

# Industrial Handheld DPM Reader V460-H

## Industrial Handheld DPM Reader with Ethernet Connectivity.

- Industrial, IP65-rated, handheld DPM (Direct Part Mark) reader with built-in PoE (Power over Ethernet) network connectivity for demanding manufacturing applications.
- Superior out-of-box reading for challenging DPM codes – minimal effort required for most applications.
- Intuitive browser-based setup and runtime monitoring via Omron's WebLink<sup>HH</sup> user interface (no need for software installation).
- Three predefined Modes of Operation ("recipes"): Auto Lighting (default), Torch Lighting, and Close-Up Lighting.
- Support for up to 20 user-defined database configurations ("custom recipes").
- Industry-leading DPM reading performance with Omron's X-Mode decoding technology.
- Patented multi-axis lighting technology for imaging challenging DPMs on a variety of part geometries, materials, and surface preparations.
- Auxiliary high-power torch lighting for longer range reading of 1D/2D codes up to 254 mm [10"] away.
- Multiple LED colors, allowing several lighting combinations for successful decodes in any situation: red, green, and blue (Dome lighting, independently and/or in combination); red (Dark Field low-angle – north and south, independently, and/or in combination); and white (Torch, independently).
- Extended read range (contact to 254 mm [10"] with built-in liquid lens autofocus optics).
- Simple point-and-click targeting with audible, haptic/vibration, and multi-directional visual indicators for real-time operator feedback.
- Automatic detection of codes within the field of view in Presentation Mode (Time-of-Flight technology), eliminating the need for continuous or manual triggering.
- Built-in Ethernet – no separate interface box required.
- Direct-wired fieldbus connectivity to PLCs via built-in EtherNet/IP and PROFINET. Function Block Library and Sample Program for Omron Controllers available for download.
- Full PoE (Power over Ethernet) capability for easy connectivity and portability over a single cable without the need for a separate power supply.




## Features

- Reliable out-of-box performance.
- Simple reader configuration with WebLink<sup>HH</sup>.
- Liquid lens autofocus optics.
- Extended read range: contact to 254 mm [10"].
- Alternate multi-color lighting configuration.
- Audible, haptic/vibration, and multi-directional visual indicators.
- IP65-rated.
- Rugged hardware – compliant with IEC-60068-2-31 drop-and-tumble standard and ISO-16750-5 chemical resistance standard.
- Full PoE – Power over Ethernet (IEEE 802.3af).
- Ethernet TCP/IP, EtherNet/IP, and PROFINET.



# V460-H

## Ordering Information

### 1. Handheld DPM Reader

Appearance	Description	Part Number
	V460-H Handheld DPM Reader, Black Grey, PoE Wired, with X-Mode	<b>V460-H0PX</b>

### 2. Cables

Appearance	Type	Length	Part Number
	Ethernet Communication Cables – Straight Connectors M12 Plug on Reader to RJ45 Connector	1 Meter	V430-WE-1M
		3 Meters	V430-WE-3M
		5 Meters	V430-WE-5M
	Standard Ethernet Cables, In-Cabinet Use Standard RJ45 Connectors on Both Ends Green	1 Meter	XS6W-5PUR8SS100CM-G
		3 Meters	XS6W-5PUR8SS300CM-G
		5 Meters	XS6W-5PUR8SS500CM-G
		10 Meters	XS6W-5PUR8SS1000CM-G
		15 Meters	XS6W-5PUR8SS1500CM-G

### 3. PoE Injector and RAM® Mount Accessories

**Note:** Omron recommends **RAM® Mount** brackets and mounts for hands-free operation in **Presentation** mode.

Appearance	Type	
	Single Port PoE Injector, 30W, IEEE802.3at Compliant, 2 x RJ45 Connector, 90 to 264VAC* (suggested for standalone PC use) *ATTENTION: Power cord NOT included (C13 connector required)	98-9000311-01
	RAM® Holders and Components – <b>C Size</b>	
	RAM® Power-Grip™ XL Universal Scanner Gun Holder ( <b>RAP-450U</b> )	
	RAM® Tough-Claw™ Large Clamp Ball Base ( <b>RAP-401U</b> )	
	RAM® Double Socket Arm with Round Ball Plate - C Size, Medium ( <b>RAM-103U</b> )	
	RAM® Double Socket Arm with Round Ball Plate - C Size, Long ( <b>RAM-103U-D</b> )	
	RAM® Double Ball Mount with Two Round Plates - C Size, Medium ( <b>RAM-101U</b> )	

## Basic PC Host Connection

### You will need:

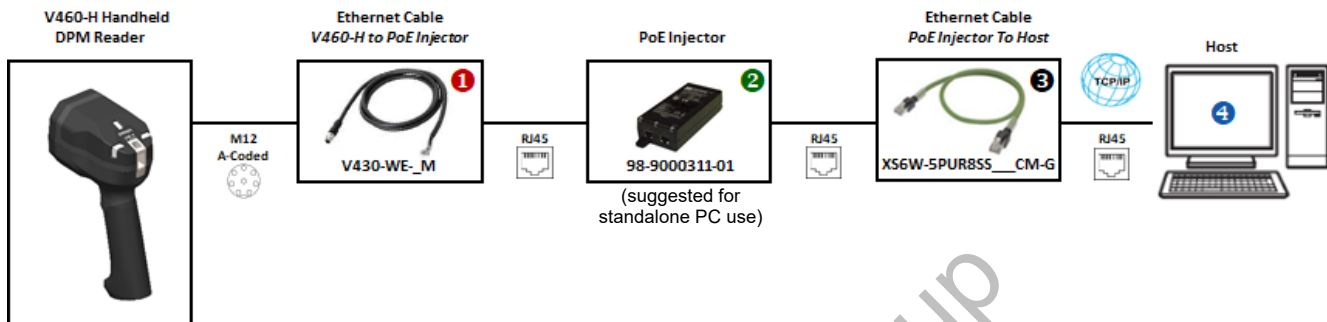
V460-H Industrial DPM Reader

1.) Ethernet Cable for V460-H to PoE Injector Connection

2.) PoE Injector (IEEE 802.3af compliant)

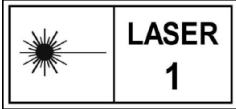
3.) Ethernet Cable for PoE Injector to Host

4.) Host PC



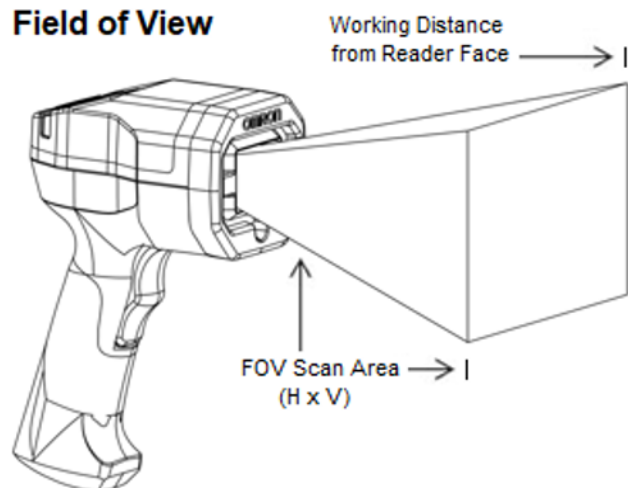
# V460-H

## Ratings and Specifications

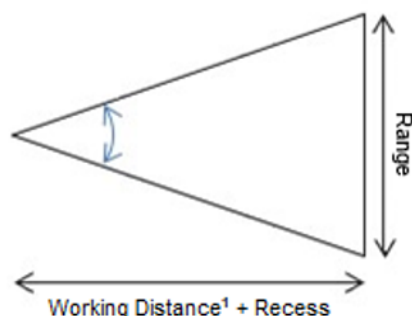
V460-H		
Item	Description	
<b>Physical Characteristics</b>		
Dimensions	7.28 (H) x 3.03" (W) x 5.20" (D) / 185 mm (H) x 77 mm (W) x 132 mm (D)	
Weight	14.82 oz. / 420 g	
Input Voltage Range	IEEE 802.3af PoE-compliant 44 to 57VDC, Class 0	
Maximum Current of PoE	0.20A	
Source: PoE	44 to 57 VDC	
Communication	Connectivity	Ethernet TCP/IP, EtherNet/IP, PROFINET I/O
	Ethernet Specifications	100BASE-T
Color	Black	
User Indicators	Good Decode top and side LEDs, green flash front LEDs, Beeper, Haptic / Vibration	
<b>Performance Characteristics</b>		
Focus	Liquid Lens Autofocus, 7.7 mm	
Image Sensor	1280 x 960 pixels (SXGA), Monochrome CMOS, Global Shutter	
Targeting Pattern	Two dots indicating center of FOV. Center the code between the two dots.	
Illumination	Multi-axis illumination: Diffuse reflective Dome (red, green and blue), low-angle Dark Field (red), and long-range Torch lighting (white)	
Imager Field of View Angles	34.6° H x 26.3° V nominal	
<b>Environmental</b>		
Operating Temperature	-32° F to 104° F / 0° C to 40° C	
Storage Temperature	-40° F to 158° F / -40° C to 70° C	
Humidity	25% to 85% Non-Condensing	
Drop Test	50 drops to concrete from 6.6 feet / 2 meters	
Tumble Test	3,000 tumbles from a height of 3.3 feet / 1 meter; exceeds IEC 60068-2-31	
Degree of Protection	IP65	
Approved Cleaners	Preferred Disinfectant: Ethanol (95%) and Hypochlorous Acid Water (concentration: 95%). Alternate Disinfectant: Sodium Hypochlorite Aqueous Solution (concentration: 90 ppm).	
Industrial Fluid Resistance	Motor / Engine Oil, Automatic Transmission Fluid (ATF), Continuously Variable Transmission Fluid (CVT), Industrial De-Greaser (Engine Brite Heavy Duty), Brake Fluid (DOT4) per ISO 16750-5	
Electrostatic Discharge (ESD)	EN 55024 (IEC 61000-4-2)	
Ambient Light Immunity	0 to 91,000 lux (direct sunlight) except for reflective codes in direct sunlight.	
<b>Symbol Decode Capability</b>		
Symbologies	1D Symbologies	Code 39, Code 128, BC412, Interleaved 2 of 5, UPC/EAN, Codabar, Code 93, Pharmacode, U.S. Postal, Australia Post, Japan Post, Royal Mail, KIX, UPU, PLANET, POSTNET, USPS4CB
	2D Symbologies	Data Matrix (ECC 0-200 and DMRE), QR Code, Micro QR Code, Aztec Code, DotCode
	Stacked Symbologies	PDF417, MicroPDF417, GS1 Databar (Composite and Stacked)
Minimum Element Resolution	1D Codes – 2.0 mil 2D Codes – 3.3 mil	
<b>Decode Ranges (Typical; Printing Density / Quality, Contrast, and Ambient Light-Dependent)</b>		
Symbology / Print Density	Near / Far	
Code 128: 2 mil	0.0" / 0 mm to 0.5" / 12 mm	
Code 128: 3.3 mil	0.0" / 0 mm to 2.3" / 60 mm	
Code 128: 5 mil	0.0" / 0 mm to 4" / 102 mm	
Code 128: 10 mil	0.0" / 0 mm to 10" / 254 mm	
Data Matrix: 3.3 mil	0.0" / 0 mm to 1" / 25 mm	
Data Matrix: 5 mil	0.0" / 0 mm to 2.3" / 60 mm	
Data Matrix: 10 mil	0.0" / 0 mm to 6.0" / 152 mm	
Data Matrix: 15 mil	0.0" / 0 mm to 10.0" / 254 mm	
<b>Utilities and Device Management</b>		
WebLink <sup>HH</sup>	Used to configure reader parameters, return barcode data, and perform image-based troubleshooting.	
<b>Regulatory Compliance</b>		
Lighting Safety Standard	IEC 62471-2, Risk Class Group 1; IEC 60825-1, Laser Class 1 CLASS 1 LASER PRODUCT	
	 IEC 60825-1:2014	
Certifications at Product Introduction*	CE (EU), UL (U.S./Canada), FCC (U.S.), AU, NZ, UK, KC (Korea)	
*Pending Certifications	BSMI (Taiwan), BIS (India)	

## Imager Field of View Calculation

### Field of View



### Field of View Angle $\theta$



**Note:** The recess value of 49.85 mm is a calculated distance from the reader's front face to the theoretical center of the imager engine optics inside the reader. The working distance to a part being imaged from the front of the reader and the recess value are added together for the FOV area calculation.

**FOV Formula:**  
 $Range = 2 * (WD + Recess) * \tan(\theta/2)$

<sup>1</sup> - The working distance is measured from the front face of the reader to the part being imaged.

**Image Field of View in Degrees = 34.6 (Horizontal) x 26.3 (Vertical)**

**Field of View (mm)**

Distance	Width	Height	FOV
0.0	31	23	31 mm x 23 mm
5.0	34	26	34 mm x 26 mm
25.0	47	35	47 mm x 35 mm
50.0	62	47	62 mm x 47 mm
75.0	78	58	78 mm x 58 mm
102.0	95	71	95 mm x 71 mm
152.0	126	94	126 mm x 94 mm
180.0	143	107	143 mm x 107 mm
200.0	156	117	156 mm x 117 mm
254.0	189	142	189 mm x 142 mm

**Field of View (in.)**

Distance	Width	Height	FOV
0.0	1.2	0.9	1.2" x 0.9"
0.2	1.3	1.0	1.3" x 1.0"
1.0	1.8	1.4	1.8" x 1.4"
2.0	2.5	1.8	2.5" x 1.8"
3.0	3.1	2.3	3.1" x 2.3"
4.0	3.7	2.8	3.7" x 2.8"
6.0	5.0	3.7	5.0" x 3.7"
7.1	5.6	4.2	5.6" x 4.2"
7.9	6.1	4.6	6.1" x 4.6"
10.0	7.5	5.6	7.5" x 5.6"

**Minimum Code Size (X-Dimension)**

1D Label	1D DPM	Distance	2D Label	2D DPM
2.00 mils	2.40 mils	0.0 mm [0.0"]	2.70 mils	3.20 mils
2.20 mils	2.70 mils	5.0 mm [0.2"]	2.90 mils	3.50 mils
2.90 mils	3.60 mils	25.0 mm [1.0"]	4.00 mils	4.70 mils
3.90 mils	4.80 mils	50.0 mm [2.0"]	5.30 mils	6.30 mils
4.80 mils	6.00 mils	75.0 mm [3.0"]	6.60 mils	7.80 mils
5.90 mils	7.30 mils	102.0 mm [4.0"]	8.10 mils	9.50 mils
7.80 mils	9.70 mils	152.0 mm [6.0"]	10.70 mils	12.60 mils
8.90 mils	11.10 mils	180.0 mm [7.1"]	12.20 mils	14.40 mils
9.60 mils	12.00 mils	200.0 mm [7.9"]	13.20 mils	15.60 mils
11.70 mils	14.60 mils	254.0 mm [10.0"]	16.10 mils	19.00 mils

## Code Readability Tables

The readability tables below are designed to help you choose the best distance to read their particular code size and code type successfully. The tables show the calculated PPE (Pixels Per Element) for a range of typical code sizes at certain focus distances.

PPE is defined as the following for 1D and 2D codes:

- PPE for 1D codes is the number of pixels across the thinnest bar in the barcode.
- PPE for 2D codes is the number of pixels across a single code cell.

The tables show a color code for readability based on labels and Direct Part Marks (DPM) where red means not likely to read, and green means that it should read. The tables also show a range of colors between red and green, while showing the zone where read rates may be acceptable for high-contrast, well-printed labels and can be considered.

### 1D Code Readability Guidelines

#### High-Contrast Labels

- 1.5 pixels per thin bar is suggested minimum;
- 2 pixels or more per thin bar is preferred.

#### Direct Part Marks

- 2 pixels per thin bar is suggested minimum;
- 2.5 pixels or more per thin bar is preferred.

### 2D Code Readability Guidelines

#### High-Contrast Labels

- 2.5 – 2.75 pixels per 2D cell is suggested minimum;
- 3.5 – 5 pixels per 2D cell is preferred.

#### Direct Part Marks

- 3.25 pixels per 2D cell is suggested minimum;
- 4 – 6 pixels per 2D cell is preferred.

Minimum Element Size (X-Dimension)	Readability of 1D LABEL Code at Distance									
	0mm [0.00"]	5mm [0.20"]	25mm [0.98"]	50mm [1.97"]	75mm [2.95"]	102mm [4.02"]	152mm [5.98"]	180mm [7.09"]	200mm [7.87"]	254mm [10.00"]
2.0 mils	2.09	1.90	1.39	1.04	0.84	0.69	0.52	0.45	0.42	0.34
2.5 mils	2.62	2.38	1.74	1.31	1.04	0.86	0.65	0.57	0.52	0.43
3.3 mils	3.45	3.14	2.30	1.72	1.38	1.13	0.85	0.75	0.69	0.57
5.0 mils	5.23	4.75	3.48	2.61	2.09	1.72	1.29	1.13	1.04	0.86
7.5 mils	7.85	7.13	5.23	3.92	3.13	2.58	1.94	1.70	1.57	1.29
10 mils	10.46	9.51	6.97	5.22	4.18	3.43	2.58	2.27	2.09	1.72
15 mils	15.69	14.26	10.45	7.83	6.27	5.15	3.88	3.40	3.13	2.57
20 mils	20.92	19.02	13.94	10.45	8.35	6.87	5.17	4.54	4.17	3.43
30 mils	31.39	28.53	20.90	15.67	12.53	10.30	7.75	6.81	6.26	5.15
40 mils	41.85	38.03	27.87	20.89	16.71	13.74	10.34	9.08	8.35	6.87
FOV (mm)	31mm x 23mm	34mm x 26mm	47mm x 35mm	62mm x 47mm	78mm x 58mm	95mm x 71mm	126mm x 94mm	143mm x 107mm	156mm x 117mm	189mm x 142mm
FOV (in)	1.2" x 0.9"	1.3" x 1.0"	1.8" x 1.4"	2.5" x 1.8"	3.1" x 2.3"	3.7" x 2.8"	5.0" x 3.7"	5.6" x 4.2"	6.1" x 4.6"	7.5" x 5.6"
X-Dimension (MIN)	2.00 mils	2.20 mils	2.90 mils	3.90 mils	4.80 mils	5.90 mils	7.80 mils	8.90 mils	9.60 mils	11.70 mils

Minimum Element Size (X-Dimension)	Readability of 1D DPM Code at Distance									
	0mm [0.00"]	5mm [0.20"]	25mm [0.98"]	50mm [1.97"]	75mm [2.95"]	102mm [4.02"]	152mm [5.98"]	180mm [7.09"]	200mm [7.87"]	254mm [10.00"]
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X-Dimension (MIN)	2.40 mils	2.70 mils	3.60 mils	4.80 mils	6.00 mils	7.30 mils	9.70 mils	11.10 mils	12.00 mils	14.60 mils

Minimum Element Size (X-Dimension)	Readability of 2D LABEL Code at Distance									
	0mm [0.00"]	5mm [0.20"]	25mm [0.98"]	50mm [1.97"]	75mm [2.95"]	102mm [4.02"]	152mm [5.98"]	180mm [7.09"]	200mm [7.87"]	254mm [10.00"]
2.0 mils	2.09	1.90	1.39	1.04	0.84	0.69	0.52	0.45	0.42	0.34
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X-Dimension (MIN)	2.70 mils	2.90 mils	4.00 mils	5.30 mils	6.60 mils	8.10 mils	10.70 mils	12.20 mils	13.20 mils	16.10 mils

Minimum Element Size (X-Dimension)	Readability of 2D DPM Code at Distance									
	0mm [0.00"]	5mm [0.20"]	25mm [0.98"]	50mm [1.97"]	75mm [2.95"]	102mm [4.02"]	152mm [5.98"]	180mm [7.09"]	200mm [7.87"]	254mm [10.00"]
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X-Dimension (MIN)	3.20 mils	3.50 mils	4.70 mils	6.30 mils	7.80 mils	9.50 mils	12.60 mils	14.40 mils	15.60 mils	19.00 mils

Aegis Electronic Group  
www.aegiselect.com

# V460-H

## Multi-Axis Lighting

The V460-H incorporates a **multi-axis illumination** system designed to ensure reliable decoding of the toughest direct part marks (DPM) and labels.

- **Dome Lighting:** Red, green, and blue LEDs (allowing any RGB combination).
- **Low-Angle Lighting:** Red LEDs (north, south and north + south).
- **Torch Lighting:** White LEDs

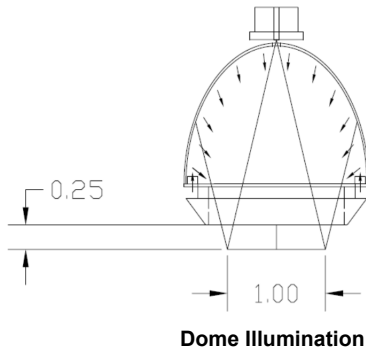
Through an advanced combination of multi-colored dome (bright field), low-angle (dark field), and torch (long-range) illumination techniques, the V460-H provides even illumination of flat, shiny surfaces, enhancing embossed features, or differentiating features on curved surfaces, as well as providing high-powered illumination for reading codes with extended read range from contact to 10" (254 mm).

### Dome Illumination

**Dome Illumination** provides diffused, uniform light. The large, solid angle of illumination supports imaging of shiny, flat surfaces or curved surfaces. This type of illumination is useful on specular (shiny) and non-specular surfaces, and is ideal for de-emphasizing surface texture and elevation (curves). The dome geometry provides the widest area of coverage at close working distances.

It is important to note that for marks that are a large percentage of the diameter of a curved surface, closer distances will provide the best performance.

In addition to illuminating marks on curved surfaces, dome lighting also provides diffuse, even bright field illumination, which provides thorough coverage on a wide variety of direct part marks.



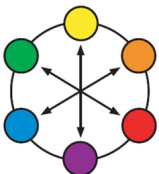
### Dome Illumination Colors

Dome Illumination provides diffused, uniform light in RGB colors that can be combined to achieve additional colors:

- Red
- Green
- Blue
- Yellow (Red + Green)
- Magenta (Red + Blue)
- Cyan (Green + Blue)
- White (Red + Green + Blue)



Dome Illumination adds another dimension of decode optimization for direct part marks. Using the opposite light spectrum as a part's surface color will make the part feature appear darker. Using the same light spectrum will make the part feature appear lighter.

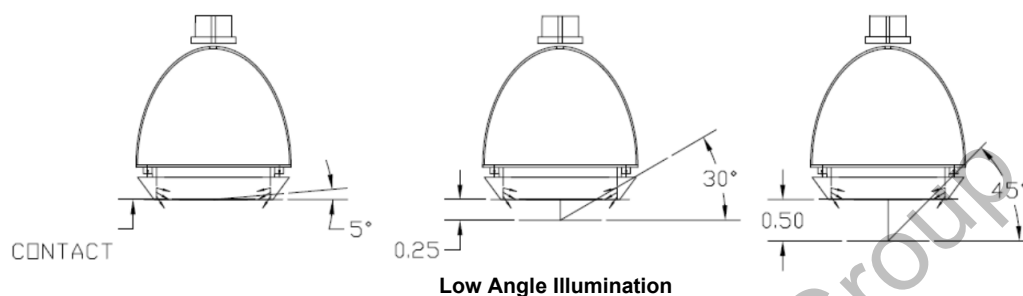


## Low Angle (Dark Field) Illumination

**Low Angle Illumination** provides what is called “dark field” illumination, ideal for very low-contrast marks such as laser-embossed or engraved marks. This type of illumination is useful on both specular (shiny) and non-specular surfaces, and emphasizes surface texture.

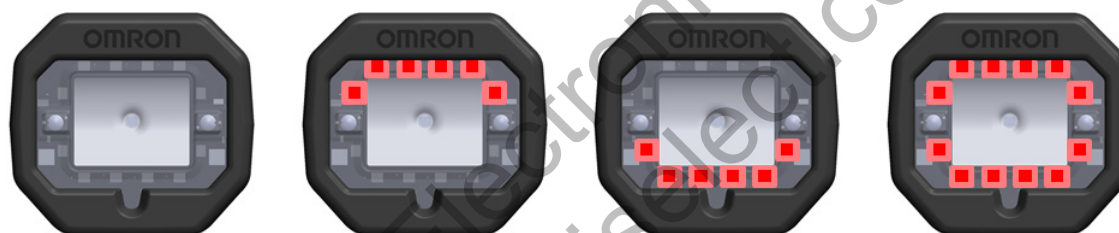
The optimum lighting angle for most marks is **30 degrees**, which occurs when the V460-H is approximately **0.25 inches** away from the target mark.

Low Angle Illumination directs light inward at an angle that varies with the working distance and provides an optimal illumination source from contact (**5 degrees**) to about **0.5 inches (45 degrees)**. Beyond this working distance, the illumination zone converts to a general-purpose illuminator as a portion of the illumination passes straight through the prism. This can be useful in providing “bright field” illumination.



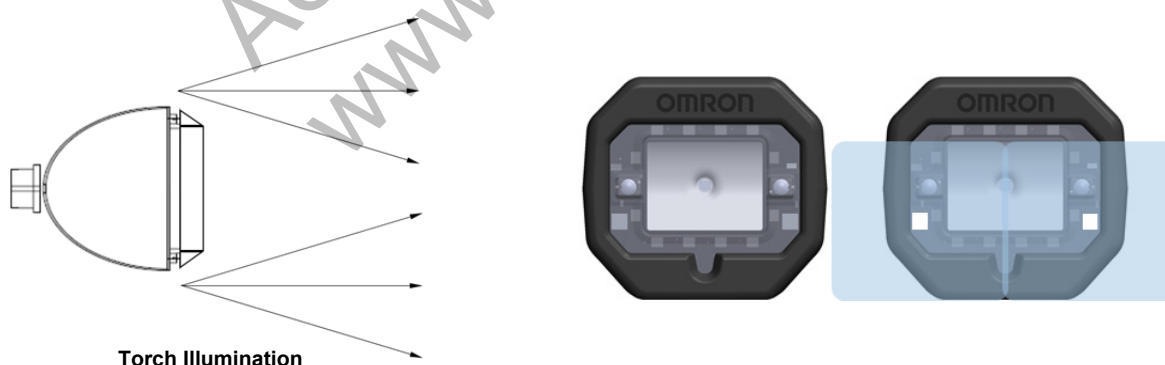
Low Angle Illumination can be selected independently (north or south) or in combination (north + south). It can also be used simultaneously with any combination of Dome Illumination.

Low Angle Illumination uses red LEDs only.



## Torch Illumination

**Torch Illumination** provides high-powered bright field illumination. This type of illumination is designed for reading 1D and 2D codes that cannot be read easily at contact or near-contact. It is useful for reading flat direct part marks (DPMs) at a greater distance with some tilt (+/- 15 degrees).



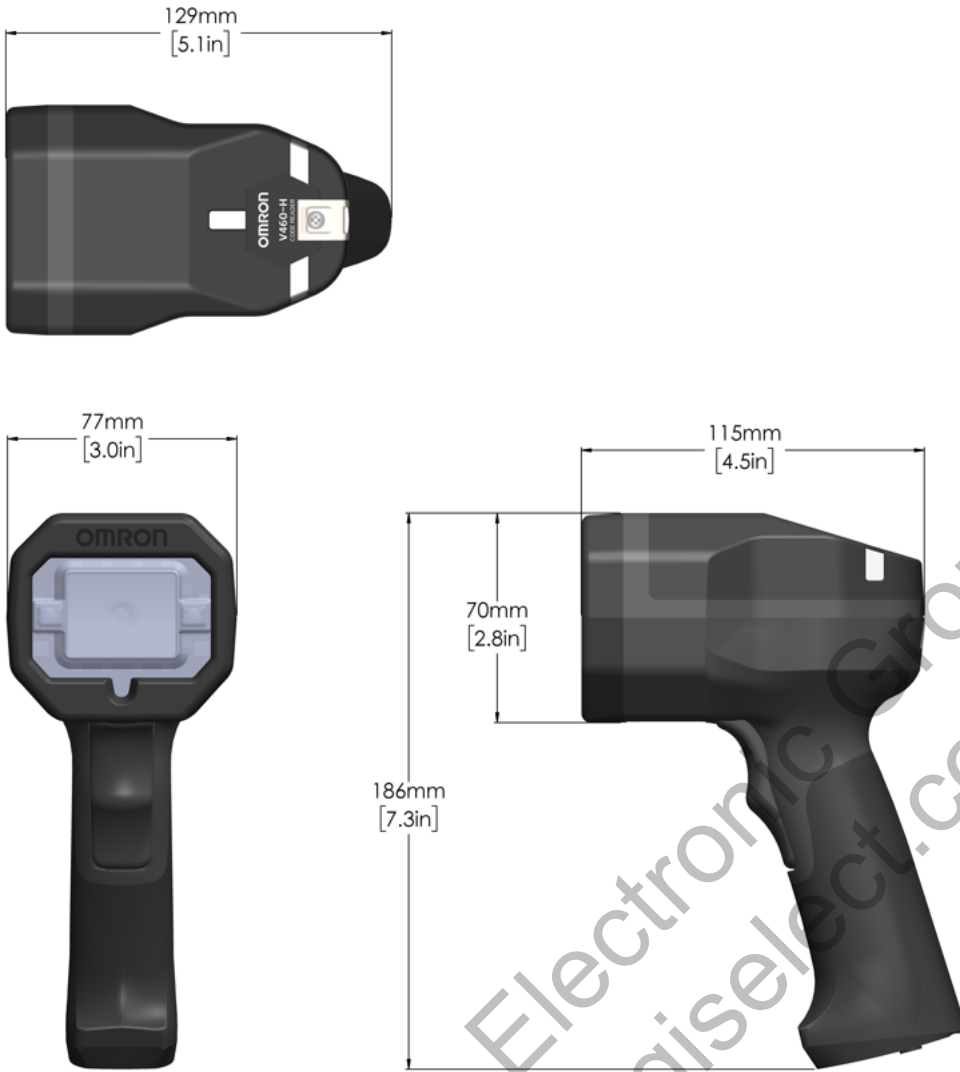
Torch Illumination

Torch Illumination cannot be used in combination with Dome Illumination or Low Angle Illumination.

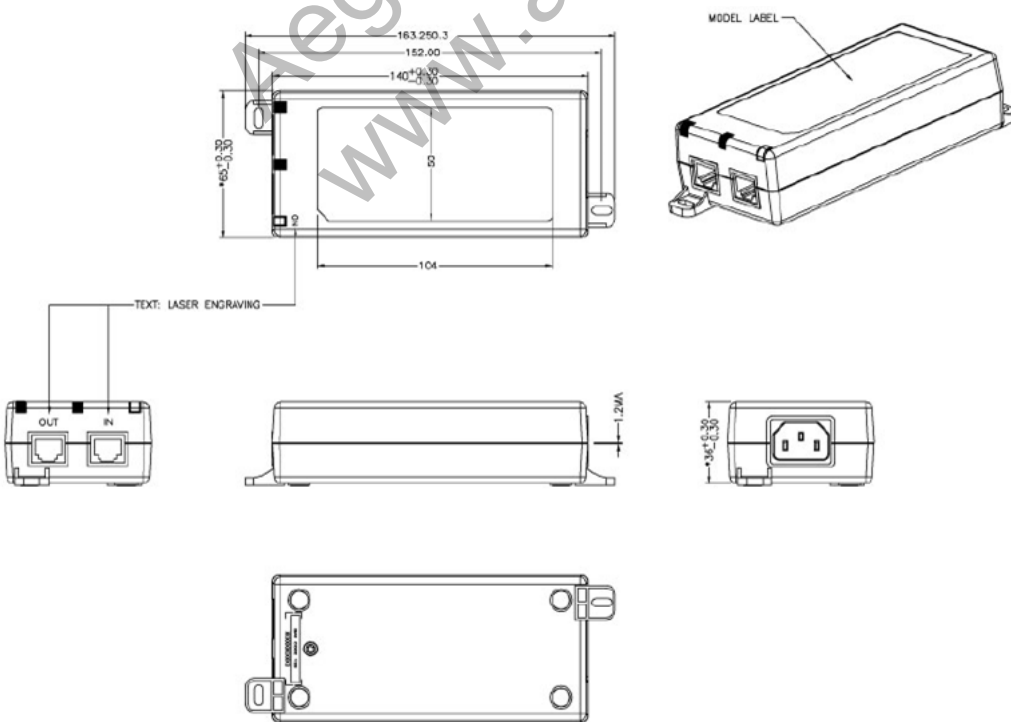
Torch Illumination uses high-intensity white LEDs only.

# V460-H

## Dimensions

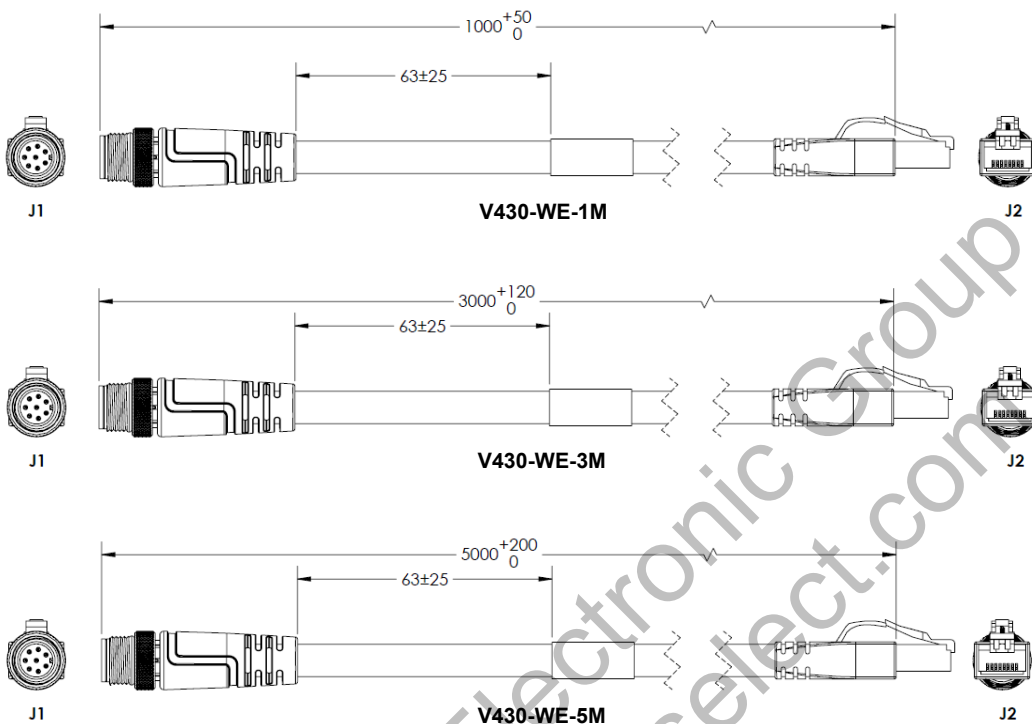


**V460-H Industrial Handheld DPM Reader (V460-H0PX)**

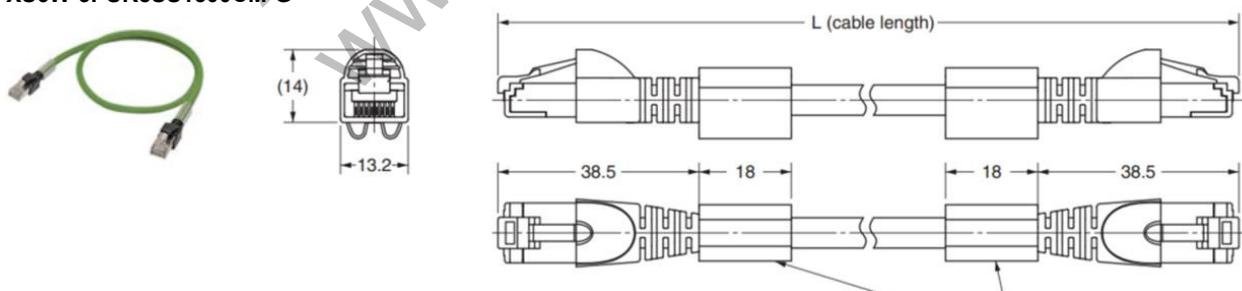


**PoE Injector (98-9000311-01)**

**Ethernet Communication Cables – Straight Connectors – 1 Meter, 3 Meters, or 5 Meters**  
**M12 Plug on Reader to RJ45 Connector**  
**V430-WE-1M**  
**V430-WE-3M**  
**V430-WE-5M**

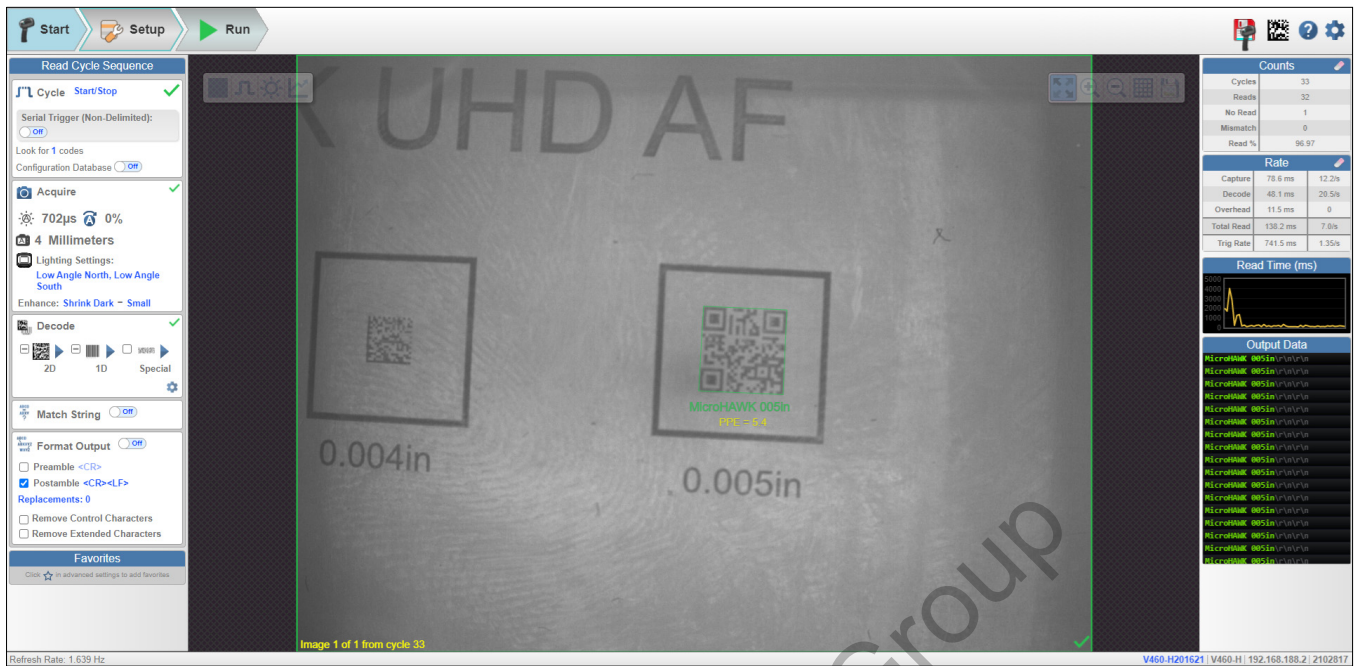


**Standard Ethernet Cables, In-Cabinet Use; Standard RJ45 Connectors on Both Ends; Green**  
**XS6W-5PUR8SS100CM-G**  
**XS6W-5PUR8SS300CM-G**  
**XS6W-5PUR8SS500CM-G**  
**XS6W-5PUR8SS1000CM-G**  
**XS6W-5PUR8SS1500CM-G**



# V460-H

## WebLink<sub>HH</sub>



### WebLink<sub>HH</sub> Setup View

In WebLink<sub>HH</sub>'s Setup view, the V460-H can be configured to meet any application's requirements.

Intuitive browser-based setup and runtime monitoring via Omron's WebLink<sub>HH</sub> user interface.

- No software to download or install.
- Support for HTML5-compliant browsers: Chrome, Safari, Firefox, Edge.
- Fast, responsive user interface.
- Live high-resolution image viewing.
- Direct configuration of reader parameters.
- Immediate updates when user changes settings.
- One-click symbol optimization.
- Configuration Database for automatic cycling through multiple focus, lighting, and parameter settings.
- Automatic image storage to external server.
- Multi-level user password protection.
- Enhanced Match String and Output Format string scripting.
- Advanced X-Mode decoder options for challenging codes.
- ISO/IEC 16022 Data Matrix quality checking.

## Related Manuals

Model	Part Number	Manual
V460-H	83-9500161-01	V460-H ReadMeFirst
	Z461 (84-9000460-02)	V460-H Handheld Code Reader User Manual
	Z462 (84-9350052-02)	V460-H Handheld Code Reader Communication Manual
	84-9200006-03	WebLink <sub>HH</sub> Help (Accessible from the Help menu in the WebLink <sub>HH</sub> user interface)

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