emission current. The default is Off for Source mode.

Note that in ECC mode, the **Source Control** is labeled **Emission Current Control** and is used to set the desired emission current. The Source Voltage will then be varied automatically by the emission feedback circuitry to maintain the set emission current.  
**Source mode must be used when pulsing.**

**Deflection On/Off switch:** A toggle switch labeled **Deflection ON / OFF**. When On, the deflection supplies are voltage programmed by the controls. When Off, a control voltage of 0 V is sent to the deflection supplies, regardless of the control settings. Note that this switch does not ground the deflection plates in the way that the physical DEF ON/OFF rocker switch on the EGPS does; that is the computer switch does not control a relay within the power supply. If switched off and then back on, the controls will return to the previously set values.

**Deflection scale range toggle switch** sets the range of the X and Y Deflection controls.

## 4.1 DESCRIPTION OF CONTROLS cont.

### EGPS-1022 Computer Panel cont.

#### SAVE & RETRIEVE

**Settings Toggle Switch:** A two position toggle switch labeled **Use Saved Settings / Use Panel Settings**. In the Panel Settings mode, all the controls on the virtual panel can be controlled by the user. When the switch is moved to the Use Saved Settings position, a dialog box allows the user to choose a previously saved file of parameter values. The saved settings will then be entered as the supply controls, and the file will be shown in the box labeled **Settings File In Use**. The toggle switch will return to the Use Panel Controls position to allow settings to be changed by the user.

**Save Settings Pushbutton:** A pushbutton labeled **Save Current Settings** that brings up a dialog box to save the current parameter values in a file for future use.

**Data Log File:** A tab-delimited text file labeled DataLog.txt that automatically records the values of all the controls and meters at a user controllable time interval while the program is running.

**Automatic Data Log Interval** sets how often the data (all the control settings and meter readings) is recorded in the DataLog.txt file.

The **Log Data** pushbutton records an additional set of all values at the time it is pushed.

**CATHODE GRAPH:** A graph that tracks the Calculated Cathode True Temperature vs Source Current in real time as the Source Control is varied. The appropriate cathode type must be selected in the user-controllable options below.

**Cathode type:** A pull-down list to select the type of cathode installed in the gun (Ta disc, LaB<sub>6</sub>, etc.). The temperature calculation used in the cathode graph, and the Source overcurrent warning limit depend on this setting.

#### Warning Messages:

A window with a reminder to change toggle switches on the EGPS to remote will be displayed when the program is opened initially.

A warning message will be displayed if the Energy or Source, is increased in too large a step; the program will then gradually bring the supply to that setting.

A warning message will be displayed if the system is in ECC mode and a settings file in Source mode is chosen. The Source will go to zero automatically and then need to be turned up again. A similar warning will occur if the system is in Source mode and an ECC file is chosen.

A yellow overcurrent button will light up if the source current exceeds the recommended maximum operating current. **Running the Source current this high greatly reduces the cathode lifetime.** For this warning to be correct, the appropriate cathode type, corresponding to the one installed in the gun, must be chosen in the Cathode Type pull-down list.

**METER MIMIC/DAQ MODE SWITCH:** A toggle switch that sets the operating mode of the computer program. When in Meter Mimic, program does not address DAQ boards. Useful for testing program on computer without DAQ boards installed. Program will make some very SIMPLE calculations to roughly mimic cathode behavior. When in DAQ mode, program addresses DAQ boards. An error message will be generated if DAQ boards are not present or are inconsistent with those expected by program.

**User Controllable Program Options:** A number of program variables that can be set by the user, but will probably not be changed frequently. This area is viewed by scrolling down below the usual operating panel. These options are stored in "user options.txt" file. When the program is started, the most recent user options are recalled. If an option is changed, the new value can be saved. These preference settings include:

**Max Source increment** sets the size of steps by which the controls for these high voltage elements can be changed. If a new settings file or operator enters too large change, the program will bring the supply up in smaller steps. The **Delay between increments** control sets the time interval for these steps.

#### Number of samples to average for meter readings

The settings with which the program is shipped are ones Kimball Physics recommends:

Max Source increment = 0.25 V

Delay = 5 sec

Number of samples to average = 100

**Check or Update Devices or Channels:** A pushbutton below the panel that brings up an array showing the ranges of all the controls and meters in the LabVIEW program. The values should only be changed if the DAQ boards or EGPS-1022 power supplies are physically modified.

**Troubleshooting indicators (hidden):** An additional set of indicators of program operation that were used during program development, but are not normally displayed. If needed for program troubleshooting, contact Kimball Physics.