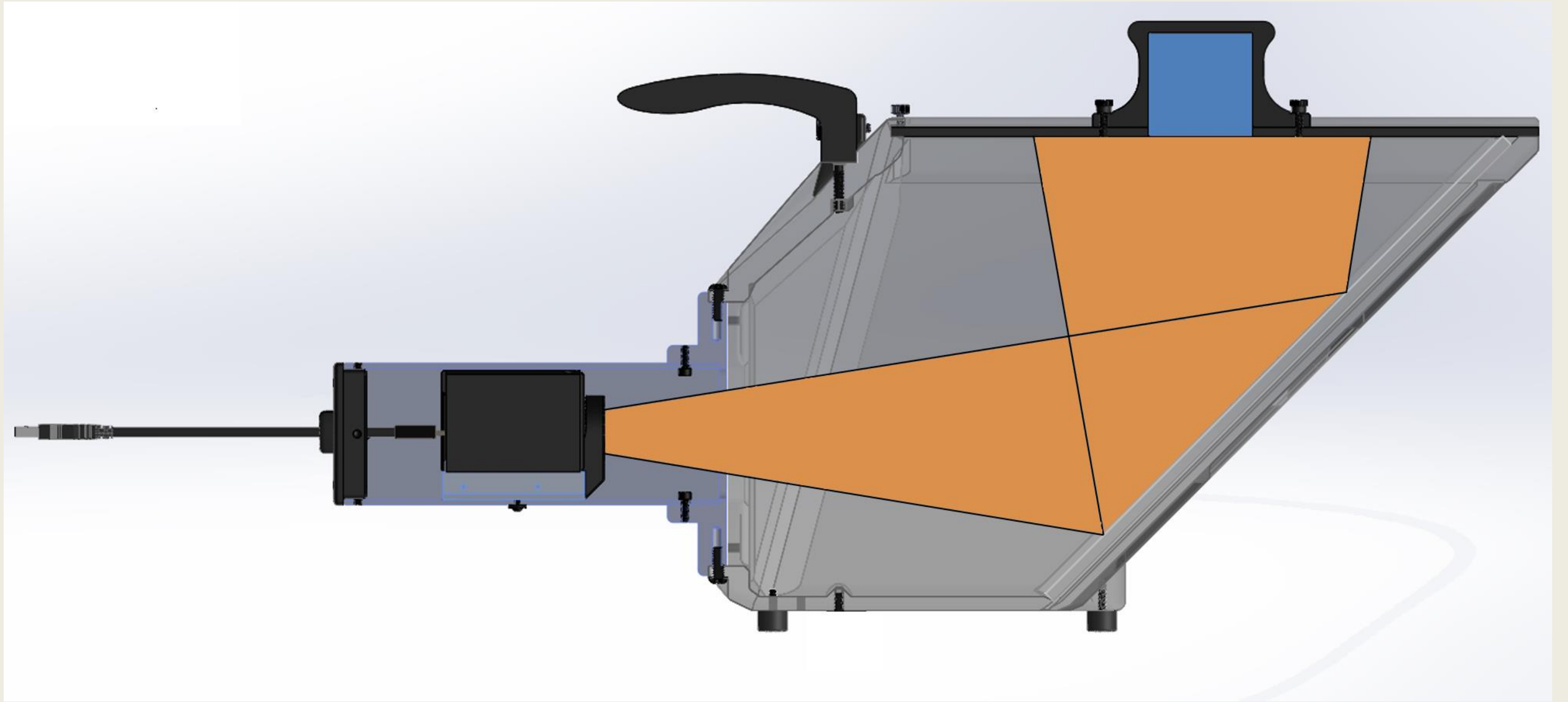


**Ranger-300 and XRV-3000 Eagle  
Proton Beam Energy Verification  
Logos Systems Int'l**

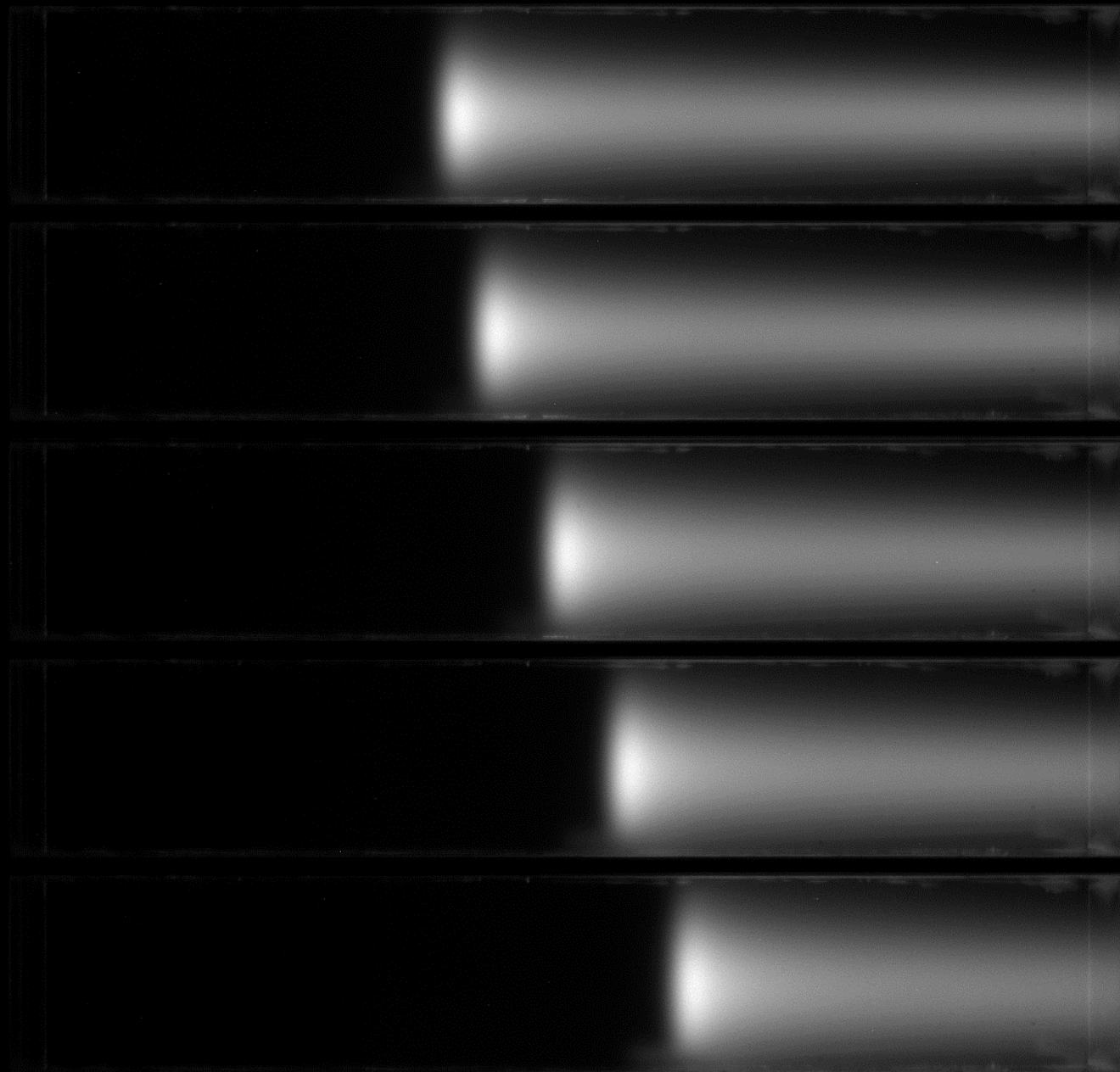
The Ranger-300 is mounted on top of the XRV-3000 Eagle



Protons exit the Mevion snout and enter the Ranger scintillator block through a build-up and opaque plastic window



As the ions slow down within the scintillator, light is generated and the beam image is reflected to the USB camera.



Beams of 50 – 244  
MeV energies can  
be captured and  
measured with the  
305 mm scintillator  
block and selectable  
range-shifting  
buildups

BraggPeakView can quickly and automatically record a series of R100 and P80/D80 measurements into a CSV log file.

The screenshot shows the BraggPeakView interface. On the left, a narrow beam profile is visible with a red crosshair. The main window displays a graph titled 'Gray Horiz' with a blue curve and a red vertical line indicating a peak. The status bar shows 'Updating profile data'. The 'Capture' section includes 'Auto Update' checked and various parameters for Start XY, End XY, Pitch, Max. Gray, and Min. Gray. The 'Measuring Bar A' and 'Measuring Bar B' sections show location, range, and value percentages. The 'Delta AB' section shows range and value percentages. The 'Auto Log' dropdown menu is set to 'R100'. The 'Excel Analysis' button is visible at the bottom right.

The screenshot shows the BraggPeakView interface. On the left, a wide beam profile is visible with a red crosshair. The main window displays a graph titled 'Gray Horiz' with a blue curve and a red vertical line indicating a peak. The status bar shows 'Updating profile data'. The 'Capture' section includes 'Auto Update' checked and various parameters for Start XY, End XY, Pitch, Max. Gray, and Min. Gray. The 'Measuring Bar A' and 'Measuring Bar B' sections show location, range, and value percentages. The 'Delta AB' section shows range and value percentages. The 'Auto Log' dropdown menu is set to 'R100'. The 'Excel Analysis' button is visible at the bottom right.

```

Profile_20210113_0001.log - Notepad
File Edit Format View Help

BraggPeakView R100 Autolog
Count:,7
Date:, 01/13/2021,11:57:04
Notes:

Image , R100 Range
Index , (mm)
1, 320.31
2, 203.91
3, 193.49
4, 173.54
5, 154.71
6, 136.14
7, 33.28
    
```



BraggPeakView\_Autolog\_R100\_MevionTemplate\_Rev1\_0520\_2020.xlsx

File Home Insert Page Layout Formulas Data Review View Developer Add-ins Help DoneEx SpreadsheetConverter Tell me what you want to do

Clipboard: Cut, Copy, Paste, Format Painter

Font: Calibri, 11, Bold, Italic, Underline, Text Color, Background Color

Alignment: Wrap Text, Merge & Center

Number: General, Currency, Percentage, Decimals

Conditional Formatting: Normal, Bad, Check Cell, Explanatory

T8

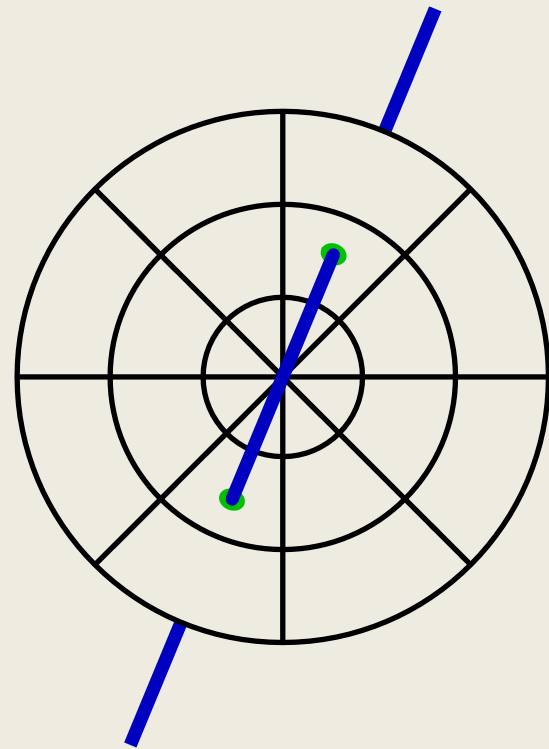
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	
1	BraggPeakView R100 Template V1.0																
2	This template is used to compare Ranger 300 data captured with WinLVS and displayed with BraggPeakView to nominal Bragg peak proton ranges as measured with ion chambers.																
3	Mevion Bortfeld Equation for R100 at Georgetown Medstar is $R100 = .0225 * E ^ 1.7625$ or $E = 8.61 * R100 ^ .5674$ (ICL Bortfeld is $R100 = .022 * E ^ 1.77$ or $E = 8.64 * R100 ^ .56497$ )																
4																	
5	BraggPeakView R100 Autolog																
6	Count:	7															
7	Date:	01/13/2021 11:57:04															
8	Notes:																
9																	
10	Image	R100 Range	Est. Energy	Beam Energy	Delta	Absolute	Commissioned				Proton Range	Delta	Absolute				
11	Index	(mm)	(MeV)	(MeV)	(MeV)	Delta	Absolute					(mm)	(mm)	Delta			
12	1	320.31	227.3337	227.1	-0.23	0.23					320.50	0.19	0.19				
13	2	203.91	175.9457	176	0.05	0.05					204.50	0.59	0.59				
14	3	193.49	170.7864	170.9	0.11	0.11					193.82	0.33	0.33				
15	4	173.54	160.5604	160.4	-0.16	0.16					173.32	-0.22	0.22				
16	5	154.71	150.4305	150.5	0.07	0.07					154.91	0.20	0.20				
17	6	136.14	139.9029	140.1	0.20	0.20					136.55	0.41	0.41				
18	7	33.28	62.9057	64.5	1.59	1.59					33.50	0.22	0.22				
19						Average:	0.35					Average:	0.31				
20						Max:	1.59					Max:	0.59				
21						Min:	0.05					Min:	0.19				
22						Std. Dev.	0.55					Std. Dev.	0.15				

The BraggPeakView log file is pasted into an Excel template for comparison with commissioning proton range values.

Commissioned			
Proton Range (mm)		Delta (mm)	Absolute Delta
320.50		0.19	0.19
204.50		0.59	0.59
193.82		0.33	0.33
173.32		-0.22	0.22
154.91		0.20	0.20
136.55		0.41	0.41
33.50		0.22	0.22
		Average:	0.31
		Max:	0.59
		Min:	0.19
		Std. Dev.	0.15

After BragPeakView is calibrated using the customer's water tank depth-dose curves, typical proton range measurement accuracy is better than 0.5 mm

# Digital Real-Time Proton and X-ray Beam Metrology Solutions



# Logos Systems

[LogosVisionSystem.com](http://LogosVisionSystem.com)