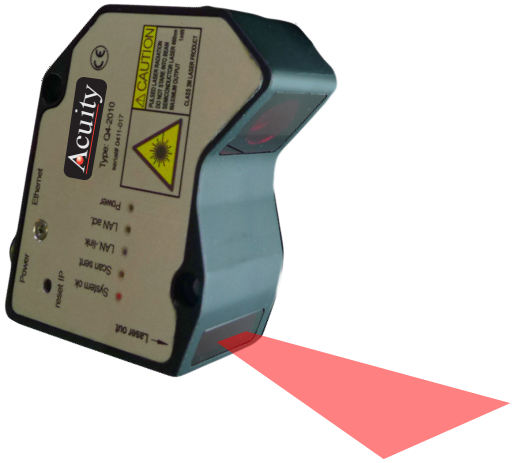
Acuity®

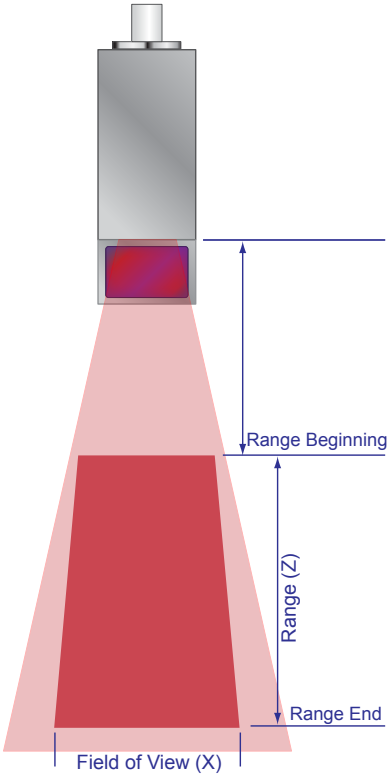
The AccuProfile 820 2D laser scanners are high-accuracy sensors for industrial surface dimensioning and measurement applications. The scanner quickly and accurately generates low-noise 2D or 3D profile scans of objects, surfaces or scenes. The sensor automatically adjusts laser power and detector exposure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

Two-Dimensional Laser Scanners

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.

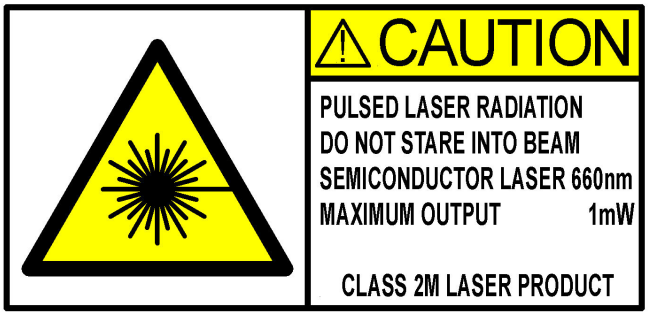




Typical Scanner Applications

- **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]	550 [21.7]
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]	1550 [61.0]
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]	600 [24]
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]	630 [25]
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 100 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			
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	**Orange** [pin 6]	Sync IN / Hardware trigger
Brown [pin 2]	Digital input 1 / Position	**Blue** [pin 7]	TxD
Green [pin 3]	GND, 0V	**Red** [pin 8]	RxD
Yellow [pin 4]	Digital input 2 / Position	Screen	Tied to connector plug housing
Gray [pin 5]	Sync OUT		

AP820 Laser Scanner Options

Optional Cables: Custom cable lengths and specifications are available

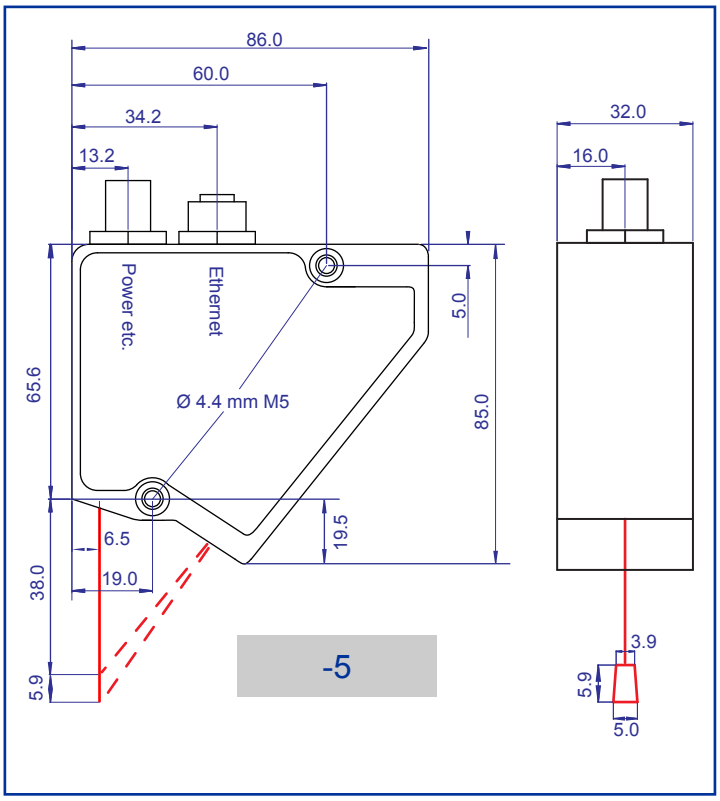
External Cooling Jacket: Extends use of to 400°C [752°F]

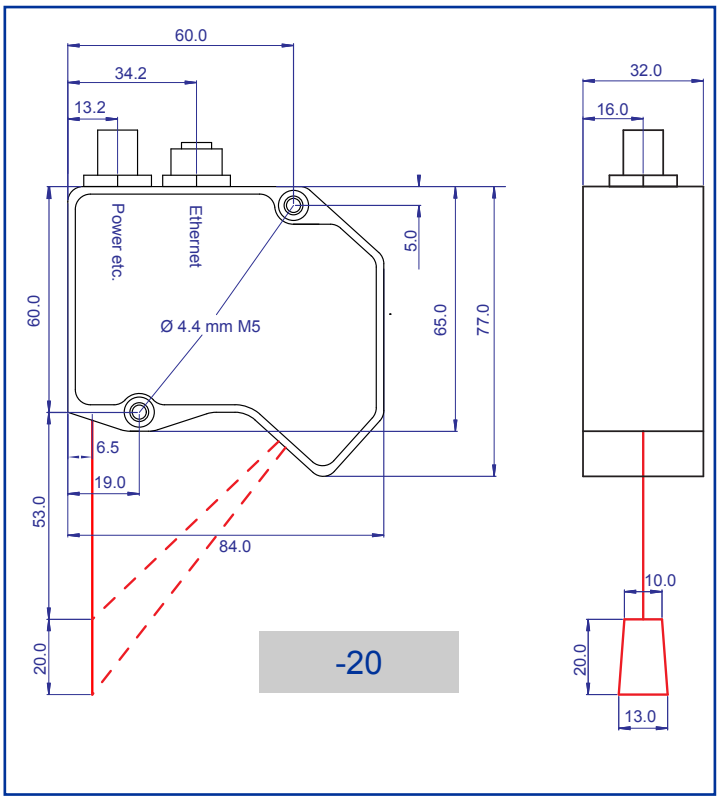
Protective Shield: This scanner option mounts to the front contours of the laser scanner to shield it from debris. The shield has windows aligned with the two scanner windows

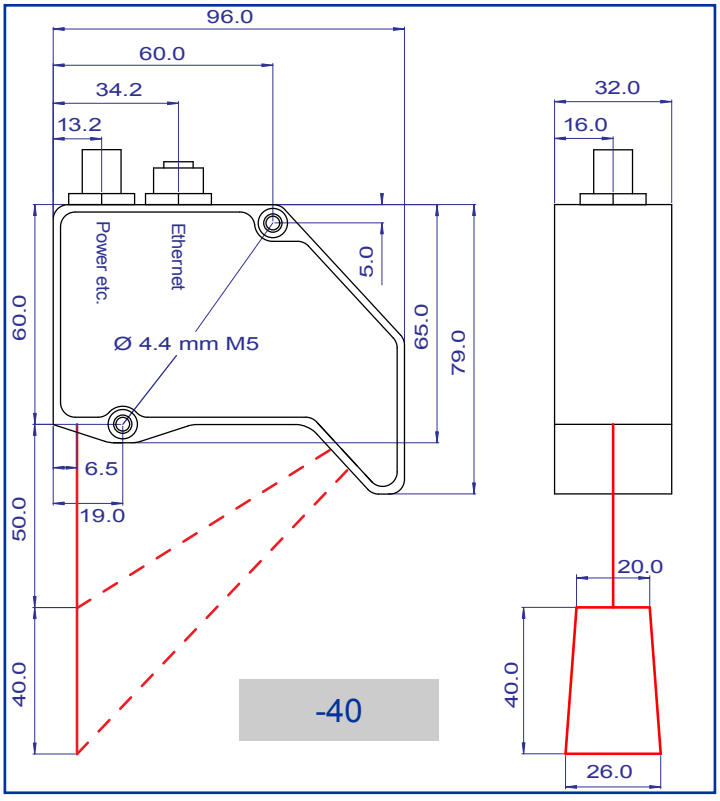
Speed: The AP820 scanners are available with optional 200 Hz sampling frequency.

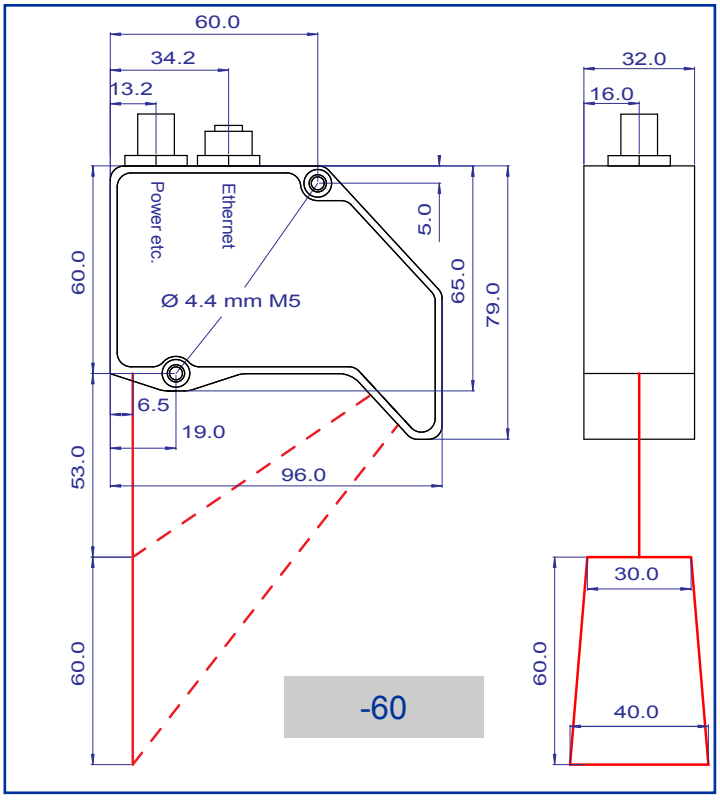
Laser Wavelength: Replace the red laser diodes with blue, or purble for use on shiny or difficult target surfaces.

Mechanical Dimensions units in mm









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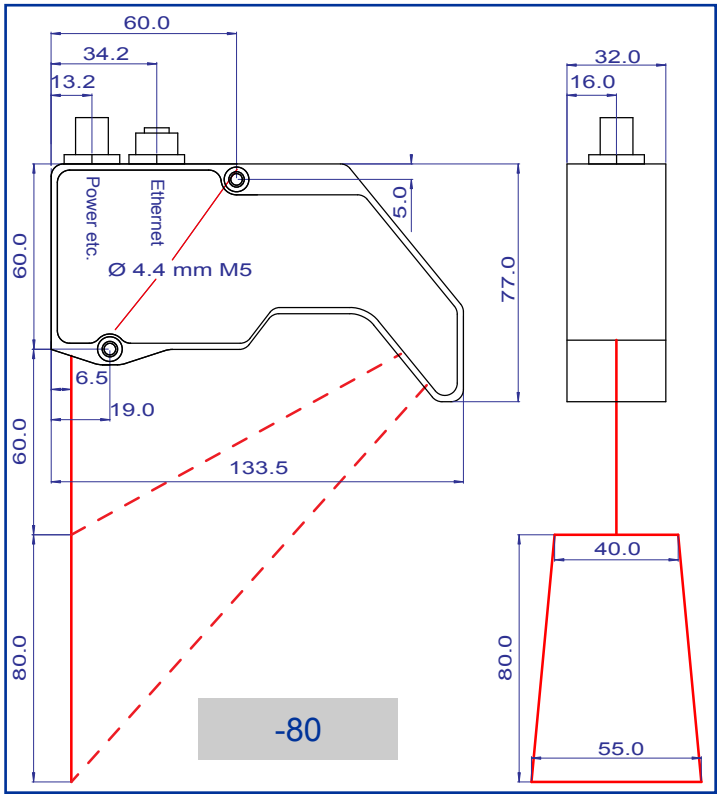
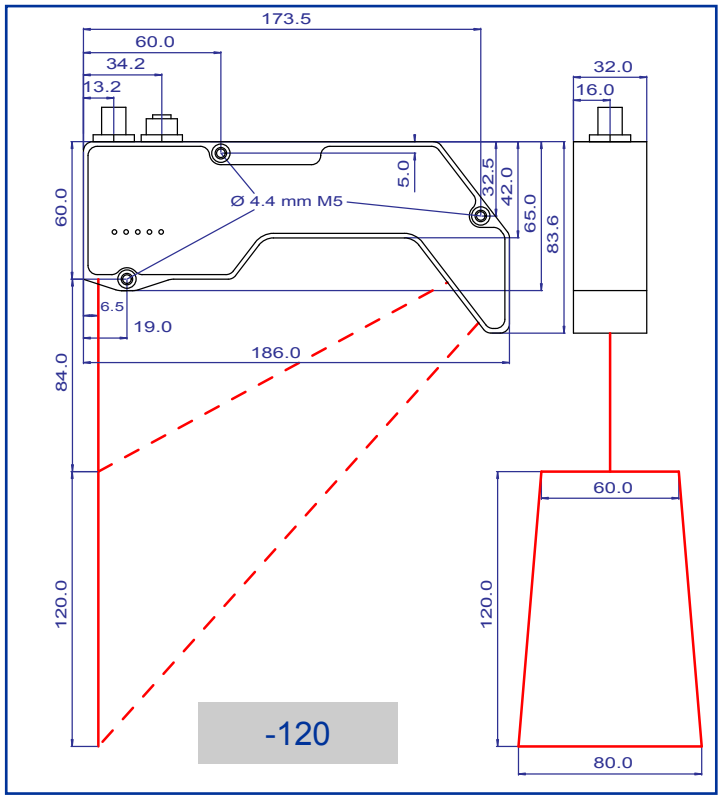
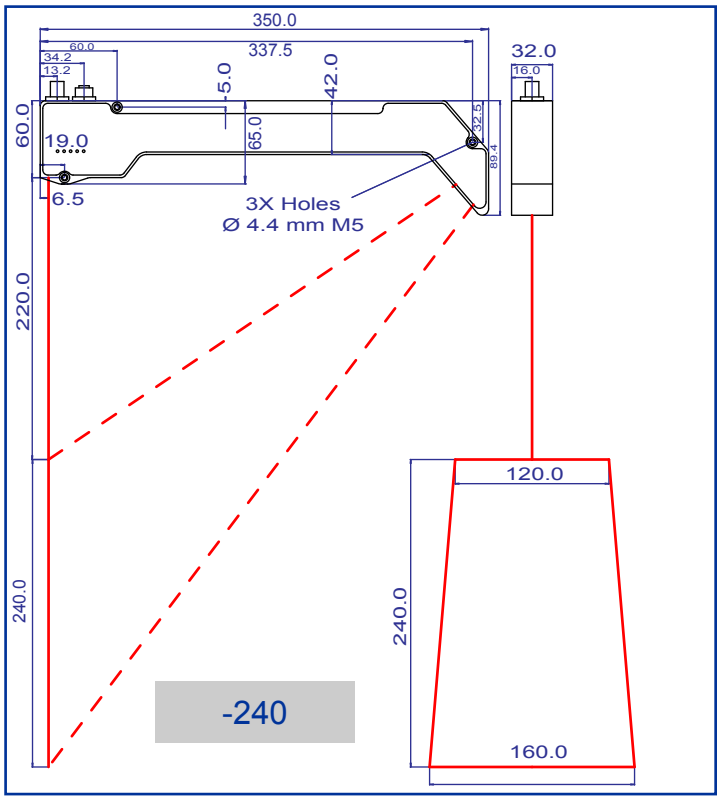
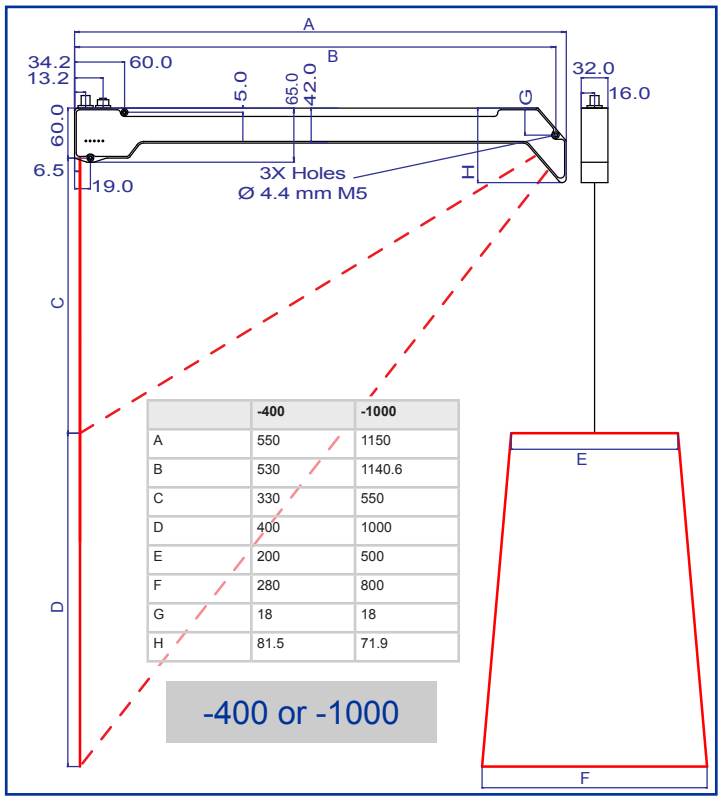
Two-Dimensional Laser Scanners









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

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