

Using the Large Linear Verification Kit

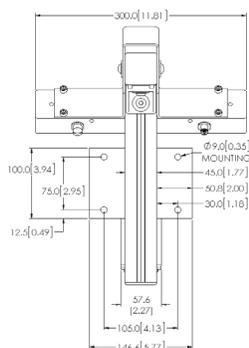
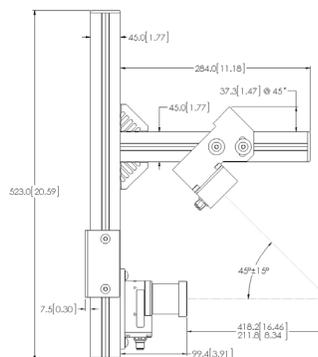
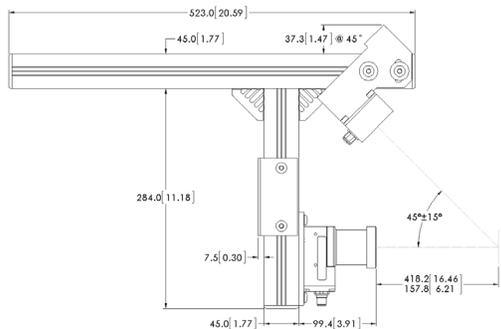


Purpose

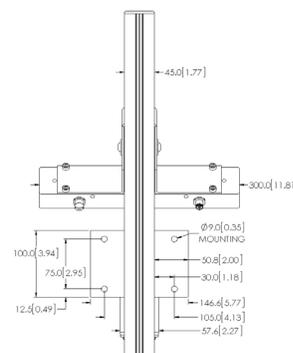
This document provides guidance to users of the **Large Linear Verification Kit**, part number **SLN-0000006**. The kit consists of a light, bracket, smart camera, lens, and other accessories required to implement a verification system that is compliant with the requirements of **ISO/IEC 15416 – Bar Code Print Quality Test Specification**, or a custom verification configuration.

Kit Contents

Part Number	Quantity	Description
NER-011660301G	1	NERLITE Smart Series MAX 300, Red, Wide, M12 connector
GMV-6800-1034G	1	Vision HAWK C-Mount Smart Camera, WUXGA Mono, AutoVISION+Verification/OCV
98-000265-02	1	AutoVISION Verification Calibration Card
98-000268-01	1	Accessory, Bracket, Smart Series MAX 300 to Vision Hawk or QX Hawk C-Mount
98-000259-01	1	Lens 25mm F/1.4-16, Front Thread 27mm P 0.5mm, 2/3" C-Mount
98-000218-01	1	Lens Protection Housing, Standard Length (up to 48mm)
83-9220128-01	1	User Documentation



Configuration 1



Configuration 2

Accessories

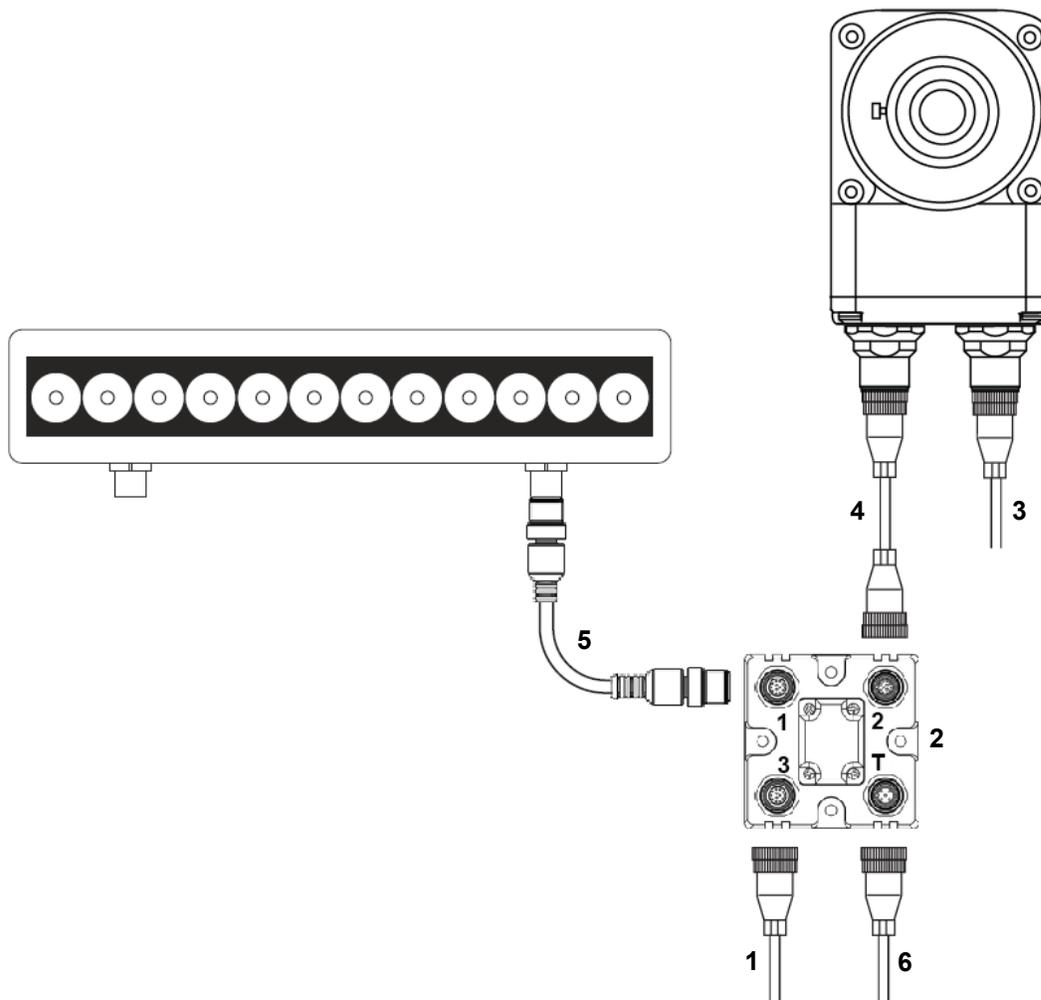
The required accessories are an Ethernet cable for the camera, a power supply, and power cables for the camera and lighting.

The selection of accessories depends on the details of the installation, such as required cable length, availability of suitable power, and whether the installation will employ continuous or strobed lighting.

The minimum set of accessories required to complete a bench-top installation is shown below. In the configuration shown, the Vision HAWK camera and the illuminator share a power supply via a QX-1 Connection Block.

Accessories – Hardware Configuration

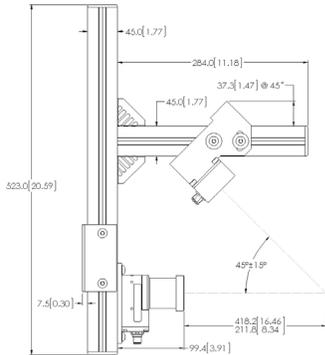
Item	Function	Part Number	Description
1	Camera/Light Power Supply	97-000012-01	Power Supply, 100-240VAC, +24 VDC, M12 12-pin Socket (Screw-On)
2	Connection Block	98-000103-02	QX-1 Connection Block
3	Ethernet Cable	61-000163-02	QX Cordset, Host, Ethernet, M12 8-pin Plug (Screw-On) to RJ45, 3 m
4	Camera Power and Signal Cable	61-000148-02	QX Cordset, Common, M12 12-pin, Socket (Screw-On) to M12 12-pin Plug (Screw-On), 3 m
5	Continuous Lighting Cable or	61-000204-01	Cable, Power, Smart Series to QX-1
	Strobe Lighting Cable	61-000218-01	Cable, Smart Series to QX-1, Strobe, NPN
6	Photo Sensor (Optional)	99-000020-02	Trigger, M12 4-pin Plug, NPN, Dark On, 2 m



Mounting Positions

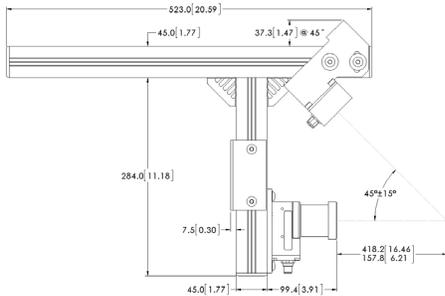
The Large Linear Verification Kit is designed to provide flexibility in the mounting of the camera and the lighting elements of the system while maintaining the 45 degree lighting angle required by the ISO specification. The principal mounting components are two aluminum extrusions (“long” and “short”) and accessory items provided in the **MAX 300 Bracket Kit (P/N 98-000268-01)**. The “long” and “short” extrusions can be assembled in two different configurations for additional flexibility.

In one configuration the “long” extrusion is the vertical element. It is used to mount the camera by means of the supplied mounting plate. The “short” extrusion mounts the light by means of the supplied angle bracket.



In the other configuration the “short” extrusion is the vertical element. It is used to mount the camera by means of the supplied mounting plate. The “long” extrusion will mount the light by means of the supplied angle bracket.

Note: The second configuration allows for shorter working distances and, therefore, a smaller field of view.



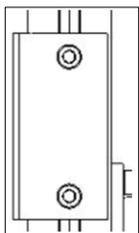
Mounting Options and Hardware

The **MAX 300 Bracket Kit** contains two **L brackets** and associated fasteners that can be used to mount the kit to a customer-supplied mounting location. The L brackets attach to slots in the extruded rail by means of supplied machine screws and T nuts.

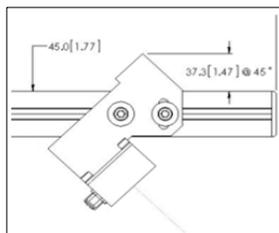
The bracket kit also contains a **lighting mount bracket** and associated fasteners which are used to mount the light on the appropriate extrusion.

The camera is mounted by means of a supplied camera mounting plate and associated hardware.

Note: See the *NERLITE Smart Series MAX 300 Bracket Kit Quick Start Guide (P/N 83-9200056-02)* in Microscan’s Download Center at www.microscan.com and on the Microscan Tools Drive (P/N 37-000010-01) for more detailed information about mounting options and hardware. The guide is also available in printed form in the MAX 300 Bracket Kit (P/N 98-00026801).



L Bracket



Lighting Mount Bracket

Applicability to Verification Standards

The Large Linear Verification Kit supplies a camera and lighting configuration that is consistent with the requirements of **ISO 15416 (Information Technology – Automatic Identification and Data Capture Techniques – Bar Code Print Quality Test Specification – Linear Symbols)**. **AutoVISION 2.0 / Visionscape 6.0** and higher support the grading methodologies defined in these standards for the following 1D symbologies:

Symbology Types
Code 39
Code 128
I2-5
UPC/EAN
Code 93
GS1 DataBar

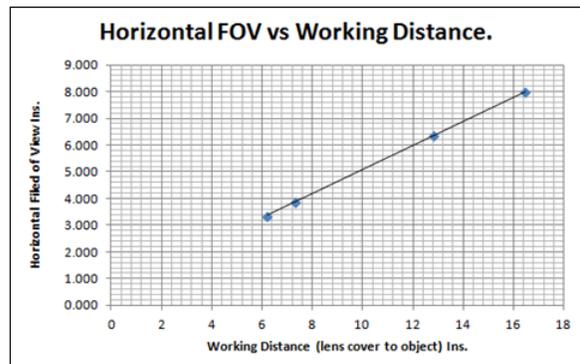
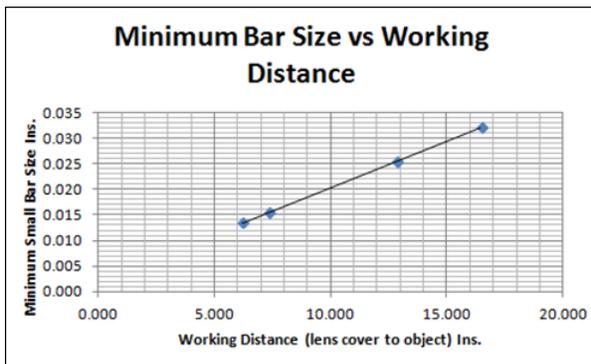
The constraints on the use of the system in terms of **maximum symbol size** and **minimum size of the narrow bar** are reflected in the table below. In the case of large symbols, care must be taken to include the quiet zone within the area that is evenly illuminated. For small symbols, the configuration chosen must ensure that at least **8 pixels** cover the width of the smallest symbol element. The minimum 1D symbol element (cell size) that will give the required number of pixels per element with the supplied camera and lens is as follows:

	Distance (Lens Cover to Symbol) in Inches	Width of Field of View (FOV) in Inches	Minimum Symbol Size – Narrow Bar in Inches
Minimum Field of View (FOV) / Smallest Symbol Element	6.2	3.4	0.014
Largest Field of View (FOV) with Even Lighting	16.5	8.0	0.032

Lighting Configurations

The ISO 15416 standard reference geometry specifies that the camera must be mounted perpendicular to the symbol surface. The reference geometry also requires that the code be illuminated at an angle of 45 degrees. The ISO 15416 grading process will result in a significantly reduced grade if all parts of the symbol do not receive the same degree of illumination. Great care should be taken to ensure that even illumination is achieved along the length of the symbol and over the two quiet zones.

The minimum narrow bar size required to achieve the minimum recommended resolution of 8 pixels per narrow bar is shown below in the **Minimum Bar Size vs. Working Distance** chart. The field of view sizes that can be achieved with the Vision HAWK Smart Camera and lens combination included with the Large Linear Verification Kit are shown in the **Horizontal FOV vs. Working Distance** chart.



Alternate Configuration for Small Symbols

The ISO 15416 standard for 1D verification calls for a single source of oblique (45 degree) illumination in the reference configuration. If called upon to verify symbols with narrow bar sizes that are smaller than those that can be graded with the Large Linear Verification Kit, you may find that the **1D/2D Label Verification Kit** (P/N **SLN-0000005**) can be usefully applied to the verification of 1D symbols that are small enough to fit into the (white LED) Pharamalite's **2.00" (50.8 mm) x 1.06" (27.0 mm)** field of view, provided that strict adherence to the reference geometry and lighting wavelength is not required. As before, care should be taken to ensure even illumination of the symbol. The Pharamalite configuration's minimum 1D symbol narrow bar width is **0.012 inches**.

Operation

The wavelength of the illumination provided by the MAX 300 is **625 nm**. This value, along with the lighting angle, should be included in any formal grading report and should be entered into the Symbol Quality Verification Tool in AutoVISION.

Configuration and use of AutoVISION verification is covered in detail in the **Symbol Quality Verification Tool** section of the *AutoVISION Software User Manual* ("autovisionmanual.pdf", located in **C:\Microscan\Vscape\Documentation** after AutoVISION installation) and also in AutoVISION Help, which can be accessed from the **File** menu in AutoVISION software.