

Mightex CCD Spectrometer Combined with 405nm Laser

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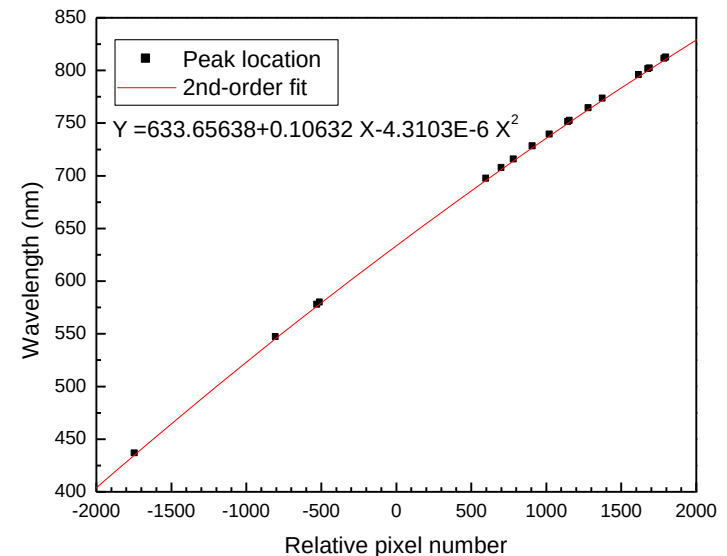
Specification and Calibration of Mightex CCD Spectrometer

- Specification

1. Grating has groove density of 600g/mm; Blazed at 500nm.
2. Visible region: 425-815nm
3. Spectrum line width of CAL-2000: $0.63 \pm 0.048 \text{ nm}$
4. Accuracy: $\sim 0.06 \text{ nm}$

- Calibration Procedure

1. Input CAL-2000 calibration light source
2. Compare the spectrum with the one in the last page.
3. Record peak locations in relative pixel (pixel number subtracted by 1824)
4. Fit the data points with 2nd order curve



Statically Analysis of Spectral Linewidth and Accuracy

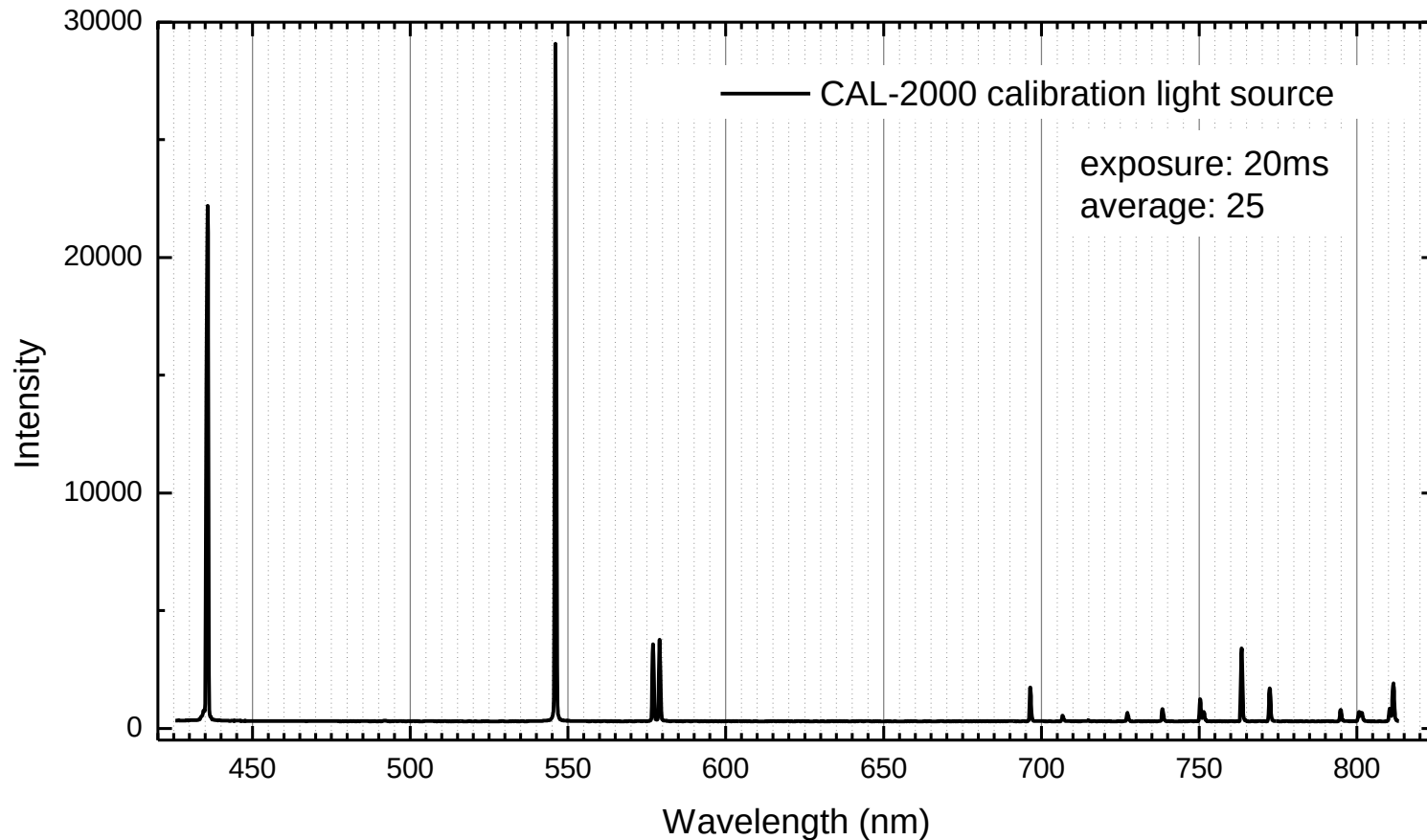
• Spectral Linewidth

Peak Location (nm)	FWHM (nm)
435.84	0.74
546.06	0.62
576.96	0.63
579.07	0.59
696.54	0.58
706.72	0.58
714.70	0.56
727.29	0.59
738.40	0.61
750.39	0.61
751.46	0.68
763.51	0.64
772.42	0.64
794.82	0.64
810.37	0.68
811.53	0.68
Average(nm)	0.63
Standard Deviation (nm)	0.048

• Accuracy of Spectrometer

Theoretical Peak Location (nm)	Reading Peak Location (nm)	Difference (nm)
435.84	435.852	0.012
546.06	546.068	0.008
576.96	576.983	0.023
579.07	578.976	-0.094
696.54	696.503	-0.037
706.72	706.770	0.050
714.7	714.860	0.160
727.29	727.232	-0.058
738.4	738.398	-0.002
750.39	750.417	0.027
751.46	751.477	0.017
763.51	763.446	-0.064
772.42	772.358	-0.062
794.82	794.860	0.040
800.62	800.659	0.039
801.48	801.393	-0.087
810.37	810.431	0.061
811.53	811.521	-0.009
Standard Deviation (nm)		0.062

Spectrum of CAL-2000 Detected by Mightex CCD Spectrometer



Peaks Location (nm)
435.84
546.06
576.96
579.07
696.54
706.72
714.7
727.29
738.4
750.39
751.46
763.51
772.42
794.82
800.62
801.48
810.37
811.53

Recalibration for Adjusting Visible Range

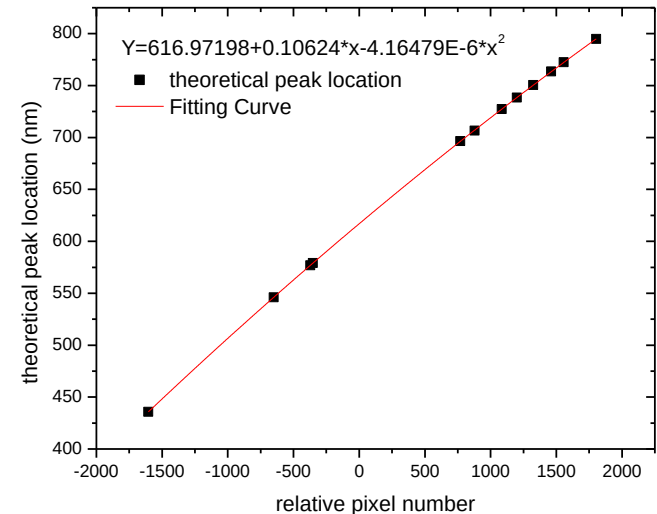
Specification and Calibration of Mightex CCD Spectrometer

- Specification

1. Grating has groove density of 600g/mm; Blazed at 500nm.
2. Visible region: 410-800nm
3. Spectrum line width of CAL-2000: $0.963 \pm 0.119 \text{ nm}$
4. Accuracy: $\sim 0.152 \text{ nm}$

- Calibration Procedure

1. Input CAL-2000 calibration light source
2. Compare the spectrum with the one in the last page.
3. Record peak locations in relative pixel (pixel number subtracted by 1824)
4. Fit the data points with 2nd order curve



Statically Analysis of Spectral Linewidth and Accuracy

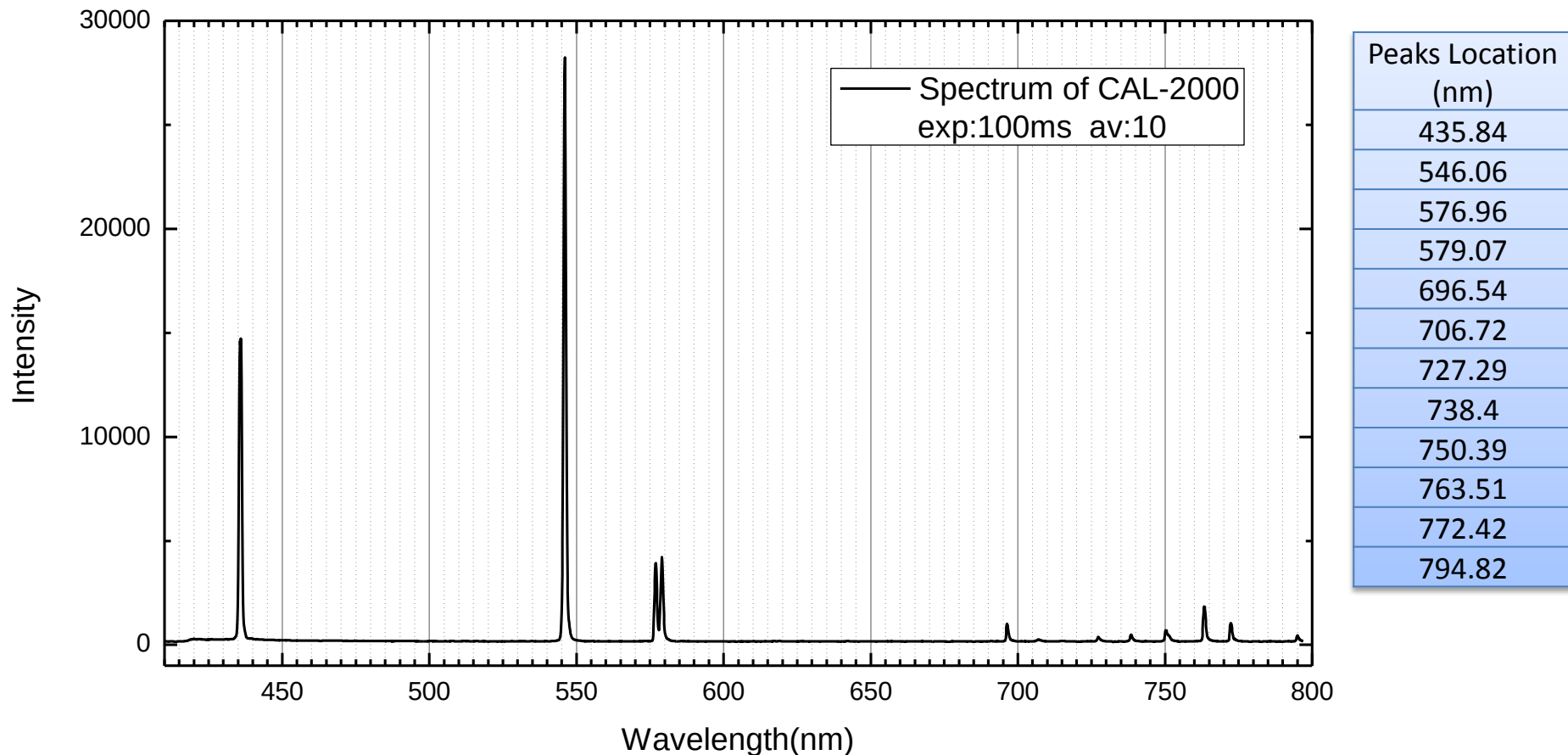
• Spectral Linewidth

Peak Location (nm)	FWHM (nm)
435.84	1.228
546.06	0.98
576.96	1
579.07	1
696.54	0.84
727.29	0.93
738.40	0.84
763.51	1.02
772.42	0.97
794.82	0.82
Average(nm)	0.963
Standard Deviation (nm)	0.119

• Accuracy of Spectrometer

Theoretical Peak Location (nm)	Reading Peak Location (nm)	Difference (nm)
435.84	435.848	0.008
546.06	546.045	-0.015
576.96	576.984	0.024
579.07	579.059	-0.011
696.54	696.307	-0.233
706.72	707.040	0.320
727.29	727.339	0.049
738.4	738.463	0.063
750.39	750.333	-0.057
763.51	763.299	-0.211
772.42	772.291	-0.129
794.82	794.984	0.164
Standard Deviation (nm)		0.152

Spectrum of CAL-2000 Detected by Mightex CCD Spectrometer



Some Notice when Building Executable File

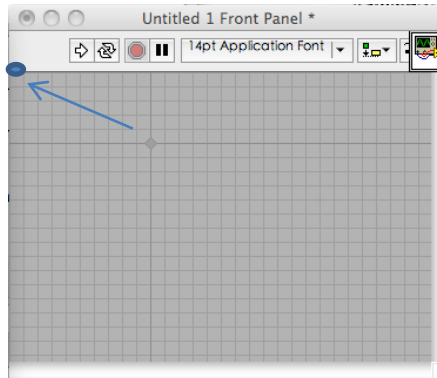
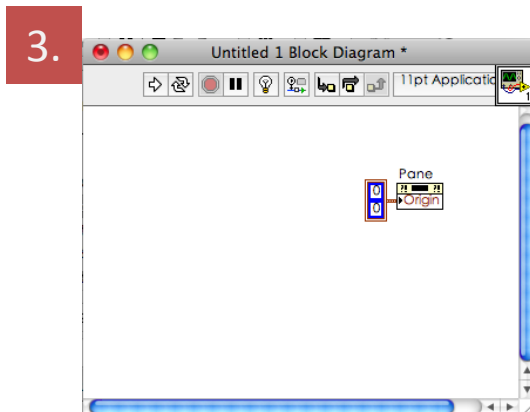
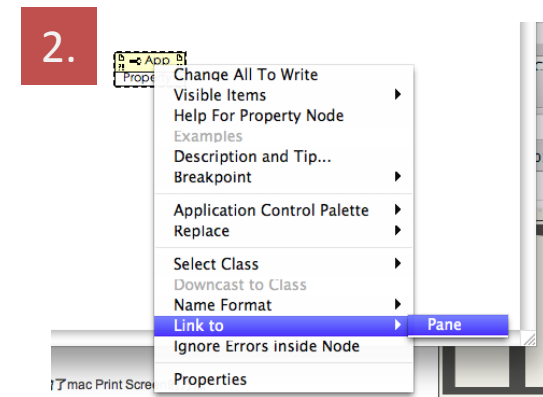
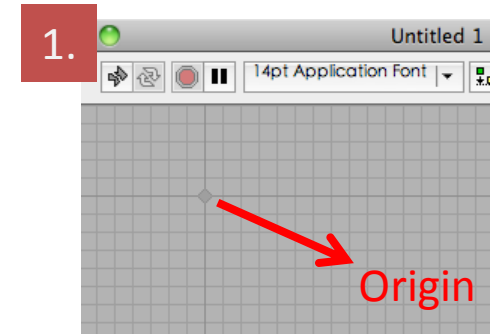
Adjusting Formatting – Part I

- Set position of the origin of VI

1. This is the origin.

2. Link property node to “Pane”

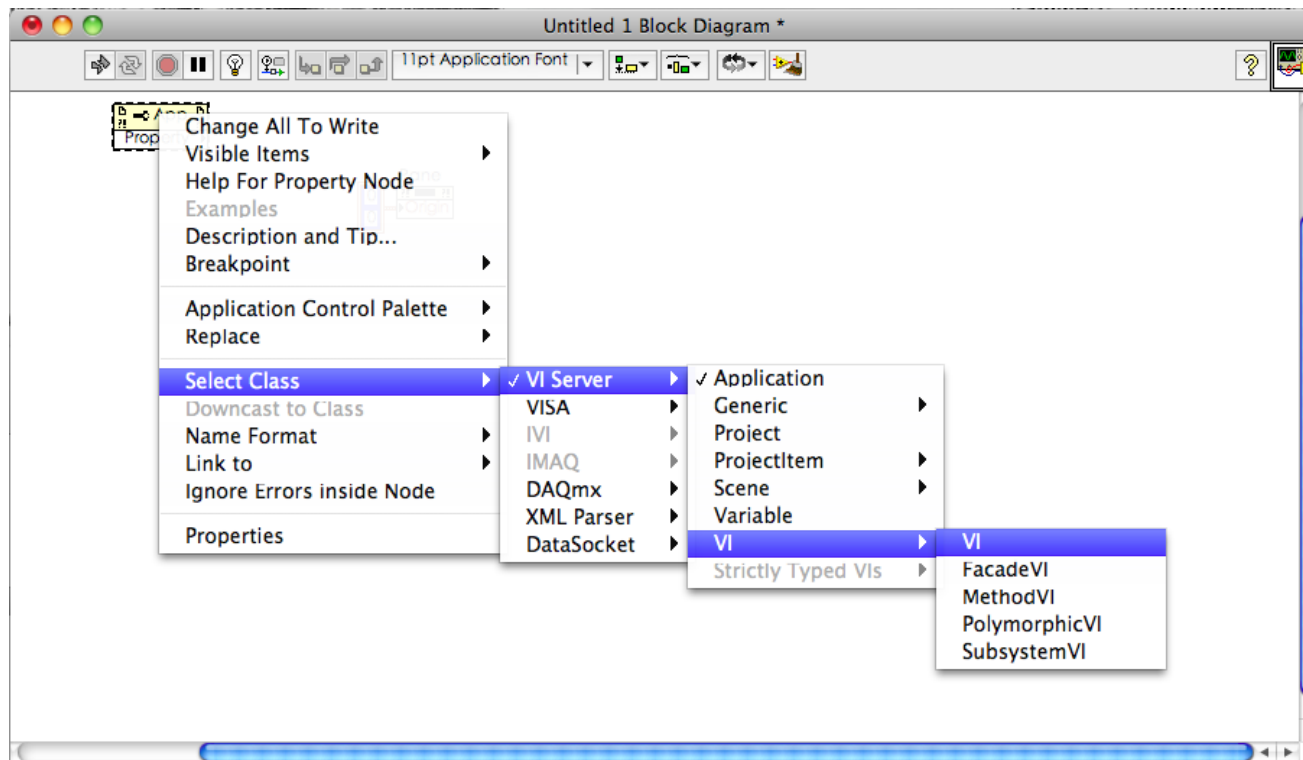
3. Set “origin” to (0,0). After running the “origin” will be seized to the blue point, the left-up corner of the front panel.



Adjusting Formatting – Part II

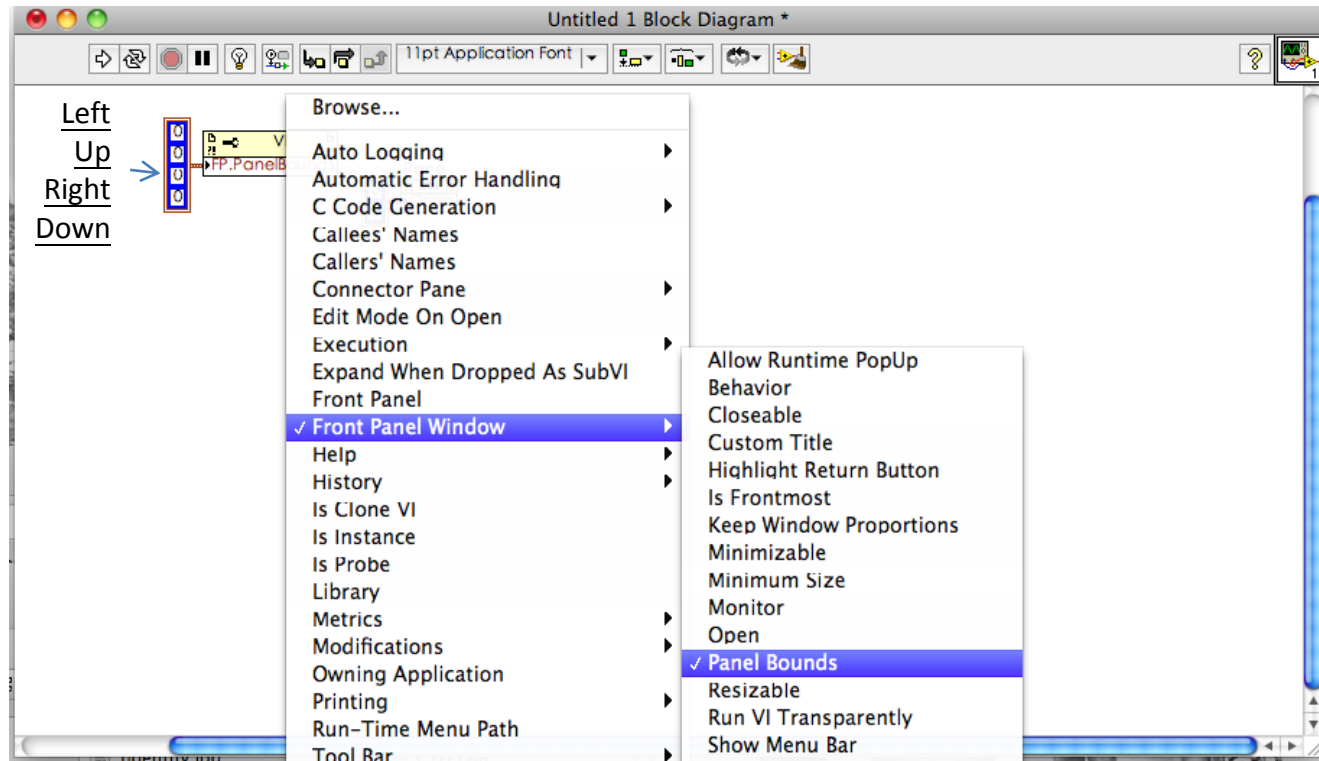
- Match size of the front panel to that of the target monitor.

1. Read the resolution of the target monitor



Adjusting Formatting – Part II

2. Set front panel bounds and the input numbers are pixel numbers of every screen. (it would be better to **set the upper bound to 50** because that is the space that the tool bar roughly needs)

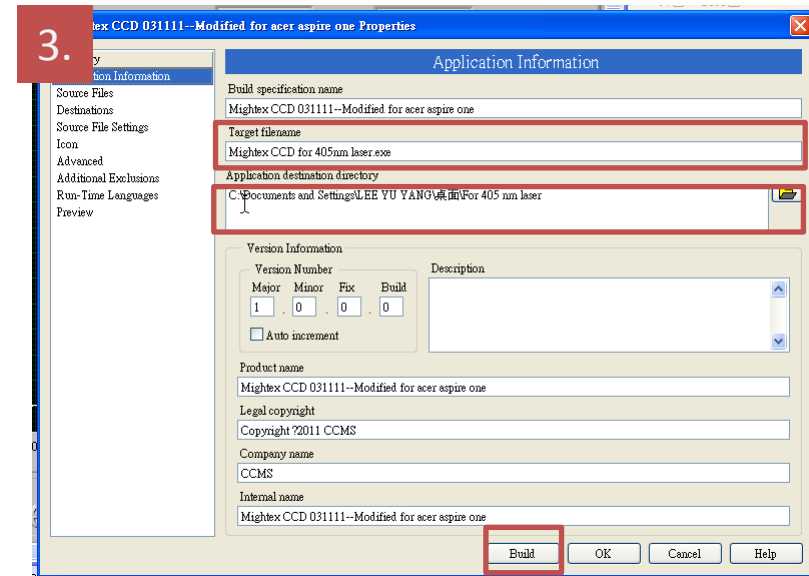
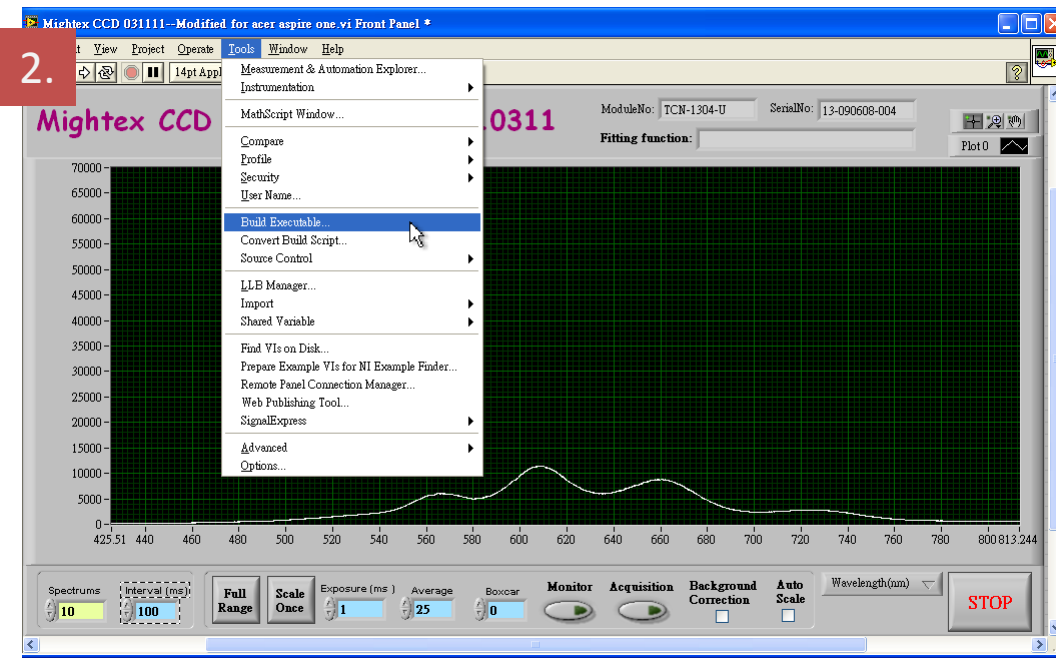


Adjusting Formatting – Part III

- After running, the size of the front panel will be confined to specified range.
- Do the modification and alignment.

Build Executable File (.exe)

1. Install right-version runtime engine in the target computer
2. Tools → Build Executable...
3. Set file name and directory, and press build



After Building Executable File

- In this transformation, labview would drop necessarily SDK or DLL files sometimes. Please check all the function in the target computer.
- Of course, don't forget the drivers.