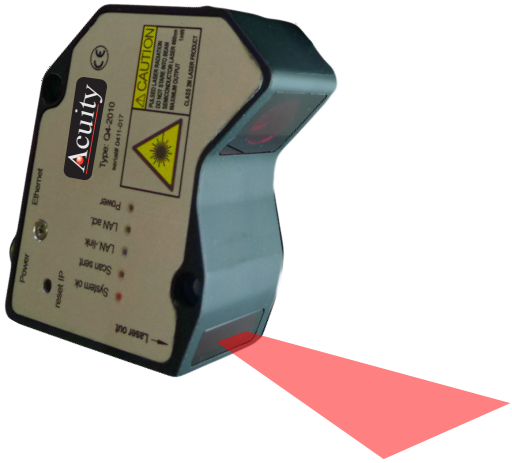
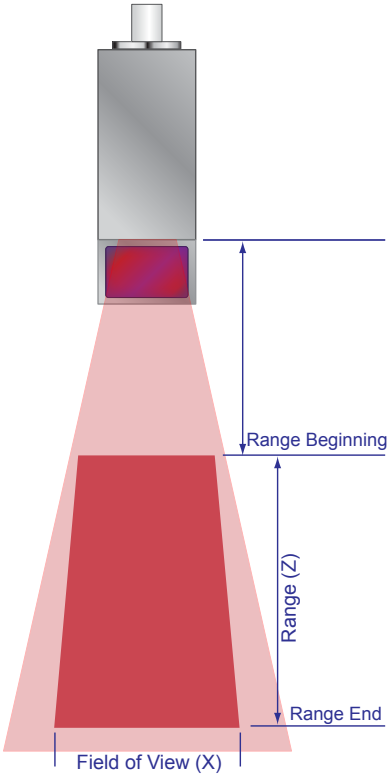
Acuity®

The AccuProfile 820 2D laser scanners are high-accuracy sensors for industrial surface dimensioning and measurement applications. The scanner quickly and accurately generates low-noise 2D or 3D profile scans of objects, surfaces or scenes. The sensor automatically adjusts laser power and detector exposure to compensate for varying surface conditions.

Principles of Operation

The AccuProfile™820 2D Laser Scanners measure surface height profiles by projecting a beam of visible laser light that creates a line on the target surface. Reflected light from the surface is viewed from an angle by a CCD detector inside the AP820 sensor. The 2D contour profile is calculated by the scanner's microprocessor from the pixel data from the diffusely - reflected laser line. The device automatically adjusts laser power and detector integration time based on the reflectivity characteristics of the target. The height distance profile is transmitted via Ethernet to a PC computer. Real-time 3D profiling may be created by synchronizing the position of the scanner with encoder inputs from conveyors, linear stages or robotic movements. A variety of models are specified, each to allow a different measurement range and field of view.

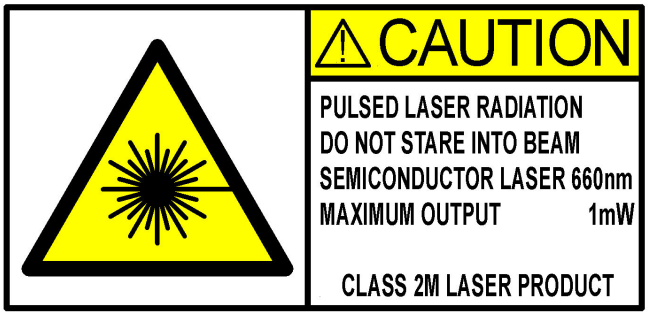


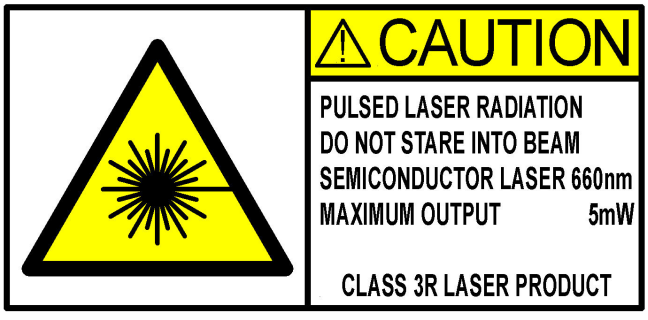


Typical Scanner Applications

- **Weld Gap Tracking and Weld Bead Profiling** - High-speed tracking of the weld bead location, size and shape
- **Positional Control of Objects and Surfaces** - Robots can be positioned based on the location of surface features and process variables
- **Tire Profiling** - Measurement of bulge, dent and other sidewall or tread defects.
- Wheel Profiling - Outer diameter scan for dimensional verification and flaw detection
- **Surface Profiling** - Inspect large surfaces to verify dimensional tolerances or identify and measure surface defects
- **3D Profile Generation** - Gather a part's dimensional information by moving the scanner's laser line across a the entire surface.
- **Dimensioning** - Measure width, thickness, length, surface angle, radius or any shape or any shape dimension using the height-profiling capabilities of a 2D scanner.

Laser Safety Labels





AP820 Model Specifications in mm [in.]

Model	-5	- 20	- 40	- 60	- 80	- 120	- 240	- 400	-1000
Range in Z-axis	5.9 [0.23]	20 [0.79]	40 [1.6]	60 [2.4]	80 [3.2]	120 [4.7]	240 [9.5]	400 [15.7]	1000 [39.4]
Range Beginning	38 [1.5]	53 [2.1]	50 [2.0]	53 [2.1]	60 [2.4]	84 [3.3]	220 8.7]	330 [13.0]	700 [27.55]
Range End	43.9 [1.7]	73 [2.9]	90 [3.5]	113 [4.5]	140 [5.5]	204 [8.0]	460 [15.7]	730 [28.7]	1700 [66.92]
Linearity, Z & X axis	+/- 0.06% of the Z range								
µm [10^{-3} in.]	3.5 [0.14]	12 [0.47]	24 [0.95]	36 [1.4]	48 [1.9]	72 [2.8]	144 [5.7]	240 [9.4]	630 [25]
Resolution Z & X axis, µm [10^{-3} in.]	3.0 [0.12]	11 [0.43]	19 [0.75]	31 [1.2]	42 [1.7]	63 [2.5]	112 [4.4]	213 [8.4]	600 [24]
Field of View X-axis @ Range Beginning	3.9[0.15]	10 [0.39]	20 [0.79]	30 [1.2]	40 [1.6]	60 [2.4]	120 [4.7]	200 [7.9]	500 [19.7]
@ Range End	5.0 [0.20]	13 [0.51]	27 [1.1]	40 [1.5]	55 [2.2]	80 [3.2]	160 [6.3]	280 [11.0]	800 31.5]
Scan frequency	up to 200 Hz (profiles / s) for the full Range								
Weight (less cables) g [oz.]	295 [10.3]	273 [9.6]	290 [10.2]	290 [10.2]	290 [10.2]	430 [15.2]	710 [25.0]	1100 [38.8]	2000 [70.5]
Laser	658 nm, visible RED, Class 2M					658 nm, visible RED, Class 3R			NA
	405 nm,visible BLUE, Class 3R						NA	NA	NA
	NA						435 nm, Blue, 3R		Blue, 3B
Power	10 - 30 VDC, 4-8 W max consumption (Suggest 12 - 24 V)								
Environmental	0° to 40°C [32° to 104°F], With cooling option to 400°C [752°F]; Humidity: < 90% RH								
Vibration	5.5 g @ 1 kHz								
Enclosure Protection	IP64, Keep optical windows clean for best performance. Aluminum case.								
Data Interface	Ethernet Reports: 2D Profile Data, Encoder postion, Status, Temperature, Clock counter, Version #, Switch-on counter								
Signal Inputs	Digital, Incremental Encoder Position Synchronization IN/OUT for Multiple Sensors								
Connector 1	Ethernet: M12 round, 4 pin, D-coded, female								
Connector 2	Power & Synchronization: M12 round, 8 pin, A-coded, male								
Cables	Ethernet: 2m cable, CAT 5, RJ45 termination Power / Serial: 2m cable, Polyurethane jacket, 9 conductor								

White [pin 1]	+10 - 30 V DC	**Yellow** [pin 4]	Digital input 2 / Position	**Blue** [pin 7]	TxD
Brown [pin 2]	Digital input 1 / Position	Gray [pin 5]	Sync OUT	**Red** [pin 8]	RxD
Green [pin 3]	GND, 0V	**Orange** [pin 6]	Sync IN / Hardware trigger	Screen	Tied to connector plug housing

* Each sensor model has unique dimensions.

AP820 Laser Scanner Options

Optional Cables: Custom cable lengths and specifications are available

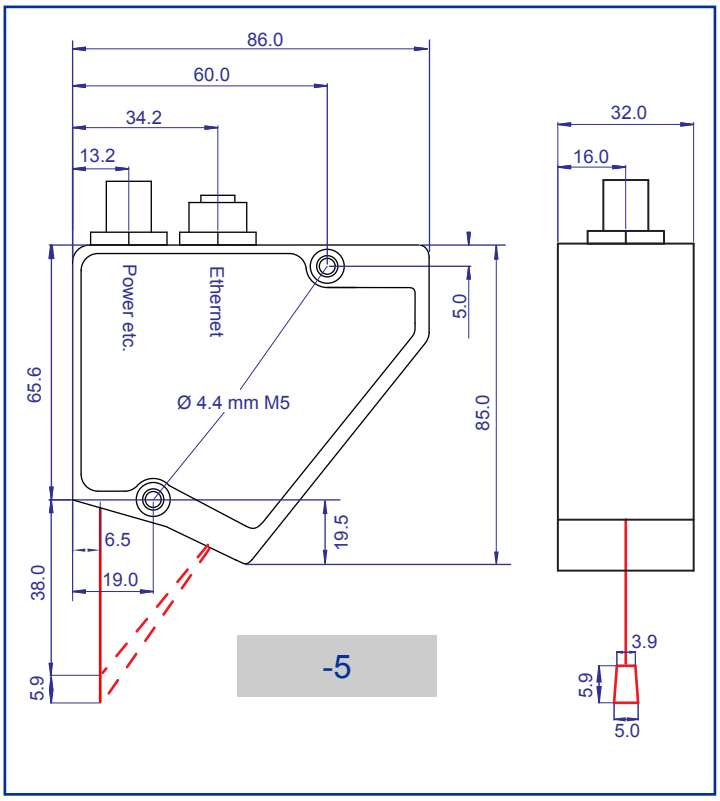
External Cooling Jacket: Extends use of to 400°C [752°F]

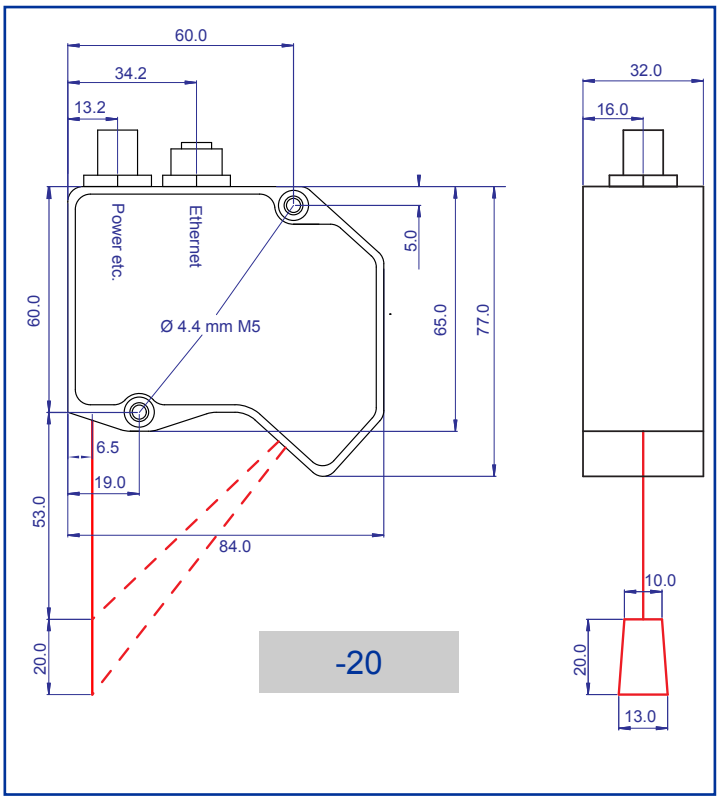
Protective Shield: This scanner option mounts to the front contours of the laser scanner to shield it from debris. The shield has windows aligned with the two scanner windows

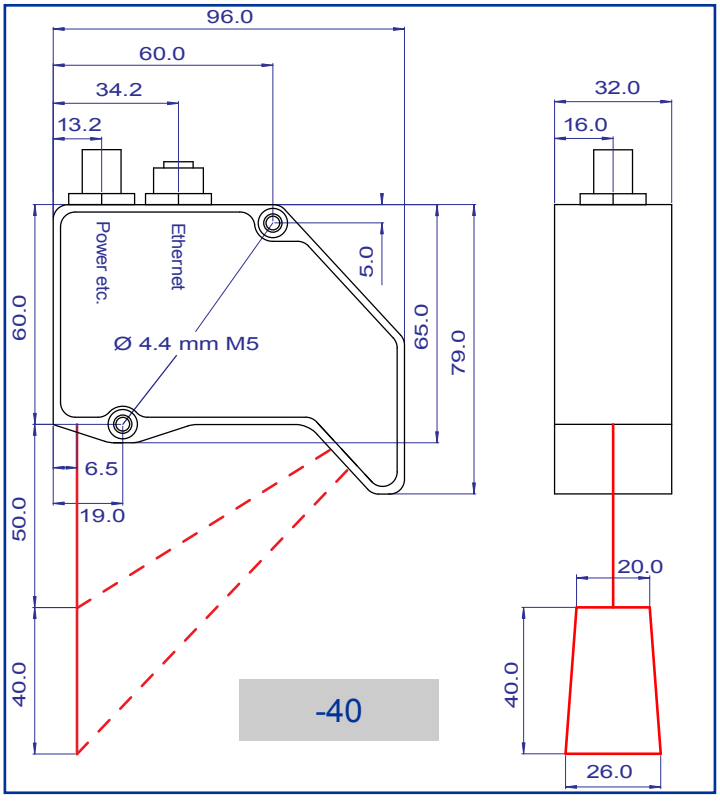
Speed: The AP820 scanners are available with optional 200 Hz sampling frequency.

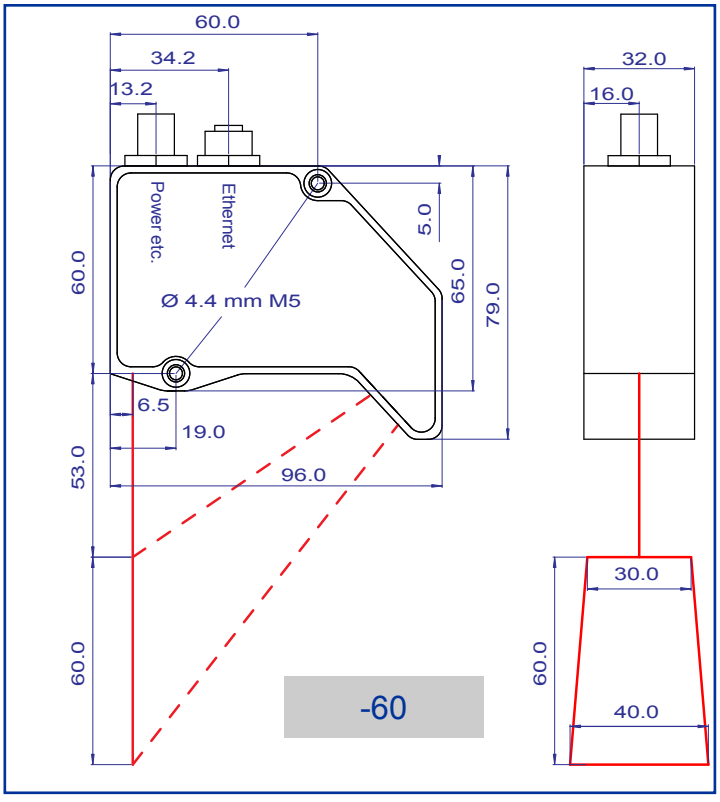
Laser Wavelength: Replace the red laser diodes with blue, or purble for use on shiny or difficult target surfaces.

Mechanical Dimensions units in mm



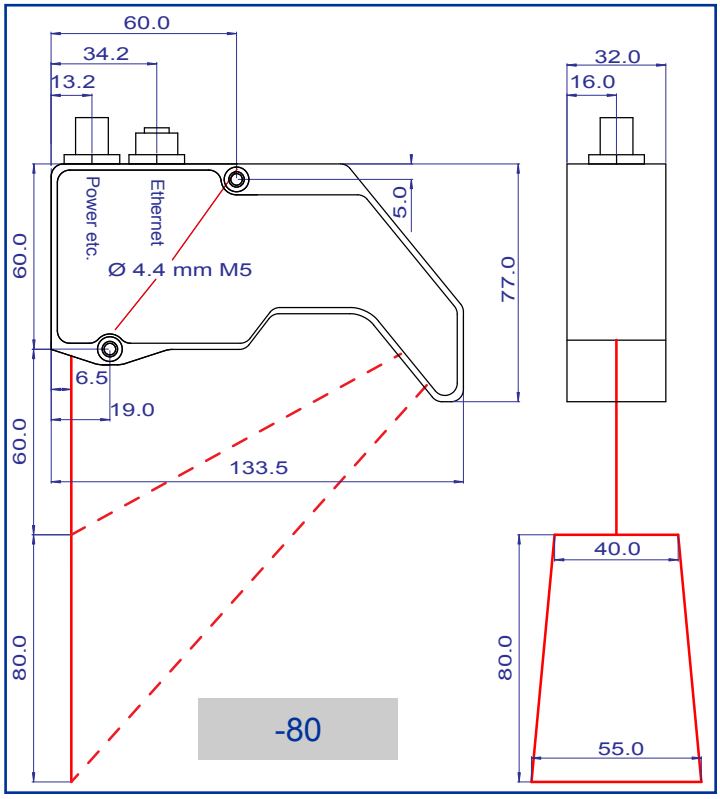


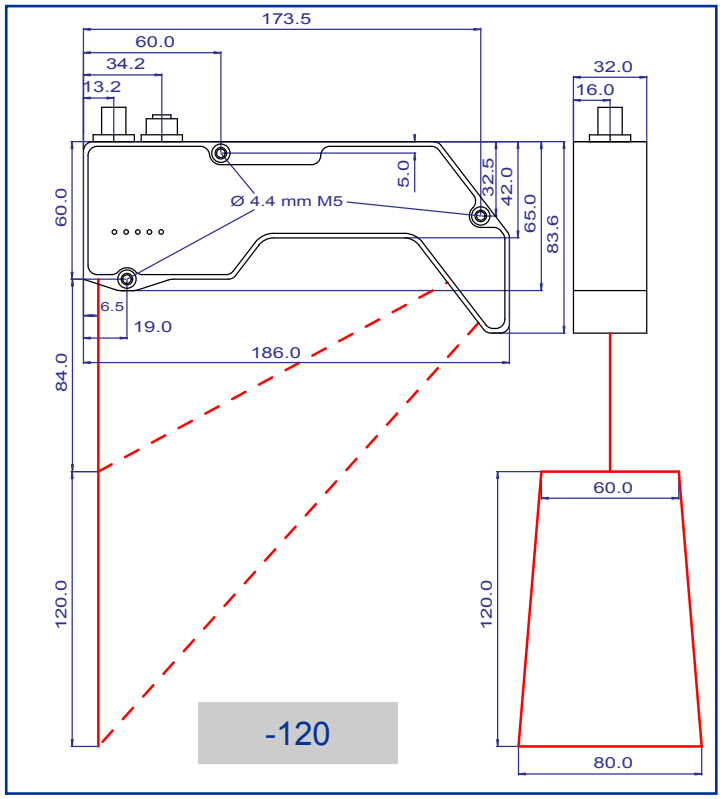


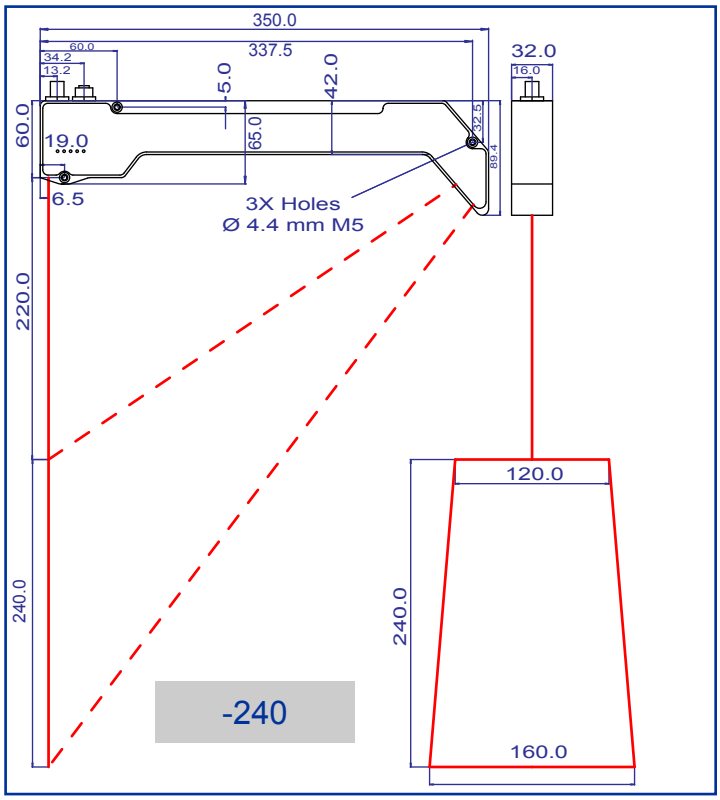


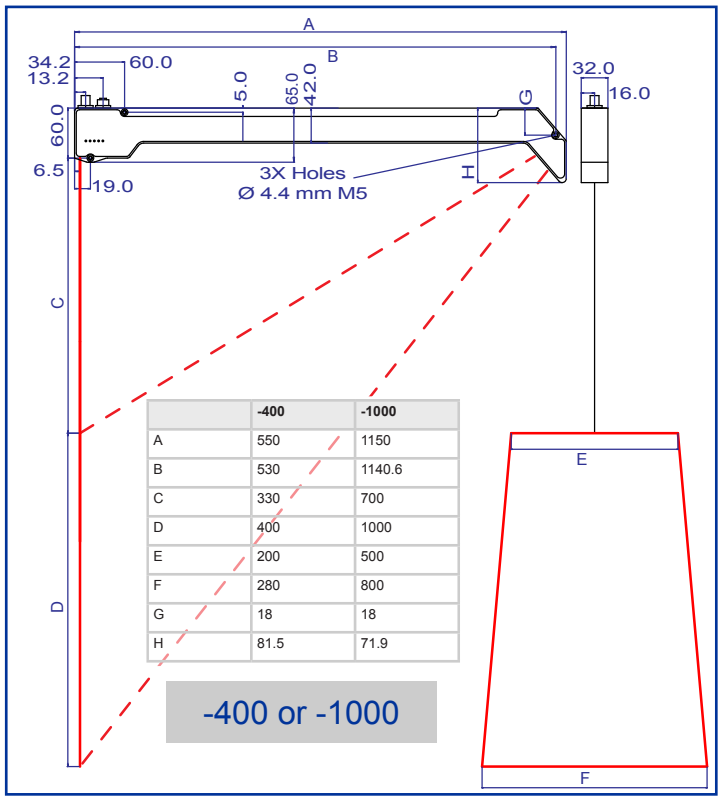
Acuity®

Two-Dimensional Laser Scanners









	-400	-1000
A	550	1150
B	530	1140.6
C	330	700
D	400	1000
E	200	500
F	280	800
G	18	18
H	81.5	71.9

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