VIM-303 Vision Guidance System

- 3D Camera
- 2D Camera
- Illumination
- Vision Processing
- Robot Control

In one compact package

VIM-303 is a ground breaking 3D vision guidance system that directly controls robotic arms and attached end effectors for pick and place, assembly, machine tending, inspection, and other vision guidance applications.

VIM-303 combines a 3D camera, a high resolution 2D camera, illumination, and embedded high performance vision processing and robot guidance into one compact package.

Vision-in-Motion™ technology, developed by Visual Robotics, enables tracking and picking of moving objects without a conveyor encoder.

Global shutter stereo cameras, a 12MP color autofocus camera, pulsed LED illumination, active stereo IR projectors, Gigabit Ethernet with PoE, powerful video processing with the Movidius Myriad X, and on-board robot control provide a high-performance industrial solution, designed for robotics.

Powerful object detectors (finders) locate objects based on their 3D shape and dimensions, or by matching the object to a reference image (template matching). Images from the high-resolution color camera can be used to read barcodes, inspect for defects, or measure features.

VIM-303 incorporates semlessly with the Universal Robots brand of robot arms. The included UR Cap adds vision guidance capability to the native PolyScope graphical programming environment. More complex functionality is possible using the XML-RPC API, allowing users to program in Python, C++ or Java. Users new to robotics can use our no-code programming method with *QuickPick-303* using Blockly.

Sample Object Detection

Rear View, showing mounting and M12 Ethernet

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Specifications

3D Camera		
Technology	Active Stereo	
Resolution	1280 x 800 (1 Megapixel)	
Frame Rate	60 FPS	
Type	Monochrome Global Shutter	
Focus	Fixed Focus 2.8mm f/2.8	
Field of View	75° x 51°	
Monocular DOF	80 mm – Infinity	
	Near Field	Far Field
Working Range	240 mm	2,000 mm
Lateral Precision	0.6 mm	5 mm
Depth Precision	1 mm	20 mm

2D Color Autofocus Camera	
Resolution	4056 x 3040 (12 Megapixel)
Frame Rate	30 FPS
Type	Color Rolling Shutter
Focus	Auto Focus 4.52 mm f/2.0
Field of View	69° x 54°
Depth of Field	80 mm - Infinity
Precision	0.05 mm at 80 mm

Illumination	
Ring Light	Integrated uniform light source Diffuse white LED ring Pulsed to freeze motion 4 independently activatable zones Ideal for glare reduction
Texture Projector	Provides texture for active stereo 850 nm Class 1 IR laser DOE 71° x 51° FWHM 11,000 dots Pulsed to freeze motion

Processing	
Vision Processor	Movidius Myriad X VPU Total processing power 4 TOPS Neural Compute Engine 1 TOPS Stereo Depth Correlation Engine 16 SHAVE processors (GPU) 500MB on-board LPDDR3 DRAM YOLOv6-N (416x416) at 65 FPS
Core Processor	Quad core 1.5GHz ARM Cortex-A72 1GB - 8GB on-board DRAM 32GB non-volatile flash memory
IMU	6 axis Inertial Measurement Unit
Interface	Gigabit Ethernet
Operating System	Linux

Electrical	
Power	Power over Ethernet (PoE)
PoE Class	802.3at Type 2 Class 4
Power Consumption	< 15 Watts
Emissions	FCC Class B

Mechanical	
Size	125.5 x 57.5 x 56.8 mm
Weight	485 grams
Connector	M12 Industrial Ethernet
Mounting	Rear or Tripod Mount
IP Rating	IP65/67

Image Control	
Illumination Control	Brightness Illumination Ring Zones Texture Projector
Camera Control	Resolution Exposure Focus
Image Outputs	- 2D (high resolution color) - 3D Depth - Images time synchronized and stamped with camera position

Object Detection "Finders"	
Depth	Match object's 3D dimensions
Template	Match features in an image Single image template

Tracking and Robot Control	
Object Motion	Stationary Constant Speed Arbitrary Motion
Method	Tracks objects visually within FOV without conveyor encoder
Object Speed (max)	500 mm/s
Typical Applications	Depalletizing Palletizing Conveyor Picking Sorting Boxing Kitting Assembly

User Interface and Programming	
User Interface	PolyScope with UR Cap Web Interface *QuickPick-303*
Programming	PolyScope Blockly XML-RPC (Python, C++, Java)

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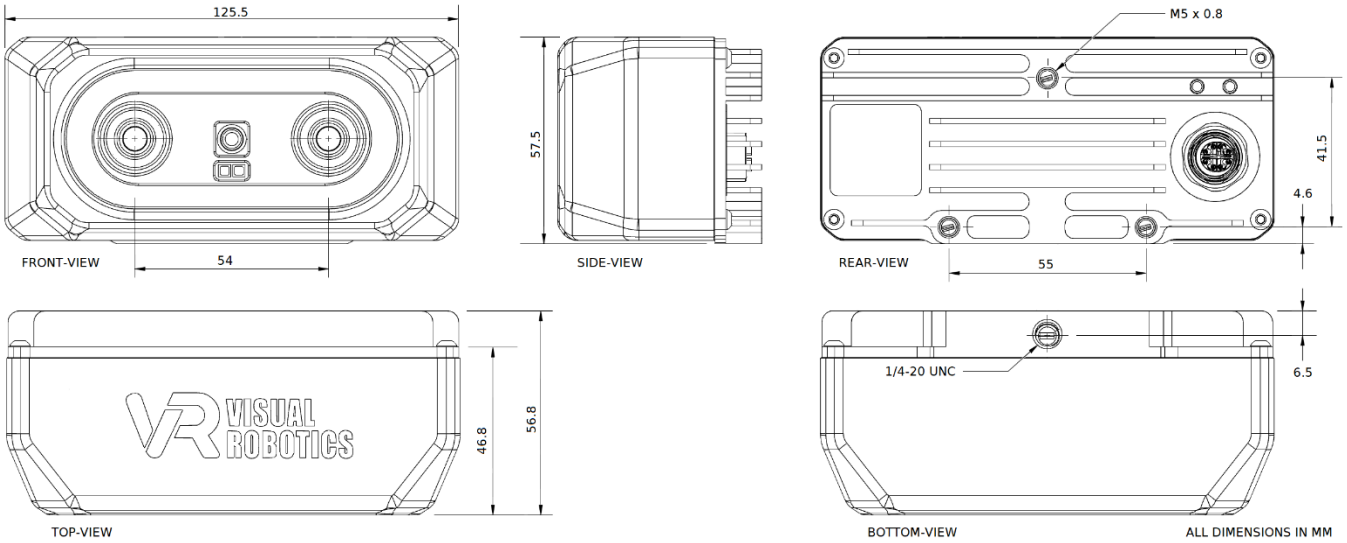
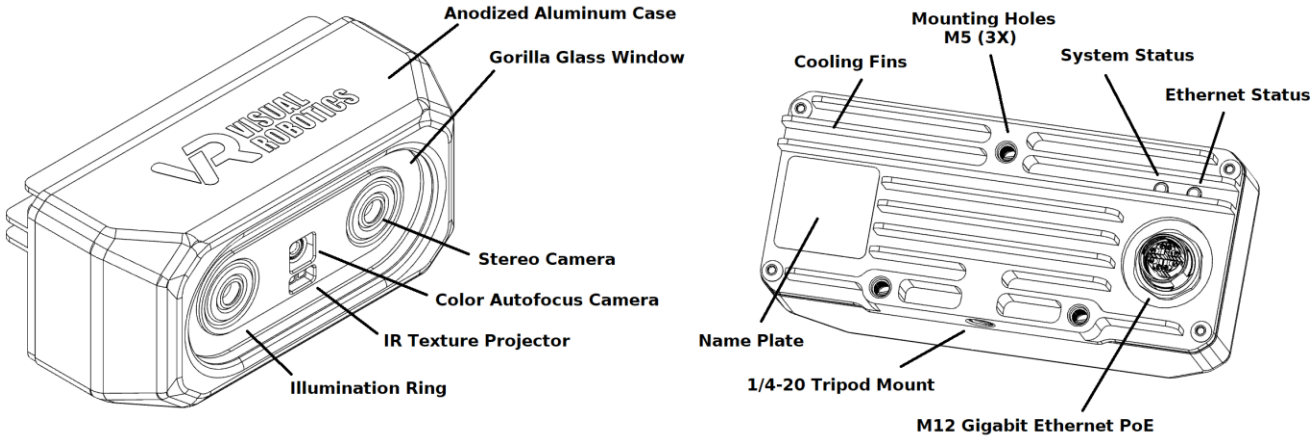
Dimensions



Physical Layout



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VIM-303 Complete Kit (KIT-116-V01)

The Kit includes everything you need to add vision guidance to a Universal Robots robot arm. Contents include a camera mount, a 5m high-flex M12-RJ45 Gigabit Ethernet Cable, a suction gripper kit, and a PoE switch to power the camera that can be mounted inside the Universal Robots controller cabinet.

Camera Mount

Ethernet Cable

PoE Switch

Suction Gripper Kit

VIM-303 Camera and Suction Gripper mounted on Universal Robots arm